Appendix A: Training and Testing Activities Descriptions

Supplemental Environmental Impact Statement/ Overseas Environmental Impact Statement Mariana Islands Training and Testing

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APPENDIX A TRAINING AND TESTING ACTIVITIES DESCRIPTIONS

A.1 TRAINING ACTIVITIES

The Navy's training activities are organized generally into eight primary mission areas and a miscellaneous category (Other Training) that includes those activities that do not fall within a primary mission area, but are an essential part of Navy training. In addition, because the Navy conducts a number of activities within larger training exercises, descriptions of those larger exercises are also included here. It is important to note that these larger exercises are comprised entirely of individual activities described in the primary mission areas.

A.1.1 MAJOR TRAINING EXERCISES

A major training exercise is comprised of several "unit level" range exercises conducted by several units operating together while commanded and controlled by a single commander. These exercises typically employ an exercise scenario developed to train and evaluate the strike group in naval tactical tasks. In a major training exercise, most of the operations and activities being directed and coordinated by the strike group commander are identical in nature to the operations conducted during individual, crew, and smaller-unit training events. In a major training exercise, however, these disparate training tasks are conducted in concert, rather than in isolation.

Major training exercises are listed below.

A.1.1.1 Joint Expeditionary Exercise

Major Training Exercises – Medium Integrated Anti-Submarine Warfare			
Joint Expeditionary Exercise			
Short Description	Typically a 10-day exercise that could include a Carrier Strike Group and Expeditionary Strike Group, Marine Expeditionary Units, Army Infantry Units, and Air Force aircraft together in a joint environment that includes planning and execution efforts as well as military training activities at sea, in the air, and ashore.	**Typical Duration** 10 days	
Long Description	Advanced joint level battle group and expeditionary amphibious warfare exercise designed to create a cohesive Carrier and Expeditionary Strike Group. Typically 15 surface ships, amphibious assault craft, helicopters, maritime patrol aircraft, strike fighter aircraft, two submarines, and various unmanned vehicles. More than 8,000 personnel may participate and could include the combined assets of a Carrier Strike Group and Expeditionary Strike Group, Marine Expeditionary Units, Army Infantry Units, and Air Force aircraft.		
Typical Components	**Platforms:** Aircraft carrier, amphibious warfare ship, fixed-wing aircraft, rotary-wing aircraft, support craft, surface combatant **Targets:** Submarines **Systems being Trained/Tested:** Mid-frequency sonar systems, sonobuoys		
Standard Operating Procedures *(Section 2.3.3)*	Aircraft safety Towed in-water device safety Vessel safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area Mariana Islands Range Complex	**Bays/Estuaries/Pierside:** Apra Harbor
Stressors to Biological Resources	**Acoustic:** Sonar and other transducers Aircraft noise Weapons noise Vessel noise **Explosive:** In-air explosions In-water explosions	**Physical Disturbance and Strike:** Aircraft and aerial targets Vessel and in-water devices Military expended materials **Ingestion:** Military expended materials – munitions Military expended materials – other than munitions	**Energy:** In-air electromagnetic devices In-water electromagnetic devices **Entanglement:** Decelerator/Parachutes Wires and cables
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Metals Explosives Other materials Chemicals	
Stressors to Human Resources	**Cultural Resources:** Physical disturbance and strike Explosives	**Socioeconomic Resources:** Accessibility Physical disturbance and strike Airborne acoustics	**Public Health and Safety:** In-water energy In-air energy Physical interactions

Major Training Exercises – Medium Integrated Anti-Submarine Warfare			
Joint Expeditionary Exercise			
Military Expended Material	**Ingestible Material:** Decelerators/parachutes - small **Non-Ingestible Material:** Expended bathythermograph, expended bathythermograph wire, sonobuoy (non-explosive), sonobuoy wires	**Military Recoverable Material**	None
Sonar and Other Transducer Bins	**Mid-Frequency:** MF1 MF4 MF5 MF12	**Anti-Submarine Warfare:** ASW2 ASW3	
Explosive Bins	None. Presented in appropriate worksheets for unit-level activities that could be conducted during this exercise.		
Procedural Mitigation Measures	**Acoustic Stressors:** *(Section 5.3.2)* Active sonar	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement Towed in-water devices	
Assumptions Used for Analysis	All military expended materials, ordnance, and explosives use is included in individual events. Additional activities utilizing sources not listed in the Sonar and Other Transducer Bins section above may occur during this exercise. All acoustic sources which may be used during training and testing activities have been accounted for in the modeling and analysis presented in this SEIS/OEIS.		

A.1.1.2 Joint Multi-Strike Group Exercise

Major Training Exercises			
Joint Multi-Strike Group Exercise – Large Integrated Anti-Submarine Warfare			
Short Description	Typically a 10-day Joint exercise, in which up to three carrier strike groups would conduct training exercises simultaneously.	**Typical Duration** 10 days	
Long Description	The Joint Multi-Strike Group Exercise demonstrates the Navy's ability to operate a large naval force of up to three Carrier Strike Groups in coordination with other Services. In addition to this joint warfare demonstration, it also fulfills the Navy's requirement to maintain, train, and equip combat-ready naval forces capable of winning wars, deterring aggression, and maintaining freedom of the seas. The exercise would involve Joint assets engaging in a "free play" battle scenario, with U.S. forces pitted against a replicated opposition force. The exercise provides realistic in-theater training.		
Typical Components	**Platforms:** Aircraft carrier, fixed-wing aircraft, rotary-wing aircraft, submarines, surface combatant **Targets:** Sub-surface targets **Systems being Trained/Tested:** High and mid-frequency sonar systems, sonobuoys		
Standard Operating Procedures *(Section 2.3.3)*	Aircraft safety Towed in-water device safety Vessel safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area Mariana Islands Range Complex	**Bays/Estuaries/Pierside:** Apra Harbor
Stressors to Biological Resources	**Acoustic:** Sonar and other transducers Aircraft noise Vessel noise Weapons noise **Explosive:** In-air explosions In-water explosions	**Physical Disturbance and Strike:** Aircraft and aerial targets Vessel and in-water devices Military expended materials **Ingestion:** Military expended materials – other than munitions	**Energy:** In-air electromagnetic devices In-water electromagnetic devices **Entanglement:** Decelerator/Parachutes Wires and cables
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Metals Explosives Other materials Chemicals	
Stressors to Human Resources	**Cultural Resources:** Physical disturbance and strike Explosives	**Socioeconomic Resources:** Accessibility Physical disturbance and strike Airborne acoustics	**Public Health and Safety:** In-water energy In-air energy Physical interactions
Military Expended Material	**Ingestible Material:** Decelerators/parachutes - small **Non-Ingestible Material:** Acoustic countermeasures, expended bathythermograph, expended bathythermograph wire, sonobuoy (non-explosive), sonobuoy wires	**Military Recoverable Material**	None
Sonar and Other Transducer Bin	**Mid-Frequency:** MF1 MF3 MF4 MF5 MF11 MF12	**Anti-Submarine Warfare:** ASW2 ASW3 ASW4	**High-Frequency:** HF1

Major Training Exercises		
Joint Multi-Strike Group Exercise – Large Integrated Anti-Submarine Warfare		
Explosive Bins	None. Presented in appropriate worksheets for unit-level activities that could be conducted during this exercise.	
Procedural Mitigation Measures	**Acoustic Stressors:** *(Section 5.3.2)* Active sonar	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement Towed in-water devices
Assumptions Used for Analysis	All military expended materials, ordnance, and explosive use is included in individual events. Additional activities utilizing sources not listed in the Sonar and Other Transducer Bins section above could be used during this exercise, and details can be found in the worksheets for those explosive events. All acoustic sources which may be used during training and testing activities have been accounted for in the modeling and analysis presented in this SEIS/OEIS.	

A.1.2 AIR WARFARE TRAINING

Air warfare is the primary mission area that addresses combat operations by air and surface forces against hostile aircraft. Navy ships contain an array of modern anti-aircraft weapon systems, including naval guns linked to radar-directed fire-control systems, surface-to-air missile systems, and radar-controlled guns for close-in point defense. Strike/fighter aircraft carry anti-aircraft weapons, including air-to-air missiles and aircraft guns. Air warfare training encompasses events and exercises to train ship and aircraft crews in employment of these weapons systems against simulated threat aircraft or targets. Air warfare training includes surface-to-air gunnery, surface-to-air and air-to-air missile exercises, and aircraft force-on-force combat maneuvers.

A.1.2.1 Air Combat Maneuver

Air Warfare			
Air Combat Maneuver (ACM)			
Short Description	Aircrews engage in flight maneuvers designed to gain a tactical advantage during combat.	**Typical Duration** 1–2 hours	
Long Description	Basic flight maneuvers in which fixed-wing aircrew engage in offensive and defensive maneuvering against each other. During air combat maneuver engagements, no ordnance is fired, however, countermeasures such as chaff and flares may be used. These maneuvers typically involve two aircraft; however, based upon the training requirement, air combat maneuver exercises may involve over a dozen aircraft.		
Typical Components	**Platforms:** Fixed-wing aircraft **Targets:** Aircraft targets **Systems being Trained/Tested:** None		
Standard Operating Procedures *(Section 2.3.3)*	Aircraft safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area, Primary areas: Special Use Airspace	**Bays/Estuaries/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Aircraft noise **Explosive:** None	**Physical Disturbance and Strike:** Aircraft and aerial targets **Ingestion:** None	**Energy:** In-air electromagnetic devices **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Metals	
Stressors to Human Resources	**Cultural Resources:** None	**Socioeconomic Resources:** Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** None
Military Expended Material	**Ingestible Material:** None **Non-Ingestible Material:** None	**Military Recoverable Material**	None
Sonar and Other Transducer Bins	None		
Explosive Bins	None		
Procedural Mitigation Measures	None		
Assumptions Used for Analysis	No munitions fired. Flare and chaff may be used. All flare and chaff accounted for in flare exercise and chaff exercise events. This activity occurs greater than 12 NM from land (FDM excepted).		

A.1.2.2 Air Defense Exercise

Air Warfare			
Air Defense Exercise (ADEX)			
Short Description	Aircrew and ship crews conduct defensive measures against threat aircraft or simulated missiles.	**Typical Duration** 1–4 hours	
Long Description	Aircrew and ship personnel perform measures designed to defend against attacking threat aircraft or missiles or reduce the effectiveness of such attack. This exercise involves full detection through engagement sequence. Aircraft operate at varying altitudes and speeds. This exercise may include Air Intercept Control exercises that involve aircraft controllers on vessels, in fixed-wing aircraft, or at land-based locations use search radars to track and direct friendly aircraft to intercept the threat aircraft, and Detect to engage exercises in which personnel on vessels use search radars in the process of detecting, classifying, and tracking enemy aircraft or missiles up to the point of engagement.		
Typical Components	**Platforms:** Surface vessels, fixed-wing aircraft **Targets:** Aircraft targets **Systems being Trained/Tested:** None		
Standard Operating Procedures *(Section 2.3.3)*	Vessel safety Aircraft safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area, Primary areas: Special Use Airspace	**Bays/Estuaries/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Aircraft noise Vessel noise **Explosive:** None	**Physical Disturbance and Strike:** Aircraft and aerial targets Vessels and in-water devices **Ingestion:** None	**Energy:** In-air electromagnetic devices **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** None	
Stressors to Human Resources	**Cultural Resources:** Physical disturbance and strike	**Socioeconomic Resources:** Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** Physical interactions
Military Expended Material	**Ingestible Material:** None **Non-Ingestible Material:** None	**Military Recoverable Material**	None
Sonar and Other Transducer Bins	None		
Explosive Bins	None		

Air Warfare	
Air Defense Exercise (ADEX)	
Procedural Mitigation Measures	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement
Assumptions Used for Analysis	No munitions are fired.

A.1.2.3 Air Intercept Control

Air Warfare			
Air Intercept Control (AIC)			
Short Description	Aircrew and air controllers conduct aircraft intercepts of other aircraft.	**Typical Duration** 1–2 hours	
Long Description	Fighter jet aircrews maneuver to defend against threat aircraft. An event involves two or more fighter aircraft.		
Typical Components	**Platforms:** Fixed-wing aircraft **Targets:** Aircraft Targets **Systems being Trained/Tested:** None		
Standard Operating Procedures *(Section 2.3.3)*	Aircraft safety	**Typical Locations**	
		Range Complexes/Testing Ranges: Mariana Islands Training and Testing Study Area, Primary areas: Special Use Airspace	**Bays/Estuaries/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Aircraft noise **Explosive:** None	**Physical Disturbance and Strike:** Aircraft and aerial targets **Ingestion:** None	**Energy:** None **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** None	
Stressors to Human Resources	**Cultural Resources:** None	**Socioeconomic Resources:** Airborne acoustics Physical Disturbance and Strike	**Public Health and Safety:** None
Military Expended Material	**Ingestible Material:** None **Non-Ingestible Material:** None	**Military Recoverable Material**	None
Sonar and Other Transducer Bins	None		
Explosive Bins	None		
Procedural Mitigation Measures	None		
Assumptions Used for Analysis	No munitions are fired. This activity would occur greater than 12 NM from land (FDM excepted).		

A.1.2.4 Gunnery Exercise Air-to-Air Medium-Caliber

Air Warfare			
Gunnery Exercise Air-to-Air Medium-Caliber (GUNEX A-A)			
Short Description	Fixed-wing aircrews fire medium-caliber guns at air targets.	**Typical Duration** 1–2 hours	
Long Description	Fixed-wing aircrews maneuver aircraft in a gunnery pattern to achieve a weapons firing solution with integrated medium-caliber guns. Typically involves two or more fixed-wing aircraft and a target banner towed by a contract aircraft (e.g., Lear jet). The target banner is recovered after the event.		
Typical Components	**Platforms:** Fixed-wing aircraft **Targets:** Air targets **Systems being Trained/Tested:** None		
Standard Operating Procedures *(Section 2.3.3)*	Aircraft safety Weapons firing safety Target deployment and retrieval safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area, Primary areas: Special Use Airspace	**Bays/Estuaries/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Aircraft noise Weapons noise **Explosive:** None	**Physical Disturbance and Strike:** Aircraft and aerial targets Military expended materials **Ingestion:** Military expended materials – munitions	**Energy:** In-air electromagnetic devices **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Metals	
Stressors to Human Resources	**Cultural Resources:** Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** Physical interactions
Military Expended Material	**Ingestible Material:** Medium-caliber projectiles (non-explosive), medium-caliber casings **Non-Ingestible Material:** None	**Military Recoverable Material**	Air target (towed target)
Sonar and Other Transducer Bins	None		
Explosive Bins	None		
Procedural Mitigation Measures	None		

Air Warfare	
Gunnery Exercise Air-to-Air Medium-Caliber (GUNEX A-A)	
Assumptions Used for Analysis	This activity is conducted at an altitude of 15,000 feet and above, during the daytime, and beyond 12 nautical miles from shore (FDM excepted). A towed air target is a banner target and will be recovered. Only non-explosive munitions used.

A.1.2.5 Gunnery Exercise Surface-to-Air Large Caliber

Air Warfare			
Gunnery Exercise Surface-to-Air Large-Caliber (GUNEX S-A)			
Short Description	Surface ship crews fire large-caliber guns at air targets.	**Typical Duration** Up to 3 hours	
Long Description	Surface ship crews defend against threat aircraft or missiles with large-caliber guns to disable or destroy the threat. An event involves one ship and a simulated threat aircraft or missile that is detected by the ship's radar. Large-caliber guns fire explosive and non-explosive projectiles at the threat before it reaches the ship. The target is towed by a contract air services jet.		
Typical Components	**Platforms:** Surface combatant **Targets:** Air targets **Systems being Trained/Tested:** None		
Standard Operating Procedures *(Section 2.3.3)*	Aircraft safety Weapons firing safety Vessel safety Target deployment and retrieval safety	**Typical Locations**	
		Range Complexes/Testing Ranges: Mariana Islands Training and Testing Study Area, Primary areas: Special Use Airspace	**Bays/Estuaries/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Aircraft noise Weapons noise Vessel noise **Explosive:** In-air explosions	**Physical Disturbance and Strike:** Aircraft and aerial targets Vessels and in-water devices Military expended materials **Ingestion:** Military expended materials – munitions	**Energy:** In-air electromagnetic devices **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Metals Explosives Other materials	
Stressors to Human Resources	**Cultural Resources:** Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** Physical interactions In-air energy
Military Expended Material	**Ingestible Material:** Large-caliber projectile (explosive) fragments **Non-Ingestible Material:** Large-caliber casings, Large-caliber projectile (non-explosive)	**Military Recoverable Material**	Air targets (towed target)
Sonar and Other Transducer Bins	None		
Explosive Bins	None. Only in-air detonations.		

Air Warfare		
Gunnery Exercise Surface-to-Air Large-Caliber (GUNEX S-A)		
Procedural Mitigation Measures	**Acoustic Stressors** *(Section 5.3.2)* Weapons firing noise	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement
Assumptions Used for Analysis	The target is a fiberglass-finned target that is towed approximately 3 nautical miles behind the towing aircraft. All projectiles are assumed to be non-explosive or explode in-air well above the water's surface. This activity would occur greater than 12 NM from land (FDM excepted).	

A.1.2.6 Gunnery Exercise Surface-to-Air Medium-Caliber

Air Warfare			
Gunnery Exercise Surface-to-Air Medium-Caliber (GUNEX S-A)			
Short Description	Surface ship crews fire medium-caliber guns at air targets.	**Typical Duration** 1–2 hours	
Long Description	Surface ship crews defend against threat aircraft or missiles with medium-caliber guns to disable or destroy the threat. An event involves one ship and a simulated threat aircraft or anti-ship missile that is detected by the ship's radar. Medium-caliber guns fire non-explosive projectiles to disable or destroy the threat before it reaches the ship. The target is towed by a contract air services jet.		
Typical Components	**Platforms:** Aircraft carrier, amphibious warfare ship, surface combatant **Targets:** Air targets **Systems being Trained/Tested:** None		
Standard Operating Procedures *(Section 2.3.3)*	Aircraft safety Weapons firing safety Vessel safety Target deployment and retrieval safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area, Primary areas: Special Use Airspace	**Bays/Estuaries/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Aircraft noise Vessel noise Weapons noise **Explosive:** None	**Physical Disturbance and Strike:** Aircraft and aerial targets Vessels and in-water devices Military expended materials **Ingestion:** Military expended materials – munitions	**Energy:** In-air electromagnetic devices **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Metals	
Stressors to Human Resources	**Cultural Resources:** Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** Physical interactions
Military Expended Material	**Ingestible Material:** Medium-caliber projectiles (non-explosive), medium-caliber casings **Non-Ingestible Material:** None	**Military Recoverable Material**	Air targets (towed target)
Sonar and Other Transducer Bins	None		
Explosive Bins	None		
Procedural Mitigation Measures	None		

Air Warfare	
Gunnery Exercise Surface-to-Air Medium-Caliber (GUNEX S-A)	
Assumptions Used for Analysis	The target is a fiberglass finned target that is towed approximately 3 nautical miles behind the towing aircraft. The target is typically recovered but may be damaged, resulting in target fragments or loss of target. This activity would occur greater than 12 NM from land (FDM excepted).

A.1.2.7 Missile Exercise Air-to-Air

Air Warfare			
Missile Exercise Air-to-Air (MISSILEX A-A)			
Short Description	Fixed-wing aircrews fire air-to-air missiles at air targets.	**Typical Duration** 1–2 hours	
Long Description	An event involves two or more fixed-wing aircraft and a target. Missiles are either high-explosive warheads or non-explosive practice munitions. The target is an unmanned aerial target drone, a tactical air-launched decoy, or a parachute suspended illumination flare. Target drones deploy parachutes and are recovered by small boat or rotary-wing aircraft. Missiles may also be employed when training against threat missiles. These events typically occur at high altitudes.		
Typical Components	**Platforms:** Fixed-wing aircraft, support craft **Targets:** Air targets **Systems being Trained/Tested:** None		
Standard Operating Procedures *(Section 2.3.3)*	Aircraft safety Weapons firing safety Vessel safety Target Deployment and Retrieval Safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area, Primary areas: Special Use Airspace	**Bays/Estuaries/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Aircraft noise Vessel noise Weapons noise **Explosive:** In-air explosions	**Physical Disturbance and Strike:** Aircraft and aerial targets Vessels and in-water devices Military expended materials **Ingestion:** Military expended materials – munitions Military expended materials – other than munitions	**Energy:** In-air electromagnetic devices **Entanglement:** Decelerators/parachutes
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Explosives Chemicals Metals	
Stressors to Human Resources	**Cultural Resources:** Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** Physical interactions
Military Expended Material	**Ingestible Material:** Missile (explosive) fragments **Non-Ingestible Material:** Air target (decoy), illumination flares, decelerators/parachutes – medium and large, end caps, o-ring, air-launched decoy, or illumination flare, (see Figure A-1 and Figure A-2)	**Military Recoverable Material**	Air targets (drones, see Figure A-3)

Air Warfare	
Missile Exercise Air-to-Air (MISSILEX A-A)	
Sonar and Other Transducer Bins	None
Explosive Bins	None. Only in-air detonations.
Procedural Mitigation Measures	None
Assumptions Used for Analysis	Assumes that all missiles are explosive, although non-explosive practice munitions may be used. All missiles explode at high altitude. All propellant and explosives are consumed. Tactical air-launched decoys and illumination flares are expended and not recovered. This activity would occur greater than 12 NM from land (FDM excepted).

Figure A-1: BQM-74 (Aerial Target)

Figure A-2: LUU-2B/B Illuminating Flare (Aerial Target)

Figure A-3: Tactical Air-Launched Decoy (Aerial Target)

A.1.2.8 Missile Exercise Surface-to-Air

Air Warfare			
Missile Exercise Surface-to-Air (MISSILEX S-A)			
Short Description	Surface ship crews fire surface-to-air missiles at air targets.	**Typical Duration** 1–2 hours	
Long Description	Surface ship crews defend against threat missiles and aircraft with ship-launched surface-to-air missiles. The event involves a simulated threat aircraft or anti-ship missile which is detected by the ship's radar. Ship-launched surface-to-air missiles are fired (high-explosive) to disable or destroy the threat. The target typically is a remote-controlled drone. Surface-to-air missiles may also be used to train against land attack missiles.		
Typical Components	**Platforms:** Aircraft carrier, amphibious warfare ship, rotary-wing aircraft, surface combatant **Targets:** Air targets **Systems being Trained/Tested:** None		
Standard Operating Procedures *(Section 2.3.3)*	Aircraft safety Weapons firing safety Vessel safety Target deployment and retrieval safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area, Primary areas: Special Use Airspace	**Bays/Estuaries/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Aircraft noise Vessel noise Weapons noise **Explosive:** In-air explosions	**Physical Disturbance and Strike:** Aircraft and aerial targets Vessels and in-water devices Military expended materials **Ingestion:** Military expended materials – munitions Military expended materials – other than munitions	**Energy:** In-air electromagnetic devices **Entanglement:** Decelerators/parachutes
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Explosives Metals Chemicals	
Stressors to Human Resources	**Cultural Resources:** Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** Physical interactions
Military Expended Material	**Ingestible Material:** Missile (explosive) fragments **Non-Ingestible Material:** Decelerators/parachutes – medium and large	**Military Recoverable Material**	Air targets (decoy or drone)
Sonar and Other Transducer Bins	None		
Explosive Bins	None. Only in-air detonations.		

Air Warfare	
Missile Exercise Surface-to-Air (MISSILEX S-A)	
Procedural Mitigation Measures	**Acoustic Stressors** *(Section 5.3.2)* Weapons firing noise **Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement
Assumptions Used for Analysis	Assumes that all surface-to-air missiles are high-explosive. Missile explodes well above surface. All explosive and propellant are consumed. Target typically not destroyed, unmanned drones are recovered when possible. This activity would occur greater than 12 NM from land (FDM excepted).

A.1.3 AMPHIBIOUS WARFARE TRAINING

Amphibious warfare is a type of naval warfare involving the utilization of naval firepower, logistics, and Marine Corps landing forces to project military power ashore. Amphibious warfare encompasses a broad spectrum of activities involving maneuver from the sea to objectives ashore, ranging from reconnaissance or raid missions involving a small unit, to large-scale amphibious operations involving over one thousand Marines and Sailors, and multiple ships and aircraft embarked in a strike group.

Amphibious warfare training includes tasks at increasing levels of complexity, from individual, crew, and small unit events to large task force exercises. Individual and crew training include the operation of amphibious vehicles and naval gunfire support training. Small-unit training activities include shore assaults, boat raids, airfield or port seizures, and reconnaissance. Larger-scale amphibious exercises involve ship-to-shore maneuver, shore bombardment and other naval fire support, and air strike and close air support training.

A.1.3.1 Amphibious Rehearsal, No Landing

Amphibious Warfare			
Amphibious Rehearsal, No Landing			
Short Description	Amphibious shipping, landing craft, and aviation elements of the Marine Air Ground Task Force rehearse amphibious landing operations without conducting an actual landing on shore.	**Typical Duration** 1–2 days	
Long Description	Amphibious vessels maneuver to position, flood well decks, and launch and recover landing craft including hovercraft, combat rubber raiding craft, armored amphibious craft, landing craft ship, and task force aircraft in assault landing rehearsals. Assault craft form landing waves and approach shore without landing.		
Typical Components	**Platforms:** Amphibious warfare ship, fleet support ship, small boat **Targets:** None **Systems being Trained/Tested:** None		
Standard Operating Procedures *(Section 2.3.3)*	Vessel safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area and Nearshore	**Bays/Estuaries/Pierside:** Apra Harbor
Stressors to Biological Resources	**Acoustic:** Vessel noise **Explosive:** None	**Physical Disturbance and Strike:** Vessel and in-water devices **Ingestion:** None	**Energy:** None **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** None	
Stressors to Human Resources	**Cultural Resources:** Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Physical disturbance and strike	**Public Health and Safety:** Physical interactions
Military Expended Material	**Ingestible Material:** None **Non-Ingestible Material:** None	**Military Recoverable Material**	None

Amphibious Warfare	
Amphibious Rehearsal, No Landing	
Sonar and Other Transducer Bins	None
Explosive Bins	None
Procedural Mitigation Measures	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement
Assumptions Used for Analysis	Amphibious vehicles train to launch from, and return to, amphibious ships. Amphibious vehicles approach surf zone but turn away before entering surf zone or landing zone. Typical participants: amphibious vessels (e.g., LHA or LHD, LPD, LSD), landing craft (Landing Craft, Air Cushioned; Landing Craft, Utility), and amphibious assault vehicles.

A.1.3.2 Marine Air Ground Task Force Exercise (Amphibious) – Battalion

Major Training Exercises			
Marine Air Ground Task Force Exercise (Amphibious) – Battalion			
Short Description	Typically a 10-day exercise that conducts over-the-horizon, ship-to-objective maneuver for the elements of the Expeditionary Strike Group and the Amphibious Marine Air Ground Task Force. The exercise utilizes all elements of the Marine Air Ground Task Force (Amphibious), conducting training activities ashore with logistic support of the Expeditionary Strike Group and conducting amphibious landings.		**Typical Duration** 10 days
Long Description	This exercise conducts over-the-horizon, ship-to-objective maneuver of the elements of the Expeditionary Strike Group and the Amphibious Marine Air Ground Task Force. The exercise utilizes all elements of the task force to secure the battlespace (air, land, and sea), maneuver to and seize the objective, and conduct self-sustaining operations ashore with continual logistic support. Tinian is the primary training area for this exercise; however, elements of the exercise may be rehearsed nearshore and on Guam. The landing force is supported by all of the battalions assigned to a Marine Expeditionary Unit.		
Typical Components	**Platforms:** Amphibious warfare ship, rotary-wing aircraft, surface combatant **Targets:** None **Systems being Trained/Tested:** Sonar systems		
Standard Operating Procedures *(Section 2.3.3)*	Aircraft safety Towed in-water device safety Vessel safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area to nearshore Mariana Islands Range Complex Tinian; Guam; Rota; Saipan; Farallon de Medinilla	**Bays/Estuaries/Pierside:** Apra Harbor; Tinian; Guam
Stressors to Biological Resources	**Acoustic:** Sonar and other transducers Aircraft noise Vessel noise Weapons noise **Explosive:** In-Air Explosions In-Water Explosions	**Physical Disturbance and Strike:** Aircraft and aerial targets Vessel and in-water devices Military expended materials **Ingestion:** Military expended materials – other than munitions	**Energy:** In-air electromagnetic Devices In-water electromagnetic devices **Entanglement:** Decelerators/parachutes Wires and cables
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Metals Explosives Other materials Chemicals	
Stressors to Human Resources	**Cultural Resources:** Explosives Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Physical disturbance and strike Airborne acoustics	**Public Health and Safety:** In-water energy In-air energy Physical interactions

Major Training Exercises			
Marine Air Ground Task Force Exercise (Amphibious) – Battalion			
Military Expended Material	**Ingestible Material:** None **Non-Ingestible Material:** Expended bathythermograph, expended bathythermograph wire	**Military Recoverable Material**	None
Sonar and Other Transducer Bins	**Mid-Frequency:** MF1 MF4 MF12	**Anti-Submarine Warfare:** ASW3	
Explosive Bins	None. Presented in appropriate worksheets for unit-level activities that could be conducted during this exercise.		
Procedural Mitigation Measures	**Acoustic Stressors:** *(Section 5.3.2)* Active sonar	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement Towed in-water devices	
Assumptions Used for Analysis	All military expended materials, ordnance, and explosive use is included in individual events. Additional activities utilizing sources not listed in the Sonar and Other Transducer Bins section above may occur during this exercise. All acoustic sources that may be used during training and testing activities have been accounted for in the modeling and analysis presented in this SEIS/OEIS.		

A.1.3.3 Amphibious Assault

Amphibious Warfare			
Amphibious Assault			
Short Description	Large unit forces move ashore from amphibious ships at sea for the immediate execution of inland objectives.	**Typical Duration** Up to 2 weeks	
Long Description	Landing forces embarked in vessels, craft, or tilt-rotor and helicopters launch an attack from the sea onto a hostile shore. Amphibious assault is conducted for the purposes of prosecuting further combat operations, obtaining a site for an advanced naval or airbase, or denying the enemy use of an area. Unit-Level Training exercises involve one or more amphibious ships, and their associated watercraft and aircraft, to move personnel and equipment from ship to shore without the command and control and supporting elements involved in a full-scale event. The goal is to practice loading, unloading, and movement, and to develop the timing required for a full-scale exercise.		
Typical Components	**Platforms:** Amphibious warfare ship, fixed-wing aircraft, rotary-wing aircraft, tilt-rotor aircraft, small boat **Targets:** None **Systems being Trained/Tested:** None		
Standard Operating Procedures *(Section 2.3.3)*	Vessel safety Aircraft safety Amphibious assault and amphibious raid procedures	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Range Complex Tinian; Guam	**Bays/Estuaries/Pierside:** Tinian; Guam
Stressors to Biological Resources	**Acoustic:** Aircraft noise Vessel noise **Explosive:** None	**Physical Disturbance and Strike:** Aircraft and aerial targets Vessels and in-water devices Personnel disturbance **Ingestion:** None	**Energy:** None **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** None	
Stressors to Human Resources	**Cultural Resources:** Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Physical disturbance and strike	**Public Health and Safety:** Physical interactions
Military Expended Material	**Ingestible Material:** None **Non-Ingestible Material:** None	**Military Recoverable Material**	None
Sonar and Other Transducer Bins	None		
Explosive Bins	None		

Amphibious Warfare	
Amphibious Assault	
Procedural Mitigation Measures	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement
Assumptions Used for Analysis	Typical event: 1–3 amphibious ships (e.g., LHA or LHD, LPD, LSD); 2-8 landing craft (landing craft, air cushioned; landing craft, utility); 4–14 amphibious assault vehicles; up to 22 aircraft (e.g., MH-53, H-46/MV-22, AH-1, UH-1, AV-8); a Marine Expeditionary Unit (2,200 Marines).

A.1.3.4 Amphibious Raid

Amphibious Warfare			
Amphibious Raid			
Short Description	Small unit forces move from amphibious ships at sea for a specific short-term mission. These are quick operations with as few personnel as possible.	**Typical Duration** 4–8 hours	
Long Description	Small unit forces swiftly move from amphibious vessels at sea into hostile territory for a specific mission, including a planned withdrawal. Raids are conducted to inflict loss or damage, secure information, create a diversion, confuse the enemy, or capture or evacuate individuals or material. Amphibious raid forces are kept as small as possible to maximize stealth and speed of the operation. An event may employ assault amphibian vehicle units, small boats, combat swimmers, or small unit non-live-fire operations, including the use of blanks and simunitions. Surveillance or reconnaissance unmanned surface and aerial vehicles may be used during this event. Events are also conducted to train in the delivery of humanitarian assistance to remote locations or areas requiring assistance after natural disasters.		
Typical Components	**Platforms:** Amphibious warfare ship, small boat, unmanned aerial system-fixed wing **Targets:** Land Targets **Systems being Trained/Tested:** None		
Standard Operating Procedures *(Section 2.3.3)*	Vessel safety Aircraft safety Amphibious assault and amphibious raid procedures	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Range Complex Tinian; Guam; Rota	**Bays/Estuaries/Pierside:** Tinian; Guam
Stressors to Biological Resources	**Acoustic:** Aircraft noise Vessel noise **Explosive:** None	**Physical Disturbance and Strike:** Aircraft and aerial target Vessels and in-water devices Personnel disturbance **Ingestion:** None	**Energy:** None **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** None	
Stressors to Human Resources	**Cultural Resources:** Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Physical disturbance and strike	**Public Health and Safety:** Physical interactions
Military Expended Material	**Ingestible Material:** Small-caliber casings **Non-Ingestible Material:** None	**Military Recoverable Material**	None
Sonar and Other Transducer Bins	None		

Amphibious Warfare	
Amphibious Raid	
Explosive Bins	None
Procedural Mitigation Measures	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement
Assumptions Used for Analysis	Weapons firing (if conducted) during this event is discussed in appropriate activity descriptions (e.g., surface-to-surface and air-to-surface small-caliber gunnery exercises). During the conduct of amphibious raids personnel may exit the watercraft in the surf zone and divers and combat swimmers will stand in the surf zone and walk onto the beach.

A.1.3.5 Humanitarian Assistance Operations/Disaster Relief Operations

Amphibious Warfare			
Humanitarian Assistance Operations/Disaster Relief Operations			
Short Description	Military units provide humanitarian assistance in times of disaster.	**Typical Duration** Up to 2 weeks	
Long Description	Military units provide humanitarian assistance and disaster relief in times of natural disaster. Ships, aircraft, and amphibious landing crafts could be expected to participate in this operation during day or night. The rapid movement of relief supplies and logistics from ships and a logistic "hub" during extreme conditions is practiced during this event.		
Typical Components	**Platforms:** Amphibious warfare ship, fixed-wing aircraft, rotary-wing aircraft, tilt-rotor aircraft, and small boat **Targets:** None **Systems being Trained/Tested:** None		
Standard Operating Procedures *(Section 2.3.3)*	Aircraft safety Vessel safety	**Typical Locations**	
		Range Complexes/Testing Ranges: Mariana Islands Range Complex; Guam; Tinian; Rota; Saipan	**Bays/Estuaries/Pierside:** Guam; Tinian; Rota; Saipan
Stressors to Biological Resources	**Acoustic:** Aircraft noise Vessel noise	**Physical Disturbance and Strike:** Aircraft and aerial targets Vessels and in-water devices	**Energy:** In-air electromagnetic devices
	Explosive: None	**Ingestion:** None	**Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** None	
Stressors to Human Resources	**Cultural Resources:** Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Physical disturbance and strike	**Public Health and Safety:** Physical interactions
Military Expended Material	**Ingestible Material:** None **Non-Ingestible Material:** None	**Military Recoverable Material**	None
Sonar and Other Transducer Bins	None		
Explosive Bins	None		
Procedural Mitigation Measures	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement		
Assumptions Used for Analysis	Sea-, land-, and air-based activity. Logistics and aid distributed across island region via "hub" location.		

A.1.3.6 Naval Surface Fire Support Exercise – Land-Based Target

Amphibious Warfare			
Naval Surface Fire Support Exercise – Land-Based Target			
Short Description	Surface ship crews fire large-caliber guns at land-based targets in support of forces ashore.	**Typical Duration** 4–6 hours	
Long Description	Surface ship crews use large-caliber guns to support forces ashore. One or more ships position themselves offshore the target area and a land-based spotter relays type and exact location of the target. After observing the fall of the shot, the spotter relays any adjustments needed to reach the target. Once the rounds are on target, the spotter requests a sufficient number to effectively destroy the target. This exercise occurs on land ranges where high-explosive and non-explosive practice ordnance is authorized and may be supported by target shapes on the ground.		
Typical Components	**Platforms:** Surface combatant **Targets:** Land targets **Systems being Trained/Tested:** None		
Standard Operating Procedures *(Section 2.3.3)*	Vessel safety Weapons firing safety Farallon de Medinilla Access Restrictions	**Typical Locations** **Range Complexes/Testing Ranges:** R-7201 and Farallon de Medinilla	**Bays/Estuaries/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Vessel noise Weapons noise **Explosive:** In-air explosions	**Physical Disturbance and Strike:** Vessels and in-water devices **Ingestion:** None	**Energy:** In-water electromagnetic devices **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** None	
Stressors to Human Resources	**Cultural Resources:** None	**Socioeconomic Resources:** Accessibility Airborne acoustics	**Public Health and Safety:** Physical interactions
Military Expended Material	**Ingestible Material:** None **Non-Ingestible Material:** Large-caliber casings	**Military Recoverable Material**	None
Sonar and Other Transducer Bins	None		
Explosive Bins	None		
Procedural Mitigation Measures	**Acoustic Stressors:** *(Section 5.3.2)* Weapons firing noise	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement	
Assumptions Used for Analysis	Projectile impact is on land; however, potential nearshore in-water impacts are considered.		

A.1.3.7 Noncombatant Evacuation Operation

Amphibious Warfare			
Noncombatant Evacuation Operation			
Short Description	Military units evacuate noncombatants from hostile or unsafe areas	**Typical Duration** 5 days	
Long Description	Military units evacuate noncombatants from hostile or unsafe areas to safe havens. Non-Combatant Evacuation Operation is conducted by military units, usually operating in conjunction with Navy ships and aircraft. Noncombatants are evacuated when their lives are endangered by war, civil unrest, or natural disaster. Expeditionary units train for evacuations in hostile environments that may require the use of force. Helicopters, landing crafts, and combat swimmers could be expected to participate in this operation during day or night.		
Typical Components	**Platforms:** Amphibious warfare ship, surface vessels, fixed-wing aircraft, rotary-wing aircraft, tilt rotor aircraft, unmanned aerial vehicles **Targets:** None **Systems Being Trained/Tested:** None		
Standard Operating Procedures *(Section 2.3.3)*	Aircraft safety Vessel safety Unmanned aerial and underwater vehicle procedures	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Range Complex Guam; Tinian; Rota	**Bays/Estuaries/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Aircraft noise Vessel noise **Explosives:** None	**Physical Disturbance and Strike:** Aircraft and aerial targets Vessels and in-water devices **Ingestion:** None	**Energy:** In-air electromagnetic devices **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Metals Chemicals Other materials	
Stressors to Human Resources	**Cultural Resources:** Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Physical disturbance and strike	**Public Health and Safety:** Physical interactions
Military Expended Material	**Ingestible Material:** None **Non-Ingestible Material:** None	**Military Recoverable Material**	None
Sonar and Other Transducer Bins	None		
In-Water Explosive Bins	None		
Procedural Mitigation Measures	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement		
Assumptions Used for Analysis	Sea-, land-, and air-based activity		

A.1.3.8 Special Purpose Marine Air Ground Task Force Exercise

Amphibious Warfare			
Special Purpose Marine Air-Ground Task Force Exercise			
Short Description	Typically a 10-day exercise similar to Marine Air Ground Task Force (Amphibious) – Battalion, but task organized to conduct a specific mission (e.g., Humanitarian Assistance, Disaster Relief, Noncombatant Evacuation Operations).	**Typical Duration** 10 days	
Long Description	Special Purpose Marine Air Ground Task Force, operating in conjunction with Navy ships and aircraft, typically conduct humanitarian and disaster relief, or evacuation of noncombatants from foreign countries to safe havens or back to the United States when their lives are endangered by war, civil unrest, or natural disaster. Normally, there is no opposition from the host country; however, Marine Corps Special Purpose Marine Air Ground Task Force or Marine Expeditionary Unit (Special Operations Capable) normally trains for evacuation under a circumstance that requires the use of force in a hostile environment. Much like a raid, the event involves the rapid introduction of forces, the evacuation of noncombatants, and a planned withdrawal. The activity is conducted during day or night.		
Typical Components	**Platforms:** Amphibious warfare ship, fixed-wing aircraft, rotary-wing aircraft, tilt-rotor aircraft, small boat **Targets:** None **Systems being Trained/Tested:** None		
Standard Operating Procedures *(Section 2.3.3)*	Aircraft safety Vessel safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area to nearshore; Mariana Islands Range Complex; Tinian; Guam; Rota; Saipan	**Bays/Estuaries/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Aircraft noise Vessel noise Weapons noise **Explosive:** In-air explosions In-water explosions	**Physical Disturbance and Strike:** Aircraft and aerial targets Vessel and in-water devices Military expended materials **Ingestion:** Military expended materials – munitions Military expended materials – other than munitions	**Energy:** None **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Explosives Metals Chemicals	
Stressors to Human Resources	**Cultural Resources:** Physical disturbance and strike Explosives	**Socioeconomic Resources:** Accessibility Physical disturbance and strike Airborne acoustics	**Public Health and Safety:** Physical interactions In-water energy In-Air Energy
Military Expended Material	**Ingestible Material:** Shell casings **Non-Ingestible Material:** None	**Military Recoverable Material**	None

Amphibious Warfare	
Special Purpose Marine Air-Ground Task Force Exercise	
Sonar and Other Transducer Bins	None
Explosive Bins	None
Procedural Mitigation Measures	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement
Assumptions Used for Analysis	Impacts from land-based targeting are not analyzed. Only the at-sea components of this activity are analyzed in this document. Weapons firing (if conducted) during this event is discussed in appropriate activity descriptions (e.g., surface-to-surface and air-to-surface small-caliber gunnery exercises) Additional activities utilizing sources not listed in the Sonar and Other Transducer Bins section above may occur during this exercise. All acoustic sources that may be used during training and testing activities have been accounted for in the modeling and analysis presented in this EIS/OEIS.

A.1.3.9 Unmanned Aerial Vehicle – Intelligence, Surveillance, and Reconnaissance

Amphibious Warfare			
Unmanned Aerial Vehicle – Intelligence, Surveillance, and Reconnaissance			
Short Description	Military units employ unmanned aerial vehicles to launch, operate, and gather intelligence for specified amphibious missions.	**Typical Duration** Varies	
Long Description	Unmanned aerial vehicles may be launched from ships, boats, submarines, or ground and are used to gather tactical or theater-level intelligence.		
Typical Components	**Platforms:** Fixed-wing aircraft, unmanned aerial system – fixed wing, unmanned aerial system – rotary wing **Targets:** None **Systems being Trained/Tested:** None		
Standard Operating Procedures *(Section 2.3.3)*	Aircraft safety Unmanned aerial and underwater vehicle procedures	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area	**Bays/Estuaries/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Aircraft noise **Explosives:** None	**Physical Disturbance and Strike:** Aircraft and aerial targets **Ingestion:** None	**Energy:** None **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** None	
Stressors to Human Resources	**Cultural Resources:** Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Physical disturbance and strike Airborne acoustics	**Public Health and Safety:** Physical interactions
Military Expended Material	**Ingestible Material:** None **Non-Ingestible Material:** None	**Military Recoverable Material**	None
Sonar and Other Transducer Bins	None		
In-Water Explosive Bins	None		
Procedural Mitigation Measures	None		
Assumptions Used for Analysis	Sea-, land-, and air-based activity. Unmanned Aerial vehicles are typically recovered; however, units may be damaged and lost. Small expendable units may also be used.		

A.1.4 ANTI-SUBMARINE WARFARE TRAINING

Anti-submarine warfare involves helicopter and maritime patrol aircraft, ships, and submarines. These units operate alone or in combination to locate, track, and neutralize submarines. Controlling the undersea battlespace is a unique naval capability and a vital aspect of sea control. Undersea battlespace dominance requires proficiency in anti-submarine warfare. Every deploying strike group and individual surface combatant must possess this capability.

Various types of active and passive sonar are used by the Navy to determine water depth, and identify, track, and target submarines. Passive sonar "listens" for sound waves by using underwater microphones, called hydrophones, which receive, amplify, and process underwater sounds. No sound is introduced into the water when using passive sonar. Passive sonar can indicate the presence, character, and movement of submarines. However, passive sonar provides only a bearing (direction) to a sound-emitting source; it does not provide an accurate range (distance) to the source. Active sonar is needed to locate objects because active sonar provides both bearing and range to the detected contact (such as an enemy submarine).

The Navy's anti-submarine warfare training plan, including the use of active sonar in at-sea training scenarios, includes multiple levels of training. Individual-level anti-submarine warfare training addresses basic skills such as detection and classification of contacts, distinguishing discrete acoustic signatures including those of ships, submarines, and marine life, and identifying the characteristics, functions, and effects of controlled jamming and evasion devices.

More advanced, integrated anti-submarine warfare training exercises involving active sonar are conducted in coordinated, at-sea operations during training events involving submarines, ships, aircraft, and helicopters. This training integrates the full anti-submarine warfare continuum from detecting and tracking a submarine to attacking a target using either exercise torpedoes or simulated weapons. Training events include detection and tracking exercises against "enemy" submarine contacts; torpedo employment exercises against the target; and exercising command and control tasks in a multi-dimensional battlespace.

A.1.4.1 Torpedo Exercise – Helicopter

Anti-Submarine Warfare			
Anti-Submarine Warfare Torpedo Exercise – Helicopter (TORPEX)			
Short Description	Helicopter crews search for, track, and detect submarines. Recoverable air launched torpedoes are employed against submarine targets.	**Typical Duration** 2–5 hours	
Long Description	Helicopters using sonobuoys and dipping sonar search for, detect, classify, localize, and track a simulated threat submarine with the goal of determining a firing solution that could be used to launch a torpedo and destroy the submarine. The exercise may be conducted on a portable underwater tracking range. Sonobuoys (both passive and active) are typically employed by a helicopter operating at altitudes below 3,000 feet (ft.). Dipping sonar (both passive and active) is employed from an altitude of about 50 ft. after the search area has been narrowed based on the sonobuoy search. The anti-submarine warfare target used for this exercise may be a MK-39 Expendable Mobile Anti-submarine Warfare Training Target, a MK-30 target, or a live submarine. This exercise may involve a single aircraft, or occur during a coordinated larger exercise involving multiple aircraft and ships, including a major range event. Unmanned aerial systems, such as the MQ-8 Fire Scout, may also be used. The exercise torpedo is recovered by a special recovery helicopter or small craft. The preferred range for this exercise is an instrumented underwater range, but it may be conducted anywhere within the Study Area depending on training requirements and available assets.		
Typical Components	**Platforms:** Rotary-wing aircraft, unmanned aerial system - rotary wing, surface vessels, small boats **Targets:** Sub-surface targets **Systems being Trained/Tested:** Mid-frequency sonar, torpedoes		
Standard Operating Procedures *(Section 2.3.3)*	Vessel safety Aircraft safety Unmanned aerial and underwater vehicle procedures Target deployment and retrieval safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area	**Bays/Estuaries/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Sonar and other transducers Aircraft noise Vessel noise **Explosive:** None	**Physical Disturbance and Strike:** Aircraft and aerial target Vessels and in-water devices Military expended materials **Ingestion:** Military expended materials – munitions Military expended materials – other than munitions	**Energy:** In-air electromagnetic devices **Entanglement:** Decelerators/parachutes Wires and cables
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Chemicals Metals Other materials	
Stressors to Human Resources	**Cultural Resources:** Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** In-water energy Physical interactions

Anti-Submarine Warfare			
Anti-Submarine Warfare Torpedo Exercise – Helicopter (TORPEX)			
Military Expended Material	**Ingestible Material:** Decelerators/parachutes - small **Non-Ingestible Material:** Expended bathythermograph, expended bathythermograph wire, expendable transponder anchors, lightweight torpedo accessories, sonobuoy (non-explosive), sonobuoy wires, sub-surface target (mobile), ASW targets	**Military Recoverable Material**	Lightweight torpedo (non-explosive), sub-surface target (mobile)
Sonar and Other Transducer Bins	**Mid-Frequency:** MF4 MF5 **Torpedoes:** TORP1		
Explosive Bins	None		
Procedural Mitigation Measures	**Acoustic Stressors:** *(Section 5.3.2)* Active sonar	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement	
Assumptions Used for Analysis	This activity occurs greater than 3 NM from land. Submarine may provide service as the target.		

A.1.4.2 Torpedo Exercise – Maritime Patrol Aircraft

Anti-Submarine Warfare			
Anti-Submarine Warfare Torpedo Exercise – Maritime Patrol Aircraft (TORPEX)			
Short Description	Maritime patrol aircraft crews search for, track, and detect submarines. Recoverable air launched torpedoes are employed against submarine targets.	**Typical Duration** 2–8 hours	
Long Description	Fixed-wing maritime patrol aircraft employ sonobuoys to search for, detect, classify, localize, and track a simulated threat submarine with the goal of determining a firing solution that could be used to launch a torpedo and destroy the submarine. The exercise may be conducted on a portable underwater tracking range. Sonobuoys (both passive and active) are typically employed by a maritime patrol aircraft operating at altitudes below 3,000 feet. However, sonobuoys may be released at higher altitudes. Sonobuoys are deployed in specific patterns based on the expected threat submarine and specific water conditions. Depending on these two factors, these patterns will cover many different size areas. For certain sonobuoys, tactical parameters of use may be classified. The anti-submarine warfare target used for this exercise may be a MK-39 Expendable Mobile Anti-Submarine Warfare Training Target, a MK-30 target, or a live submarine. This exercise may involve a single aircraft, or be undertaken in the context of a coordinated larger exercise involving multiple aircraft and vessels, including a major range event. The exercise torpedo is recovered by helicopter or small craft. The preferred range for this exercise is an instrumented underwater range, but it may be conducted anywhere within the Study Area depending on training requirements and available assets.		
Typical Components	**Platforms:** Fixed-wing aircraft, range support craft **Targets:** Sub-surface targets **Systems being Trained/Tested:** Mid-frequency sonar, torpedoes		
Standard Operating Procedures *(Section 2.3.3)*	Aircraft safety Target deployment and retrieval safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area	**Bays/Estuaries/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Sonar and other transducers Aircraft noise **Explosive:** None	**Physical Disturbance and Strike:** Aircraft and aerial targets Military expended materials Vessels and in-water devices **Ingestion:** Military expended materials – munitions Military expended materials – other than munitions	**Energy:** In-air electromagnetic devices **Entanglement:** Decelerators/parachutes Wires and cables
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Chemicals Metals Other materials	
Stressors to Human Resources	**Cultural Resources:** Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** In-water energy Physical interactions

Anti-Submarine Warfare			
Anti-Submarine Warfare Torpedo Exercise – Maritime Patrol Aircraft (TORPEX)			
Military Expended Material	**Ingestible Material:** Decelerators/parachutes - small **Non-Ingestible Material:** Expended bathythermograph, expended bathythermograph wire, lightweight torpedo accessories, sonobuoy (non-explosive), sonobuoy wires, sub-surface target (mobile), ASW targets	**Military Recoverable Material**	Lightweight torpedo (non-explosive), sub-surface target (mobile)
Sonar and Other Transducer Bins	Mid-Frequency: MF5	Torpedoes: TORP1	
Explosive Bins	None		
Procedural Mitigation Measures	**Acoustic Stressors:** *(Section 5.3.2)* Active sonar		
Assumptions Used for Analysis	Submarine may provide service as the target. If target is air-dropped, one parachute per target. This activity occurs greater than 3 NM from land.		

A.1.4.3 Torpedo Exercise – Submarine

Anti-Submarine Warfare			
Anti-Submarine Warfare Torpedo Exercise – Submarine (TORPEX)			
Short Description	Submarine crews search for, track, and detect submarines. Exercise torpedoes are used during this event.	**Typical Duration** 8 hours	
Long Description	Submarine crews search for, detect and track a threat submarine to develop firing position to launch a torpedo. A single submerged submarine operates at slow speeds and various depths while using its hull mounted or towed array sonar to track a threat submarine. While passive sonar is most typically used for this training event, some active sonar may be used on occasion. Non-explosive exercise torpedoes may also be fired during training. This exercise may involve a single submarine, or be undertaken in the context of a coordinated larger exercise involving multiple aircraft, ships, and submarines, including a major range event. The exercise torpedo is recovered by helicopter or small craft. The preferred range for this exercise is an instrumented underwater range, but it may be conducted anywhere within the Study Area depending on training requirements and available assets.		
Typical Components	**Platforms:** Submarines, support boat, support aircraft **Targets:** Sub-surface targets **Systems being Trained/Tested:** Mid-frequency and high-frequency sonar, torpedoes		
Standard Operating Procedures *(Section 2.3.3)*	Vessel safety Aircraft safety Target deployment and retrieval safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area	**Bays/Estuaries/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Sonar and other transducers Vessel noise **Explosive:** None	**Physical Disturbance and Strike:** Vessels and in-water devices Military expended materials **Ingestion:** Military expended materials – other than munitions	**Energy:** None **Entanglement:** Wires and cables
Stressors to Physical Resources	**Air Quality:** None	**Sediments and Water Quality:** Metals	
Stressors to Human Resources	**Cultural Resources:** Physical disturbance and strike	**Socioeconomic Resources:** Physical disturbance and strike	**Public Health and Safety:** In-water energy Physical interactions
Military Expended Material	**Ingestible Material:** None **Non-Ingestible Material:** Acoustic countermeasures, expended bathythermograph, expended bathythermograph wire, guidance wire, heavyweight torpedo accessories, ASW targets	**Military Recoverable Material**	Heavyweight (non-explosive) torpedo, sub-surface target (mobile)
Sonar and Other Transducer Bins	**Anti-Submarine Warfare:** ASW4 **Torpedoes:** TORP2	**High Frequency:** HF1	**Mid-Frequency:** MF3

Anti-Submarine Warfare		
Anti-Submarine Warfare Torpedo Exercise – Submarine (TORPEX)		
Explosive Bins	None	
Procedural Mitigation Measures	**Acoustic Stressors:** *(Section 5.3.2)* Active sonar	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement
Assumptions Used for Analysis	Torpedoes are recovered. Guidance wire has a low breaking strength and breaks easily. Weights and flex tubing sink rapidly. This activity occurs greater than 3 NM from land.	

A.1.4.4 Torpedo Exercise – Surface

Anti-Submarine Warfare			
Anti-Submarine Warfare Torpedo Exercise – Surface (TORPEX)			
Short Description	Surface ship crews search for, track, and detect submarines. Exercise torpedoes are used during this event.	**Typical Duration** 2–5 hours	
Long Description	Surface ships search for, detect, and track threat submarines to determine a firing position to launch a torpedo and attack the submarine. The exercise may be conducted on a portable underwater tracking range. A surface ship operates at slow speeds while employing hull mounted or towed array sonar. Passive or active sonar is employed depending on the type of threat submarine, the tactical situation, and environmental conditions. The anti-submarine warfare target used for this exercise is a MK-39 Expendable Mobile Anti-Submarine Warfare (ASW) Training Target, MK-30 Target, or live submarine. This exercise may involve a single ship, or be undertaken in the context of a coordinated larger exercise involving multiple aircraft, ships, and submarines, including a major range event. The exercise torpedo is recovered by helicopter or small craft. The preferred area for this exercise is an instrumented underwater range, but it may be conducted anywhere within the Study Area depending on training requirements and available assets.		
Typical Components	**Platforms:** Surface combatant **Targets:** Sub-surface targets **Systems being Trained/Tested:** Mid-frequency sonar, torpedoes		
Standard Operating Procedures *(Section 2.3.3)*	Towed in-water device safety Vessel safety Target deployment and retrieval safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area	**Bays/Estuaries/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Sonar and other transducers Vessel noise **Explosive:** None	**Physical Disturbance and Strike:** Vessels and in-water devices Military expended materials **Ingestion:** Military expended materials – other than munitions	**Energy:** In-air electromagnetic devices **Entanglement:** Decelerator/parachutes Wires and cables
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Metals	
Stressors to Human Resources	**Cultural Resources:** Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** In-water energy Physical interactions
Military Expended Material	**Ingestible Material:** Decelerators/parachutes - small **Non-Ingestible Material:** Expended bathythermograph, expended bathythermograph wire, lightweight torpedo accessories, sonobuoy (non-explosive), sonobuoy wires, ASW targets	**Military Recoverable Material**	Lightweight torpedo (non-explosive), sub-surface target (mobile)

Anti-Submarine Warfare			
Anti-Submarine Warfare Torpedo Exercise – Surface (TORPEX)			
Sonar and Other Transducer Bins	**Anti-Submarine Warfare:** ASW3	**Mid-Frequency:** MF1 MF5	**Torpedoes:** TORP1
Explosive Bins	None		
Procedural Mitigation Measures	**Acoustic Stressors:** *(Section 5.3.2)* Active sonar	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement Towed In-water devices	
Assumptions Used for Analysis	Submarines may provide service as the target. Torpedoes are recovered. This activity occurs greater than 3 NM from land.		

A.1.4.5 Tracking Exercise – Helicopter

Anti-Submarine Warfare			
Anti-Submarine Warfare Tracking Exercise – Helicopter (TRACKEX)			
Short Description	Helicopter crews search for, track, and detect submarines.	**Typical Duration** 2–4 hours	
Long Description	Helicopters using sonobuoys and dipping sonar search for, detect, classify, localize, and track a simulated threat submarine with the goal of determining a firing solution that could be used to launch a torpedo and destroy the submarine. Sonobuoys (both passive and active) are typically employed by a helicopter operating at altitudes below 3,000 ft. Dipping sonar (both passive and active) is employed from an altitude of about 50 ft. after the search area has been narrowed based on the sonobuoy search. The anti-submarine warfare target used for this exercise may be a MK-39 Expendable Mobile Anti-submarine Warfare Training Target, a MK-30 target, or a live submarine. This exercise may involve a single aircraft, or occur during a coordinated larger exercise involving multiple aircraft and ships, including a major range event. Unmanned aerial systems, such as the MQ-8 Fire Scout, may also be used. The preferred range for this exercise is an instrumented range, but it may be conducted anywhere within the Study Area depending on training requirements and available assets.		
Typical Components	**Platforms:** Rotary-wing aircraft **Targets:** Sub-surface targets **Systems being Trained/Tested:** Mid Frequency Sonar (sonobuoys, dipping sonar)		
Standard Operating Procedures *(Section 2.3.3)*	Aircraft safety	**Typical Locations**	
		Range Complexes/Testing Ranges: Mariana Islands Training and Testing Study Area Transit Corridor	**Bays/Estuaries/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Sonar and other transducers Aircraft noise **Explosive:** None	**Physical Disturbance and Strike:** Aircraft and aerial target Vessels and in-water devices Military expended materials **Ingestion:** Military expended materials – other than munitions	**Energy:** In-air electromagnetic devices **Entanglement:** Decelerators/parachutes Wires and cables
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Chemicals Metals Other materials	
Stressors to Human Resources	**Cultural Resources:** Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** In-water energy Physical interactions

Anti-Submarine Warfare			
Anti-Submarine Warfare Tracking Exercise – Helicopter (TRACKEX)			
Military Expended Material	**Ingestible Material:** Decelerators/parachutes - small **Non-Ingestible Material:** Expended bathythermograph, expended bathythermograph wire, sonobuoy (non-explosive), sonobuoy wires, sub-surface target (mobile), ASW targets	**Military Recoverable Material**	None
Sonar and Other Transducer Bins	**Mid-Frequency:** MF4 MF5		
Explosive Bins	None		
Procedural Mitigation Measures	**Acoustic Stressors:** *(Section 5.3.2)* Active sonar		
Assumptions Used for Analysis	Submarines may provide service as the target. This activity occurs greater than 3 NM from land.		

A.1.4.6 Tracking Exercise – Maritime Patrol Aircraft

Anti-Submarine Warfare			
Anti-Submarine Warfare Tracking Exercise – Maritime Patrol Aircraft (TRACKEX)			
Short Description	Maritime patrol aircraft crews search for, track, and detect submarines.	**Typical Duration** 2–8 hours	
Long Description	Fixed-wing maritime patrol aircraft employ sonobuoys to search for, detect, classify, localize, and track a simulated threat submarine with the goal of determining a firing solution that could be used to launch a torpedo and destroy the submarine. Sonobuoys (both passive and active) are typically employed by a maritime patrol aircraft operating at altitudes below 3,000 feet. However, sonobuoys may be released at higher altitudes. Sonobuoys are deployed in specific patterns based on the expected threat submarine and specific water conditions. Depending on these two factors, these patterns will cover many different size areas. For certain sonobuoys, tactical parameters of use may be classified. The anti-submarine warfare target used for this exercise may be a MK-39 Expendable Mobile Anti-Submarine Warfare (ASW) Training Target, a MK-30 target, or a live submarine. This exercise may involve a single aircraft, or be undertaken in the context of a coordinated larger exercise involving multiple aircraft and vessels, including a major range event.		
Typical Components	**Platforms:** Fixed-wing aircraft **Targets:** Sub-surface targets **Systems being Trained/Tested:** Mid-frequency sonar		
Standard Operating Procedures *(Section 2.3.3)*	Aircraft safety Target Deployment and Retrieval Safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area	**Bays/Estuaries/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Sonar and other transducers Aircraft noise **Explosive:** None	**Physical Disturbance and Strike:** Aircraft and aerial target Vessels and in-water devices Military expended materials **Ingestion:** Military expended materials – other than munitions	**Energy:** In-air electromagnetic devices **Entanglement:** Decelerators/parachutes Wires and cables
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Chemicals Metals Other materials	
Stressors to Human Resources	**Cultural Resources:** Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** In-water energy Physical interactions
Military Expended Material	**Ingestible Material:** Decelerators/parachutes - small **Non-Ingestible Material:** Expended bathythermograph, expended bathythermograph wire, sonobuoy (non-explosive), sonobuoy wires, ASW targets	**Military Recoverable Material**	Sub-surface target (mobile)

Anti-Submarine Warfare	
Anti-Submarine Warfare Tracking Exercise – Maritime Patrol Aircraft (TRACKEX)	
Sonar and Other Transducer Bins	**Mid-Frequency:** MF5
Explosive Bins	None
Procedural Mitigation Measures	**Acoustic Stressors:** *(Section 5.3.2)* Active sonar
Assumptions Used for Analysis	Submarine may provide service as the target. If target is air-dropped, one parachute per target. This activity occurs greater than 3 NM from land.

A.1.4.7 Tracking Exercise – Submarine

Anti-Submarine Warfare			
Anti-Submarine Warfare Tracking Exercise – Submarine (TRACKEX)			
Short Description	Submarine crews search for, track, and detect submarines.	**Typical Duration** 8 hours	
Long Description	Submarine crews search for, detect and track a threat submarine to develop firing position to launch a torpedo. A single submerged submarine operates at slow speeds and various depths while using its hull mounted or towed array sonar to track a threat submarine. Passive sonar is used almost exclusively. The target for this exercise is either an MK 39 expendable mobile anti-submarine warfare training target, MK 30 recoverable training target, or live submarine. This exercise could occur anywhere throughout the MITT Study Area. This exercise may involve a single submarine, or be undertaken in the context of a coordinated larger exercise involving multiple aircraft, ships, and submarines, including a major range event.		
Typical Components	**Platforms:** Submarines **Targets:** Sub-surface targets **Systems being Trained/Tested:** Mid-frequency and high-frequency sonar		
Standard Operating Procedures *(Section 2.3.3)*	Vessel safety Target Deployment and Retrieval Safety	**Typical Locations**	
		Range Complexes/Testing Ranges: Mariana Islands Training and Testing Study Area Transit Corridor	**Bays/Estuaries/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Sonar and other transducers Vessel noise **Explosive:** None	**Physical Disturbance and Strike:** Vessel and in-water devices Military expended materials **Ingestion:** None	**Energy:** None **Entanglement:** Wires and cables
Stressors to Physical Resources	**Air Quality:** None	**Sediments and Water Quality:** Metals	
Stressors to Human Resources	**Cultural Resources:** Physical disturbance and strike	**Socioeconomic Resources:** Physical disturbance and strike	**Public Health and Safety:** In-water energy Physical interactions
Military Expended Material	**Ingestible Material:** None **Non-Ingestible Material:** Acoustic countermeasures, expended bathythermograph, expended bathythermograph wire, ASW targets	**Military Recoverable Material**	Sub-surface target (mobile)
Sonar and Other Transducer Bins	**Anti-Submarine Warfare:** ASW4	**High-Frequency:** HF1 HF3	**Mid-Frequency:** MF3
Explosive Bins	None		

Anti-Submarine Warfare	
Anti-Submarine Warfare Tracking Exercise – Submarine (TRACKEX)	
Procedural Mitigation Measures	**Acoustic Stressors:** *(Section 5.3.2)* Active sonar
Assumptions Used for Analysis	This activity occurs greater than 3 NM from land.

A.1.4.8 Tracking Exercise – Surface

Anti-Submarine Warfare			
Anti-Submarine Warfare Tracking Exercise – Surface (TRACKEX)			
Short Description	Surface ship crews search for, track, and detect submarines.	**Typical Duration** 2–4 hours	
Long Description	Surface ships search for, detect, and track threat submarines to determine a firing position to launch a torpedo and attack the submarine. A surface ship operates at slow speeds while employing sonobuoys, hull mounted sonar, or towed array sonar. Passive or active sonar is employed depending on the type of threat submarine, the tactical situation, and environmental conditions. The target for this exercise is either a MK-39 Expendable Mobile Anti-Submarine Warfare Training Target, MK-30 Recoverable Training Target, or live submarine. Anti-Submarine Warfare (ASW) Tracking exercise – Ship could occur anywhere throughout the MITT Study Area. This exercise may involve a single ship, or be undertaken in the context of a coordinated larger exercise involving multiple aircraft, ships, and submarines, including a major range event.		
Typical Components	**Platforms:** Surface combatant **Targets:** Sub-surface targets **Systems being Trained/Tested:** Mid-frequency sonar		
Standard Operating Procedures *(Section 2.3.3)*	Vessel safety Towed in-water device safety Target deployment and retrieval safety	**Typical Locations**	
		Range Complexes/Testing Ranges: Mariana Islands Training and Testing Study Area Transit Corridor	**Bays/Estuaries/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Sonar and other transducers Vessel noise **Explosive:** None	**Physical Disturbance and Strike:** Vessels and in-water devices Military Expended Materials **Ingestion:** None	**Energy:** In-air electromagnetic devices In-water electromagnetic devices **Entanglement:** Wires and cables
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** None	
Stressors to Human Resources	**Cultural Resources:** Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** In-water energy Physical interactions
Military Expended Material	**Ingestible Material:** None **Non-Ingestible Material:** Buoy (non-explosive), expended bathythermograph, expended bathythermograph wire, sub-surface target (mobile), ASW targets	**Military Recoverable Material**	Sub-surface target (mobile)

Anti-Submarine Warfare				
Anti-Submarine Warfare Tracking Exercise – Surface (TRACKEX)				
Sonar and Other Transducer Bins	**Anti-Submarine Warfare:** ASW1 ASW3	**Mid-Frequency:** MF1 MF11 MF12		
Explosive Bins	None			
Procedural Mitigation Measures	**Acoustic Stressors:** *(Section 5.3.2)* Active sonar		**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement Towed in-water devices	
Assumptions Used for Analysis	A submarine may provide service as the target. This activity occurs greater than 3 NM from land.			

A.1.4.9 Surface Warfare Advanced Tactical Training

Small Integrated Anti-Submarine Warfare Training			
Surface Warfare Advanced Tactical Training			
Short Description	Multiple ships and aircraft coordinate the use of sensors, including sonobuoys, to search, detect, and track a threat submarine. Surface Warfare Advanced Tactical Training exercises are not dedicated Anti-Submarine Warfare events and involve multiple warfare areas.	**Typical Duration** Up to 15 days	
Long Description	Surface Warfare Advanced Tactical Training (SWATT) is an intermediate training exercise designed primarily to increase operator proficiency and exercise combined force responses to surface warfare, anti-submarine warfare, air warfare and electromagnetic spectrum operations. Surface Warfare Advanced Tactical Training is conducted after a carrier strike group's first Group Sail, and before Composite Training Unit Exercise, and consists of multiple surface warfare, anti-submarine, and air warfare live-fire events. Multiple ships and aircraft search for, locate, and track one submarine. Occurs once per carrier strike group training cycle. All other warfare area training conducted during SWATT was analyzed as unit-level training (gunnery, missile exercise, etc.).		
Typical Components	**Platforms:** Multiple Surface Combatants, fixed-wing aircraft, helicopters, unmanned vehicles, and submarines **Targets:** All surface, air and anti-submarine warfare targets (e.g., MK-30s, MK-39 Expendable Mobile Training Targets, recoverable or expendable floating targets) **Systems being Trained/Tested:** Mid-frequency sonar, high-frequency sonar, lightweight torpedoes, high-frequency acoustic modems		
Standard Operating Procedures *(Section 2.3.3)*	Vessel safety Aircraft safety Weapons firing safety Towed in-water device safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area	**Bays/Estuaries/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Sonar and other transducers Aircraft noise Vessel noise Weapons noise **Explosive:** In-air explosions	**Physical Disturbance and Strike:** Aircraft and aerial targets Vessels and in-water devices Military expended materials **Ingestion:** Military expended materials – munitions Military expended materials – other than munitions	**Energy:** In-air electromagnetic devices **Entanglement:** Wires and cables Decelerators/parachutes
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants **Habitats:** Physical disturbance and strike – military expended material	**Sediments and Water Quality:** Explosives Metals	Chemicals
Stressors to Human Resources	**Cultural Resources:** Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** Physical interactions

Small Integrated Anti-Submarine Warfare Training			
Surface Warfare Advanced Tactical Training			
Military Expended Material	**Ingestible Material:** Target fragments, small-caliber projectiles, small decelerators/parachutes **Non-Ingestible Material:** Sonobuoys, large and medium-caliber projectiles, acoustic countermeasures, ASW targets	**Military Recoverable Material**	Air warfare targets Surface warfare targets
Sonar and Other Transducer Bins	**Mid-Frequency:** MF1 MF1K MF3 MF4 MF5 MF6 MF12 **High-Frequency:** HF1	**Anti-Submarine Warfare:** ASW2 ASW3 ASW4 **Torpedoes:** TORP1 TORP2 **Acoustic Modems:** Yes	
Explosive Bins	None		
Procedural Mitigation Measures	**Acoustic Stressors:** *(Section 5.3.2)* Active sonar	**Physical Disturbance and Strike:** *(Section 5.3.4)* Vessel movement Towed in-water devices	
Assumptions Used for Analysis	All other warfare area training conducted during SWATT was analyzed as unit-level training (gunnery, missile exercise, etc.). All military expended materials, munitions, explosives and sonar use is included in individual unit-level events. Additional activities utilizing sources not listed in the Sonar and Other Transducer Bins section above may occur during this exercise. All acoustic sources which may be used during training and testing activities have been accounted for in the modeling and analysis presented in this EIS/OEIS. A submarine may provide service as a target for non-firing events.		

A.1.4.10 Small Joint Coordinated ASW Exercise (Multi-Sail/GUAMEX)

Anti-Submarine Warfare			
Small Joint Coordinated ASW Exercise (Multi-Sail/GUAMEX)			
Short Description	Typically a 5-day exercise with multiple ships, aircraft and submarines integrating the use of their sensors, including sonobuoys, to search, detect, and track threat submarines.	**Typical Duration** 5 days	
Long Description	This is an Anti-Submarine Warfare (ASW) exercise conducted by the forward deployed Navy Strike Groups to sustain and assess their ASW proficiency while located in the Seventh Fleet area of operations. The exercise is designed to assess the Strike Groups' ability to conduct ASW in the most realistic environment, against the level of threat expected, in order to effect changes to both training and capabilities (e.g., equipment, tactics, and changes to size and composition) of U.S. Navy Strike Groups. The Strike Group receives significant sustainment training value in ASW and other warfare areas, as training is inherent in all at-sea exercises. Additional unit-level activities, such as MISSILEX may be conducted during these events.		
Typical Components	**Platforms:** Fixed-wing aircraft, rotary-wing aircraft, submarines, surface combatant **Targets:** Surface targets, sub-surface targets **Systems being Trained/Tested:** Mid-frequency Sonar		
Standard Operating Procedures *(Section 2.3.3)*	Aircraft safety Towed in-water device safety Vessel safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area	**Bays/Estuaries/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Sonar and other transducers Aircraft noise Vessel noise **Explosive:** None	**Physical Disturbance and Strike:** Aircraft and aerial targets Vessel and in-water devices Military expended materials **Ingestion:** Military expended materials – munitions Military expended material – other than munitions	**Energy:** In-air electromagnetic devices **Entanglement:** Decelerator/Parachutes Wires and cables
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Metals Chemicals Other materials	
Stressors to Human Resources	**Cultural Resources:** Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Physical disturbance and strike Airborne acoustics	**Public Health and Safety:** In-water energy In-air energy Physical interactions
Military Expended Material	**Ingestible Material:** Decelerators/parachutes - small **Non-Ingestible Material:** Acoustic countermeasures, aircraft stores and ballast, expended bathythermograph, expended bathythermograph wire, sonobuoy (non-explosive), sonobuoy wires, sub-surface target (mobile), ASW targets	**Military Recoverable Material**	None

Anti-Submarine Warfare					
Small Joint Coordinated ASW Exercise (Multi-Sail/GUAMEX)					
Sonar and Other Transducer Bins	**Anti-Submarine Warfare:**		**High-Frequency:**	**Mid-Frequency:**	
	ASW2	ASW3	HF1	MF1	MF3
	ASW4			MF4	MF5
				MF11	MF12
Explosive Bins	None. Presented in appropriate worksheets for unit-level activities that could be conducted during this exercise.				
Procedural Mitigation Measures	**Acoustic Stressors:** *(Section 5.3.2)* Active sonar		**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement Towed in-water devices		
Assumptions Used for Analysis	This activity occurs at least 3 NM from land (FDM excepted). Additional activities utilizing sources not listed in the Sonar and Other Transducer Bins section above may occur during this exercise. All acoustic sources which may be used during training and testing activities have been accounted for in the modeling and analysis presented in this EIS.				

A.1.5 ELECTRONIC WARFARE

Electronic warfare is the mission area of naval warfare that aims to control use of the electromagnetic spectrum and to deny its use by an adversary. Typical electronic warfare activities include threat avoidance training, signals analysis for intelligence purposes, and use of airborne and surface electronic jamming devices to defeat tracking systems.

A.1.5.1 Counter Targeting Chaff Exercise – Aircraft

Electronic Warfare			
Counter Targeting Chaff Exercise – Aircraft			
Short Description	Fixed-wing aircraft and helicopter aircrews deploy chaff to disrupt threat targeting and missile guidance radars.	**Typical Duration** 1–2 hours	
Long Description	Fixed-wing aircraft and helicopter aircrews deploy chaff to disrupt threat targeting and missile guidance radars. Fixed-wing aircraft and helicopter aircrews detect electronic targeting signals from threat radars or missiles, dispense chaff, and immediately maneuver to defeat the threat. The chaff cloud deceives the inbound missile and the aircraft clears away from the threat. Chaff is a radar reflector material made of thin, narrow, metallic strips cut in various lengths to elicit frequency responses, which deceive enemy radars. Chaff is employed to create a target that will lure enemy radar and weapons system away from the actual friendly platform.		
Typical Components	**Platforms:** Fixed-wing aircraft, rotary-wing aircraft **Targets:** None **Systems being Trained/Tested:** None		
Standard Operating Procedures *(Section 2.3.3)*	Aircraft safety	**Typical Locations**	
		Range Complexes/Testing Ranges: Mariana Islands Training and Testing Study Area	**Bays/Estuaries/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Aircraft noise **Explosive:** None	**Physical Disturbance and Strike:** Aircraft and aerial targets Military expended materials **Ingestion:** Military expended materials – other than munitions	**Energy:** In-air electromagnetic devices **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Other materials	
Stressors to Human Resources	**Cultural Resources:** None	**Socioeconomic Resources:** Airborne acoustics	**Public Health and Safety:** Physical interactions
Military Expended Material	**Ingestible Material:** Per chaff: one chaff-air cartridge, one plastic endcap, chaff fibers **Non-Ingestible Material:** None	**Military Recoverable Material**	None

Electronic Warfare	
Counter Targeting Chaff Exercise – Aircraft	
Sonar and Other Transducer Bins	None
Explosive Bins	None
Procedural Mitigation Measures	None
Assumptions Used for Analysis	Chaff is usually expended while conducting other training activities, such as air combat maneuvering. Potential effects are analyzed under this activity. This activity occurs greater than 12 NM from land.

A.1.5.2 Counter Targeting Chaff Exercise – Ship

Electronic Warfare			
Counter Targeting Chaff Exercise – Ship			
Short Description	Surface ship crews deploy chaff to disrupt threat targeting and missile guidance radars.	**Typical Duration** 1–2 hours	
Long Description	Surface ship crews deploy chaff to disrupt threat targeting and missile guidance radars to defend against an attack. Surface ship crews detect electronic targeting signals from threat radars or missiles, dispense chaff, and immediately maneuver to defeat the threat. The chaff cloud deceives the inbound missile and the vessel clears away from the threat. The typical event duration is approximately one and one-half hours. Chaff is a radar reflector material made of thin, narrow, metallic strips cut in various lengths to elicit frequency responses, which deceive enemy radars. Chaff is employed to create a target that will lure enemy radar and weapons system away from the actual friendly platform. Ships may also train with advanced countermeasure systems, such as the MK 53 Decoy Launching System (Nulka).		
Typical Components	**Platforms:** Navy Ships **Targets:** None **Systems being Trained/Tested:** None		
Standard Operating Procedures *(Section 2.3.3)*	Vessel safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area	**Bays/Estuaries/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Vessel noise **Explosive:** None	**Physical Disturbance and Strike:** Vessels and in-water devices Military expended materials **Ingestion:** Military expended materials – other than munitions	**Energy:** In-air electromagnetic devices **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Other materials	
Stressors to Human Resources	**Cultural Resources:** None	**Socioeconomic Resources:** Accessibility	**Public Health and Safety:** Physical interactions
Military Expended Material	**Ingestible Material:** Chaff-ship fibers **Non-Ingestible Material:** Chaff-ship cartridge	**Military Recoverable Material**	None
Sonar and Other Transducer Bins	None		
Explosive Bins	None		

Electronic Warfare	
Counter Targeting Chaff Exercise – Ship	
Procedural Mitigation Measures	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement
Assumptions Used for Analysis	This activity occurs greater than 12 NM from land.

A.1.5.3 Counter Targeting Flare Exercise – Aircraft

Electronic Warfare			
Counter Targeting Flare Exercise - Aircraft			
Short Description	Fixed-wing aircraft and helicopter aircrews deploy flares to disrupt threat infrared missile guidance systems.	**Typical Duration** 1–2 hours	
Long Description	Fixed-wing aircraft and helicopter aircrews deploy flares to disrupt threat infrared missile guidance systems. Range personnel acting as opposition forces may use pyrotechnics to simulate missile launch. Aircraft detect electronic targeting signals from threat radars or missiles, or a threat missile plume, when launched and dispense flares and immediately maneuver to defeat the threat. This exercise trains aircraft personnel in the use of defensive flares designed to confuse infrared sensors or infrared homing missiles, thereby causing the sensor or missile to lock onto the flares instead of the real aircraft. Typically an aircraft will expend five flares in an exercise while operating above 3,000 feet. Flare exercises are often conducted with chaff exercises, rather than as a stand-alone exercise.		
Typical Components	**Platforms:** Fixed-wing aircraft, rotary-wing aircraft **Targets:** None **Systems being Trained/Tested:** None		
Standard Operating Procedures *(Section 2.3.3)*	Aircraft safety	**Typical Locations**	
		Range Complexes/Testing Ranges: Mariana Islands Training and Testing Study Area	**Bays/Estuaries/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Aircraft noise **Explosive:** None	**Physical Disturbance and Strike:** Aircraft and aerial targets Military expended materials **Ingestion:** Military expended materials – other than munitions	**Energy:** In-air electromagnetic devices **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Metals Other materials	
Stressors to Human Resources	**Cultural Resources:** None	**Socioeconomic Resources:** Airborne acoustics	**Public Health and Safety:** Physical interactions
Military Expended Material	**Ingestible Material:** Per flare: one casing, one compression pad or one plastic piston, one plastic endcap, one O-ring **Non-Ingestible Material:** None	**Military Recoverable Material**	None
Sonar and Other Transducer Bins	None		

Electronic Warfare	
Counter Targeting Flare Exercise - Aircraft	
Explosive Bins	None
Procedural Mitigation Measures	None
Assumptions Used for Analysis	Approximately five flares per aircraft. This activity typically occurs greater than 12 NM from land. However, rotary-wing events may occur closer to land (up to 3 NM when crew-served EW threat emitters [MANPADS] are employed).

A.1.5.4 Electronic Warfare Operations

Electronic Warfare			
Electronic Warfare Operations			
Short Description	Aircraft and surface ship crews control portions of the electromagnetic spectrum used by enemy systems to degrade or deny the enemy's ability to take defensive actions.	**Typical Duration** 1–2 hours	
Long Description	Aircraft and surface ship crews control the electromagnetic spectrum used by enemy systems to degrade or deny the enemy's ability to take defensive actions. Electronic Warfare Operations can be active or passive, offensive or defensive. Fixed-wing aircraft employ active jamming and deception against enemy search radars to mask the friendly inbound strike aircraft mission. Surface ships detect and evaluate enemy electronic signals from enemy aircraft or missile radars, evaluate courses of action concerning the use of passive or active countermeasures, then use ship maneuvers and either chaff, flares, active electronic countermeasures, or a combination of them to defeat the threat.		
Typical Components	**Platforms:** Fixed-wing aircraft, rotary-wing aircraft, surface combatant **Targets:** Aircraft targets; electronic warfare targets **Systems being Trained/Tested:** None		
Standard Operating Procedures *(Section 2.3.3)*	Aircraft safety Vessel safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area	**Bays/Estuaries/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Aircraft noise Vessel noise **Explosive:** None	**Physical Disturbance and Strike:** Aircraft and aerial targets Vessels and in-water devices **Ingestion:** None	**Energy:** In-air electromagnetic devices **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Metals Other materials	
Stressors to Human Resources	**Cultural Resources:** None	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** Physical interactions
Military Expended Material	**Ingestible Material:** None **Non-Ingestible Material:** Expendable decoys	**Military Recoverable Material**	None
Sonar and Other Transducer Bins	None		
Explosive Bins	None		
Procedural Mitigation Measures	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement		

Electronic Warfare	
Electronic Warfare Operations	
Assumptions Used for Analysis	All chaff and flares involved in this event are covered under chaff exercise and flare exercises, respectively.

A.1.6 EXPEDITIONARY WARFARE

A.1.6.1 Parachute Insertion

Expeditionary Warfare			
Parachute Insertion			
Short Description	Military personnel train for covert insertion into target areas using parachutes.	**Typical Duration** 2–8 hours	
Long Description	These operations will vary in length depending on the transportation method and systems being used. Target areas are parachute drop zones that may be at sea or on land.		
Typical Components	**Platforms:** Fixed-wing aircraft, rotary-wing aircraft, tilt-rotor aircraft, small boat **Targets:** None **Systems being Trained/Tested:** None		
Standard Operating Procedures *(Section 2.3.3)*	Aircraft safety Vessel safety	**Typical Locations**	
		Range Complexes/Testing Ranges: Mariana Islands Range Complex parachute drop zones; Guam; Tinian; Rota	**Bays/Estuaries/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Aircraft noise Vessel noise **Explosive:** None	**Physical Disturbance and Strike:** Aircraft and aerial targets Vessel and in-water devices Personnel disturbance **Ingestion:** None	**Energy:** None **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Other materials	
Stressors to Human Resources	**Cultural Resources:** Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Physical disturbance and strike Airborne acoustics	**Public Health and Safety:** Physical interactions
Military Expended Material	**Ingestible Material:** None **Non-Ingestible Material:** None	**Military Recoverable Material**	Decelerators/parachutes
Sonar and Other Transducer Bins	None		
Explosive Bins	None		
Procedural Mitigation Measures	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement		
Assumptions Used for Analysis	Combat swimmers inserted at sea may transit through surf zone onto beach.		

A.1.6.2 Personnel Insertion/Extraction

Expeditionary Warfare			
Personnel Insertion/Extraction			
Short Description	Military personnel train for covert insertion and extraction into target areas using helicopters, fixed-wing (insertion only), small boats, and submersibles.	**Typical Duration** 2–8 hours	
Long Description	Personnel train to approach or depart an objective area using various transportation methods and tactics. These operations train forces to insert and extract personnel and equipment day or night. Tactics and techniques employed include insertion from aircraft by parachute, by rope, or from low, slow-flying helicopters from which personnel jump into the water. Parachute training is required to be conducted on surveyed drop zones to enhance safety. Insertion and extraction methods also employ small inflatable boats.		
Typical Components	**Platforms:** Fixed-wing aircraft, rotary-wing aircraft, tilt-rotor aircraft, small craft, submersibles **Targets:** None **Systems being Trained/Tested:** None		
Standard Operating Procedures *(Section 2.3.3)*	Aircraft safety Vessel safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Range Complex; Guam; Tinian; Rota; Saipan	**Bays/Estuaries/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Aircraft noise Vessel noise **Explosive:** None	**Physical Disturbance and Strike:** Aircraft and aerial targets Vessel and in-water devices Personnel disturbance **Ingestion:** None	**Energy:** None **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** None	
Stressors to Human Resources	**Cultural Resources:** Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Physical disturbance and strike	**Public Health and Safety:** Physical interactions
Military Expended Material	**Ingestible Material:** None **Non-Ingestible Material:** None	**Military Recoverable Material**	Decelerators/parachutes
Sonar and Other Transducer Bins	None		
Explosive Bins	None		
Procedural Mitigation Measures	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement		

Expeditionary Warfare	
Personnel Insertion/Extraction	
Assumptions Used for Analysis	During the conduct of insertion/extraction activities personnel may exit the watercraft in the surf zone and divers and combat swimmers will stand in the surf zone and walk onto the beach.

A.1.7 MINE WARFARE

Mine warfare is the naval warfare area involving the detection, avoidance, and neutralization of mines to protect Navy ships and submarines, and offensive mine laying in naval operations. A naval mine is a self-contained explosive device placed in water to destroy ships or submarines. Naval mines are deposited and left in place until triggered by the approach of an enemy ship, or are destroyed or removed. Naval mines can be laid by purpose-built minelayers, other ships, submarines, or airplanes. Mine warfare training includes mine countermeasure exercises, mine laying, and recovery exercises. Recovery of mine shapes and targets can include raising and towing the training aides to shore.

A.1.7.1 Civilian Port Defense

Mine Warfare			
Civilian Port Defense			
Short Description	Maritime security personnel train to protect civilian ports and harbors against enemy efforts to interfere with access to those ports.	**Typical Duration** Multiple days	
Long Description	Naval forces provide Mine Warfare capabilities to support Department of Homeland Security sponsored events. The three pillars of mine warfare, airborne (helicopter), surface (surface ships), and undersea (divers, marine mammals, and unmanned vehicles) mine countermeasures will be brought to bear in order to ensure strategic U.S. ports remain free of mine threats. Various mine warfare sensors, which utilize active acoustics, will be employed in the detection, classification, and neutralization of mines. Along with traditional mine warfare techniques, such as helicopter towed mine countermeasures, new technologies (unmanned vehicles) will be utilized. Event locations and scenarios will vary according to Department of Homeland Security strategic goals and evolving world events.		
Typical Components	**Platforms:** Mine warfare ship, rotary-wing aircraft, small boat, unmanned underwater vehicle **Targets:** Mine shapes **Systems being Trained/Tested:** Mine detection systems, towed mine neutralization systems, airborne mine neutralization system		
Standard Operating Procedures *(Section 2.3.3)*	Vessel safety Aircraft safety Unmanned aerial and underwater vehicle procedures Towed in-water device safety Laser Procedures Target deployment and retrieval safety Pierside testing safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Range Complex	**Bays/Estuaries/Pierside:** Mariana littorals Inner and Outer Apra Harbor
Stressors to Biological Resources	**Acoustic:** Sonar and other transducers Aircraft noise Vessel noise **Explosive:** In-air explosions In-water explosions	**Physical Disturbance and Strike:** Aircraft and aerial targets Vessels and in-water devices Seafloor devices Military expended materials **Ingestion:** Military expended materials – munitions Military expended materials – other than munitions	**Energy:** In-water electromagnetic devices In-air electromagnetic devices **Entanglement:** Wires and cables Decelerators/Parachutes

Mine Warfare			
Civilian Port Defense			
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Explosives Metals Chemicals Other materials	
Stressors to Human Resources	**Cultural Resources:** Explosives Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** In-air energy In-water energy Physical interactions
Military Expended Material	**Ingestible Material:** None **Non-Ingestible Material:** None	**Military Recoverable Material**	Mine shapes (non-explosive)
Sonar and Other Transducer Bins	**High-Frequency:** HF4	**Synthetic Aperture Sonar:** SAS2	
Explosive Bins	None		
Procedural Mitigation Measures	**Acoustic Stressors:** *(Section 5.3.2)* Active sonar	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement Towed in-water devices	
Assumptions Used for Analysis	Non-permanent mine shapes will be laid in various places on the bottom and will be retrieved Shapes are varied, from about 1 m circular to about 2.5 meters long by 1 meter wide. They will be recovered using normal assets, with diver involvement.		

A.1.7.2 Limpet Mine Neutralization System

Mine Warfare			
Limpet Mine Neutralization System			
Short Description	Navy Explosive Ordnance Disposal divers place a small charge on a simulated underwater mine.	**Typical Duration** 2 hours	
Long Description	A metal sheet containing a non-explosive limpet mine is lowered into the water, sometimes from the side of a small vessel, such as an LCM- 8 craft. Navy Explosive Ordnance Divers place a single shock wave generator of Limpet Mine Neutralizing Systems on the mine that is located mid-water column, within water depths of 10 to 20 feet. A bag is placed over the mine to catch falling debris.		
Typical Components	**Platforms:** Support craft **Targets:** Mine Shapes **Systems being Trained/Tested:** None		
Standard Operating Procedures *(Section 2.3.3)*	Vessel safety Target deployment and retrieval safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana littorals	**Bays/Estuaries/Pierside:** Mariana littorals Inner and Outer Apra Harbor
Stressors to Biological Resources	**Acoustic:** Vessel noise **Explosive:** In-water explosions (*de minimis*)	**Physical Disturbance and Strike:** Vessels and in-water devices **Ingestion:** None	**Energy:** None **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Explosives Chemicals Metals	
Stressors to Human Resources	**Cultural Resources:** Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Physical disturbance and strike Airborne acoustics	**Public Health and Safety:** Physical interactions In-water energy
Military Expended Material	**Ingestible Material:** None **Non-Ingestible Material:** None	**Military Recoverable Material**	Sub-surface target (stationary)
Sonar and Other Transducer Bins	None		
Explosive Bins	None		
Procedural Mitigation Measures	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement		
Assumptions Used for Analysis	*De minimis* small explosive charges would be used during this activity and not quantitatively analyzed and therefore are not included under munitions.		

A.1.7.3 Mine Neutralization – Remotely Operated Vehicle Sonar

Mine Warfare			
Mine Neutralization – Remotely Operated Vehicle Sonar			
Short Description	Ship, small boat, and helicopter crews locate and disable mines using remotely operated underwater vehicles.	**Typical Duration** 1–4 hours	
Long Description	Ship, small boat, and helicopter crews utilize remotely operated vehicles to neutralize potential mines. Remotely operated vehicles will use sonar and optical systems to locate and target mine shapes. Explosive mine neutralizers may be used during live-fire events.		
Typical Components	**Platforms:** Rotary-wing aircraft, surface combatants, small boat **Targets:** Mine shapes **Systems being Trained/Tested:** Towed sonar systems, underwater explosives		
Standard Operating Procedures *(Section 2.3.3)*	Aircraft safety Towed in-water device safety Vessel safety Target deployment and retrieval safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area	**Bays/Estuaries/Pierside:** Mariana littorals and Outer Apra Harbor
Stressors to Biological Resources	**Acoustic:** Sonar and other transducers Aircraft noise Vessel noise **Explosive:** In-water explosions	**Physical Disturbance and Strike:** Aircraft and aerial targets Vessels and in-water devices Military expended materials Seafloor devices **Ingestion:** Military expended materials – munitions Military expended materials – other than munitions	**Energy:** In-air electromagnetic devices In-water electromagnetic devices **Entanglement:** Wires and cables
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Explosives Metals	
Stressors to Human Resources	**Cultural Resources:** Explosives Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** In-water energy Physical interactions
Military Expended Material	**Ingestible Material:** Neutralizer fragments **Non-Ingestible Material:** Fiber optic cable, fiber optic can	**Military Recoverable Material**	Mine shapes (non-explosive)
Sonar and Other Transducer Bins	None		
Explosive Bins	E4		
Procedural Mitigation Measures	**Explosive Stressors:** *(Section 5.3.3)* Explosive Mine Countermeasure and Neutralization Activities	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement Towed in-water devices	

Mine Warfare	
Mine Neutralization – Remotely Operated Vehicle Sonar	
Assumptions Used for Analysis	Fiber optic cable is only expended during use of explosive mine neutralizers.

A.1.7.4 Mine Countermeasure Exercise – Surface Ship Sonar

Mine Warfare			
Mine Countermeasure Exercise – Surface Sonar			
Short Description	Ship crews detect, locate, identify, and avoid mines while navigating restricted areas or channels, such as while entering or leaving port.	**Typical Duration** Up to 15 hours	
Long Description	This event trains ship crews to detect mines for future neutralization or to alert other ships. Training utilizes simulated minefields constructed of moored or bottom mines, or instrumented mines that can record effectiveness of mine detection efforts. Ships will use active sonar to search the area ahead of the ship for moored mines or other hazards of navigation.		
Typical Components	**Platforms:** Mine sweeper, Surface combatant **Targets:** Mine shapes **Systems being Trained/Tested:** High-frequency sonar, mid-frequency sonar		
Standard Operating Procedures *(Section 2.3.3)*	Vessel safety Target deployment and retrieval safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area	**Bays/Estuaries/Pierside:** Apra Harbor
Stressors to Biological Resources	**Acoustic:** Sonar and other transducers Vessel noise **Explosive:** None	**Physical Disturbance and Strike:** Vessels and in-water devices Seafloor devices **Ingestion:** None	**Energy:** In-air electromagnetic devices **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** None	
Stressors to Human Resources	**Cultural Resources:** None	**Socioeconomic Resources:** Accessibility	**Public Health and Safety:** In-water energy Physical interactions
Military Expended Material	**Ingestible Material:** None **Non-Ingestible Material:** None	**Military Recoverable Material**	Mine shapes (non-explosive)
Sonar and Other Transducer Bins	**High-Frequency Sonar** HF4	Mid-Frequency Sonar MF1K	
Explosive Bins	None		
Procedural Mitigation Measures	**Acoustic Stressors:** *(Section 5.3.2)* Active sonar	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement	
Assumptions Used for Analysis	Existing placed mine shapes or targets of opportunity (buoys) to be used. There is potential for temporarily placed mine shapes to be used.		

A.1.7.5 Mine Countermeasure – Towed Mine Neutralization

Mine Warfare			
Mine Countermeasures – Towed Mine Neutralization			
Short Description	Helicopter aircrews, manned and unmanned vehicles tow systems through the water which are designed to disable or trigger mines.	**Typical Duration** Up to 12 hours	
Long Description	Helicopter, vehicle operators and unmanned vehicles use towed devices to trigger mines that are designed to detonate when they detect ships/submarines by engine/propeller sounds or magnetic (steel construction) signature. Towed devices can also employ cable cutters to detach floating moored mines. Training will be conducted either with non-explosive training mine shapes or without any mine shapes. A high degree of pilot skill is required in deploying devices, safely towing them at relatively low speeds and altitudes, and then recovering devices. Devices used may include the following: Organic Airborne and Surface Influence Sweep (OASIS). The Organic Airborne and Surface Influence Sweep is a towed device that imitates the magnetic and acoustic signatures of naval ships and submarines. MK 105 sled: the MK 105 sled, similar to the Organic Airborne and Surface Influence Sweep, creates a magnetic field used to trigger mines. The MK 105 sled can also be used in conjunction with the MK 103 cable cutter system and the MK 104 acoustic countermeasure. AN/SPU-1/W "Magnetic Orange Pipe": As the name implies, the AN/SPU-1/W is a magnetic pipe that is used to trigger magnetically influenced mines.		
Typical Components	**Platforms:** Mine warfare ship, rotary-wing aircraft, unmanned surface vehicle **Targets:** Mine Shapes **Systems being Trained/Tested:** Electromagnetic devices		
Standard Operating Procedures *(Section 2.3.3)*	Aircraft safety Towed in-water device safety Vessel safety Unmanned surface vehicle safety Pierside testing safety Target deployment and retrieval safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area	**Bays/Estuaries/Pierside:** Apra Harbor
Stressors to Biological Resources	**Acoustic:** Aircraft noise Vessel noise **Explosive:** None	**Physical Disturbance and Strike:** Aircraft and aerial target Vessels and in-water devices Seafloor devices **Ingestion:** None	**Energy:** In-water electromagnetic devices In-air electromagnetic devices **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** None	
Stressors to Human Resources	**Cultural Resources:** Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** In-water energy In-air energy Physical interactions

Mine Warfare			
Mine Countermeasures – Towed Mine Neutralization			
Military Expended Material	**Ingestible Material:** None **Non-Ingestible Material:** None	**Military Recoverable Material**	Mine shape (non-explosive)
Sonar and Other Transducer Bins	None		
Explosive Bins	None		
Procedural Mitigation Measures	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement Towed in-water devices		
Assumptions Used for Analysis	Mechanical sweeping (cable cutting), acoustic and magnetic influence sweeping devices are towed from helicopters, surface vessels, and unmanned vehicles. Cable cutters utilize an insignificant charge (similar to a shotgun shell). Acoustic sweeps generate ship type noise via a mechanical system. Towing systems though minefields (or without mines, to train to deploy, tow, and recover) may involve instrumented mines. Mine shapes would be recovered.		

A.1.7.6 Mine Countermeasure – Towed Mine Detection

Mine Warfare			
Mine Countermeasures – Towed Mine Detection			
Short Description	Helicopter aircrews, manned and unmanned vehicles detect mines using towed or laser mine detection systems.	**Typical Duration** Typically 1.5 hours up to 4 hours	
Long Description	Helicopter aircrews, manned and unmanned vehicles use towed and airborne devices to detect, locate, and classify potential mines. Towed devices employ active acoustic sources, such as high-frequency and side scanning sonar. These devices are similar in function to systems used to map the seafloor or locate submerged structures/items. Airborne devices utilize laser systems to locate mines located below the surface. Devices used include the ANAQS-20/A, towed mine-hunting sonar used to detect and classify bottom and floating/moored mines in deep and shallow water, and the Airborne Laser Mine Detection System, developed to detect and classify floating and near-surface, moored mines.		
Typical Components	**Platforms:** Mine warfare ship, rotary-wing aircraft, unmanned surface vehicles **Targets:** Mine shapes **Systems being Trained/Tested:** Mine detection systems		
Standard Operating Procedures *(Section 2.3.3)*	Aircraft safety Vessel safety Unmanned surface vehicle safety Laser Procedures Target deployment and retrieval safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area	**Bays/Estuaries/Pierside:** Apra Harbor
Stressors to Biological Resources	**Acoustic:** Aircraft noise Vessel noise **Explosive:** None	**Physical Disturbance and Strike:** Aircraft and aerial target Vessels and in-water devices Seafloor devices **Ingestion:** None	**Energy:** None **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** None	
Stressors to Human Resources	**Cultural Resources:** Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** In-water energy In-air energy Physical interactions
Military Expended Material	**Ingestible Material:** None **Non-Ingestible Material:** None	**Military Recoverable Material**	Mine shapes (non-explosive)
Sonar and Other Transducer Bins	None		
Explosive Bins	None		

Mine Warfare	
Mine Countermeasures – Towed Mine Detection	
Procedural Mitigation Measures	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Towed in-water devices Vessel movement
Assumptions Used for Analysis	Sonar mine detection systems towed from helicopters and surface vessels. Airborne laser systems used to detect mine shapes. Laser systems are similar to commercial Light Detection And Ranging systems. The in-air low energy laser stressor was used in analysis of potential impacts on human resources. Mine shapes may be deployed via ship and will be recovered.

A.1.7.7 Mine Countermeasure Exercise – Towed Sonar

Mine Warfare			
Mine Countermeasure Exercise – Towed Sonar			
Short Description	Surface ship crews detect and avoid mines while navigating restricted areas or channels using towed active sonar systems.	**Typical Duration** 1–4 hours	
Long Description	Surface vessel crews detect and avoid mines or other underwater hazardous objects while navigating restricted areas or channels using active sonar. Littoral Combat Ship utilizes unmanned surface vehicles and remotely operated vehicles to tow mine detection (hunting) equipment. Systems will operate from shallow zone greater than 40 feet to deep water. Events could be embedded in major training exercises.		
Typical Components	**Platforms:** Surface combatant, unmanned aerial vehicles, unmanned surface vehicles **Targets:** Mine shapes **Systems being Trained/Tested:** High frequency sonar		
Standard Operating Procedures *(Section 2.3.3)*	Unmanned aerial, surface, and subsurface vehicle safety Vessel safety Laser Procedures Target deployment and retrieval safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area	**Bays/Estuaries/Pierside:** Apra Harbor
Stressors to Biological Resources	**Acoustic:** Sonar and other transducers Vessel noise **Explosive:** None	**Physical Disturbance and Strike:** Aircraft and aerial targets Vessel and in-water devices Seafloor devices **Ingestion:** None	**Energy:** In-air electromagnetic devices In-water electromagnetic devices **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Explosives	
Stressors to Human Resources	**Cultural Resources:** Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** In-water energy Physical interactions
Military Expended Material	**Ingestible Material:** None **Non-Ingestible Material:** None	**Military Recoverable Material**	Mine shapes (non-explosive)
Sonar and Other Transducer Bins	**High Frequency:** HF4		
Explosive Bins	None		
Procedural Mitigation Measures	**Acoustic Stressors:** *(Section 5.3.2)* Active sonar	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement Towed-in water devices	

Mine Warfare	
Mine Countermeasure Exercise – Towed Sonar	
Assumptions Used for Analysis	No explosives used. Constraints: Assume system will be operated in areas free of obstructions, and will be towed well above the seafloor. Towed system will be operated in a manner to avoid entanglement and damage. Events will take place in water depths 40 feet and greater. Existing placed mine shapes to be used. Potential for temporary placement of mine shapes.

A.1.7.8 Mine Laying

Mine Warfare			
Mine Laying			
Short Description	Fixed-wing aircraft drop non-explosive mine shapes.	**Typical Duration** 1 hour	
Long Description	Fixed-wing aircraft lay offensive or defensive mines for a tactical advantage for friendly forces. Fixed-wing aircraft lay a precise minefield pattern for specific tactical situations. The aircrew typically makes multiple passes in the same flight pattern, and drop one or more training shapes per pass (four shapes total). Training shapes are non-explosive and are recovered when possible.		
Typical Components	**Platforms:** Fixed-wing aircraft, support vessels **Targets:** Mine shapes **Systems being Trained/Tested:** None		
Standard Operating Procedures *(Section 2.3.3)*	Aircraft safety Target deployment and retrieval safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area, Primary areas: Special Use Airspace, nearshore FDM.	**Bays/Estuaries/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Aircraft noise Vessel noise **Explosive:** None	**Physical Disturbance and Strike:** Aircraft and aerial targets Military expended materials Seafloor devices **Ingestion:** None	**Energy:** None **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Metals	
Stressors to Human Resources	**Cultural Resources:** Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** Physical interactions
Military Expended Material	**Ingestible Material:** None **Non-Ingestible Material:** Mine shapes (non-explosive)	**Military Recoverable Material**	Mine shapes (non-explosive)
Sonar and Other Transducer Bins	None		
Explosive Bins	None		
Procedural Mitigation Measures	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Non-explosive bombs and mine shapes		
Assumptions Used for Analysis	Mine laying is similar to a non-explosive bombing exercise. While some mine shapes will be recovered if possible, assume they will not for the analysis. Nearshore/shallow water events will be planned to minimize/avoid coral impacts.		

A.1.7.9 Mine Neutralization – Explosive Ordnance Disposal

Mine Warfare			
Mine Neutralization Explosive Ordnance Disposal			
Short Description	Personnel disable threat mines using explosive charges.	**Typical Duration** Up to 4 hours	
Long Description	Navy divers, typically explosive ordnance disposal personnel, disable threat mines with explosive charges to create a safe channel for friendly vessels to transit. Personnel detect, identify, evaluate, and neutralize mines in the water with an explosive device and may involve detonation of one or more explosive typically up to 20 pounds (lb.) of TNT equivalent. These operations are normally conducted during daylight hours for safety reasons. Time delay fuses may be used for these events.		
Typical Components	**Platforms:** Rotary-wing aircraft, small boats **Targets:** Mine shapes **Systems being Trained/Tested:** None		
Standard Operating Procedures *(Section 2.3.3)*	Underwater detonation safety Aircraft safety Vessel safety Target deployment and retrieval safety	**Typical Locations** **Range Complexes/Testing Ranges:** Agat Bay underwater detonation site Piti and Outer Apra Harbor underwater detonation sites	**Bays/Estuaries/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Aircraft noise Vessel noise **Explosive:** In-water explosions	**Physical Disturbance and Strike:** Aircraft and aerial targets Vessels and in-water devices Military expended materials Seafloor devices **Ingestion:** Military expended materials – munitions Military expended materials – other than munitions	**Energy:** None **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Explosives Metals	Chemicals Other materials
Stressors to Human Resources	**Cultural Resources:** Explosives Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** In-water energy Physical interactions
Military Expended Material	**Ingestible Material:** Target fragments **Non-Ingestible Material:** None	**Military Recoverable Material**	Mine shapes (non-explosive)
Sonar and Other Transducer Bins	None		

Mine Warfare		
Mine Neutralization Explosive Ordnance Disposal		
Explosive Bins	E5 E6	
Procedural Mitigation Measures	**Explosive Stressors:** *(Section 5.3.3)* Explosive Mine Neutralization Activities Involving Navy Divers	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement
Assumptions Used for Analysis	Charge placed anywhere in water column, including bottom. Mine shapes will be recovered when practicable. Some will explode, and fragments will not be recovered. Agat Bay underwater detonation site has a maximum charge size of 20 lb. net explosive weight (NEW). Piti and Outer Apra Harbor underwater detonation sites have a maximum charge size of 10 lb. NEW.	

A.1.7.10 Submarine Mine Exercise

Mine Warfare			
Submarine Mine Exercise			
Short Description	Submarine crews practice detecting mines in a designated area.	**Typical Duration** Varies	
Long Description	Submarine crews use active sonar to detect and avoid mines or other underwater hazardous objects, while navigating restricted areas or channels, such as while entering or leaving port. This event trains submarine crews to detect and avoid mines. Training utilizes simulated minefields constructed of moored or bottom mines, or instrumented mines that can record effectiveness of mine detection efforts. In a typical training exercise, submarine crews will use high-frequency sonar to locate and avoid the mine shapes. Each mine avoidance exercise involves one submarine operating the high-frequency sonar to navigate through the training minefield		
Typical Components	**Platforms:** Submarines **Targets:** Mine shapes **Systems being Trained/Tested:** High-frequency sonar (hull mounted)		
Standard Operating Procedures *(Section 2.3.3)*	Vessel safety Target deployment and retrieval safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area; nearshore, littorals	**Bays/Estuaries/Pierside:**
Stressors to Biological Resources	**Acoustic:** Sonar and other transducers **Explosive:** None	**Physical Disturbance and Strike:** Vessels and in-water devices Military expended materials Seafloor Devices **Ingestion:** None	**Energy:** None **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** None	**Sediments and Water Quality:** None	
Stressors to Human Resources	**Cultural Resources:** None	**Socioeconomic Resources:** None	**Public Health and Safety:** In-water energy Physical interactions
Military Expended Material	**Ingestible Material:** None **Non-Ingestible Material:** None	**Military Recoverable Material**	Mine shapes (non-explosive)
Sonar and Other Transducer Bins	**High Frequency:** HF1		
Explosive Bins	None		
Procedural Mitigation Measures	**Acoustic Stressors:** *(Section 5.3.2)* Active sonar	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement	

Mine Warfare	
Submarine Mine Exercise	
Assumptions Used for Analysis	There is potential for temporarily placed mine shapes to be used. This event could involve submarines placing mine shapes.

A.1.7.11 Surface Ship Object Detection

Mine Warfare			
Surface Ship Object Detection			
Short Description	Ship crews detect and avoid mines while navigating restricted areas or channels using active sonar.	**Typical Duration** Up to 15 hours	
Long Description	Surface ship crews detect and avoid mines or other underwater hazardous objects while navigating restricted areas or channels using active sonar. A Littoral Combat Ship utilizes unmanned surface vehicles and remotely operated vehicles to tow mine detection (hunting) equipment. Systems will operate from a shallow zone greater than 40 feet (ft.) to deep water. Events could be embedded within major training exercises.		
Typical Components	**Platforms:** Surface combatant, unmanned surface vehicle **Targets:** Sub-surface targets (mine shapes), targets of opportunity (buoys, fish aggregating devices) **Systems being Trained/Tested:** High-frequency sonar, mid-frequency sonar, towed sonar systems		
Standard Operating Procedures *(Section 2.3.3)*	Vessel safety Unmanned aerial and underwater vehicle procedures Towed in-water device safety Target deployment and retrieval safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area	**Bays/Estuaries/Pierside:** Apra Harbor
Stressors to Biological Resources	**Acoustic:** Sonar and other transducers Vessel noise **Explosive:** None	**Physical Disturbance and Strike:** Vessels and in-water devices Seafloor devices **Ingestion:** None	**Energy:** None **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** None	
Stressors to Human Resources	**Cultural Resources:** Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Physical disturbance and strike	**Public Health and Safety:** In-water energy In-air energy Physical interactions
Military Expended Material	**Ingestible Material:** None **Non-Ingestible Material:** None	**Military Recoverable Material**	Mine shapes (non-explosive)
Sonar and Other Transducer Bins	**Mid-Frequency:** MF1K	**High-Frequency:** None	
Explosive Bins	None		

Mine Warfare		
Surface Ship Object Detection		
Procedural Mitigation Measures	**Acoustic Stressors:** Active sonar	**Physical Disturbance and Strike:** Vessel movement Towed in-water devices
Assumptions Used for Analysis	No explosives are used. Constraints: Assume system will be operated in areas free of obstructions, and will be towed well above the seafloor. Towed system will be operated in a manner to avoid entanglement and damage. Events will take place in water depths 40 ft. and greater. Existing placed mine shapes/targets of opportunity to be used. There is the potential for temporary placement of mine shapes. Potential locations for this activity include Mariana Littorals and Apra Harbor.	

A.1.7.12 Underwater Demolition Qualification and Certification

Mine Warfare			
Underwater Demolition Qualification and Certification			
Short Description	Navy divers conduct various levels of training and certification in placing underwater demolition charges.	**Typical Duration** Varies	
Long Description	Underwater explosive charges, up to 20 lb. net explosive weight are detonated to complete training qualification or certification.		
Typical Components	**Platforms:** Rotary-wing aircraft, small boats **Targets:** Mine shapes **Systems being Trained/Tested:** None		
Standard Operating Procedures *(Section 2.3.3)*	Aircraft safety Vessel safety Underwater detonation safety Target deployment and retrieval safety	**Typical Locations** **Range Complexes/Testing Ranges:** Agat Bay underwater detonation site Piti and Outer Apra Harbor underwater detonation sites	**Bays/Estuaries/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Aircraft noise Vessel noise **Explosive:** In-air explosions In-water explosions	**Physical Disturbance and Strike:** Aircraft and aerial targets Vessels and in-water devices Military expended materials Seafloor devices **Ingestion:** Military expended materials – other than munitions	**Energy:** None **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Explosives Metals	Chemicals Other materials
Stressors to Human Resources	**Cultural Resources:** Explosives Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** In-water energy Physical interactions
Military Expended Material	**Ingestible Material:** Target fragments **Non-Ingestible Material:** Mine shape (non-explosive)	**Military Recoverable Material**	None
Sonar and Other Transducer Bins	None		
Explosive Bins	E5 E6		
Procedural Mitigation Measures	**Explosive Stressors:** *(Section 5.3.3)* Explosive mine neutralization activities involving Navy divers	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement	

Mine Warfare	
Underwater Demolition Qualification and Certification	
Assumptions Used for Analysis	Agat Bay underwater detonation site has a maximum charge size of 20 lb. net explosive weight (NEW). Piti and Outer Apra Harbor underwater detonation sites have a maximum charge size of 10 lb. NEW.

A.1.8 STRIKE WARFARE

A.1.8.1 Bombing Exercise (Air-to-Ground)

Strike Warfare			
Bombing Exercise (Air-to-Ground)			
Short Description	Fixed-wing aircraft drop bombs against a land target.	**Typical Duration** 1–2 hours	
Long Description	Bombing exercise involves training of bomber or strike fighter aircraft delivery of ordnance against land targets in day or night conditions. The bombing exercise may involve close air support training in direct support of and in close proximity to forces on the ground, such as Navy or Marine forces engaged in training exercises on land, and may include the use of targeting laser.		
Typical Components	**Platforms:** Fixed-wing aircraft **Targets:** Land targets **Systems being Trained/Tested:** Targeting laser systems		
Standard Operating Procedures *(Section 2.3.3)*	Aircraft safety Laser Procedures	**Typical Locations** **Range Complexes/Testing Ranges:** Farallon de Medinilla, R-7201, R-7201A	**Bays/Estuaries/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Aircraft noise **Explosive:** None	**Physical Disturbance and Strike:** Aircraft and aerial targets Military expended material **Ingestion:** None	**Energy:** None **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria pollutants	**Sediments and Water Quality:** Metals	
Stressors to Human Resources	**Cultural Resources:** Explosives Physical disturbance and strike	**Socioeconomic Resources:** Airborne acoustics	**Public Health and Safety:** None
Military Expended Material	**Ingestible Material:** None **Non-Ingestible Material:** None	**Military Recoverable Material**	None
Sonar and Other Transducer Bins	None		
Explosive Bins	None		
Procedural Mitigation Measures	None		
Assumptions Used for Analysis	Bombs are released in accordance with range standard operating procedures. Land targets only.		

A.1.8.2 Gunnery Exercise (Air-to-Ground)

Strike Warfare			
Gunnery Exercise (Air-to-Ground)			
Short Description	Helicopter crews fire guns at stationary land targets; fixed-wing aircraft also strafe land targets.	**Typical Duration** 1 hour	
Long Description	Fixed-wing aircraft and helicopter crews use guns to attack ground targets, day or night, with the goal of destroying or disabling enemy vehicles, structures, or personnel. Aircraft will fire a burst of rounds, then break off and reposition for another strafing run until each aircraft expends its exercise ordnance allowance. This exercise may include the use of targeting laser.		
Typical Components	**Platforms:** Fixed-wing aircraft, rotary-wing aircraft **Targets:** Land targets **Systems being Trained/Tested:** Targeting laser systems		
Standard Operating Procedures *(Section 2.3.3)*	Aircraft safety Weapons firing safety Laser procedures	**Typical Locations** **Range Complexes/Testing Ranges:** Farallon de Medinilla, R 7201, R 7201A	**Bays/Estuaries/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Aircraft noise Weapons noise **Explosive:** None	**Physical Disturbance and Strike:** Aircraft and aerial targets Military expended materials **Ingestion:** Military expended materials – munitions	**Energy:** None **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria pollutants	**Sediments and Water Quality:** Metals	
Stressors to Human Resources	**Cultural Resources:** Explosives Physical disturbance and strike	**Socioeconomic Resources:** Airborne acoustics	**Public Health and Safety:** None
Military Expended Material	**Ingestible Material:** Projectile casings **Non-Ingestible Material:** None	**Military Recoverable Material**	None
Sonar and Other Transducer Bins	None		
Explosive Bins	None		
Procedural Mitigation Measures	None		
Assumptions Used for Analysis	Land-based targets only		

A.1.8.3 Missile Exercise

Strike Warfare			
Missile Exercise (MISSILEX)			
Short Description	Missiles or rockets are launched against a land target.	**Typical Duration** 1–2 hours	
Long Description	Fixed-wing aircraft, helicopter, ship or submarine crews use missiles to attack ground targets, day or night, with the goal of destroying or disabling enemy vehicles, structures, or personnel.		
Typical Components	**Platforms:** Fixed-wing aircraft, rotary-wing aircraft, surface ships, submarines **Targets:** Land targets **Systems being Trained/Tested:** Targeting Lasers		
Standard Operating Procedures *(Section 2.3.3)*	Aircraft safety Weapons firing safety Vessel safety Laser Procedures	**Typical Locations** **Range Complexes/Testing Ranges:** Farallon de Medinilla, R 7201, R 7201A	**Bays/Estuaries/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Aircraft noise Weapons noise Vessel noise **Explosive:** None	**Physical Disturbance and Strike:** Aircraft and aerial target Military expended materials Vessel and in-water device **Ingestion:** None	**Energy:** None **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria pollutants	**Sediments and Water Quality:** Metals	
Stressors to Human Resources	**Cultural Resources:** Explosives Physical disturbance and strike	**Socioeconomic Resources:** Airborne acoustics	**Public Health and Safety:** None
Military Expended Material	**Ingestible Material:** None **Non-Ingestible Material:** Missile booster sections	**Military Recoverable Material**	None
Sonar and Other Transducer Bins	None		
Explosive Bins	Land based, various munitions included.		
Procedural Mitigation Measures	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement		
Assumptions Used for Analysis	Land-based targets only		

A.1.9 Surface Warfare Training

Surface warfare is a type of naval warfare in which aircraft, surface ships, and submarines employ weapons and sensors in operations directed against enemy surface ships or small boats. Aircraft-to-surface warfare is conducted by long-range attacks using air-launched cruise missiles, precision guided munitions, or aircraft guns. Surface warfare also is conducted by warships employing torpedoes, naval guns, and surface-to-surface missiles. Submarines attack surface ships using torpedoes or submarine-launched, anti-ship cruise missiles. Training in surface warfare includes surface-to-surface gunnery and missile exercises, air-to-surface gunnery and missile exercises, and submarine missile or torpedo launch events. Gunnery and missile training generally involves expenditure of ordnance against a towed target. A sinking exercise is a specialized training event that provides an opportunity for ship, submarine, and aircraft crews to use multiple weapons systems to deliver high-explosive ordnance on a deactivated vessel, which is deliberately sunk.

Surface warfare also encompasses maritime security, that is, the interception of a suspect surface ship by a Navy ship for the purpose of boarding-party inspection or the seizure of the suspect ship. Training in these tasks is conducted in visit, board, search and seizure exercises.

A.1.9.1 Bombing Exercise Air-to-Surface

Surface Warfare			
Bombing Exercise Air-to-Surface			
Short Description	Fixed-wing aircrews deliver bombs against surface targets.	**Typical Duration** 1 hour	
Long Description	Fixed-wing aircraft conduct bombing exercises against stationary floating targets (e.g., MK-58 smoke buoy), towed targets, or maneuvering targets. An aircraft clears the area, deploys a smoke buoy, and then delivers high-explosive or non-explosive practice munitions bomb(s) on the target. A range boat may be used to deploy towed or maneuvering targets for an aircraft to attack. Exercises for strike fighters typically involve a flight of two aircraft delivering unguided or guided munitions that may be either high-explosive or non-explosive. The following munitions may be employed by strike fighter aircraft in the course of bombing exercise: Unguided munitions include non-explosive subscale bombs (MK-76 and BDU-45), explosive and non-explosive general purpose bombs (MK-80 series), MK-20 cluster bomb (explosive, non-explosive). Precision-guided munitions include laser-guided bombs (explosive, non-explosive), laser-guided training rounds (non-explosive), Joint Direct Attack Munition (explosive, non-explosive).		
Typical Components	**Platforms:** Fixed-wing aircraft, support craft **Targets:** Surface targets **Systems being Trained/Tested:** Aircraft platforms, bombs, non-explosive practice munitions, targeting lasers		
Standard Operating Procedures *(Section 2.3.3)*	Aircraft safety Weapons firing safety Laser Procedures	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area, Primary areas: Special Use Airspace	**Bays/Estuaries/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Vessel noise Aircraft noise Weapons noise **Explosive:** In-water explosions	**Physical Disturbance and Strike:** Aircraft and aerial target Vessels and in-water devices Military expended materials **Ingestion:** Military expended materials – munitions Military expended materials – other than munitions	**Energy:** None **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Explosives Metals	
Stressors to Human Resources	**Cultural Resources:** Explosives Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** In-water energy In-air energy Physical interactions
Military Expended Material	**Ingestible Material:** Bomb fragments, target fragments **Non-Ingestible Material:** Bomb (non-explosive), marine marker, surface target (stationary)	**Military Recoverable Material**	None

Surface Warfare				
Bombing Exercise Air-to-Surface				
Sonar and Other Transducer Bins	None			
Explosive Bins	E9	E10	E12	
Procedural Mitigation Measures	**Explosive Stressors:** *(Section 5.3.3)* Explosive bombs			**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement Non-explosive bombs and mine shapes
Assumptions Used for Analysis	Explosive bombs are assumed to explode just below the surface. This activity would occur at least 12 NM from land (FDM excepted).			

A.1.9.2 Gunnery Exercise Air-to-Surface Medium-Caliber

Surface Warfare			
Gunnery Exercise Air-to-Surface Medium-Caliber			
Short Description	Fixed-wing and helicopter aircrews fire medium-caliber guns at surface targets.	**Typical Duration** 1 hour	
Long Description	Fighter and helicopter aircrew, engage surface targets with medium-caliber guns. Targets simulate enemy ships, boats, swimmers, and floating/near- surface mines. Fighter aircraft descend on a target firing high-explosive or non-explosive practice munitions medium-caliber projectiles. Helicopters will fly a racetrack pattern around an at-sea target. Aircrew will engage the target with medium-caliber weapons. Targets range from a smoke float, or an empty steel drum, to high-speed remote-controlled boats and jet-skis.		
Typical Components	**Platforms:** Fixed-wing aircraft, rotary-wing aircraft, support vessels **Targets:** Surface targets **Systems being Trained/Tested:** Medium-caliber gun systems		
Standard Operating Procedures *(Section 2.3.3)*	Aircraft safety Weapons firing safety Target deployment and retrieval safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area, Primary areas: Special Use Airspace	**Bays/Estuaries/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Vessel noise Aircraft noise Weapons noise **Explosive:** In-air explosions In-water explosions	**Physical Disturbance and Strike:** Aircraft and aerial target Vessels and in-water devices Military expended materials **Ingestion:** Military expended materials – munitions Military expended materials – other than munitions	**Energy:** None **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Metals Explosives	
Stressors to Human Resources	**Cultural Resources:** Physical disturbance and strike Explosives	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** In-water energy Physical interactions
Military Expended Material	**Ingestible Material:** Medium-caliber casings, medium-caliber projectiles **Non-Ingestible Material:** Marine marker	**Military Recoverable Material**	Surface target (mobile and stationary)
Sonar and Other Transducer Bins	None		
Explosive Bins	E0 (*de minimis*), E1, and E2		

Surface Warfare		
Gunnery Exercise Air-to-Surface Medium-Caliber		
Procedural Mitigation Measures	**Explosive Stressors:** *(Section 5.3.3)* Explosive medium-caliber and large-caliber projectiles	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement Small-, medium-, and large-caliber non-explosive practice munitions
Assumptions Used for Analysis	Most medium-caliber air-to-surface gunnery exercises will be with non-explosive training projectiles. High-explosive rounds will supplement when non-explosive training projectiles are not available. Fixed-wing casings remain with aircraft, and helicopter shell casings are expended into the water. This activity occurs greater than 3 NM from land (FDM excepted).	

A.1.9.3 Gunnery Exercise Air-to-Surface Small-Caliber

Surface Warfare			
Gunnery Exercise Air-to-Surface Small-Caliber			
Short Description	Helicopter and tilt-rotor aircrews, use small-caliber guns to engage surface targets.	**Typical Duration** 1 hour	
Long Description	Helicopters and tilt-rotor aircraft, fly a racetrack pattern around an at-sea target. Targets simulate enemy ships, boats, and floating/near-surface mines. Each gunner will engage the target with small-caliber weapons. Targets range from a smoke float, an empty steel drum, to high-speed remote-controlled boats and jet-skis.		
Typical Components	**Platforms:** Rotary-wing aircraft, tilt-rotor aircraft **Targets:** Surface targets (e.g., MK 58 marine marker, empty steel drum, high-speed remote-controlled boats and jet-skis) **Systems being Trained/Tested:** Small-caliber gun systems		
Standard Operating Procedures *(Section 2.3.3)*	Aircraft safety Weapons firing safety Target deployment and retrieval safety	**Typical Locations**	
		Range Complexes/Testing Ranges: Mariana Islands Training and Testing Study Area, Primary areas: Special Use Airspace	**Bays/Estuaries/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Aircraft noise Vessel noise Weapons noise **Explosive:** None	**Physical Disturbance and Strike:** Aircraft and aerial target Vessels and in-water devices Military expended materials **Ingestion:** Military expended materials – munitions Military expended materials – other than munitions	**Energy:** None **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Metals	
Stressors to Human Resources	**Cultural Resources:** Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** Physical interactions
Military Expended Material	**Ingestible Material:** Small-caliber projectile (non-explosive), small-caliber casings **Non-Ingestible Material:** MK 58 marine marker	**Military Recoverable Material**	Surface target (mobile)
Sonar and Other Transducer Bins	None		
Explosive Bins	None		

Surface Warfare		
Gunnery Exercise Air-to-Surface Small-Caliber		
Procedural Mitigation Measures	**Acoustic Stressors:** *(Section 5.3.2)* Weapons firing noise	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement Small-, medium-, and large-caliber non-explosive practice munitions
Assumptions Used for Analysis	One target used per event. Expendable smoke float (50 percent), stationary target (45 percent), or remote-controlled target (5 percent). This activity occurs greater than 12 NM from land.	

A.1.9.4 Gunnery Exercise Surface-to-Surface Boat Medium-Caliber

Surface Warfare			
Gunnery Exercise Surface-to-Surface Boat Medium-Caliber			
Short Description	Small boat crews fire medium-caliber guns at surface targets.	**Typical Duration** 1 hour	
Long Description	Small boat crews fire medium-caliber guns at surface targets. Boat crews may use high or low speeds to approach and engage targets simulating other boats, floating mines, or nearshore land targets with medium-caliber (up to and including 40-millimeter [mm]) weapons. A commonly used target is an empty steel drum. This event also includes use of anti-swimmer grenades, which may be employed within harbors. A number of different types of boats are used depending on the unit using the boat and their mission. Boats are most used to protect ships in harbors and high value units, such as: aircraft carriers, nuclear submarines, liquid natural gas tankers, etc., while entering and leaving ports, as well as to conduct riverine operations, and various naval special warfare operations. The boats used by these units include small unit river craft, combat rubber raiding craft, rigid-hull inflatable boats, patrol craft, and many other versions of these types of boats. These boats use inboard or outboard, diesel or gasoline engines with either propeller or water jet propulsion.		
Typical Components	**Platforms:** Small boat **Targets:** Surface targets **Systems being Trained/Tested:** Medium-caliber gun systems		
Standard Operating Procedures *(Section 2.3.3)*	Vessel safety Weapons firing safety Target deployment and retrieval safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area	**Bays/Estuaries/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Vessel noise Weapons noise **Explosive:** In-air explosions In-water explosions	**Physical Disturbance and Strike:** Vessels and in-water devices Military expended materials **Ingestion:** Military expended materials – munitions Military expended materials – other than munitions	**Energy:** None **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Explosives Metals	
Stressors to Human Resources	**Cultural Resources:** Explosives Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** In-water energy Physical interactions
Military Expended Material	**Ingestible Material:** Grenade (explosive) fragments, medium-caliber projectiles (non-explosive), medium-caliber casings, target fragments **Non-Ingestible Material:** Surface target (stationary)	**Military Recoverable Material**	Surface target (stationary and mobile)

Surface Warfare		
Gunnery Exercise Surface-to-Surface Boat Medium-Caliber		
Sonar and Other Transducer Bins	None	
Explosive Bins	E2	
Procedural Mitigation Measures	**Acoustic Stressors:** *(Section 5.3.2)* Weapons firing noise **Explosive Stressors:** *(Section 5.3.3)* Explosive medium-caliber and large-caliber projectiles Maritime security operations – anti swimmer grenades	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement Small-, medium-, and large-caliber non-explosive practice munitions
Assumptions Used for Analysis	Assume all events include the use of some explosive rounds. Most events will involve boat crews training with MK 203 40 mm grenade launcher. One target used per event, typically a stationary target such as a 50-liter steel drum. Explosive rounds would be fired greater than 12 NM from land. Non-explosive rounds would be fired greater than 3 NM from land.	

A.1.9.5 Gunnery Exercise Surface-to-Surface Boat Small-Caliber

Surface Warfare			
Gunnery Exercise Surface-to-Surface Boat Small-Caliber			
Short Description	Small boat crews fire small-caliber guns at surface targets.	**Typical Duration** 1 hour	
Long Description	Small boat crews fire small-caliber guns at surface targets. Boat crews may use high or low speeds to approach and engage targets simulating other boats, swimmers, floating mines, or nearshore land targets with small-caliber (up to and including .50-caliber) weapons. A commonly used target is an empty steel drum. A number of different types of boats are used depending on the unit using the boat and their mission. Boats are most used to protect ships in harbors and high value units, such as: aircraft carriers, nuclear submarines, liquid natural gas tankers, etc., while entering and leaving ports, as well as to conduct riverine operations, and various naval special warfare operations. The boats used by these units include small unit river craft, combat rubber raiding craft, rigid-hull inflatable boats, patrol craft, and many other versions of these types of boats. These boats use inboard or outboard, diesel or gasoline engines with either propeller or water jet propulsion.		
Typical Components	**Platforms:** Small Boat **Targets:** Surface Targets **Systems being Trained/Tested:** Small-caliber gun systems		
Standard Operating Procedures *(Section 2.3.3)*	Vessel safety Weapons firing safety Target deployment and retrieval safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area	**Bays/Estuaries/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Vessel noise Weapons noise **Explosive:** In-air explosions	**Physical Disturbance and Strike:** Vessels and in-water devices Military expended materials **Ingestion:** Military expended materials – munitions Military expended materials – other than munitions	**Energy:** None **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Metals	
Stressors to Human Resources	**Cultural Resources:** Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** Physical interactions
Military Expended Material	**Ingestible Material:** Small-caliber projectile (non-explosive), small-caliber casings **Non-Ingestible Material:** None	**Military Recoverable Material**	Surface target (mobile and stationary)
Sonar and Other Transducer Bins	None		

Surface Warfare		
Gunnery Exercise Surface-to-Surface Boat Small-Caliber		
Explosive Bins	None	
Procedural Mitigation Measures	**Acoustic Stressors:** *(Section 5.3.2)* Weapons firing noise	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement Small-, medium-, and large-caliber non-explosive practice munitions
Assumptions Used for Analysis	Events will occur relatively nearshore due to short range of boats and safety concerns. Events mostly occur within 3 NM of the shoreline, but can occur further from shore.	

A.1.9.6 Gunnery Exercise Surface-to-Surface Ship Large-Caliber

Surface Warfare			
Gunnery Exercise Surface-to-Surface Ship – Large-Caliber			
Short Description	Surface ship crews fire large-caliber guns at surface targets.	**Typical Duration** Up to 3 hours	
Long Description	This exercise involves ships' gun crews engaging surface targets at sea with their main battery large-caliber (typically 57 millimeter [mm], 76 mm, and 5-inch) guns. Targets include the QST-35 seaborne powered target, high speed maneuverable surface target, or a specially configured remote-controlled water craft. Some targets are expended during the exercise and are not recovered. The exercise proceeds with the target boat approaching from about 10 nautical miles distance. The target is tracked by radar and when within a predetermined range, it is engaged first with large-caliber "warning shots." As threats get closer all weapons may be used to disable the threat. This exercise may involve a single firing ship, or be undertaken in the context of a coordinated larger exercise involving multiple ships, including a major training exercise. Large-caliber guns will also be fired during weapon certification events and in conjunction with weapon maintenance. During all events, either high-explosive or non-explosive rounds may be used. High-explosive rounds can either be fused for detonation on impact (with water surface or target), or for proximity to the target (in-air detonation).		
Typical Components	**Platforms:** Surface combatant **Targets:** Surface targets **Systems being Trained/Tested:** Large-caliber gun systems		
Standard Operating Procedures *(Section 2.3.3)*	Vessel safety Weapons firing safety	**Typical Locations**	
		Range Complexes/Testing Ranges: Mariana Islands Training and Testing Study Area, Primary areas: Special Use Airspace	**Bays/Estuaries/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Vessel noise Weapons noise **Explosive:** In-air explosions In-water explosions	**Physical Disturbance and Strike:** Vessels and in-water devices Military expended materials **Ingestion:** Military expended materials – munitions Military expended materials – other than munitions	**Energy:** In-air electromagnetic devices **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Explosives Metals	
Stressors to Human Resources	**Cultural Resources:** Explosives Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** In-air energy In-water energy Physical interactions

Surface Warfare			
Gunnery Exercise Surface-to-Surface Ship – Large-Caliber			
Military Expended Material	**Ingestible Material:** Large-caliber projectile (explosive) fragments, target fragments **Non-Ingestible Material:** Large-caliber projectile (non-explosive), large-caliber casings Surface target (stationary)	**Military Recoverable Material**	None
Sonar and Other Transducer Bins	None		
Explosive Bins	E5		
Procedural Mitigation Measures	**Acoustic Stressors:** *(Section 5.3.2)* Weapons firing noise **Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement Small-, medium-, and large-caliber non-explosive practice munitions	**Explosive Stressors:** *(Section 5.3.3)* Explosive medium-caliber and large-caliber projectiles	
Assumptions Used for Analysis	For analytical purposes assume all high explosive rounds are fused to detonate upon impact with water surface or target. After impacting the water, the high explosive rounds are expected to detonate within three feet of the surface. Non-explosive rounds and fragments from the high explosive rounds will sink to the bottom of the ocean. This activity would occur greater than 12 NM from land (FDM excepted).		

A.1.9.7 Gunnery Exercise Surface-to-Surface Ship Small- and Medium-Caliber

Surface Warfare			
Gunnery Exercise Surface-to-Surface Ship Small- and Medium-Caliber			
Short Description	Surface ship crews fire medium and small-caliber guns at surface targets.	**Typical Duration** 2–3 hours	
Long Description	Ships use small- and medium-caliber weapons to practice defensive marksmanship, typically against a stationary floating target (a 10-foot diameter red balloon [Killer Tomato]) and high-speed mobile targets. Some targets are expended during the exercise and are not recovered. Shipboard protection systems (Close-In Weapon System) utilizing medium-caliber projectiles would train against high speed mobile targets.		
Typical Components	**Platforms:** Small boat, surface combatant **Targets:** Surface Targets (e.g., stationary floating target, high speed mobile target) **Systems being Trained/Tested:** Medium and small-caliber gun systems		
Standard Operating Procedures *(Section 2.3.3)*	Vessel safety Weapons firing safety Target deployment and retrieval safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area, Primary areas: Special Use Airspace	**Bays/Estuaries/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Vessel noise Weapons noise **Explosive:** In-air explosions In-water explosions	**Physical Disturbance and Strike:** Vessels and in-water devices Military expended materials **Ingestion:** Military expended materials – munitions Military expended materials – other than munitions	**Energy:** In-air electromagnetic devices **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutant	**Sediments and Water Quality:** Explosives Metals	
Stressors to Human Resources	**Cultural Resources:** Explosives Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** In-air energy In-water energy Physical interactions
Military Expended Material	**Ingestible Material:** Medium-caliber projectiles (non-explosive), medium-caliber projectile (explosive) fragments, small-caliber projectile (explosive) fragments, small-caliber projectile (non-explosive), small-caliber casings, target fragments **Non-Ingestible Material:** Surface target (stationary)	**Military Recoverable Material**	Surface target (mobile) surface target (stationary)
Sonar and Other Transducer Bins	None		

Surface Warfare		
Gunnery Exercise Surface-to-Surface Ship Small- and Medium-Caliber		
Explosive Bins	E1	
Procedural Mitigation Measures	**Acoustic Stressors:** *(Section 5.3.2)* Weapons firing noise **Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement Small-, medium-, and large-caliber non-explosive practice munitions	**Explosive Stressors:** *(Section 5.3.3)* Explosive medium-caliber and large-caliber projectiles
Assumptions Used for Analysis	One target used per event. Approximately 50 percent of targets are "Killer Tomatoes" (usually recovered). Approximately 35 percent are high-speed maneuvering targets, which are recovered. Approximately 15 percent of targets are other stationary targets such as a steel drum. This activity would occur greater than 12 NM from land (FDM excepted).	

A.1.9.8 Laser Targeting – At-Sea

Surface Warfare			
Laser Targeting – At-Sea			
Short Description	Fixed-wing and helicopter aircrews and shipboard personnel illuminate enemy targets with lasers.	**Typical Duration** 1–2 hours	
Long Description	Fixed-wing and helicopter aircrew and shipboard personnel illuminate enemy targets with lasers for engagement by aircraft with laser guided bombs or missiles. This exercise may be conducted alone or in conjunction with other events utilizing precision guided munitions, such as surface missiles and guided rockets. Events where weapons are fired are addressed in the appropriate activity (e.g., air-to-surface missile exercise). Lower powered lasers may also be used as non-lethal deterrents during maritime security operations (force protection).		
Typical Components	**Platforms:** Fixed-wing aircraft, rotary-wing aircraft, navy ships and boats, unmanned aerial system – rotary-wing **Targets:** Surface targets **Systems being Trained/Tested:** Aircraft platforms, lasers		
Standard Operating Procedures *(Section 2.3.3)*	Aircraft safety Unmanned aerial and underwater vehicle procedures Vessel safety Laser procedures Target deployment and retrieval safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area, Primary areas: Special Use Airspace	**Bays/Estuaries/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Aircraft noise Vessel noise **Explosive:** None	**Physical Disturbance and Strike:** Aircraft and aerial target Vessel and in-water devices **Ingestion:** None	**Energy:** Lasers **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** None	
Stressors to Human Resources	**Cultural Resources:** None	**Socioeconomic Resources:** Accessibility Airborne acoustics	**Public Health and Safety:** In-air energy Physical interactions
Military Expended Material	**Ingestible Material:** None **Non-Ingestible Material:** None	**Military Recoverable Material**	Surface target (mobile)
Sonar and Other Transducer Bins	None		
Explosive Bins	None		
Procedural Mitigation Measures	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement		

Surface Warfare	
Laser Targeting – At-Sea	
Assumptions Used for Analysis	Laser targeting for missile/rocket guidance will occur in areas where these events also occur. Use of lasers as force protection non-lethal deterrents will primarily occur proximate to Navy homeports.

A.1.9.9 Maritime Security Operations

Surface Warfare			
Maritime Security Operations			
Short Description	Helicopter, surface ship, and small boat crews conduct a suite of maritime security operations at sea, to include visit, board, search and seizure, maritime interdiction operations, force protection, and anti-piracy operations.	**Typical Duration**	
		Up to 3 hours	
Long Description	Helicopter and surface ship crews conduct a suite of maritime security operations (e.g., visit, board, search and seizure, maritime interdiction operations, force protection, and anti-piracy operations). These activities involve training of boarding parties delivered by helicopters and surface ships to surface vessels for the purpose of simulating vessel search and seizure operations. Various training scenarios are employed and may include small arms with non-explosive blanks, explosive Anti-Swimmer Grenades, and surveillance or reconnaissance unmanned surface and aerial vehicles. The entire exercise may last 2–3 hours. Vessel Visit, Board, Search, and Seizure: Military personnel from ships and aircraft board suspect vessels, potentially under hostile conditions. Maritime Interdiction Operations: Ships and aircraft train in pursuing, intercepting, and ultimately detaining suspect vessels. Maritime Infrastructure Protection and Harbor Defense: Naval personnel train to defend oil platforms, similar at-sea structures, harbors, piers, and other infrastructure. Warning Shot/Disabling Fire: Naval personnel train in the use of weapons to force fleeing or threatening small boats (typically operating at high speeds) to come to a stop. Ship Force Protection: Ship crews train in tracking multiple approaching, circling small craft, assessing threat potential, and communicating amongst crewmates and other vessels to ensure ships are protected against attack. Anti-Piracy Training: Naval and U.S. Coast Guard personnel train in deterring and interrupting piracy activity. Training includes large vessels (pirate “mother ships”), and multiple small, maneuverable, and fast craft.		
Typical Components	**Platforms:** Amphibious warfare ship, rotary-wing aircraft, small boat, surface combatant, unmanned aerial vehicle, unmanned surface vehicle **Targets:** Surface targets **Systems being Trained/Tested:** Targeting systems, non-lethal deterrents, unmanned systems		
Standard Operating Procedures *(Section 2.3.3)*	Vessel safety Aircraft safety Unmanned aerial and underwater vehicle procedures Unmanned surface vehicle safety Laser procedures Target deployment and retrieval safety	**Typical Locations**	
		Range Complexes/Testing Ranges: Mariana Islands Training and Testing Study Area Mariana Islands Range Complex Mariana littorals	**Bays/Estuaries/Pierside:** Apra Harbor

Surface Warfare			
Maritime Security Operations			
Stressors to Biological Resources	**Acoustic:** Aircraft noise Vessel noise Weapons noise **Explosive:** In-air explosions In-water explosions	**Physical Disturbance and Strike:** Aircraft and aerial target Vessels and in-water devices Military expended materials **Ingestion:** Military Expended Materials – Munitions	**Energy:** None **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Explosives	
Stressors to Human Resources	**Cultural Resources:** None	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** In-air energy In-water energy Lasers Physical interactions
Military Expended Material	**Ingestible Material:** Grenade (explosive) fragments **Non-Ingestible Material:** None	**Military Recoverable Material**	None
Sonar and Other Transducer Bins	None		
Explosive Bins	E2		
Procedural Mitigation Measures	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement	**Explosive Stressors:** *(Section 5.3.3)* Maritime security operations – Anti-swimmer grenades	
Assumptions Used for Analysis	Maritime Security Operations is a broad term used to describe activities intended train naval forces in the skills necessary to protect naval vessels from small boat attack, counter piracy and drug operations (maritime interdiction operations and visit, board, search, and seizure), and protect key infrastructure (e.g., oil platforms). Maritime security operations need to remain broad as naval forces need to be able to tailor training events to respond to emergent threats. Maritime Security Operations events typically do not involve live fire of weapons; however, the use of various non-lethal deterrents is likely. All maritime security operations events involve vessel movement, sometimes at high rates of speed (naval vessels maneuvering to overtake suspect vessel or small boats (targets) closing in and maneuvering around naval vessels), and some event involve helicopters and boarding parties. Maritime security operations training events are typically conducted proximate to naval homeports including during times of transit in and out of port, as well as during major training exercises. These events may occur in littorals throughout the Study Area..		

A.1.9.10 Missile Exercise Air-to-Surface

Surface Warfare			
Missile Exercise Air-to-Surface (MISSILEX)			
Short Description	Fixed-wing and helicopter aircrews fire air-to-surface missiles at surface targets.	**Typical Duration** 2 hours	
Long Description	Fighter, maritime patrol aircraft, and helicopter aircrews fire precision-guided missiles against surface targets. Aircraft involved may be unmanned. Fixed-wing aircraft (fighters or maritime patrol aircraft) approach an at-sea surface target from high altitude, and launch high-explosive precision guided missiles. Helicopters designate at-sea surface targets with a laser or optics for precision guided missiles. Helicopter launched missiles typically pass through the target's "sail," and, if explosive, detonate at or just below, the water's surface.		
Typical Components	**Platforms:** Fixed-wing aircraft, rotary-wing aircraft, support vessel **Targets:** Surface targets **Systems being Trained/Tested:** Aircraft platforms		
Standard Operating Procedures *(Section 2.3.3)*	Aircraft safety Laser procedures Weapons firing safety Target deployment and retrieval safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area, Primary areas: Special Use Airspace	**Bays/Estuaries/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Vessel noise Aircraft noise Weapons noise **Explosive:** In-air explosions In-water explosions	**Physical Disturbance and Strike:** Vessels and in-water devices Aircraft and aerial target Military expended materials **Ingestion:** Military expended materials – munitions Military expended materials – other than munitions	**Energy:** In-air electromagnetic devices **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Explosives Metals Chemicals	
Stressors to Human Resources	**Cultural Resources:** Explosives Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** In-water energy In-air energy Physical interactions
Military Expended Material	**Ingestible Material:** Missile (explosive) fragments, target fragments **Non-Ingestible Material:** None	**Military Recoverable Material**	Surface target (mobile and stationary)
Sonar and Other Transducer Bins	None		

Surface Warfare		
Missile Exercise Air-to-Surface (MISSILEX)		
Explosive Bins	E6 E8 E10	
Procedural Mitigation Measures	**Acoustic Stressors** *(Section 5.3.2)* Weapons firing noise **Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Non-explosive missiles and rockets	**Explosive Stressors:** *(Section 5.3.3)* Explosive missiles and rockets
Assumptions Used for Analysis	Assume one missile and one target per event. While missiles could explode above the water's surface after contacting targets, analysis assumes all warheads explode at or just below the water's surface. Targets are usually recovered but could be lost due to damage. This activity occurs greater than 12 NM from land (FDM excepted).	

A.1.9.11 Missile Exercise Air-to-Surface – Rocket

Surface Warfare			
Missile Exercise Air-to-Surface – Rocket			
Short Description	Helicopter aircrews fire both precision-guided and unguided rockets at surface targets.	**Typical Duration** 1 hour	
Long Description	Helicopters designate an at-sea surface target with a laser or optics for precision-guided high explosive or non-explosive practice munitions rockets. Unguided rockets may also be used during this event.		
Typical Components	**Platforms:** Fixed-wing aircraft, rotary-wing aircraft, support vessel, unmanned aerial system - rotary wing **Targets:** Surface targets **Systems being Trained/Tested:** Aircraft platforms		
Standard Operating Procedures *(Section 2.3.3)*	Aircraft safety laser safety Weapons firing safety Laser procedures Unmanned aerial and underwater vehicle procedures Target deployment and retrieval safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area, Primary areas: Special Use Airspace	**Bays/Estuaries/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Vessel noise Aircraft noise Weapons noise **Explosive:** In-air explosions In-water explosions	**Physical Disturbance and Strike:** Vessels and in-water devices Aircraft and aerial target Military expended materials **Ingestion:** Military expended materials – munitions Military expended materials – other than munitions	**Energy:** In-air electromagnetic devices Lasers **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Explosives Metals	Chemicals
Stressors to Human Resources	**Cultural Resources:** Explosives Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** In-water energy In-air energy Physical interactions
Military Expended Material	**Ingestible Material:** Rocket (explosive) fragments, target fragments **Non-Ingestible Material:** Mk 58 marine marker, rocket (non-explosive)	**Military Recoverable Material**	Surface target (mobile and stationary)
Sonar and Other Transducer Bins	None		
Explosive Bins	E3		

Surface Warfare		
Missile Exercise Air-to-Surface – Rocket		
Procedural Mitigation Measures	**Acoustic Stressors** *(Section 5.3.2)* Weapons firing noise **Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Non-explosive missiles and rockets	**Explosive Stressors:** *(Section 5.3.3)* Explosive missiles and rockets
Assumptions Used for Analysis	Assume all explosive rockets detonate in water. Rockets may be used in conjunction with force protection events. The in-air low energy laser stressor was used in analysis of potential impacts on human resources. Targets are usually recovered but could be lost due to damage. This activity would occur greater than 12 NM from land (FDM excepted).	

A.1.9.12 Missile Exercise Surface-to-Surface

Surface Warfare			
Missile Exercise Surface-to-Surface			
Short Description	Surface ship crews defend against surface threats (ships or small boats) and engage them with missiles.	**Typical Duration** 2–5 hours	
Long Description	Surface ships launch missiles at surface maritime targets with the goal of destroying or disabling enemy ships or boats. After detecting and confirming a surface threat, the ship will fire a precision guided surface missile. Events with destroyers and cruisers will involve long range (over the horizon) Harpoon (or similar) surface missiles. While past Harpoon events occurred during sinking exercises, the requirement exists for non-sinking exercise events to certify ship crews. If a sinking exercise target is unavailable, a towed sled would likely be used. Events with littoral combat and patrol combatant ships will involve shorter range surface missiles, such as Hellfire and Griffin. Events with littoral combat and patrol combatant ships would be to certify ship's crew to defend against "close-in" (less than 10 miles) surface threats. These exercises are live fire, meaning that a missile is fired down range. Surface missiles could be equipped with either high-explosive or non-explosive warheads.		
Typical Components	**Platforms:** Surface combatant **Targets:** Surface targets **Systems being Trained/Tested:** None		
Standard Operating Procedures *(Section 2.3.3)*	Vessel safety Weapons firing safety Target deployment and retrieval safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area, Primary areas: Special Use Airspace	**Bays/Estuaries/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Vessel noise Weapons noise **Explosive:** In-air explosions In-water explosions	**Physical Disturbance and Strike:** Vessels and in-water devices Military expended materials **Ingestion:** Military expended materials – munitions Military expended materials – other than munitions	**Energy:** In-air electromagnetic devices **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Explosives Metals Chemicals	
Stressors to Human Resources	**Cultural Resources:** Explosives Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** In-air energy In-water energy Physical interactions

Surface Warfare			
Missile Exercise Surface-to-Surface			
Military Expended Material	**Ingestible Material:** Missile (explosive) fragments, target fragments **Non-Ingestible Material:** None	**Military Recoverable Material**	Surface target (mobile and stationary)
Sonar and Other Transducer Bins	None		
Explosive Bins	E6 E10		
Procedural Mitigation Measures	**Acoustic Stressors** *(Section 5.3.2)* Weapons firing noise **Physical Disturbance and Strike Stressors** *(Section 5.3.4)* Vessel movement **Explosive Stressors** (*Section 5.3.3*) Explosive missiles and rockets		
Assumptions Used for Analysis	Assume one missile and one target used per event. While missile could explode above water's surface after contacting target, analysis assumes all warheads explode at or just below surface. Targets are usually recovered but could be lost due to damage. This activity would occur greater than 50 NM from land (FDM excepted).		

A.1.9.13 Sinking Exercise

Surface Warfare			
Sinking Exercise			
Short Description	Aircraft, ship, and submarine crews deliberately sink a seaborne target, usually a decommissioned ship made environmentally safe for sinking according to U.S. Environmental Protection Agency standards, with a variety of ordnance.	**Typical Duration** 4–8 hours, possibly over 1–2 days	
Long Description	Ship personnel and aircrew deliver high-explosive ordnance on a seaborne target, (large deactivated vessel), which is deliberately sunk using multiple weapon systems. A sinking exercise is typically conducted by aircraft, surface vessels, and submarines to train in live ordnance delivery on a full-size ship target. The target is typically a decommissioned ship made environmentally safe for sinking according to U.S. Environmental Protection Agency standards. The location is greater than 50 nautical miles from shore and in water depths greater than 6,000 feet (ft.). Ship, aircraft, and submarine crews attack with coordinated tactics and deliver a variety of inert and high-explosive ordnance. Typically, the exercise lasts for 4–8 hours and possibly over 1–2 days; however, it is unpredictable and ultimately ends when the target ship sinks.		
Typical Components	**Platforms:** Fixed-wing aircraft, submarines, support craft, surface combatant **Targets:** Ship hulk **Systems being Trained/Tested:** Large-caliber gun systems, missile systems, bombs, torpedoes, small-caliber gun systems, targeting systems		
Standard Operating Procedures *(Section 2.3.3)*	Vessel safety Aircraft safety Weapons firing safety Sinking exercise safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area	**Bays/Estuaries/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Aircraft noise Vessel noise Weapons noise **Explosive:** In-air explosions In-water explosions	**Physical Disturbance and Strike:** Aircraft and aerial target Vessels and in-water devices Military expended materials Seafloor devices **Ingestion:** Military expended materials – munitions Military expended materials – other than munitions	**Energy:** In-air electromagnetic devices **Entanglement:** Wires and cables
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Explosives Metals	Chemicals
Stressors to Human Resources	**Cultural Resources:** Explosives Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** In-air energy In-water energy Physical interactions

Surface Warfare			
Sinking Exercise			
Military Expended Material	**Ingestible Material:** Bomb (explosive) fragments, heavyweight torpedo (explosive) fragments, large-caliber projectile (explosive) fragments, missile (explosive) fragments, small-caliber projectile (non-explosive), small-caliber casings **Non-Ingestible Material:** Ship hulk, heavyweight torpedo accessories, guidance wire, large-caliber projectile (non-explosive), large-caliber casings	**Military Recoverable Material**	None
Sonar and Other Transducer Bins	**Torpedoes:** TORP2		
Explosive Bins	E5 E8 E10 E11 E12		
Procedural Mitigation Measures	**Acoustic Stressors:** *(Section 5.3.2)* Weapons firing noise **Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement	**Explosive Stressors:** *(Section 5.3.3)* Sinking Exercises	
Assumptions Used for Analysis	Events occur greater than 50 nautical miles from shore and in water depths greater than 6,000 ft. during daylight hours only. The participants and assets typically include: • 1 full-size target ship hulk • 1–5 CG, DDG, or LCS ships • 1-10 Fixed-wing aircraft (e.g., F/A-18, or maritime patrol aircraft) • 1 or 2 MH-60 helicopters • 1 E-2 aircraft for Command and Control • 1 submarine • 1–3 range clearance aircraft For purposes of analysis, the below represents the types of munitions that might be employed. Actual SINKEX ordnance expenditures will vary. • 1–2 Harpoon surface-to-surface or air-to-surface missiles • 2–4 Maverick or Hellfire air-to-surface missiles • 2–12 MK-80 series general purpose bombs • 200 rounds large-caliber projectiles • 1–2 MK-48 heavyweight submarine-launched torpedo • Assume 2 guidance wires expended per event Acoustic effects modeling assumed only a percentage of munitions missed target and exploded in water. Precision guided munitions are assumed to impact target well above waterline and are not modeled (or reported) as in water explosions.		

A.1.10 Other Training Exercises

A.1.10.1 Direct Action (Tactical Air Control Party)

Other Training Exercises			
Direct Action (Tactical Air Control Party)			
Short Description	Military personnel train for controlling of combat support aircraft; providing airspace de-confliction and terminal control for Close Air Support.	**Typical Duration** Multiple days	
Long Description	Tactical Air Control personnel, once at Farallon de Medinilla, participate in tactical air control training in conjunction with an Air-to-Ground bombing or missile exercise. They may also employ small arms, grenades, mortars, and crew served weapons in direct action against targets on the island.		
Typical Components	**Platforms:** Fixed-wing aircraft, rotary-wing aircraft, small boats **Targets:** None **Systems being Trained/Tested:** Small-caliber rounds, explosive grenades and mortars		
Standard Operating Procedures *(Section 2.3.3)*	Aircraft safety Vessel safety Laser procedures Target Deployment and Retrieval Safety Farallon de Medinilla Access Restrictions	**Typical Locations** **Range Complexes/Testing Ranges:** Farallon de Medinilla	**Bays/Estuaries/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Aircraft noise Vessel noise **Explosive:** None	**Physical Disturbance and Strike:** Aircraft and aerial targets Vessel and in-water devices **Ingestion:** None	**Energy:** None **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** None	
Stressors to Human Resources	**Cultural Resources:** None	**Socioeconomic Resources:** None	**Public Health and Safety:** None
Military Expended Material	**Ingestible Material:** None **Non-Ingestible Material:** None	**Military Recoverable Material**	None
Sonar and Other Transducer Bins	None		
Explosive Bins	None		
Procedural Mitigation Measures	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement		
Assumptions Used for Analysis	May involve overnight camping on FDM.		

A.1.10.2 Intelligence, Surveillance, Reconnaissance

Other Training Exercises			
Intelligence, Surveillance, Reconnaissance			
Short Description	Personnel train to collect and report battlefield intelligence.	**Typical Duration** Multiple days	
Long Description	Personnel conduct event to evaluate the battlefield, enemy forces, and gather intelligence. For training of assault forces, "red cell" units may be positioned ahead of the assault force and permitted a period of time to conduct surveillance and prepare defenses to the assaulting force.		
Typical Components	**Platforms:** Fixed-wing aircraft, small boat, unmanned aerial systems, submarines **Targets:** None **Systems being Trained/Tested:** None		
Standard Operating Procedures *(Section 2.3.3)*	Aircraft safety Unmanned Aerial and Underwater Vehicle Procedures Vessel safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Range Complex; Guam; Tinian; Rota; Saipan, Mariana littorals	**Bays/Estuaries/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Aircraft noise Vessel noise **Explosive:** None	**Physical Disturbance and Strike:** Aircraft and aerial targets Vessel and in-water devices **Ingestion:** Military expended materials – other than munitions	**Energy:** None **Entanglement:** Decelerator/parachute Wires and cables
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** None	
Stressors to Human Resources	**Cultural Resources:** None	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** Physical interactions
Military Expended Material	**Ingestible Material:** Decelerator/parachute **Non-Ingestible Material:** Sonobuoys (non-explosive), sonobuoy wires	**Military Recoverable Material**	None
Sonar and Other Transducer Bins	None		
Explosive Bins	None		
Procedural Mitigation Measures	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement		
Assumptions Used for Analysis	These events may occur in littorals throughout the Study Area.		

A.1.10.3 Precision Anchoring

Other Training Exercises			
Precision Anchoring			
Short Description	Surface ship crews release and retrieve anchors in designated locations.	**Typical Duration** Up to 1 hour	
Long Description	Ship crews choose the best available anchoring sites. The ship uses all means available to determine its position when anchor is dropped to demonstrate calculating and plotting the anchor's position within 100 yards of center of planned anchorage.		
Typical Components	**Platforms:** Navy Ships **Targets:** None **Systems being Trained/Tested:** None		
Standard Operating Procedures *(Section 2.3.3)*	Vessel safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands anchorages	**Bays/Estuaries/Pierside:** Apra Harbor
Stressors to Biological Resources	**Acoustic:** Vessel noise **Explosive:** None	**Physical Disturbance and Strike:** Vessels and in-water devices Seafloor devices **Ingestion:** None	**Energy:** None **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Chemicals Other materials	
Stressors to Human Resources	**Cultural Resources:** Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Physical disturbance and strike	**Public Health and Safety:** Physical interactions
Military Expended Material	**Ingestible Material:** None **Non-Ingestible Material:** None	**Military Recoverable Material**	Anchors
Sonar and Other Transducer Bins	None		
Explosive Bins	None		
Procedural Mitigation Measures	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement		
Assumptions Used for Analysis	None		

A.1.10.4 Search and Rescue At Sea

Other Training Exercises			
Search and Rescue At Sea			
Short Description	Helicopter and ship crews rescue military personnel at sea.	**Typical Duration** Up to 3 days	
Long Description	Helicopter, ship, and submarine crews practice the skills required to recover personnel lost at sea. Helicopters locate survivors and deploy rescue swimmer and rescue basket. Survivors are winched up to the hovering helicopter. Surface ships would conduct man overboard drills and deploy a dummy figure in the water. Ship crews would launch a small boat, direct the recovery of the dummy, and recover the small boat. Submarine crews would maneuver submarine to effect recovery of personnel.		
Typical Components	**Platforms:** Fixed-wing aircraft, rotary-wing aircraft, surface ships, unmanned aerial vehicles **Targets:** None **Systems being Trained/Tested:**		
Standard Operating Procedures *(Section 2.3.3)*	Aircraft safety Unmanned Aerial and Underwater Vehicle Procedures Vessel safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Test and Training Study Area	**Bays/Estuaries/Pierside:** Apra Harbor and Mariana littorals
Stressors to Biological Resources	**Acoustic:** Aircraft noise Vessel noise **Explosive:** None	**Physical Disturbance and Strike:** Aircraft and aerial targets Vessel and in-water devices Military expended materials **Ingestion:** None	**Energy:** None **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** None	
Stressors to Human Resources	**Cultural Resources:** None	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** Physical interactions
Military Expended Material	**Ingestible Material:** None **Non-Ingestible Material:** None	**Military Recoverable Material**	None
Sonar and Other Transducer Bins	None		
Explosive Bins	None		
Procedural Mitigation Measures	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement		
Assumptions Used for Analysis	These events may occur in littorals throughout the Study Area.		

A.1.10.5 Small Boat Attack

Other Training Exercises			
Small Boat Attack			
Short Description	Afloat units defend against small boat or personal water craft attack	**Typical Duration** 6 hours	
Long Description	For this activity, one or two small boats or personal watercraft conduct attack activities on units afloat, training ship crews how to respond to small boat attack in harbors, restricted channels, and nearshore areas using non-lethal means or armament appropriate to the threat and location.		
Typical Components	**Platforms:** Small boat, unmanned surface vehicle, ships **Targets:** Surface targets **Systems being Trained/Tested:** None		
Standard Operating Procedures *(Section 2.3.3)*	Vessel safety Unmanned Aerial and Underwater Vehicle Procedures Target deployment and retrieval safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area	**Bays/Estuaries/Pierside:** Apra Harbor and Mariana littorals
Stressors to Biological Resources	**Acoustic:** Vessel noise **Explosive:** None	**Physical Disturbance and Strike:** Vessel and in-water devices Military expended materials **Ingestion:** Military Expended Materials – Munitions Military Expended Materials – Other than munitions	**Energy:** None **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Metals	
Stressors to Human Resources	**Cultural Resources:** None	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** Physical interactions In-air energy
Military Expended Material	**Ingestible Material:** Small-caliber projectile (non-explosive), small-caliber casings, small-caliber blanks **Non-Ingestible Material:** None	**Military Recoverable Material**	Surface target (stationary)
Sonar and Other Transducer Bins	None		
Explosive Bins	None		

Other Training Exercises	
Small Boat Attack	
Procedural Mitigation Measures	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement
Assumptions Used for Analysis	None

A.1.10.6 Submarine Navigation

Other Training Exercises			
Submarine Navigation			
Short Description	Submarine crews operate sonar for navigation and detection while transiting into and out of port during reduced visibility.	**Typical Duration** Up to 2 hours	
Long Description	Submarine crews train to operate sonar for navigation. The ability to navigate using sonar is critical for detection while transiting into and out of port during periods of reduced visibility. During this activity the submarine will be surfaced.		
Typical Components	**Platforms:** Submarines **Targets:** None **Systems being Trained/Tested:** High-frequency sonar, mid-frequency sonar (hull-mounted)		
Standard Operating Procedures *(Section 2.3.3)*	Vessel safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area	**Bays/Estuaries/Pierside:** Apra Harbor and Mariana littorals
Stressors to Biological Resources	**Acoustic:** Sonar and other transducers **Explosive:** None	**Physical Disturbance and Strike:** Vessels and in-water devices **Ingestion:** None	**Energy:** None **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** None	**Sediments and Water Quality:** None	
Stressors to Human Resources	**Cultural Resources:** None	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** Physical interactions In-water energy
Military Expended Material	**Ingestible Material:** None **Non-Ingestible Material:** None	**Military Recoverable Material**	None
Sonar and Other Transducer Bins	**High Frequency:** HF1	**Mid-Frequency:** MF3	
Explosive Bins	None		
Procedural Mitigation Measures	**Acoustic Stressors:** *(Section 5.3.2)* Active sonar	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement	
Assumptions Used for Analysis	None		

A.1.10.7 Submarine Sonar Maintenance

Other Training Exercises			
Submarine Sonar Maintenance			
Short Description	Maintenance of submarine sonar and other system checks are conducted pierside or at sea.	**Typical Duration** Up to 1 hour	
Long Description	A submarine performs periodic maintenance on the AN/BQQ-10 and submarine high-frequency sonar systems while in port or at sea. Submarines conduct maintenance to their sonar systems in shallow water near their homeport, however, sonar maintenance could occur anywhere as the system's performance may warrant.		
Typical Components	**Platforms:** Submarines **Targets:** None **Systems being Trained/Tested:** Mid-frequency hull mounted sonar		
Standard Operating Procedures *(Section 2.3.3)*	Vessel safety Pierside testing safety	**Typical Locations**	
		Range Complexes/Testing Ranges: Mariana Islands Training and Testing Study Area	**Bays/Estuaries/Pierside:** Apra Harbor and Mariana littorals
Stressors to Biological Resources	**Acoustic:** Sonar and other transducers **Explosive:** None	**Physical Disturbance and Strike:** Vessels and in-water devices **Ingestion:** None	**Energy:** None **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** None	**Sediments and Water Quality:** None	
Stressors to Human Resources	**Cultural Resources:** None	**Socioeconomic Resources:** Airborne acoustics	**Public Health and Safety:** In-water energy
Military Expended Material	**Ingestible Material:** None **Non-Ingestible Material:** None	**Military Recoverable Material**	None
Sonar and Other Transducer Bins	**Mid-Frequency:** MF3		
Explosive Bins	None		
Procedural Mitigation Measures	**Acoustic Stressors:** *(Section 5.3.2)* Active sonar	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement	
Assumptions Used for Analysis	Conducted at pier or while underway		

A.1.10.8 Surface Ship Sonar Maintenance

Other Training Exercises			
Surface Ship Sonar Maintenance			
Short Description	Maintenance of surface ship sonar and other system checks are conducted pierside or at sea.	**Typical Duration** Up to 4 hours	
Long Description	This scenario consists of surface ships performing periodic maintenance to the AN/SQS-53 sonar and other ship systems while in port or at sea. This maintenance takes up to four hours. Surface ships operate active sonar systems for maintenance while in shallow water near their homeport, however, sonar maintenance could occur anywhere as the system's performance may warrant.		
Typical Components	**Platforms:** Surface combatant **Targets:** None **Systems being Trained/Tested:** Mid-frequency hull mounted		
Standard Operating Procedures *(Section 2.3.3)*	Vessel safety Pierside testing safety	**Typical Locations**	
		Range Complexes/Testing Ranges: Mariana Islands Training and Testing Study Area	**Bays/Estuaries/Pierside:** Apra Harbor and Mariana littorals
Stressors to Biological Resources	**Acoustic:** Sonar and other transducers Vessel noise **Explosive:** None	**Physical Disturbance and Strike:** Vessels and in-water devices **Ingestion:** None	**Energy:** In-air electromagnetic devices **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** None	
Stressors to Human Resources	**Cultural Resources:** None	**Socioeconomic Resources:** None	**Public Health and Safety:** In-water energy
Military Expended Material	**Ingestible Material:** None **Non-Ingestible Material:** None	**Military Recoverable Material**	None
Sonar and Other Transducer Bins	**Mid-Frequency:** MF1		
Explosive Bins	None		
Procedural Mitigation Measures	**Acoustic Stressors:** *(Section 5.3.2)* Active sonar	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement	
Assumptions Used for Analysis	Conducted at pier or while underway		

A.1.10.9 Underwater Survey

Other Training Exercises			
Underwater Survey			
Short Description	Navy divers train in survey of underwater conditions and features in preparation for insertion, extraction, or intelligence, surveillance, and reconnaissance activities.	**Typical Duration** 4 hours	
Long Description	A survey of underwater terrain conditions nearshore and a report of findings to provide precise analysis for amphibious landings. Personnel perform methodical reconnoitering of beaches and surf conditions during the day and night to find and clear underwater obstacles and determine the feasibility of landing an amphibious force on a particular beach.		
Typical Components	**Platforms:** Small boats **Targets:** None **Systems being Trained/Tested:** None		
Standard Operating Procedures *(Section 2.3.3)*	Vessel safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area	**Bays/Estuaries/Pierside:** Apra Harbor and Mariana littorals
Stressors to Biological Resources	**Acoustic:** Vessel noise **Explosive:** None	**Physical Disturbance and Strike:** Vessel and in-water devices **Ingestion:** None	**Energy:** None **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** None	
Stressors to Human Resources	**Cultural Resources:** None	**Socioeconomic Resources:** Accessibility Physical disturbance and strike	**Public Health and Safety:** Physical interactions
Military Expended Material	**Ingestible Material:** None **Non-Ingestible Material:** None	**Military Recoverable Material**	None
Sonar and Other Transducer Bins	None		
Explosive Bins	None		
Procedural Mitigation Measures	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement		
Assumptions Used for Analysis	Hand-held (or similar) *de minimis* sonar sources may be used. During the conduct of underwater survey activities personnel may stand in the surf zone and walk onto the beach.		

A.1.10.10 Unmanned Aerial Vehicle Training and Certification

Other Training Exercises			
Unmanned Aerial System Training and Certification			
Short Description	Units conduct training with unmanned aerial vehicles from a variety of platforms including surface ships and submarines.	**Typical Duration** 2 days	
Long Description	Conduct unmanned aerial vehicle activity in support of tactical and theater requirements. During training, personnel use radio frequency communications to control and communicate with the unmanned aerial system during its flight.		
Typical Components	**Platforms:** Submarines, surface ship, unmanned aerial system-fixed wing **Targets:** Land targets, surface targets **Systems being Trained/Tested:** None		
Standard Operating Procedures *(Section 2.3.3)*	Aircraft safety Unmanned aerial and underwater vehicle procedures Vessel safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area Mariana Islands Range Complex airfields (Orote Point Airfield, Guam; Northwest Airfield, Guam; North Airfield, Tinian) Mariana Islands Special Use Airspace	**Bays/Estuaries/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Vessel noise **Explosive:** None	**Physical Disturbance and Strike:** Aircraft and aerial targets Military expended materials Vessel and in-water devices **Ingestion:** None	**Energy:** None **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** None	
Stressors to Human Resources	**Cultural Resources:** None	**Socioeconomic Resources:** None	**Public Health and Safety:** None
Military Expended Material	**Ingestible Material:** None **Non-Ingestible Material:** Canister, weight, flotation collar	**Military Recoverable Material**	None
Sonar and Other Transducer Bins	None		
Explosive Bins	None		
Procedural Mitigation Measures	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement		

Other Training Exercises	
Unmanned Aerial System Training and Certification	
Assumptions Used for Analysis	Unmanned aerial vehicles are typically recovered; however, some units may be lost and some are designed to be expendable. Submarine launched unmanned aerial systems result in expenditure of ballast weight and launched capsule. These events may occur in littorals throughout the Study Area.

A.1.10.11 Unmanned Underwater Vehicle Training

Other Training Exercises			
Unmanned Underwater Vehicle Training			
Short Description	Units conduct training with unmanned underwater vehicles from a variety of platforms including surface ships, small boats, and submarines.	**Typical Duration** Up to 24 hours	
Long Description	Conduct unmanned underwater vehicle activities in support of tactical and theater requirements. Unmanned underwater vehicle activities involve training with unmanned platforms on which various sensors and payloads are attached and used for different purposes, such as mine warfare, bottom mapping, and other missions. Vehicles may be crew served or mechanically launched from ships and submarines.		
Typical Components	**Platforms:** Surface ships, small boats, submarines, support craft, unmanned underwater vehicle **Targets:** Mine shapes **Systems being Trained/Tested:** Acoustic modem, high-frequency sonar, synthetic aperture sonar		
Standard Operating Procedures *(Section 2.3.3)*	Vessel safety Unmanned aerial and underwater vehicle procedures Target deployment and retrieval safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Range Complex	**Bays/Estuaries/Pierside:** Apra Harbor and Mariana Iittorals
Stressors to Biological Resources	**Acoustic:** Sonar and other transducers Vessel noise **Explosive:** None	**Physical Disturbance and Strike:** Vessels and in-water devices Military expended materials Seafloor devices **Ingestion:** None	**Energy:** None **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** None	
Stressors to Human Resources	**Cultural Resources:** None	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** Physical interactions In-air energy In-water energy
Military Expended Material	**Ingestible Material:** None **Non-Ingestible Material:** Anchors	**Military Recoverable Material**	Mine shapes (non-explosive)
Sonar and Other Transducer Bins	**Forward Looking Sonar:** FLS2	**Acoustic Modems:** M3	**Synthetic Aperture Sonar:** SAS2 SAS4

Other Training Exercises	
Unmanned Underwater Vehicle Training	
Explosive Bins	None
Procedural Mitigation Measures	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement
Assumptions Used for Analysis	These events may occur in littorals throughout the Study Area.

A.2 TESTING ACTIVITIES

A.2.1 NAVAL AIR SYSTEMS COMMAND TESTING ACTIVITIES

Naval Air Systems Command activities will generally fall under Fleet primary mission areas, such as the testing of airborne mine warfare and anti-submarine warfare weapons and systems. Naval Air Systems Command activities include, but are not limited to, the testing of new aircraft platforms (e.g., the P-8 maritime patrol aircraft), weapons, and systems (e.g., newly developed sonobuoys) that will ultimately be integrated into Fleet training activities. In addition to testing new platforms, weapons, and systems, Naval Air Systems Command also conducts lot acceptance testing of sonobuoys and follow-on testing and evaluation of updated systems in support of Fleet operational units. In general, the potential environmental effects from most Naval Air Systems Command testing events are similar to the associated Fleet training events.

While many of these systems tested by Naval Air Systems Command will ultimately be used by the Fleet, testing activities involving the same or similar systems may be conducted in different locations and manners than when conducted by the Fleet. Because of these differences, the results of the analysis for testing activities may differ from the results for training activities.

A.2.1.1 Anti-Submarine Warfare

A.2.1.1.1 Anti-Submarine Warfare Torpedo Test

Anti-Submarine Warfare			
Anti-Submarine Warfare Torpedo Test			
Short Description	This event is similar to the training event torpedo exercise. Test evaluates anti-submarine warfare systems onboard rotary-wing and fixed-wing aircraft and the ability to search for, detect, classify, localize, track, and attack a submarine or similar target.	**Typical Duration** 2–6 flight hours per event	
Long Description	Similar to a torpedo exercise, an anti-submarine warfare (ASW) torpedo test evaluates anti-submarine warfare systems onboard rotary-wing (e.g., MH-60R helicopter) and fixed-wing (marine patrol aircraft P-8, P-3) aircraft and the ability to search for, detect, classify, localize, track, and attack a submarine or similar target (e.g., MK-39 expendable mobile ASW training target [EMATT], or MK-30). The focus of the anti-submarine warfare torpedo test is the operation of non-explosive torpedoes (e.g., MK-46 or MK-54), but other anti-submarine warfare systems are often used during the test. MK-39 (EMATT) or MK-30 targets simulate a submarine threat and are deployed at varying depths and speeds. If available, tests may be conducted using an actual submarine as the target. This activity can be conducted in shallow or deep waters and aircraft can originate from a land base or from a surface ship. The torpedo test culminates with the release of an exercise torpedo against the target and is intended to evaluate the targeting, release, and tracking process of deploying torpedoes from aircraft. All exercise torpedoes used in testing are either running or non- running and are non-explosive. Eighty-five percent of torpedoes are recovered. A parachute assembly used for aircraft-launched torpedoes is jettisoned and sinks. Ballast (typically lead weights) may be released from the torpedoes to allow for recovery, and sink to the bottom.		
Typical Components	**Platforms:** Fixed-wing aircraft, rotary-wing aircraft, range support craft **Targets:** Sub-surface targets **Systems being Trained/Tested:** Torpedoes/torpedo launching systems		
Standard Operating Procedures *(Section 2.3.3)*	Aircraft safety Target Deployment and Retrieval Safety Weapons firing safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area	**Inland Waters/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Sonar and other transducers Aircraft noise **Explosive:** None	**Physical Disturbance and Strike:** Aircraft and aerial target Vessels and in-water devices Military expended materials Seafloor devices **Ingestion:** Military expended materials – other than munitions	**Energy:** In-air electromagnetic devices **Entanglement:** Decelerators/parachutes Wires and cables
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Metals Chemicals Other materials	
Stressors to Human Resources	**Cultural Resources:** Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** In-water energy Physical interactions

Anti-Submarine Warfare			
Anti-Submarine Warfare Torpedo Test			
Military Expended Material	**Ingestible Material:** Decelerators/parachutes - small **Non-Ingestible Material:** Expended bathythermograph, expended bathythermograph wire, lightweight torpedo accessories, sonobuoy (non-explosive), sonobuoy wires,	**Military Recoverable Material**	Lightweight torpedo (non-explosive), sub-surface target (mobile)
Sonar and Other Transducer Bins	**Mid-Frequency:** MF5	**Torpedoes:** TORP1	
Explosive Bins	None		
Procedural Mitigation Measures	**Acoustic Stressors:** *(Section 5.3.2)* Active sonar **Physical Disturbance and Strike Stressors:** (*Section 5.3.4*) Vessel movement		
Assumptions Used for Analysis	Assume one torpedo accessory package (parachute, ballast) per torpedo. Assume one target per torpedo. This activity would occur greater than 3 NM from land.		

A.2.1.1.2 Anti-Submarine Warfare Tracking Test – Maritime Patrol Aircraft

Anti-Submarine Warfare			
Anti-Submarine Warfare Tracking Test – Maritime Patrol Aircraft			
Short Description	The test evaluates the sensors and systems used by maritime patrol aircraft to detect and track submarines and to ensure that aircraft systems used to deploy the tracking systems perform to specifications and meet operational requirements.	**Typical Duration** 8 flight hours per event	
Long Description	Similar to an anti-submarine warfare (ASW) tracking exercise-maritime patrol aircraft, an anti-submarine warfare tracking test – maritime patrol aircraft evaluates the sensors and systems used to detect and track submarines and to ensure that platform systems used to deploy the tracking systems perform to specifications and meet operational requirements. P-3 or P-8 fixed-wing aircraft conduct anti-submarine warfare testing using non-impulsive sonobuoys (e.g., AN/SSQ-62 DICASS), explosive sonobuoys (e.g., MK-61 SUS), passive sonobuoys (e.g., AN/SSQ-53 DIFAR), and smoke devices (e.g., MK-58). Targets (e.g., MK-39 Expendable Mobile ASW Training Target) may also be employed during an anti-submarine warfare scenario. If available, tests may be conducted using an actual submarine as the target. This activity would be conducted in deep (typically beyond 100 feet) waters. Some anti-submarine warfare maritime patrol aircraft tracking tests could be conducted as part of a coordinated event with Fleet training activities.		
Typical Components	**Platforms:** Fixed-wing aircraft, range support craft **Targets:** Sub-surface targets **Systems being Trained/Tested:** Sonobuoys/sonobuoy launching systems, data transmission systems		
Standard Operating Procedures *(Section 2.3.3)*	Aircraft safety Vessel safety Target Deployment and Retrieval Safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area	**Inland Waters/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Sonar and other transducers Aircraft noise Vessel noise **Explosive:** In-water explosions	**Physical Disturbance and Strike:** Aircraft and aerial target Vessels and in-water devices Military expended materials **Ingestion:** Military expended materials – other than munitions	**Energy:** In-air electromagnetic devices **Entanglement:** Decelerators/parachutes Wires and cables
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Explosives Metals	 Chemicals Other materials
Stressors to Human Resources	**Cultural Resources:** Explosives Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** In-water energy Physical interactions

Anti-Submarine Warfare			
Anti-Submarine Warfare Tracking Test – Maritime Patrol Aircraft			
Military Expended Material	**Ingestible Material:** Sonobuoy (explosive) fragments, decelerators/parachutes – small **Non-Ingestible Material:** Expended bathythermograph, expended bathythermograph wire, sonobuoy (non-explosive), sonobuoy wires	**Military Recoverable Material**	Sub-surface target (mobile)
Sonar and Other Transducer Bins	**Anti-Submarine Warfare:** ASW2 ASW5 **Mid-Frequency:** MF5 MF6		
Explosive Bins	E1 E3		
Procedural Mitigation Measures	**Acoustic Stressors:** *(Section 5.3.2)* Active sonar **Explosive Stressors:** (*Section 5.3.3*) Explosive Sonobuoys		
Assumptions Used for Analysis	This activity would occur greater than 3 NM from land.		

A.2.1.2 Electronic Warfare

A.2.1.2.1 Intelligence Surveillance Reconnaissance/Electronic Warfare Testing

Electronic Warfare			
ISR/EW Testing			
Short Description	Aircrews use all available sensors to collect data on threat vessels.	**Typical Duration** 2–20 flight hours per event	
Long Description	An air warfare intelligence, surveillance, and reconnaissance (ISR) test involves evaluating communications capabilities of aircraft, including unmanned aerial systems that can carry cameras, sensors, communications equipment, or other payloads. New systems are tested at sea to ensure proper communications between aircraft and ships. ISR aircraft systems act as eyes in the sky, relaying raw imagery back to military personnel on the ground or to ships at sea. The data is processed, analyzed, and shared with U.S. Navy or other U.S. military aircraft or vessels. New ISR technology systems provide combat identification (friend or foe) and are used for aircraft and ship-based communications.		
Typical Components	**Platforms:** Unmanned aerial system – fixed-wing **Targets:** None **Systems being Trained/Tested:** ISR systems		
Standard Operating Procedures *(Section 2.3.3)*	Unmanned aerial and underwater vehicle procedures	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Range Complex; Guam; Tinian; Rota; Saipan	**Inland Waters/Pierside:** None
Stressors to Biological Resources	**Acoustic:** None **Explosive:** None	**Physical Disturbance and Strike:** Aircraft and aerial targets **Ingestion:** None	**Energy:** In-air electromagnetic devices **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** None	
Stressors to Human Resources	**Cultural Resources:** None	**Socioeconomic Resources:** Airborne acoustics	**Public Health and Safety:** Physical interactions
Military Expended Material	**Ingestible Material:** None **Non-Ingestible Material:** None	**Military Recoverable Material**	None
Sonar and Other Transducer Bins	None		
Explosive Bins	None		
Procedural Mitigation Measures	None		
Assumptions Used for Analysis	None		

A.2.1.3 Surface Warfare

Surface warfare is a type of naval warfare in which aircraft, surface ships, and submarines employ weapons, sensors, and operations directed against enemy surface vessels. Naval Air Systems Command surface warfare tests include air-to-surface missile, gunnery, and bombing tests, rocket tests, laser targeting tests, and high-energy laser weapons tests.

A sinking exercise is a specialized Fleet training event that provides an opportunity for Naval Air Systems Command aircrew along with ship and submarine crews to deliver explosive ordnance on a deactivated vessel that has been cleaned and environmentally remediated. The vessel is deliberately sunk using multiple weapons systems. A Naval Air Systems Command testing event may take place in conjunction with a sinking exercise to test aircraft or aircraft systems in the delivery of explosive ordnance on a surface target.

A.2.1.3.1 Air-to-Surface Missile Test

Surface Warfare			
Air-to-Surface Missile Test			
Short Description	This event is similar to the training event missile exercise air-to-surface. Test may involve both fixed-wing and rotary-wing aircraft launching missiles at surface maritime targets to evaluate the weapons system or as part of another systems integration test.	**Typical Duration** 2–4 flight hours per event	
Long Description	Similar to a missile exercise air-to-surface, an air-to-surface missile test may involve both fixed-wing and rotary-wing aircraft launching missiles at surface maritime targets to evaluate the weapons system or as part of another systems integration test. Air-to-surface missile tests can include high explosive, non-explosive, or non-firing (captive air training missile) weapons. Laser targeting systems may also be used. Both stationary and mobile targets would be utilized during testing		
Typical Components	**Platforms:** Fixed-wing aircraft **Targets:** Surface targets **Systems being Trained/Tested:** Missile firing/launching systems		
Standard Operating Procedures *(Section 2.3.3)*	Aircraft safety High-energy laser safety Weapons firing safety Target deployment and retrieval safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area, Primary areas: Special Use Airspace	**Inland Waters/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Aircraft noise Weapons noise **Explosive:** In-air explosions In-water explosions	**Physical Disturbance and Strike:** Aircraft and aerial targets Military expended materials **Ingestion:** Military expended materials – munitions Military expended materials – Other than munitions	**Energy:** In-air electromagnetic devices **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Explosives Metals	 Chemicals Other materials
Stressors to Human Resources	**Cultural Resources:** Explosives Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** Physical interactions
Military Expended Material	**Ingestible Material:** Missile (explosive) fragments, target fragments **Non-Ingestible Material:** Non-explosive missiles	**Military Recoverable Material**	Surface target (mobile and stationary)
Sonar and Other Transducer Bins	None		

Surface Warfare		
Air-to-Surface Missile Test		
Explosive Bins	E10	
Procedural Mitigation Measures	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Non-explosive missiles and rockets	**Explosive Stressors:** *(Section 5.3.3)* Explosive missiles and rockets
Assumptions Used for Analysis	This activity would typically occur greater than 50 NM from shore.	

A.2.2 Naval Sea Systems Command Testing Activities

A.2.2.1 Anti-Submarine Warfare

A.2.2.1.1 Anti-Submarine Warfare Mission Package Testing

Anti-Submarine Warfare			
Anti-Submarine Warfare Mission Package Testing			
Short Description	Ships and their supporting platforms (e.g., helicopters and unmanned aerial systems) detect, localize, and prosecute submarines.	**Typical Duration** 1–2 weeks, with 4–8 hours of active sonar use with intervals of non-activity in between.	
Long Description	Littoral combat ships conduct detect-to-engage operations against modern diesel-electric and nuclear submarines using airborne and surface assets (both manned and unmanned). Active and passive acoustic systems are used to detect and track submarine targets, culminating in the deployment of lightweight torpedoes to engage the threat.		
Typical Components	**Platforms:** Rotary-wing aircraft, surface combatant **Targets:** Sub-surface targets **Systems being Trained/Tested:** Sonar systems, countermeasure systems, torpedo systems, sonobuoys		
Standard Operating Procedures *(Section 2.3.3)*	Vessel safety Aircraft safety Towed in-water device safety Target deployment and retrieval safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Range Complex	**Inland Waters/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Sonar and other transducers Aircraft noise Vessel noise **Explosive:** None	**Physical Disturbance and Strike:** Aircraft and aerial targets Vessels and in-water devices Military expended materials **Ingestion:** Military expended materials – other than munitions	**Energy:** In-air electromagnetic devices **Entanglement:** Decelerators/parachutes Wires and cables
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Metals Chemicals Other materials	
Stressors to Human Resources	**Cultural Resources:** Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** In-water energy In-air energy Physical interactions
Military Expended Material	**Ingestible Material:** Decelerators/parachutes - small **Non-Ingestible Material:** Acoustic countermeasures, expended bathythermograph, expended bathythermograph wire, lightweight torpedo accessories, sonobuoy (non-explosive), sonobuoy wires	**Military Recoverable Material**	Sub-surface target (mobile) – recovered, lightweight torpedo (non-explosive)
Sonar and Other Transducer Bins	**Anti-Submarine Warfare:** ASW1 ASW2 ASW3 ASW5	**Mid-Frequency:** MF4 MF5 MF12	**Torpedoes:** TORP1

Anti-Submarine Warfare		
Anti-Submarine Warfare Mission Package Testing		
Explosive Bins	None	
Procedural Mitigation Measures	**Acoustic Stressors:** *(Section 5.3.2)* Active sonar	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement Towed in-water devices
Assumptions Used for Analysis	All sonobuoys have parachutes unless otherwise noted. Sub-surface targets are submarines.	

A.2.2.1.2 At-Sea Sonar Testing

Anti-Submarine Warfare			
At-Sea Sonar Testing			
Short Description	At-sea testing to ensure systems are fully functional in an open ocean environment.	**Typical Duration** From 4 hours to 11 days	
Long Description	At-sea sonar testing is required to calibrate or document the functionality of sonar and torpedo systems while the ship or submarine is in an open ocean environment. At-sea sonar testing is conducted to verify the ship meets design acoustic specifications, define the underwater characteristics of the ship, determine effects of systems and equipment on ship's acoustic characteristics, and provide technical background necessary to initiate development of design improvements to reduce noise. Tests also consist of electronic support measurement, photonics, and sonar sensor accuracy testing. In some instances, a submarine's passive detection capability is tested when a second submarine utilizes its active sonar or is equipped with a noise augmentation system in order to replicate acoustic or electromagnetic signatures of other vessel types or classes.		
Typical Components	**Platforms:** Fixed platform, submarines **Targets:** None **Systems being Trained/Tested:** High and mid-frequency sonar, acoustic modems		
Standard Operating Procedures *(Section 2.3.3)*	Vessel safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area	**Inland Waters/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Sonar and other transducers **Explosive:** None	**Physical Disturbance and Strike:** Military expended materials **Ingestion:** None	**Energy:** In-water electromagnetic devices In-air electromagnetic devices **Entanglement:** Wires and cables
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Metals Other materials	
Stressors to Human Resources	**Cultural Resources:** None	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** In-water energy In-air energy Physical interactions
Military Expended Material	**Ingestible Material:** None **Non-Ingestible Material:** Expended bathythermograph, expended bathythermograph wire	**Military Recoverable Material**	None
Sonar and Other Transducer Bins	**High-Frequency:** HF1 HF6	**Acoustic Modems:** M3	**Mid-Frequency:** MF3 MF9
Explosive Bins	None		

Anti-Submarine Warfare		
At-Sea Sonar Testing		
Procedural Mitigation Measures	**Acoustic Stressors:** *(Section 5.3.2)* Active sonar	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement
Assumptions Used for Analysis	Active sonar is intermittent throughout the duration of this event.	

A.2.2.1.3 Torpedo (Explosive) Testing

Anti-Submarine Warfare			
Torpedo (Explosive) Testing			
Short Description	Air, surface, or submarine crews employ explosive and non-explosive torpedoes against artificial targets.	**Typical Duration** 1–2 days during daylight hours	
Long Description	Non-explosive and explosive torpedoes (carrying a warhead) will be launched at a suspended target by a submarine and fixed- or rotary-wing aircraft or surface combatants. Event duration is one to two days during daylight hours.		
Typical Components	**Platforms:** Fixed-wing aircraft, rotary-wing aircraft, moored platform, submarines, support craft, surface combatant **Targets:** Sub-surface targets; surface targets **Systems being Trained/Tested:** Sonar systems, acoustic countermeasures, sonobuoys, torpedo systems		
Standard Operating Procedures *(Section 2.3.3)*	Vessel safety Aircraft safety Weapons firing safety Target deployment and retrieval safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Range Complex	**Inland Waters/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Sonar and other transducers Aircraft noise Vessel noise **Explosive:** In-water explosions	**Physical Disturbance and Strike:** Aircraft and aerial targets Vessels and in-water devices Military expended materials **Ingestion:** Military expended materials – munitions Military expended materials – other than munitions	**Energy:** In-air electromagnetic devices **Entanglement:** Decelerators/parachutes Wires and cables
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Explosives Metals	 Chemicals Other materials
Stressors to Human Resources	**Cultural Resources:** Explosives Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** In-air energy In-water energy Physical interactions
Military Expended Material	**Ingestible Material:** Lightweight torpedo (explosive) fragments, heavyweight torpedo (explosive) fragments, decelerators/parachutes - small, target fragments **Non-Ingestible Material:** Buoy (non-explosive), expended bathythermograph, expended bathythermograph wire, guidance wire, heavyweight torpedo accessories, lightweight torpedo accessories, sonobuoy (non-explosive), sonobuoy wires	**Military Recoverable Material**	Heavyweight (non-explosive) torpedo, lightweight torpedo (non-explosive), sub-surface target (stationary), surface target (stationary)

Anti-Submarine Warfare			
Torpedo (Explosive) Testing			
Sonar and Other Transducer Bins	**Anti-Submarine Warfare:** ASW3 **Torpedoes:** TORP1 TORP2	**High-Frequency:** HF1 HF6	**Mid-Frequency:** MF1 MF3 MF4 MF5 MF6
Explosive Bins	E8 E11		
Procedural Mitigation Measures	**Acoustic Stressors:** *(Section 5.3.2)* Active sonar **Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement	**Explosive Stressors:** *(Section 5.3.3)* Explosive torpedoes	
Assumptions Used for Analysis	Only one heavyweight torpedo test could occur on a single day; two heavyweight torpedo tests could occur on consecutive days. Two lightweight torpedo tests could occur in a single day. All non-explosive torpedoes are recovered.		

A.2.2.1.4 Torpedo (Non-Explosive) Testing

Anti-Submarine Warfare			
Torpedo (Non- Explosive) Testing			
Short Description	Air, surface, or submarine crews employ non-explosive torpedoes against submarines or surface vessels.	**Typical Duration** Up to 2 weeks	
Long Description	Aerial, surface, and subsurface assets fire exercise torpedoes against surface or subsurface targets or at no target and programmed with a particular run geometry. Torpedo testing evaluates the performance and the effectiveness of hardware and software upgrades of heavyweight or lightweight torpedoes. It also includes testing of experimental torpedoes. Not all torpedo tests involve acoustics. Exercise torpedoes are recovered, typically from surface ships and helicopters that are specifically crewed and outfitted for torpedo recovery. Event duration is dependent on number of torpedoes fired.		
Typical Components	**Platforms:** Fixed-wing aircraft, rotary-wing aircraft, moored platform, submarines, support craft, surface combatant **Targets:** Sub-surface targets; surface targets **Systems being Trained/Tested:** Sonar systems, acoustic countermeasures, sonobuoys, torpedo systems		
Standard Operating Procedures *(Section 2.3.3)*	Vessel safety Aircraft safety Weapons firing safety Target deployment and retrieval safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Range Complex	**Inland Waters/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Sonar and other transducers Aircraft noise Vessel noise **Explosive:** None	**Physical Disturbance and Strike:** Aircraft and aerial targets Vessels and in-water devices Military expended materials **Ingestion:** Military expended materials – other than munitions	**Energy:** In-air electromagnetic devices **Entanglement:** Decelerators/parachutes Wires and cables
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Chemicals Metals Other materials	
Stressors to Human Resources	**Cultural Resources:** Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** In-water energy In-air energy Physical interactions
Military Expended Material	**Ingestible Material:** Decelerators/parachutes - small **Non-Ingestible Material:** Acoustic countermeasures, buoy (non-explosive), expended bathythermograph, expended bathythermograph wire, guidance wire, heavyweight torpedo accessories, lightweight torpedo accessories, anti-torpedo torpedo, anti-torpedo torpedo accessories, sonobuoy (non-explosive), sonobuoy wires	**Military Recoverable Material**	Heavyweight (non-explosive) torpedo, lightweight torpedo (non-explosive), sub-surface target (mobile), sub-surface target (stationary)

Anti-Submarine Warfare				
Torpedo (Non- Explosive) Testing				
Sonar and Other Transducer Bins	**Anti-Submarine Warfare:** ASW3 ASW4 **Mid-Frequency:** MF1 MF3 MF4 MF5 MF6	**High-Frequency:** HF1 HF6 **Torpedoes:** TORP1 TORP2 TORP3	**Low-Frequency:** LF4	
Explosive Bins	None			
Procedural Mitigation Measures	**Acoustic Stressors:** *(Section 5.3.2)* Active sonar	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement		
Assumptions Used for Analysis	All torpedoes are recovered. Events can last up to two weeks and use up to 40 torpedoes. Typically, no more than eight torpedoes are fired per day during daylight hours.			

A.2.2.2 Electronic Warfare

A.2.2.2.1 Radar and Other System Testing

Electronic Warfare			
Radar and Other System Testing			
Short Description	Test may include radiation of military or commercial radar, communication systems (or simulators), or high-energy lasers. Testing may occur aboard a ship against drones, small boats, rockets, missiles, or other targets.	**Typical Duration** 12 hours per day over a 7-day period	
Long Description	At-sea and docked testing may use radiation of military or commercial radar, communication systems (or simulators), or high-energy lasers. No subsurface transmission will occur during this testing. Testing of various air and surface targets may include unmanned aerial systems, or small craft (floating cardboard triwalls, towed, anchored, or self-propelled vessels). High-energy laser testing may include tracking, scoring, and neutralization runs with single or multiple targets.		
Typical Components	**Platforms:** Surface combatant **Targets:** Air targets; surface targets **Systems being Trained/Tested:** Radar, high-energy lasers		
Standard Operating Procedures *(Section 2.3.3)*	Vessel safety Laser Procedures Unmanned aerial and underwater vehicle procedures High-energy laser safety Target deployment and retrieval safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area	**Inland Waters/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Vessel noise Aircraft noise **Explosive:** None	**Physical Disturbance and Strike:** Aircraft and aerial targets Vessels and in-water devices Military expended materials **Ingestion:** None	**Energy:** In-air electromagnetic devices In-water electromagnetic devices High-energy lasers **Entanglement:** Decelerators/parachutes
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Other materials	
Stressors to Human Resources	**Cultural Resources:** Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** In-air energy Physical interactions
Military Expended Material	**Ingestible Material:** None **Non-Ingestible Material:** Decelerators/parachutes – large, air target (drone)	**Military Recoverable Material**	Surface target (mobile and stationary), air targets

Electronic Warfare	
Radar and Other System Testing	
Sonar and Other Transducer Bins	None
Explosive Bins	None
Procedural Mitigation Measures	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement
Assumptions Used for Analysis	High-energy lasers will not be tested pierside. Any sources used during this activity would be *de minimis* and not quantitatively analyzed and therefore are not included under munitions.

A.2.2.3 Mine Warfare

A.2.2.3.1 Mine Countermeasure and Neutralization Testing

Mine Warfare			
Mine Countermeasure and Neutralization Testing			
Short Description	Air, surface, and subsurface vessels neutralize threat mines and mine-like objects.	**Typical Duration** 1–10 days, with intermittent use of countermeasure/neutralization systems during this period	
Long Description	Mine countermeasure-neutralization and mine system testing is required to ensure systems can effectively neutralize threat (live or inert) mines that will otherwise restrict passage through an area and to ensure U.S. Navy mines remain effective against enemy ships. These systems may be deployed with a variety of ships, aircraft, submarines, or unmanned autonomous vehicles and operate in water depths up to 6,000 feet. Mines are neutralized by cutting mooring cables of buoyant mines, producing acoustic energy that fires acoustic-influence mines, employing radar or laser fields, producing electrical energy to replicate the magnetic signatures of surface ships in order to detonate threat mines, detonation of mines using remotely-operated vehicles, and using explosive charges to destroy threat mines.		
Typical Components	**Platforms:** Amphibious warfare ship, mine warfare ship, unmanned aerial system – rotary-wing, rotary-wing aircraft, surface combatant, unmanned underwater vehicle **Targets:** Mine shapes **Systems being Trained/Tested:** Electromagnetic devices, high-frequency sonar, radar, low energy lasers		
Standard Operating Procedures *(Section 2.3.3)*	Vessel safety Aircraft safety Unmanned aerial and underwater vehicle procedures Towed in-water device safety Laser Procedures Target deployment and retrieval safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Range Complex, nearshore, and littorals	**Inland Waters/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Sonar and other transducers Aircraft noise Vessel noise **Explosive:** In-water explosions	**Physical Disturbance and Strike:** Aircraft and aerial targets Vessels and in-water devices Military expended materials Seafloor devices **Ingestion:** Military expended materials – munitions	**Energy:** In-water electromagnetic devices In-air electromagnetic devices **Entanglement:** Wires and cables
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Explosives Metals	Chemicals Other materials
Stressors to Human Resources	**Cultural Resources:** Explosives	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** In-water energy In-air energy Physical interactions

Mine Warfare			
Mine Countermeasure and Neutralization Testing			
Military Expended Material	**Ingestible Material:** Neutralizer (explosive) fragments **Non-Ingestible Material:** Fiber optic cable, fiber optic can, mine shape (non-explosive)	**Military Recoverable Material**	Anchor - mine
Sonar and Other Transducer Bins	**High-Frequency:** HF4		
Explosive Bins	E4		
Procedural Mitigation Measures	**Acoustic Stressors:** *(Section 5.3.2)* Active sonar **Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement Towed in-water devices	**Explosive Stressors: (***Section 5.3.3***)** Explosive mine countermeasure and neutralization activities	
Assumptions Used for Analysis	Agat Bay underwater detonation site, 20 lb. net explosive weight (NEW) maximum charge. Piti and Outer Apra Harbor underwater detonation sites, 10 lb. NEW maximum.		

A.2.2.4 Surface Warfare Testing

A.2.2.4.1 Kinetic Energy Weapon Testing

Surface Warfare			
Kinetic Energy Weapon Testing			
Short Description	A kinetic energy weapon uses stored energy released in a burst to accelerate a projectile.	**Typical Duration** 1 day	
Long Description	A kinetic energy weapon uses stored energy released in a burst to accelerate a projectile to more than seven times the speed of sound to a range of up to 200 miles.		
Typical Components	**Platforms:** Surface combatant **Targets:** Air targets, surface targets **Systems being Trained/Tested:** Kinetic energy weapon		
Standard Operating Procedures *(Section 2.3.3)*	Vessel safety Weapons firing safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area, Primary areas: Special Use Airspace	**Inland Waters/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Vessel noise Weapons noise **Explosive:** In-air explosions	**Physical Disturbance and Strike:** Aircraft and aerial targets Vessels and in-water devices Military expended materials **Ingestion:** Military expended materials – munitions Military expended materials – other than munitions	**Energy:** In-air electromagnetic devices **Entanglement:** Decelerators/parachutes
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Metals	
Stressors to Human Resources	**Cultural Resources:** Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** In-air energy Physical interactions
Military Expended Material	**Ingestible Material:** Large-caliber (explosive) fragments, target fragments **Non-Ingestible Material:** Air target (drone), decelerator/parachute – large, kinetic energy round, large-caliber projectile (non-explosive), large-caliber casings, sabot - kinetic energy round, surface target (stationary)	**Military Recoverable Material**	None
Sonar and Other Transducer Bins	None		
Explosive Bins	None		

Surface Warfare	
Kinetic Energy Weapon Testing	
Procedural Mitigation Measures	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement
Assumptions Used for Analysis	Assume one target per event. Explosive rounds are designed to detonate above the surface target.

A.2.2.5 Vessel Evaluation

A.2.2.5.1 Undersea Warfare Testing

Vessel Evaluation			
Undersea Warfare Testing			
Short Description	Ships demonstrate capability of countermeasure systems and underwater surveillance, weapons engagement and communications systems. This tests ships ability to detect, track, and engage undersea targets.	**Typical Duration** Up to 10 days	
Long Description	Undersea warfare events may be comprised of tracking and firing events or tests of hull-mounted sonar system capabilities to detect and avoid torpedo type targets. Tracking and firing events ensure the operability of the undersea warfare suite and its interface with the rotary-wing helicopter. Tests include demonstrating the ability of the ship to search, detect, and track a target; and conduct attacks with exercise torpedoes. Detection and avoidance events may use surface craft and underwater platforms to test the capability of mid- and high-frequency acoustic sources. Subsurface moving targets, rocket and air-dropped weapons, sonobuoys, towed arrays and sub-surface torpedo-like devices may be used. Approximately one week of in-port training may precede the event.		
Typical Components	**Platforms:** Rotary-wing aircraft, surface combatant **Targets:** Sub-surface targets **Systems being Trained/Tested:** Acoustic countermeasures, sonar systems, sonobuoys, torpedo sonar		
Standard Operating Procedures *(Section 2.3.3)*	Vessel safety Aircraft safety Target deployment and retrieval safety	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Range Complex	**Inland Waters/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Sonar and other transducers Aircraft noise Vessel noise **Explosive:** None	**Physical Disturbance and Strike:** Aircraft and aerial targets Vessels and in-water devices Military expended materials **Ingestion:** Military expended materials – other than munitions	**Energy:** In-air electromagnetic devices **Entanglement:** Decelerators/parachutes Wires and cables
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Metals Other materials	
Stressors to Human Resources	**Cultural Resources:** Physical disturbance and strike	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** In-water energy In-air energy Physical interactions
Military Expended Material	**Ingestible Material:** Decelerators/parachutes - small **Non-Ingestible Material:** Expended bathythermograph, expended bathythermograph wire, lightweight torpedo accessories, sonobuoy (non-explosive), sonobuoy wires	**Military Recoverable Material**	Lightweight torpedo (non-explosive), sub-surface target (mobile)

Vessel Evaluation				
Undersea Warfare Testing				
Sonar and Other Transducer Bins	**High-Frequency:** HF4	**Mid-Frequency:** MF1 MF5	 MF4	**Torpedoes:** TORP1
Explosive Bins	None			
Procedural Mitigation Measures	**Acoustic Stressors:** *(Section 5.3.2)* Active sonar		**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement	
Assumptions Used for Analysis	Five targets per event. Sonobuoys from surface ships do not have an associated parachute. Ships will not be conducting test constantly during the entire duration.			

A.2.2.6 Other Testing

A.2.2.6.1 Simulant Testing

Other Testing Activities			
Simulant Testing			
Short Description	The capability of surface ship defense systems to detect and protect against chemical and biological attacks are tested.	**Typical Duration** 3 days	
Long Description	The capabilities of surface ship defense systems to detect and protect in the event of chemical and biological attacks are tested. Testing involves the deployment of harmless compounds (i.e., simulants) as substitutes for chemical and biological warfare agents. Methods of simulant delivery include aerial dispersal and hand-held spray.		
Typical Components	**Platforms:** Fixed-wing aircraft, rotary-wing aircraft, surface combatant **Targets:** None **Systems being Trained/Tested:** None		
Standard Operating Procedures *(Section 2.3.3)*	Vessel safety Aircraft safety	**Typical Locations** **Range Complexes/Testing Ranges:** Marianas Islands Training and Testing Study Area	**Inland Waters/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Aircraft noise Vessel noise **Explosive:** None	**Physical Disturbance and Strike:** Aircraft and aerial targets Vessels and in-water devices **Ingestion:** None	**Energy:** In-air electromagnetic devices **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** Chemicals Other materials	
Stressors to Human Resources	**Cultural Resources:** None	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** Physical interactions
Military Expended Material	**Ingestible Material:** None **Non-Ingestible Material:** None	**Military Recoverable Material**	None
Sonar and Other Transducer Bins	None		
Explosive Bins	None		
Procedural Mitigation Measures	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement		

Other Testing Activities	
Simulant Testing	
Assumptions Used for Analysis	All chemical simulants have low toxicity to humans and the environment. Examples of chemical simulants include glacial acetic acid and triethyl phosphate. All biological simulants are considered to be Biosafety Level 1 organisms. Examples of biological simulants are spore-forming bacteria, non-spore-forming bacteria, the protein ovalbumin, MS2 bacteriophages, and the fungus *Aspergillus niger*.

A.2.3 Office of Naval Research Testing Activities

A.2.3.1 Acoustic and Oceanographic Research

Acoustic and Oceanographic Science and Technology			
Acoustic and Oceanographic Research			
Short Description	Research of oceanographic processes using active transmissions, typically high-frequency (38 kHz and above) oceanographic measurement devices, deployed from ships, unmanned underwater vehicles and on moored platform	**Typical Duration** 1–2 weeks	
Long Description	ONR performs research on oceanographic processes in U.S. territorial waters and international waters using passive measurement devices and active acoustic systems such as acoustic Doppler current profilers and echosounders. Measurement systems may be deployed by ship, unmanned underwater vehicle, or on standard oceanographic moorings. Moorings may be left in place for more than 1 year.		
Typical Components	**Platforms:** Research vessels, unmanned vehicles, oceanographic moorings **Targets:** None **Systems being Trained/Tested:** None		
Standard Operating Procedures *(Section 2.3.3)*	Vessel safety Unmanned aerial and underwater vehicle procedures	**Typical Locations** **Range Complexes/Testing Ranges:** Mariana Islands Training and Testing Study Area	**Inland Waters/Pierside:** None
Stressors to Biological Resources	**Acoustic:** Vessel noise **Explosive:** None	**Physical Disturbance and Strike:** Vessel and in-water devices Seafloor devices **Ingestion:** None	**Energy:** None **Entanglement:** None
Stressors to Physical Resources	**Air Quality:** Criteria air pollutants	**Sediments and Water Quality:** None	
Stressors to Human Resources	**Cultural Resources:** None	**Socioeconomic Resources:** Accessibility Airborne acoustics Physical disturbance and strike	**Public Health and Safety:** In-water energy In-air energy Physical interactions
Military Expended Material	**Ingestible Material:** None **Non-Ingestible Material:** None	**Military Recoverable Material**	None
Sonar and Other Transducer Bins	None		
Explosive Bins	None		
Procedural Mitigation Measures	**Physical Disturbance and Strike Stressors:** *(Section 5.3.4)* Vessel movement		

Acoustic and Oceanographic Science and Technology	
Acoustic and Oceanographic Research	
Assumptions Used for Analysis	Approximately 12 non-recoverable bottom moorings may be used. Any sonar transducers used would be *de minimis*.

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Appendix B: Federal Register Notices

Supplemental Environmental Impact Statement/

Overseas Environmental Impact Statement

Mariana Islands Training and Testing

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APPENDIX B FEDERAL REGISTER NOTICES

Appendix B contains the following Federal Register Notices:

1. Notice of Intent To Prepare a Supplemental Environmental Impact Statement/Overseas Environmental Impact Statement for Mariana Islands Training and Testing
2. Notice of Public Meetings for the Draft Supplemental Environmental Impact Statement/Overseas Environmental Impact Statement for Mariana Islands Training and Testing
3. Notice of Availability for the Draft Supplemental Environmental Impact Statement/Overseas Environmental Impact Statement for Mariana Islands Training and Testing
4. Notice of Rescheduled Public Meetings and Extension of Public Comment Period for the Draft Supplemental Environmental Impact Statement/Overseas Environmental Impact Statement for Mariana Islands Training and Testing
5. Notice of Extension of Public Comment Period for the Draft Supplemental Environmental Impact Statement/Overseas Environmental Impact Statement for Mariana Islands Training and Testing
6. Proposed Rule for Takes of Marine Mammals Incidental to U.S. Navy Training and Testing Activities in the Mariana Islands Training and Testing Study Area [85 FR 5782]

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SIDCO/SUBPART C DCO REGULATIONS—RECORDKEEPING COLLECTION—Continued

	Estimated number of recordkeepers per year	Records to be kept annually by each	Total annual responses	Estimated average number of hours per record	Estimated total number of hours of annual burden in fiscal year
Liquidity Resource Due Diligence and Testing	7	4	28	10	280
Financial and Liquidity Resources, Excluding Due Diligence	7	4	28	10	280
Generally	7	28	196	10	1960
Totals		118	662	31	4570

[FR Doc. 2017–16019 Filed 7–31–17; 8:45 am]
BILLING CODE 6351–01–P

DEPARTMENT OF DEFENSE

Department of the Navy

Meeting of the Board of Visitors of Marine Corps University

AGENCY: Department of the Navy, DOD.

ACTION: Notice of open meeting.

SUMMARY: The Board of Visitors of the Marine Corps University (BOV MCU) will meet to review, develop and provide recommendations on all aspects of the academic and administrative policies of the University; examine all aspects of professional military education operations; and provide such oversight and advice, as is necessary, to facilitate high educational standards and cost effective operations. The Board will be focusing primarily on the internal procedures of Marine Corps University. All sessions of the meeting will be open to the public.

DATES: The meeting will be held on Thursday, September 14, 2017, from 9:00 a.m. to 4:30 p.m. and Friday, September 15, 2017, from 8:00 a.m. to 2:30 p.m. Eastern Time Zone.

ADDRESSES: The meeting will be held at Marine Corps University in Quantico, Virginia. The address is: 2076 South St., Quantico, VA.

FOR FURTHER INFORMATION CONTACT: Dr. Kim Florich, Director of Faculty Development and Outreach, Marine Corps University Board of Visitors, 2076 South Street, Quantico, Virginia 22134, telephone number 703–432–4682.

Dated: July 24, 2017.

A.M. Nichols,

Lieutenant Commander, Judge Advocate General's Corps, U.S. Navy, Federal Register Liaison Officer.

[FR Doc. 2017–16150 Filed 7–31–17; 8:45 am]
BILLING CODE 3810–FF–P

DEPARTMENT OF DEFENSE

Department of the Navy

Notice of Intent To Prepare a Supplemental Environmental Impact Statement/Overseas Environmental Impact Statement for Mariana Islands Training and Testing

AGENCY: Department of the Navy, DOD.

ACTION: Notice.

SUMMARY: Pursuant to the National Environmental Policy Act (NEPA) of 1969 and regulations implemented by the Council on Environmental Quality, the Department of the Navy (DoN) announces its intent to prepare a supplement to the 2015 Final Mariana Islands Training and Testing (MITT) Environmental Impact Statement/ Overseas Environmental Impact Statement (EIS/OEIS).

DATES: Public scoping meetings will not be held, but public comments will be accepted during the scoping period from August 1, 2017 to September 15, 2017.

ADDRESSES: The DoN invites scoping comments on the MITT Supplemental EIS/OEIS from all interested parties. Substantive comments may be provided by mail to the address below and through the project Web site at *http://mitt-eis.com/*. Comments must be postmarked or received by September 15, 2017, for consideration during the development of the Draft Supplemental EIS/OEIS.

FOR FURTHER INFORMATION CONTACT: Naval Facilities Engineering Command Pacific, Attention: MITT Supplemental EIS/OEIS Project Manager, 258 Makalapa Drive, Suite 100, Pearl Harbor, HI 96860–3134.

SUPPLEMENTARY INFORMATION: The Navy will assess the potential environmental impacts associated with ongoing and proposed military readiness activities conducted within the MITT EIS/OEIS Study Area (hereafter known as the "Study Area"). The Supplement to the 2015 Final EIS/OEIS is being prepared to support ongoing and future activities conducted at sea and on Farallon de Medinilla (FDM) within the Study Area beyond 2020. Military readiness activities include training and research, development, testing, and evaluation (hereafter known as "testing"). The Supplemental EIS/OEIS will include an analysis of training and testing activities using new information available after the release of the 2015 Final MITT EIS/OEIS. New information includes an updated acoustic effects model, updated marine mammal density data, and other best available science. Proposed activities are generally consistent with those analyzed in the 2015 Final MITT EIS/OEIS and are representative of training and testing activities the DoN has been conducting in the Study Area for decades.

The Study Area remains unchanged since the 2015 Final MITT EIS/OEIS. The Study Area includes the existing Mariana Islands Range Complex (MIRC); areas on the high seas to the north and west of the MIRC; a transit corridor between the MIRC and the Hawaii Range Complex, starting at the International Date Line; and Apra Harbor and select DoN pierside and harbor locations. The Study Area includes only the in-water components of the range complex and FDM; land components associated with the range complex are not included in the Study Area.

As part of this process the DoN will seek the issuance of regulatory permits and authorizations under the Marine Mammal Protection Act and Endangered Species Act to support training and testing requirements within the Study Area, beyond 2020, thereby ensuring critical Department of Defense requirements are met.

Pursuant to 40 CFR 1501.6, the DoN will invite the National Marine Fisheries Service to be a cooperating agency in preparation of the Supplemental EIS/OEIS.

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The DoN's lead action proponent is Commander, U.S. Pacific Fleet. Additional action proponents include Naval Sea Systems Command, Naval Air Systems Command, and the Office of Naval Research.

The DoN's Proposed Action is to conduct military training and testing activities within the Study Area. Activities include the use of active sonar and explosives while employing appropriate marine species protective mitigation measures. The Proposed Action does not alter the DoN's original purpose and need as presented in the 2015 MITT Final EIS/OEIS.

The purpose of the Proposed Action is to maintain a ready force, which is needed to ensure the military can accomplish its mission to maintain, train, and equip combat-ready naval forces capable of winning wars, deterring aggression, and maintaining freedom of the seas, consistent with Congressional direction in section 5062 of Title 10 of the U.S. Code. A Supplemental EIS/OEIS is considered the appropriate document, as there is recent scientific information including revised acoustic criteria to consider, in furtherance of NEPA, relevant to the environmental effects of the DoN's Proposed Action, and the analysis will support Marine Mammal Protection Act authorization requests.

Proposed training and testing activities are generally consistent to those analyzed in the 2015 MITT Final EIS/OEIS. The Supplemental EIS/OEIS will propose changes to the tempo and types of training and testing activities, accounting for the introduction of new technologies, the evolving nature of international events, advances in war fighting doctrine and procedures, and changes in the organization of vessels, aircraft, weapon systems, and military personnel. The MITT Supplemental EIS/OEIS will reflect the compilation of training and testing activities required to fulfill the DoN's military readiness requirements beyond 2020, and therefore includes the analysis of newly proposed activities and changes to previously analyzed activities.

In the Supplemental EIS/OEIS, the DoN will evaluate the potential environmental impacts of a No Action Alternative and action alternatives. Resources to be evaluated include, but are not limited to, marine mammals, sea turtles, essential fish habitat, and threatened and endangered species.

The scoping process is used to identify public concerns and local issues to be considered during the development of the Draft Supplemental EIS/OEIS. Federal agencies, local agencies, the public, and interested persons are encouraged to provide substantive comments to the DoN on environmental resources and issue areas of concern the commenter believes the DoN should consider.

Comments must be postmarked or received online by September 15, 2017, for consideration during the development of the Draft Supplemental EIS/OEIS. Comments can be mailed to: Naval Facilities Engineering Command Pacific, Attention: MITT Supplemental EIS/OEIS Project Manager, 258 Makalapa Drive, Suite 100, Pearl Harbor, HI, 96860–3134. Comments can be submitted online via the project Web site at *http://mitt-eis.com/*.

Dated: July 20, 2017.

A.M. Nichols,

Lieutenant Commander, Judge Advocate General's Corps, U.S. Navy, Federal Register Liaison Officer.

[FR Doc. 2017–15939 Filed 7–31–17; 8:45 am]

BILLING CODE 3810–FF–P

DEPARTMENT OF EDUCATION

Final Waiver and Extension of the Project Period for the Native American Career and Technical Education Program

[Catalog of Federal Domestic Assistance (CFDA) Number: 84.101A]

AGENCY: Office of Career, Technical, and Adult Education, Department of Education.

ACTION: Final waiver and extension of the project period.

SUMMARY: For the 24-month projects originally funded in fiscal year (FY) 2013 and extended for an additional 24-months in FY 2015 under the Native American Career and Technical Education Program (NACTEP), the Secretary: Waives the requirements in Education Department regulations that generally prohibit project extensions involving the obligation of additional Federal funds; and extends the project period for the current 30 NACTEP grantees for an additional 12 months under the existing program authority. This waiver and extension will allow the 30 current NACTEP grantees to seek FY 2017 continuation awards for the project period through FY 2018.

DATES: As of August 1, 2017, the waiver and extension of the project period are finalized.

FOR FURTHER INFORMATION CONTACT: Gwen Washington by telephone at (202) 245–7790 or by email at *gwen.washington@ed.gov*. You may also contact Linda Mayo by telephone at (202) 245–7792 or by email at *linda.mayo@ed.gov*. If you use a telecommunications device for the deaf (TDD) or a text telephone (TTY), call the Federal Relay Service, toll free, at 1–800–877–8339.

SUPPLEMENTARY INFORMATION: On April 26, 2017, we published a notice in the **Federal Register** (82 FR 19240) proposing to waive the requirements of 34 CFR 75.261(a) and (c)(2) that generally prohibit project period extensions involving the obligation of additional Federal funds. In that notice, the Secretary also proposed to extend the NACTEP project period for up to an additional 12 months. The proposed waiver and extension of project period would enable the Secretary to provide continuation awards to the current NACTEP grantees through FY 2018 under the existing program authority.

That notice contained background information and our reasons for proposing the waiver and extension of the project period. This notice makes the waiver and extension of the project period final. Any activities carried out during the period of a NACTEP continuation award must be consistent with, or a logical extension of, the scope, goals, and objectives of the grantee's application as approved in the FY 2013 NACTEP competition. The requirements applicable to continuation awards for this competition set forth in the 2013 notice inviting applications and the requirements in 34 CFR 75.253 will apply to any continuation awards sought by the current NACTEP grantees.

We will make decisions regarding the continuation awards based on grantee program narratives, budgets and budget narratives, program performance reports, and the requirements in 34 CFR 75.253. We will not announce a new competition or make new awards in FY 2017.

The final waiver and project period extension will not exempt the current NACTEP grantees from the appropriation account closing provisions of 31 U.S.C. 1552(a), nor will it extend the availability of funds previously awarded to current NACTEP grantees. As a result of 31 U.S.C. 1552(a), appropriations available for a limited period may be used for payment of valid obligations for only five years after the expiration of their period of availability for Federal obligation. After that time, the unexpended balance of those funds is canceled and returned to the U.S. Department of the Treasury and is unavailable for restoration for any purpose (31 U.S.C. 1552(b)).

Public Comment: In response to our invitation in the proposed waiver and extension, we received 85 comments.

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Authority: 35 U.S.C. 207, 37 CFR part 404.

Dated: January 28, 2019.

M.S. Werner,

Commander, Judge Advocate General's Corps, U.S. Navy, Federal Register Liaison Officer.

[FR Doc. 2019–00373 Filed 1–30–19; 8:45 am]

BILLING CODE 3810–FF–P

DEPARTMENT OF DEFENSE

Department of the Navy

Notice of Public Meetings for the Draft Supplemental Environmental Impact Statement/Overseas Environmental Impact Statement for Mariana Islands Training and Testing

AGENCY: Department of the Navy, DoD.

ACTION: Notice.

SUMMARY: Pursuant to section 102(2)(c) of the National Environmental Policy Act (NEPA) of 1969, as implemented by the Council on Environmental Quality, and Presidential Executive Order (E.O.) 12114, the Department of the Navy (DoN) has prepared and filed with the U.S. Environmental Protection Agency a Draft Supplemental Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS). In the Draft Supplemental EIS/OEIS, the DoN reassesses the potential environmental impacts associated with conducting ongoing and future military readiness activities, which includes training activities and research, development, testing, and evaluation activities (referred to as "testing activities") conducted at sea and on Farallon de Medinilla (FDM) within the Mariana Islands Training and Testing (MITT) Study Area (hereafter referred to as the Study Area) beyond 2020. In the Draft Supplemental EIS/OEIS, the DoN evaluates new, relevant information, such as more recent marine mammal density data and new scientific information, and updates the environmental analyses as appropriate. The DoN prepared the Draft Supplemental EIS/OEIS to support the issuance of federal regulatory permits and authorizations under the Marine Mammal Protection Act and the Endangered Species Act. The National Marine Fisheries Service (NMFS) is a cooperating agency for this Supplemental EIS/OEIS.

DATES: This notice announces the public comment period and the dates and locations of the public meetings, includes information about how the public can review and comment on the document, and provides supplementary information about the environmental planning effort. All comments must be postmarked or received online by March 18, 2019, Chamorro Standard Time, for consideration in the Final Supplemental EIS/OEIS. Federal and local agencies and officials, and interested organizations and individuals, are encouraged to provide substantive comments on the Draft Supplemental EIS/OEIS during the public review period or in person at one of the scheduled open house public meetings.

ADDRESSES: Public meetings will be held in an open-house format, with DoN representatives available to provide information and answer questions related to the Draft Supplemental EIS/OEIS. Open house public meetings will be held on Guam and Saipan. The public may arrive at any time during the open house, as there will not be a presentation or formal oral comment session. Open house public meetings will be held on the following dates and at the following locations:

1. 5:00 to 8:00 p.m. February 26, 2019, at University of Guam, Jesus & Eugenia Leon Guerrero School of Business and Public Administration Building, Anthony Leon Guerrero Multi-Purpose Room 129 and Henry Sy Atrium, Mangilao, Guam 96923.

2. 5:00 to 8:00 p.m. February 27, 2019, at Kanoa Resort Saipan, Seaside Hall, Beach Road in Susupe, Saipan, MP 96950.

Attendees will be able to submit written comments during the open house public meetings. A stenographer will be available for attendees wishing to provide oral comments, one-on-one. Equal weight will be given to oral and written comments. Comments may also be mailed to Naval Facilities Engineering Command Pacific, Attention: MITT Supplemental EIS/OEIS Project Manager, 258 Makalapa Drive, Suite 100, Pearl Harbor, HI 96860–3134, or electronically via the project website at *www.MITT-EIS.com*. All comments, written or oral, submitted during the public comment period will become part of the public record and substantive comments will be addressed in the Final Supplemental EIS/OEIS.

FOR FURTHER INFORMATION CONTACT: Naval Facilities Engineering Command Pacific, Attention: MITT Supplemental EIS/OEIS Project Manager, 258 Makalapa Drive, Suite 100, Pearl Harbor, HI 96860–3134.

SUPPLEMENTARY INFORMATION: The Draft Supplemental EIS/OEIS was distributed to federal and local agencies with which the DoN consulted. Copies of the Draft Supplemental EIS/OEIS are available for public review at the following public libraries:

1. Robert F. Kennedy Memorial Library, University of Guam, UOG Station, Mangilao, GU 96923–1871.

2. Nieves M. Flores Memorial Library, 254 Martyr Street, Hagåtña, GU 96910–5141.

3. Tinian Public Library, San Jose Village, Tinian, MP 96952–9997.

4. Antonio C. Atalig Memorial Library (Rota Public Library), Rota, MP 96951–9997.

5. Joeten-Kiyu Public Library, Insatto Street, Saipan, MP 96950–9996.

The MITT Draft Supplemental EIS/OEIS is available for electronic viewing or download at *www.MITT-EIS.com*. A compact disc of the Draft Supplemental EIS/OEIS will be made available upon written request by contacting: Naval Facilities Engineering Command Pacific, Attention: MITT Supplemental EIS/OEIS Project Manager, 258 Makalapa Drive, Suite 100, Pearl Harbor, HI 96860–3134.

Dated: January 25, 2019.

M.S. Werner,

Commander, Judge Advocate General's Corps, U.S. Navy, Federal Register Liaison Officer.

[FR Doc. 2019–00368 Filed 1–30–19; 8:45 am]

BILLING CODE 3810–FF–P

DEPARTMENT OF DEFENSE

Department of the Navy

Notice of Availability of the Record of Decision for the Final Supplemental Environmental Impact Statement for Land-Water Interface and Service Pier Extension at Naval Base Kitsap Bangor, Kitsap County, WA

AGENCY: Department of the Navy, DoD.

ACTION: Notice.

SUMMARY: The United States Department of the Navy (Navy), announces its decision to construct and operate a Service Pier Extension (SPE) and associated support facilities in Hood Canal on the waterfront of Naval Base (NAVBASE) Kitsap Bangor, Washington (WA). The Navy will implement Alternative 2, short pier configuration, which is the preferred alternative in the October 2018 Final Supplemental Environmental Impact Statement (SEIS) for the Land-Water Interface (LWI) and SPE, NAVBASE Kitsap Bangor, WA. The Alternative 2 short pier configuration is also the environmentally preferred alternative and will fully meet the Navy's purpose and need for the proposed action.

SUPPLEMENTARY INFORMATION: The existing Service Pier will be extended by 520 feet and will require in-water as well as upland construction of

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DEPARTMENT OF ENERGY

Federal Energy Regulatory Commission

[Docket Nos. IS18–766–000, IS18–767–000]

Notice Rescheduling Technical Conference: Mid-America Pipeline Company, LLC; Seminole Pipeline Company LLC

The technical conference originally scheduled for January 17, 2016, in the above-referenced proceeding, is hereby rescheduled to convene on February 20, 2019, at 9:00 a.m. (Eastern Standard Time). It will occur in Hearing Room 2 at the Commission's Washington DC offices.[1]

Dated: January 15, 2019.

Kimberly D. Bose,

Secretary.

[FR Doc. 2019–00541 Filed 1–31–19; 8:45 am]

BILLING CODE 6717–01–P

ENVIRONMENTAL PROTECTION AGENCY

[ER–FRL–9043–2]

Environmental Impact Statements; Notice of Availability

Responsible Agency: Office of Federal Activities, General Information 202–564–5632 or *https://www.epa.gov/nepa/.*

Receipt of Environmental Impact Statements
Filed 12/21/2018 Through 01/25/2019
Pursuant to 40 CFR 1506.9.

Notice

Section 309(a) of the Clean Air Act requires that EPA make public its comments on EISs issued by other Federal agencies. EPA's comment letters on EISs are available at: *https://cdxnodengn.epa.gov/cdx-enepa-public/action/eis/search.*

EIS No. 20180325, Final, USFS, WA, Sunrise Vegetation and Fuels Management, *Review Period Ends:* 03/04/2019, *Contact:* Johnny Collin 509–843–4643

EIS No. 20180326, Draft Supplement, BR, CA, Long-Term Water Transfers, *Comment Period Ends:* 03/18/2019, *Contact:* Dan Cordova 916–987–5483

EIS No. 20180327, Final, TxDOT, TX, Oakhill Parkway, *Contact:* Carlos Swonke 512–416–2734

Under 23 U.S.C. 139(n)(2), TxDOT has issued a single document that consists of a supplemental final environmental impact statement and record of decision. Therefore, the 30-day wait/review period under NEPA does not apply to this action.

EIS No. 20180328, Draft, HUD, CT, Resilient Bridgeport, *Comment Period Ends:* 03/18/2019, *Contact:* Rebecca French 860–270–8231

EIS No. 20180329, Draft, USACE, CA, Amoruso Ranch, *Comment Period Ends:* 03/18/2019, *Contact:* Leah M. Fisher 916–557–6639

EIS No. 20180330, Draft, FHWA, LA, Lafayette Regional Xpressway Tier 1, *Comment Period Ends:* 03/18/2019, *Contact:* Todd Jeter 225–757–7612

EIS No. 20180331, Final, FERC, LA, Driftwood LNG Project, *Review Period Ends:* 03/04/2019, *Contact:* Office of External Affairs 866–208–3372

EIS No. 20180332, Final, FERC, CA, Yuba River Development Project, *Review Period Ends:* 03/04/2019, *Contact:* Alan Mitchnick 202–502–6074

EIS No. 20180333, Final, FERC, OR, Swan Lake North Pumped Storage Project, *Review Period Ends:* 03/04/2019, *Contact:* Office of External Affairs 866–208–3372

EIS No. 20180334, Final, FERC, NY, Northeast Supply Enhancement Project, *Review Period Ends:* 03/04/2019, *Contact:* Office of External Affairs 866–208–3372

EIS No. 20180335, Draft Supplement, USN, GU, **Mariana Islands Training and Testing Draft Supplemental Environmental Impact Statement/Overseas Environmental Impact Statement, *Comment Period Ends:* 03/18/2019, *Contact:* Nora Macariola-See 808–472–1402**

EIS No. 20180336, Draft, FHWA, NY, Van Wyck Expressway Capacity and Access Improvements to JFK Airport, *Comment Period Ends:* 03/18/2019, *Contact:* Hans Anker 518–431–8896

Amended Notices

EIS No. 20180282, Final, USACE, IL, The Great Lakes and Mississippi River Interbasin Study—Brandon Road Integrated Feasibility Study and Environmental Impact Statement—Will County, Illinois, *Review Period Ends:* 02/22/2019, *Contact:* Andrew Leichty 309–794–5399. Revision to FR Notice Published 12/21/2018; Extending the Comment Period from 01/07/2019 to 02/22/2019.

Dated: January 29, 2019.

Robert Tomiak,

Director, Office of Federal Activities.

[FR Doc. 2019–00664 Filed 1–31–19; 8:45 am]

BILLING CODE 6560–50–P

FARM CREDIT SYSTEM INSURANCE CORPORATION

Regular Meeting; Farm Credit System Insurance Corporation Board

AGENCY: Farm Credit System Insurance Corporation.

ACTION: Notice, regular meeting.

SUMMARY: Notice is hereby given of the regular meeting of the Farm Credit System Insurance Corporation Board (Board).

DATES: The meeting of the Board will be held at the offices of the Farm Credit Administration in McLean, Virginia, on January 17, 2019, from 2:00 p.m. until such time as the Board concludes its business.

ADDRESSES: Farm Credit System Insurance Corporation, 1501 Farm Credit Drive, McLean, Virginia 22102. Submit attendance requests via email to *VisitorRequest@FCA.gov.* See **SUPPLEMENTARY INFORMATION** for further information about attendance requests.

FOR FURTHER INFORMATION CONTACT: Dale Aultman, Secretary to the Farm Credit System Insurance Corporation Board, (703) 883–4009, TTY (703) 883–4056, *aultmand@fca.gov.*

SUPPLEMENTARY INFORMATION: Parts of this meeting of the Board will be open to the public (limited space available), and parts will be closed to the public. Please send an email to *VisitorRequest@FCA.gov* at least 24 hours before the meeting. In your email include: Name, postal address, entity you are representing (if applicable), and telephone number. You will receive an email confirmation from us. Please be prepared to show a photo identification when you arrive. If you need assistance for accessibility reasons, or if you have any questions, contact Dale Aultman, Secretary to the Farm Credit System Insurance Corporation Board, at (703) 883–4009. The matters to be considered at the meeting are:

Open Session

A. Approval of Minutes

- December 13, 2018

B. New Business

- Review of Insurance Premium Rates

[1] See the *Notice of Technical Conference* issued on December 12, 2018, for additional details regarding this conference.

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EXEMPTIONS PROMULGATED FOR THE SYSTEM:

None.

HISTORY:

February 22, 1993, 58 FR 10227.

[FR Doc. 2019–04191 Filed 3–7–19; 8:45 am]

BILLING CODE 5001–06–P

DEPARTMENT OF DEFENSE

Office of the Secretary

[Docket ID: DOD–2018–OS–0104]

Submission for OMB Review; Comment Request

AGENCY: Office of the Secretary of Defense, DoD.

ACTION: 30-Day information collection notice.

SUMMARY: The Department of Defense has submitted to OMB for clearance the following proposal for collection of information under the provisions of the Paperwork Reduction Act.

DATES: Consideration will be given to all comments received by April 8, 2019.

ADDRESSES: Comments and recommendations on the proposed information collection should be emailed to Ms. Jasmeet Seehra, DoD Desk Officer, at *oira_submission@omb.eop.gov*. Please identify the proposed information collection by DoD Desk Officer, Docket ID number, and title of the information collection.

FOR FURTHER INFORMATION CONTACT: Angela James, 571–372–7574, or *whs.mc-alex.esd.mbx.dd-dod-information-collections@mail.mil.*

SUPPLEMENTARY INFORMATION:

Title; Associated Form; and OMB Number: Vietnam War Commemoration Program Partner Events; DD Form 2953; DD Form 2954; DD Form 3027; DD Form 3028; DD Form 3029; OMB Control Number 0704–0500.

Type of Request: Extension.

Number of Respondents: 16,020.

Responses per Respondent: 1.8739.

Annual Responses: 30,020.

Average Burden per Response: 15 minutes.

Annual Burden Hours: 7,505.

Needs and Uses: This information collection requirement is necessary to notify the United States of America Vietnam War Commemoration Program of Commemorative Partner's planned events. Information is submitted for inclusion on the program's events calendar and to request event support in the form of materials and/or speakers from the program. The information collection is necessary to obtain, vet, record, process and provide Certificates of Honor to be presented on behalf of a grateful nation by partner organizations. Additionally, this collection is necessary for the partner organizations to communicate to the Commemoration program the results of their events and lessons learned.

Affected Public: Businesses or other for-profits; Not-for-profit institutions; Federal Government; State, local or tribal government, or, by exception, eligible individuals or households.

Frequency: On occasion.

Respondent's Obligation: Voluntary.

OMB Desk Officer: Ms. Jasmeet Seehra.

You may also submit comments and recommendations, identified by Docket ID number and title, by the following method:

• *Federal eRulemaking Portal: http://www.regulations.gov.* Follow the instructions for submitting comments.

Instructions: All submissions received must include the agency name, Docket ID number, and title for this **Federal Register** document. The general policy for comments and other submissions from members of the public is to make these submissions available for public viewing on the internet at *http://www.regulations.gov* as they are received without change, including any personal identifiers or contact information.

DOD Clearance Officer: Ms. Angela James.

Requests for copies of the information collection proposal should be sent to Ms. James at *whs.mc-alex.esd.mbx.dd-dod-information-collections@mail.mil.*

Dated: March 4, 2019.

Aaron T. Siegel,

Alternate OSD Federal Register Liaison Officer, Department of Defense.

[FR Doc. 2019–04173 Filed 3–7–19; 8:45 am]

BILLING CODE 5001–06–P

DEPARTMENT OF DEFENSE

Department of the Navy

Notice of Rescheduled Public Meetings and Extension of Public Comment Period for the Draft Supplemental Environmental Impact Statement/Overseas Environmental Impact Statement for Mariana Islands Training and Testing

AGENCY: Department of the Navy, DoD.

ACTION: Notice.

SUMMARY: A notice of public meetings was published in the **Federal Register** by the U.S. Environmental Protection Agency on January 31, 2019 for the Department of the Navy's (DoN) Draft Supplemental Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) for the Mariana Islands Training and Testing (MITT) Study Area. Due to the effects of Typhoon Wutip, Navy officials postponed public meetings supporting the Draft Supplemental EIS/OEIS planned for February 26–27, 2019.

DATES: This notice announces the dates and locations of the rescheduled public meetings in March 2019, and a 15-day extension of the public comment period from March 18, 2019, to April 2, 2019.

ADDRESSES: Public meetings will be held in an open-house format with DoN representatives available to provide information and answer questions related to the Draft Supplemental EIS/OEIS. The public may arrive at any time during meetings, as there will not be a presentation or public oral comment session. Open house public meetings will be held on the following dates and at the following locations:

1. 1:00 to 3:30 p.m. March 14, 2019, at Tinian Public Library, San Jose Village, Tinian, MP 96952.
2. 1:30 to 4:30 p.m. March 15, 2019, at Mayor's Conference Hall, Songsong Village, Rota, MP 96951.
3. 5:00 to 8:00 p.m. March 18, 2019, at Kanoa Resort Saipan, Seaside Hall, Beach Road in Susupe, Saipan, MP 96950.
4. 5:00 to 8:00 p.m. March 19, 2019, at University of Guam, Jesus & Eugenia Leon Guerrero School of Business and Public Administration Building, Anthony Leon Guerrero Multi-Purpose Room 129 and Henry Sy Atrium, Mangilao, Guam 96923.

Attendees will be able to submit comments during the open house public meetings. Comments may also be mailed to Naval Facilities Engineering Command Pacific, Attention: MITT Supplemental EIS/OEIS Project Manager, 258 Makalapa Drive, Suite 100, Pearl Harbor, HI 96860–3134, or electronically via the project website at *www.MITT-EIS.com.* All comments submitted during the public comment period will become part of the public record and substantive comments will be addressed in the Final Supplemental EIS/OEIS. All comments must be postmarked or received online by April 2, 2019, Chamorro Standard Time, for consideration in the Final Supplemental EIS/OEIS.

Naval Facilities Engineering Command Pacific, Attention: MITT Supplemental EIS/OEIS Project Manager, 258 Makalapa Drive, Suite 100, Pearl Harbor, HI 96860–3134.

SUPPLEMENTARY INFORMATION: The Draft Supplemental EIS/OEIS is available

electronically for public viewing at *www.MITT-EIS.com* and at the following public libraries:

1. Robert F. Kennedy Memorial Library, University of Guam, UOG Station, Mangilao, GU 96923–1871.
2. Nieves M. Flores Memorial Library, 254 Martyr St., Hagåtña, GU 96910–5141.
3. Tinian Public Library, San Jose Village, Tinian, MP 96952–9997.
4. Antonio C. Atalig Memorial Library (Rota Public Library), Rota, MP 96951–9997.
5. Joeten-Kiyu Public Library, Beach Road and Insatto St., Saipan, MP 96950–9996.

Dated: March 1, 2019.

M.S. Werner,

Commander, Judge Advocate General's Corps, U.S. Navy, Federal Register Liaison Officer.

[FR Doc. 2019–04019 Filed 3–7–19; 8:45 am]

BILLING CODE 3810–FF–P

DEPARTMENT OF DEFENSE

Department of the Navy

Notice of Intent To Grant Exclusive Patent License; Nanocrine, Inc.

AGENCY: Department of the Navy, DoD.

ACTION: Notice.

SUMMARY: The Department of the Navy hereby gives notice of its intent to grant to Nanocrine, Inc., of Frederick, Maryland an exclusive license in the field of use of products and services for use in cell biology research for cell signaling and phenotyping studies and the field of use of products and services for use in cell biology research for cell protein and chemical secretion, in the United States, to U.S. Patent 9,791,368: Nanoplasmonic Imaging Technique for the Spatio-temporal Mapping of Single Cell Secretions in Real Time, Navy Case No. 102,395.//U.S. Patent Application No. 15/784,433: Nanoplasmonic Imaging Technique for the Spatio-Temporal Mapping of Single Cell Secretion in Real Time, Navy Case No, 102,395.//U.S. Patent No. 9,915,654: Light Microscopy Chips and Data Analysis Methodology for Quantitative Localized Surface Plasmon Resonance (LSPR) Biosensing and Imaging, Navy Case No. 101,529.//U.S. Patent Application No. 15/882,081: Light Microscopy Chips and Data Analysis Methodology for Quantitative Localized Surface Plasmon Resonance (LSPR) Biosensing and Imaging, Navy Case No. 101,529.//U.S Patent Application No. 14/039,326: Calibrating Single Plasmonic Nanostructures for Quantitative Biosensing, Navy Case No. 102,043.//U.S Patent Application No. 15/186,742: Determining Extracellular Protein Concentration with Nanoplasmonic Sensors, Navy Case No. 103,502.//U.S. Patent Application No. 16/196,097: Substrates with Indendently Tunable Topographies and Chemistries for Quantifying Surface-Induced Cell Behavior, Navy Case No. 107,399 and any continuations, divisionals, or re-issues thereof.

DATES: Anyone wishing to object to the grant of this license must file written objections along with supporting evidence, if any, not later than March 25, 2019.

ADDRESSES: Written objections are to be filed with the Naval Research Laboratory, Code 1004, 4555 Overlook Avenue SW, Washington, DC 20375–5320.

FOR FURTHER INFORMATION CONTACT: Amanda Horansky McKinney, Head, Technology Transfer Office, NRL Code 1004, 4555 Overlook Avenue SW, Washington, DC 20375–5320, telephone 202–767–1644. Due to U.S. Postal delays, please fax 202–404–7920, email: *techtran@.nrl.navy.mil* or use courier delivery to expedite response.

[Authority: 35 U.S.C. 207, 37 CFR part 404.]

M.S. Werner,

Commander, Judge Advocate General's Corps, U.S. Navy, Federal Register Liaison Officer.

[FR Doc. 2019–04220 Filed 3–7–19; 8:45 am]

BILLING CODE 3810–FF–P

DEPARTMENT OF ENERGY

Energy Conservation Program for Consumer Products: Representative Average Unit Costs of Energy

AGENCY: Office of Energy Efficiency and Renewable Energy, Department of Energy.

ACTION: Notice.

SUMMARY: In this notice, the U.S. Department of Energy (DOE) is forecasting the representative average unit costs of five residential energy sources for the year 2019 pursuant to the Energy Policy and Conservation Act (Act). The five sources are electricity, natural gas, No. 2 heating oil, propane, and kerosene.

DATES: The representative average unit costs of energy contained in this notice will become effective April 8, 2019 and will remain in effect until further notice.

FOR FURTHER INFORMATION CONTACT: John Cymbalsky, U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy Forrestal Building, Mail Station EE–5B, 1000 Independence Avenue SW, Washington, DC 20585–0121, (202) 287–1692, *ApplianceStandardsQuestions@ee.doe.gov.*

Francine Pinto, Esq. U.S. Department of Energy, Office of General Counsel Forrestal Building, Mail Station GC–33, 1000 Independence Avenue SW, Washington, DC 20585–0103, (202) 586–7432, *Francine.Pinto@hq.doe.gov.*

SUPPLEMENTARY INFORMATION: Section 323 of the Energy Policy and Conservation Act requires that DOE prescribe test procedures for the measurement of the estimated annual operating costs or other measures of energy consumption for certain consumer products specified in the Act. (42 U.S.C. 6293(b)(3)) These test procedures are found in Title 10 of the Code of Federal Regulations (CFR) part 430, subpart B.

Section 323(b)(3) of the Act requires that the estimated annual operating costs of a covered product be calculated from measurements of energy use in a representative average use cycle or period of use and from representative average unit costs of the energy needed to operate such product during such cycle. (42 U.S.C. 6293(b)(3)) The section further requires that DOE provide information to manufacturers regarding the representative average unit costs of energy. (42 U.S.C. 6293(b)(4)) This cost information should be used by manufacturers to meet their obligations under section 323(c) of the Act. Most notably, these costs are used to comply with Federal Trade Commission (FTC) requirements for labeling. Manufacturers are required to use the revised DOE representative average unit costs when the FTC publishes new ranges of comparability for specific covered products, 16 CFR part 305. Interested parties can also find information covering the FTC labeling requirements at *http://www.ftc.gov/appliances.*

DOE last published representative average unit costs of residential energy in a **Federal Register** notice entitled, "Energy Conservation Program for Consumer Products: Representative Average Unit Costs of Energy", dated April 24, 2018, 83 FR 17811.

On April 8, 2019, the cost figures published in this notice will become effective and supersede those cost figures published on April 24, 2018. The cost figures set forth in this notice will be effective until further notice.

DOE's Energy Information Administration (EIA) has developed the 2019 representative average unit after-tax residential costs found in this notice. These costs for electricity,

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and Recreation Department, Oregon Department of Environmental Quality, Oregon Department of Land Conservation and Development, Oregon Department of State Lands, and Oregon Department of Agriculture.

Alternatives. The EIS will evaluate a no action alternative and action alternatives. The no action alternative is the current management direction for the WVS. Action alternatives will be composed of various measures for continued operations and maintenance of the WVS, as well as measures that will be developed to meet ESA obligations to avoid jeopardizing the continued existence of listed species. Comments received during the scoping comment period will inform the development of action alternatives.

Scoping Process/Public Involvement. The Corps invites all affected federal, state, and local agencies, affected Native American Tribes, other interested parties, and the general public to participate in the NEPA process during development of the EIS. The purpose of the public scoping process is to provide information to the public, narrow the scope of analysis to significant environmental issues, serve as a mechanism to solicit agency and public input on alternatives and issues of concern, and ensure full and open participation in scoping for the Draft EIS. Numerous public scoping meetings will be held during the scoping period. The specific dates, times, and locations of the meetings will be published on the Corps' project website: *https://www.mwp.usace.army.mil/Locations/Willamette-Valley/Evaluation/.*

This is not a notice for the public comment periods for the Cougar Downstream Passage and Detroit Downstream Passage projects; public comment periods for those projects will be noticed separately.

Documents and other important information related to the EIS will be available for review on the Corps' project website.

Aaron L. Dorf,
Colonel, Corps of Engineers, District Commander.

[FR Doc. 2019–06258 Filed 3–29–19; 8:45 am]

BILLING CODE 3720–58–P

DEPARTMENT OF DEFENSE

Department of the Navy

Notice of Availability of Government-Owned Inventions; Available for Licensing

AGENCY: Department of the Navy, DoD.

ACTION: Notice.

SUMMARY: The Department of the Navy (DoN) announces the availability of the inventions listed below, assigned to the United States Government, as represented by the Secretary of the Navy, for domestic and foreign licensing by the Department of the Navy.

ADDRESSES: Requests for copies of the patents cited should be directed to Naval Surface Warfare Center, Crane Div, Code OOL, Bldg 2, 300 Highway 361, Crane, IN 47522–5001.

FOR FURTHER INFORMATION CONTACT: Mr. Christopher Monsey, Naval Surface Warfare Center, Crane Div, Code OOL, Bldg 2, 300 Highway 361, Crane, IN 47522–5001, Email *Christopher.Monsey@navy.mil*, 812–854–2777.

SUPPLEMENTARY INFORMATION: The following patents are available for licensing: Patent No. 10,200,081 (Navy Case No. 200348): SYSTEMS AND METHODS FOR SIGNAL DETECTION AND DIGITAL BANDWIDTH REDUCTION IN DIGITAL PHASED ARRAYS// Patent No. 10,204,875 (Navy Case No. 200421): SYSTEMS AND METHODS FOR INHIBITING BACKEND ACCESS TO INTEGRATED CIRCUITS BY INTEGRATING PHOTON AND ELECTRON SENSING LATCH-UP CIRCUITS// Patent No. 10,209,342 (Navy Case No. 200479): ELECTROMAGNETIC RADIATION SOURCE LOCATING SYSTEM// and Patent No. 10,215,531 (Navy Case No. 200357): TESTING SYSTEM FOR OPTICAL AIMING SYSTEMS WITH LIGHT EMITTER SYSTEMS INCLUDING TESTING SYSTEM FOR THERMAL DRIFT AND RELATED METHODS.

Authority: 35 U.S.C. 207, 37 CFR part 404.

Dated: March 26, 2019.

M.S. Werner,
Commander, Judge Advocate General's Corps, U.S. Navy, Federal Register Liaison Officer.

[FR Doc. 2019–06163 Filed 3–29–19; 8:45 am]

BILLING CODE 3810–FF–P

DEPARTMENT OF DEFENSE

Department of the Navy

Notice of Extension of Public Comment Period for the Draft Supplemental Environmental Impact Statement/Overseas Environmental Impact Statement for Mariana Islands Training and Testing

AGENCY: Department of the Navy, DoD.

ACTION: Notice.

SUMMARY: A notice of public meetings was published in the **Federal Register** by the U.S. Environmental Protection Agency on January 31, 2019 and March 8, 2019 for the Department of the Navy's (DoN) Draft Supplemental Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) for the Mariana Islands Training and Testing (MITT) Study Area.

DATES: This notice announces a 15-day extension of the public comment period from April 2, 2019, to April 17, 2019.

ADDRESSES: Comments may be mailed to Naval Facilities Engineering Command Pacific, Attention: MITT Supplemental EIS/OEIS Project Manager, 258 Makalapa Drive, Suite 100, Pearl Harbor, HI 96860–3134, or electronically via the project website at *www.MITT-EIS.com.* All comments submitted during the public comment period will become part of the public record and substantive comments will be addressed in the Final Supplemental EIS/OEIS. All comments must be postmarked or received online by April 17, 2019, Chamorro Standard Time, for consideration in the Final Supplemental EIS/OEIS.

Naval Facilities Engineering Command Pacific, Attention: MITT Supplemental EIS/OEIS Project Manager, 258 Makalapa Drive, Suite 100, Pearl Harbor, HI 96860–3134.

SUPPLEMENTARY INFORMATION: The Draft Supplemental EIS/OEIS is available electronically for public viewing at *www.MITT-EIS.com* and at the following public libraries:

1. Robert F. Kennedy Memorial Library, University of Guam, UOG Station, Mangilao, GU 96923–1871.

2. Nieves M. Flores Memorial Library, 254 Martyr St., Hagåtña, GU 96910–5141.

3. Tinian Public Library, San Jose Village, Tinian, MP 96952–9997.

4. Antonio C. Atalig Memorial Library (Rota Public Library), Rota, MP 96951–9997.

5. Joeten-Kiyu Public Library, Beach Road and Insatto St., Saipan, MP 96950–9996.

Dated: March 25, 2019.

M.S. Werner,
Commander, Judge Advocate General's Corps, U.S. Navy, Federal Register Liaison Officer.

[FR Doc. 2019–06028 Filed 3–29–19; 8:45 am]

BILLING CODE 3810–FF–P

Appendix C: Agency Correspondence

Supplemental Environmental Impact Statement/ Overseas Environmental Impact Statement Mariana Islands Training and Testing

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There are no figures in this appendix.

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There are no tables in this appendix.

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APPENDIX C AGENCY CORRESPONDENCE

This appendix contains correspondence between the Navy and government agencies with respect to cooperating agency status, the Coastal Zone Management Act, the Endangered Species Act, the Essential Fish Habitat Assessment, and the National Historic Preservation Act.

C.1 Cooperating Agency Status

C.1.1 Navy Request Letter to the U.S. Coast Guard

DEPARTMENT OF THE NAVY
COMMANDER
UNITED STATES PACIFIC FLEET
250 MAKALAPA DRIVE
PEARL HARBOR, HAWAII 96860-3131

IN REPLY REFER TO:
5090
Ser N465/1489
December 13, 2019

RADM Kevin Lunday
Commander, Fourteenth Coast Guard District
300 Ala Moana Blvd FL 9-204
Honolulu, HI 96850-4982

Dear RADM Lunday:

SUBJECT: MARIANA ISLANDS TRAINING AND TESTING SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT/OVERSEA ENVIRONMENTAL IMPACT STATEMENT - COOPERATING AGENCY REQUEST

In accordance with the National Environmental Policy Act (NEPA) of 1969 and Executive Order (EO) 12114, the United States (U.S.) Department of the Navy (Navy) is preparing a Supplemental Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) to assess the potential environmental impacts associated with the continuation of military readiness activities, which consist of training as well as research, development, testing and evaluation (RDT&E, hereinafter referred to as "testing") activities that include the use of active sonar and explosives in the Mariana Islands Training and Testing (MITT) Study Area. The Navy's purpose of the Proposed Action is to conduct training and testing activities to ensure that the Navy and other Services meet their respective missions, which, for the Navy under Title 10 United States Code (U.S.C.) Section 8062, is to maintain, train, and equip combat-ready military forces capable of winning wars, deterring aggression, and maintaining freedom of the seas.

This MITT Supplemental EIS/OEIS represents the third phase (Phase III) of ongoing NEPA and EO 12114 compliance for continuation of at-sea training and testing. It will evaluate the conduct of military readiness activities from 2020 into the reasonably foreseeable future and accommodate evolving mission requirements associated with force structure changes, including those resulting from the development, testing, and ultimate introduction of new platforms (vessels, aircraft, and weapon systems) into the Fleet.

The Phase III MITT Study Area remains consistent with the area studied in the Phase II MITT EIS/OEIS completed in 2015 and consists of the established at sea ranges, operating areas and special use airspace in the region of the Mariana Islands that are part of the Mariana Islands Range Complex (MIRC) and its surrounding seas, and includes a transit corridor. The transit corridor is outside the geographic boundaries of the MIRC and is a direct route across the high seas for Navy ships in transit between the MIRC and the Hawaii Range Complex. The Proposed

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December 13, 2019

Action also includes pierside sonar maintenance and testing alongside Navy piers located in Inner Apra Harbor.

The MITT Phase III Supplemental EIS/OEIS is intended to serve as a basis for the renewal of current regulatory permits and authorizations and the analysis of emerging and future force structure changes and training and testing requirements. An important aspect of the MITT Supplemental EIS/OEIS will be the analysis of the potential effects to marine species protected under the Marine Mammal Protection Act (MMPA) and the Endangered Species Act (ESA) and habitats protected under the Magnuson-Stevens Fishery Conservation and Management Act. The existing MMPA Final Rule and Letters of Authorization for Phase II MITT activities will expire in August 2020.

Pursuant to 40 CFR Section 1501.6, the Navy requests the U.S. Coast Guard's participation in the NEPA process as a cooperating agency.

We appreciate your consideration of our request and look forward to your response. If you require additional information or have questions regarding this project, my points of contact for this matter are Mr. John Van Name, john.vanname@navy.mil, (808) 471-1714 and Ms. Suzanne Smith, suzanne.smith3@navy.mil, (808) 471-4696.

Sincerely,

DANIEL McNAIR
Director, Fleet Environmental Readiness
By direction of the Commander

Copy to:
ASN (EI&E)
DASN (E)
OAGC (EI&E)
CNIC (N45)
COMMANDER, JOINT REGION MARIANAS
NAVFAC PACIFIC
NAVFAC MARIANAS
CNO (N45)

C.1.2 U.S. COAST GUARD RESPONSE LETTER

U.S. Department of Homeland Security
United States Coast Guard

Commander
Fourteenth Coast Guard District

300 Ala Moana Blvd
Honolulu, HI 96850-4982
Staff Symbol: (d)
Phone: (808) 535-3201
Email: Kevin.E.Lunday@uscg.mil

5090
April 1, 2020

United States Pacific Fleet
Attn: Mr. Daniel McNair
Director, Fleet Environmental Readiness
250 Makalapa Drive
Pearl Harbor, Hawaii 96860-3131

Dear Mr. McNair:

Subject: MARIANA ISLANDS TRAINING AND TESTING SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT/OVERSEA ENVIRONMENTAL IMPACT STATEMENT – COAST GUARD COOPERATING AGENCY ACCEPTANCE

Ref: (a) National Environmental Policy Act (NEPA), 42 U.S.C 4321, et seq.
(b) Council on Environmental Quality Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act, 40 C.F.R. § 1500–1508
(c) Environmental Effects Abroad of Major Federal Actions, Executive Order 12114
(d) U.S. Coast Guard Environmental Planning Policy, COMDTINST 5090.1

The United States Coast Guard (Coast Guard), in response to your letter of 13 December 2019, and in accordance with references (a), (b), and (c), is pleased to accept cooperating agency status with the United States Navy (Navy) as part of the Mariana Islands Training and Testing (MITT) Supplemental Environmental Impact Statement (SEIS)/Overseas Supplemental Environmental Impact Statement (OSEIS). The Coast Guard acknowledges that the Navy is the lead federal agency for SEIS/OSEIS and is primarily responsible for the scope and content of the document. The Coast Guard will participate in the Navy NEPA process as a cooperating agency in order to provide special expertise for Coast Guard training and testing activities analyzed in the SEIS/OSEIS in the MITT study area. The SEIS/OSEIS assesses the potential environmental impacts associated with the continuation of these military readiness activities, which consist of training as well as research, development, testing, and evaluation (RDT&E, hereinafter referred to as "testing") activities that include the use of active sonar and explosives in the MITT study area.

The Coast Guard's actions in the MITT will include surface-to-surface gunnery exercises with small to medium caliber weapons that may include firearms and shoulder line-throwing guns, maritime security operations and civilian port defense using helicopters and vessels to simulate visiting, boarding, and seizing vessels, search and rescue exercises, and precision anchoring training. The purpose of the Coast Guard's actions in the MITT is to ensure effective, close coordination and mission execution between the Navy, Air Force, and Coast Guard operators and assets during actual emergencies and security operations. Joint exercises allow for Navy, Air Force, and Coast Guard commands, operators, and assets to more quickly and effectively respond to threats in the maritime environment and/or prevent such threats.

Subject: MARIANA ISLANDS TRAINING AND TESTING SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT/OVERSEA ENVIRONMENTAL IMPACT STATEMENT – COAST GUARD COOPERATING AGENCY ACCEPTANCE

5090
April 1, 2020

As previously discussed between the Navy and Coast Guard, the Coast Guard intends to adopt the final Navy MITT SEIS/OSEIS (and by SEIS/OSEIS reference the 2015 Navy MITT EIS/OEIS) to provide NEPA compliance coverage for Coast Guard training and testing activities conducted in the MITT and analyzed jointly in the SEIS/OSEIS with Navy and Air Force training and testing activities. The Coast Guard is required by reference (d) to issue and publish a Coast Guard Record of Decision (ROD)/Overseas Decision (OD) when adopting another federal agency's final EIS/OEIS. This Coast Guard policy is based on a similar policy found in the current Department of Homeland Security's NEPA policy.

As a cooperating agency in the MITT SEIS/OSEIS, the Coast Guard agrees to:

a. Participate in the MITT NEPA process;

b. Provide data to the Navy on Coast Guard testing and training activities that take place in the MITT SEIS/OSEIS study area;

c. Assume, on request of the Navy, responsibility for developing information and preparing portions of the SEIS/OSEIS, for which the Coast Guard has special expertise;

d. Provide staff support at the Navy's request to fulfill environmental compliance, consistent with operational and mitigation requirements;

e. Participate, as necessary, in the biweekly meetings hosted by the Navy for discussion of issues related to the SEIS/OSEIS;

f. Provide the draft Coast Guard ROD/OD to Navy for review and comment for a minimum of 10 working days; and

g. Coordinate with Navy on the timing and release of Coast Guard's ROD/OD so that it is synchronized with Navy's ROD release.

The Coast Guard understands that the Navy agrees to:

a. Provide the Coast Guard with a draft final Navy ROD as early as possible in its NEPA process to assist the Coast Guard in the preparation of its own ROD/OD and to facilitate, to the extent appropriate, consistency between the Navy and Coast Guard versions;

b. Provide Coast Guard with comments to Coast Guard's draft ROD/OD within 10 working days of when the Coast Guard submits its draft ROD/OD to Navy;

c. Coordinate with Coast Guard on the timing and publication of Navy's ROD so that Coast Guard can synchronize the publication of its ROD/OD; and

d. Provide the Coast Guard with a copy of the final SEIS/OSEIS.

2

Subject: MARIANA ISLANDS TRAINING AND TESTING SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT/OVERSEA ENVIRONMENTAL IMPACT STATEMENT – COAST GUARD COOPERATING AGENCY ACCEPTANCE

5090
April 1, 2020

We look forward to working with the Navy to successfully complete the MITT SEIS/OSEIS process. The main Coast Guard point of contact for this matter is Ms. Maile Norman. Ms. Norman's contact information is:

Ms. Maile Norman
Coast Guard District Fourteen Enforcement
300 Ala Moana BLVD, FL 9 RM 232
Honolulu, Hawaii 96850
(808) 535-3264
Maile.C.Norman@uscg.mil

Sincerely,

K. E. LUNDAY
Rear Admiral, U. S. Coast Guard
Commander, Fourteenth Coast Guard District

Copy: Commandant, U.S. Coast Guard (CG-DCMS, CG-LMI-E, CG-4, CG-47, CG-7)
Commander, Coast Guard Pacific Area (PAC-00)
Commander, Coast Guard Sector Guam (s)
CNO (N45 – Dawn Schroeder)

3

C.1.3 NAVY REQUEST LETTER TO THE NATIONAL MARINE FISHERIES SERVICE

DEPARTMENT OF THE NAVY
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
2000 NAVY PENTAGON
WASHINGTON DC 20350-2000

5090
Ser N45/17U132422
September 27, 2017

Ms. Donna S. Wieting
Director, Office of Protected Resources
National Marine Fisheries Service
1315 East West Highway
Silver Spring, MD 20910

SUBJECT: MARIANA ISLANDS TRAINING AND TESTING SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT/OVERSEAS ENVIRONMENTAL IMPACT STATEMENT - COOPERATING AGENCY REQUEST

Dear Ms. Wieting:

In accordance with the National Environmental Policy Act (NEPA) of 1969 and Executive Order (EO) 12114, the United States (U.S.) Department of the Navy (Navy) is preparing a Supplemental Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) to assess the potential environmental impacts associated with the continuation of military readiness activities, which consist of training as well as research, development, testing, and evaluation (RDT&E, hereinafter referred to as "testing") activities that include the use of active sonar and explosives in the Mariana Islands Training and Testing (MITT) Study Area. The proposed training and testing activities within the MITT Study Area supports the Navy's Title 10 of the U.S. Code requirements to achieve and maintain military readiness by ensuring the Navy can provide trained and equipped combat-ready forces capable of winning wars, deterring aggression, and maintaining freedom of the seas.

This MITT Supplemental EIS/OEIS represents the third phase (Phase III) of ongoing NEPA and EO 12114 compliance for continuation of at-sea training and testing. It will evaluate the conduct of military readiness activities from 2020 into the reasonably foreseeable future and accommodate evolving mission requirements associated with force structure changes, including those resulting from the development, testing, and ultimate introduction of new platforms (vessels, aircraft, and weapon systems) into the Fleet.

The Phase III MITT Study Area remains consistent with the area studied in the Phase II MITT EIS/OEIS completed in 2015 and consists of the established at sea ranges, operating areas, and special use airspace in the region of the Mariana Islands that are part of the Mariana Islands Range Complex (MIRC) and its surrounding seas, and includes a transit corridor. The transit corridor is outside the geographic boundaries of the MIRC and is a direct route across the high seas for Navy ships in transit between the MIRC and the Hawaii Range Complex. The Proposed Action also includes pierside sonar maintenance and testing alongside Navy piers located in Inner Apra Harbor.

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Ser N45/17U132422
September 27, 2017

The MITT Phase III Supplemental EIS/OEIS is intended to serve as a basis for the renewal of current regulatory permits and authorizations and the analysis of emerging and future force structure changes and training and testing requirements. An important aspect of the MITT Supplemental EIS/OEIS will be the analysis of the potential effects to marine species protected under the Marine Mammal Protection Act (MMPA) and the Endangered Species Act (ESA) and habitats protected under the Magnuson-Stevens Fishery Conservation and Management Act. The existing MMPA Final Rule and Letters of Authorization for Phase II MITT activities will expire in August 2020.

To complete the analysis required by the permitting and consultation process pursuant to MMPA and ESA in an efficient and effective way, the Navy believes that participation by the National Marine Fisheries Service (NMFS) is needed. Therefore, in accordance with the Council on Environmental Quality's (CEQ) regulations implementing NEPA (specifically 40 CFR Part 1501) and CEQ's 2002 guidance on cooperating agencies, the Navy requests that the NMFS serve as a cooperating agency for the development of the Phase III MITT Supplemental EIS/OEIS.

Consistent with 40 CFR 1501.6, the Navy is requesting NMFS' participation as early in the planning process as possible. As the lead agency, the Navy will:

a. Gather all necessary background information and prepare the Phase III Supplemental EIS/OEIS and all necessary permit applications associated with acoustic issues within the Study Area;

b. Work with NMFS personnel to determine the method of estimating potential effects to protected marine species, including threatened and endangered species;

c. Determine the scope of the Phase III MITT Supplemental EIS/OEIS, including the alternatives evaluated;

d. Circulate the NEPA document to the general public and any other interested parties;

e. Schedule and supervise meetings held in support of the NEPA process and compile comments received; and

f. Maintain an administrative record and respond to Freedom of Information Act (FOIA) requests relating to the Phase III Supplemental EIS/OEIS.

Navy respectfully requests that NMFS, in its role as a cooperating agency, provide the following support:

2

5090
Ser N45/17U132422
September 27, 2017

a. Participate in the NEPA process, to include public participation efforts pertaining to the Phase III Supplemental EIS/OEIS, and fund such support through its own sources to the maximum extent possible;

b. Provide timely comments on working drafts of the Phase III Supplemental EIS/OEIS in accordance with the approved project schedule and commenting protocols, and provide minutes of any agency information meeting that have been adjudicated within the agency;

c. Adhere to the overall schedule as set forth by the Navy in coordination with NMFS;

d. Respond to Navy requests for information, in particular, those related to review of the acoustic effects analysis and evaluation of the effectiveness of protection and mitigation measures;

e. Coordinate, to the maximum extent practicable, any public comment periods that are necessary in the MMPA permitting process with the Navy's NEPA public comment periods;

f. Make available staff support at Navy's request to enhance the Navy's interdisciplinary capability;

g. Participate, as necessary, in meetings hosted by the Navy for discussion of issues related to the Phase III Supplemental EIS/OEIS;

h. Utilize NMFS resources, including funding where appropriate, in support of executing its cooperating agency responsibilities.;

i. Prepare any NMFS-specific documents required to support the NMFS decision-making process;

j. Maintain an administrative record and respond to FOIA requests relating to the Phase III Supplemental EIS/OEIS; and

k. Provide a formal, written response to this request.

The Navy views this agreement as important to the successful completion of the environmental planning process for the Phase III MITT Supplemental EIS/OEIS. It is the Navy's goal to complete the analysis as expeditiously as possible, while using the best scientific information available. NMFS assistance is invaluable to this endeavor.

3

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Ser N45/17U132422
September 27, 2017

We appreciate your consideration of our request and look forward to your response. The point of contact for this action is Ms. Dawn Schroeder, (703) 695-5219, email: dawn.schroeder@navy.mil.

Sincerely,

C. A. LAHTI
Director, Energy and Environmental
Readiness Division

Copy to:
ASN (EI&E)
DASN (E)
OAGC (EI&E)
OPNAV (N9I, N83)
Commander, U.S. Fleet Forces Command (N46)
Commander, U.S. Pacific Fleet (N465)
Commander, Navy Installations Command (N45)
Commander, Naval Sea Systems Command
Commander, Naval Air Systems Command
Commander, Joint Region Marianas
Commander, Naval Facilities Engineering Command, (N45)

4

C.1.4 NATIONAL MARINE FISHERIES SERVICE RESPONSE LETTER

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Silver Spring, MD 20910

Captain C.A. Lahti
Director, Energy and
Environmental and Readiness Division
Department of the Navy
2000 Navy Pentagon
Washington, DC 20350-2000

Dear Captain Lahti:

Thank you for your letter requesting the National Marine Fisheries Service (NOAA Fisheries) be a cooperating agency in the preparation of a Supplemental Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) to evaluate potential environmental effects in the Department of the Navy's (Navy) Mariana Islands Training and Testing (MITT) Study Area. Activities conducted in the MITT Study Area will achieve and maintain military readiness and include current, emerging, and future training activities and research, development, test and evaluation events (Phase III). We support the Navy's decision to prepare a Supplemental EIS/OEIS on this activity and agree to be a cooperating agency, due, in part, to our responsibilities under section 101(a)(5)(A) of the Marine Mammal Protection Act and under section 7 of the Endangered Species Act. NOAA Fisheries will make every effort to support the Navy in the development of a Supplemental EIS/OEIS, including:

- Participating, as necessary, in meetings hosted by the Navy for the discussion of issues related to the Phase III Supplemental EIS/OEIS;
- Providing timely comments on working drafts of the Phase III Supplemental EIS/OEIS in accordance with the approved project schedule and commenting protocols;
- Responding to Navy requests for information, in particular, those related to review of the acoustic effects analysis and evaluation of the effectiveness of protection and mitigation measures; and
- Adhering to the overall schedule as set forth by the Navy in coordination with NMFS.

If you need any additional information, please contact Jolie Harrison at (301) 427-8420.

Sincerely,

Samuel D. Rauch III
Deputy Assistant Administrator for
Regulatory Programs
National Marine Fisheries Service

cc: Michael Tosatto, NMFS PIRO
Vicki Wedell, NMFS HQ NMS
Steve Leathery, NMFS HQ NEPA
Dawn Schroeder, Navy

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C.2 COASTAL ZONE MANAGEMENT ACT

C.2.1 NAVY CONSISTENCY DETERMINATION LETTERS – COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS

DEPARTMENT OF THE NAVY
COMMANDER
UNITED STATES PACIFIC FLEET
250 MAKALAPA DRIVE
PEARL HARBOR, HAWAII 96860-3131

IN REPLY REFER TO:
5090
Ser N465/1491
December 16, 2019

Mr. Arthur Charsauros
Director
Division of Coastal Resources Management
Bureau of Environmental and Coastal Quality
P.O. Box 501304, Saipan, MP 96950

Dear Mr. Charsauros:

SUBJECT: CONSISTENCY DETERMINATION FOR MILITARY TRAINING AND TESTING WITHIN THE COASTAL ZONE OF THE COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS

In accordance with the Federal Coastal Zone Management Act and 15 C.F.R. § 930, the U.S. Navy submits the enclosed Federal Consistency Determination (CD) for proposed activities in the Mariana Islands Training and Testing (MITT) Study Area that have reasonably foreseeable coastal effects on the coastal zone of the Commonwealth of the Northern Mariana Islands (CNMI).

Based on the enclosed consistency assessment and the activities and analysis contained in the enclosed Draft Supplemental Environmental Impact Statement/Overseas Impact Statement (DSEIS/OEIS), the Navy finds that the proposed military training and testing activities presented in Alternative 2 are consistent to the maximum extent practicable with the enforceable policies of the CNMI Coastal Resource Management Program.

If you have any questions, please contact Mr. John Van Name at (808) 471-1714 or john.vanname@navy.mil or Ms. Suzanne Smith at (808) 471-4696 or suzanne.smith3@navy.mil.

Sincerely,

DANIEL McNAIR
Director, Fleet Environmental Readiness
By direction of the Commander

Enclosures: 1. CD for the CNMI
2. CDROM – MITT DSEIS/OEIS

Copy to:
COMNAVREGMARIANAS (w/o enclosure)
OPNAV N45 (w/o enclosure)
MS. GLENNA SP REYES, DIRECTOR, BUREAU OF MILITARY AFFAIRS, OFFICE OF THE GOVERNOR COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS, JUAN A. SABLAN MEMORIAL BUILDING, CALLER BOX 10007, SAIPAN, MP 96950 (w/enclosures)

DEPARTMENT OF THE NAVY
COMMANDER
UNITED STATES PACIFIC FLEET
250 MAKALAPA DRIVE
PEARL HARBOR, HAWAII 96860-3131

IN REPLY REFER TO:
5090
Ser N465/1492
December 16, 2019

Ms. Glenna SP Reyes
Director, Bureau of Military Affairs
Office of the Governor
Commonwealth of the Northern Mariana Islands
Juan A. Sablan Memorial Building
Caller Box 10007
Saipan, MP 96950

Dear Ms. Reyes:

SUBJECT: CONSISTENCY DETERMINATION FOR MILITARY TRAINING AND TESTING WITHIN THE COASTAL ZONE OF THE COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS

In accordance with the Federal Coastal Zone Management Act and 15 C.F.R. § 930, the U.S. Navy submits the enclosed Federal Consistency Determination (CD) for proposed activities in the Mariana Islands Training and Testing (MITT) Study Area that have reasonably foreseeable coastal effects on the coastal zone of the Commonwealth of the Northern Mariana Islands (CNMI).

Based on the enclosed consistency assessment and the activities and analysis contained in the enclosed Draft Supplemental Environmental Impact Statement/Overseas Impact Statement (DSEIS/OEIS), the Navy finds that the proposed military training and testing activities presented in Alternative 2 are consistent to the maximum extent practicable with the enforceable policies of the CNMI Coastal Resource Management Program.

If you have any questions, please contact Mr. John Van Name at (808) 471-1714 or john.vanname@navy.mil or Ms. Suzanne Smith at (808) 471-4696 or suzanne.smith3@navy.mil.

Sincerely,

DANIEL McNAIR
Director, Fleet Environmental Readiness
By direction of the Commander

Enclosures: 1. CD for the CNMI
2. CDROM – MITT DSEIS/OEIS

Copy to:
COMNAVREGMARIANAS (w/o enclosure)
OPNAV N45 (w/o enclosure)
MR. ARTHUR CHARSAUROS, DIRECTOR, DIVISION OF COASTAL RESOURCES MANAGEMENT BUREAU OF ENVIRONMENTAL AND COASTAL QUALITY, P.O. BOX 501304, SAIPAN, MP 96950 (w/enclosures)

C.2.2 COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS RESPONSE LETTERS

Commonwealth of the Northern Mariana Islands
OFFICE OF THE GOVERNOR
Bureau of Environmental and Coastal Quality
Division of Coastal Resources Management
P.O. Box 501304, Saipan, MP 96950
Tel: (670) 664-8300; Fax: (670) 664-8315
www.dcrm.gov.mp

COASTAL RESOURCES MANAGEMENT

Eli D. Cabrera
Administrator

Janice E. Castro
Director, DCRM

March 9, 2020

Mr. John Van Name & Ms. Suzanne Smith
Environmental Program Manager, United States Pacific Fleet
Department of the Navy
250 Makalapa Drive
Pearl Harbor, HI 96860-3131

Re: Consistency Determination for Military Training and Testing Within the Coastal Zone of the Commonwealth of the Northern Marianas Islands (CNMI)

Dear Mr. Van Name and Ms. Smith,

The Commonwealth of the Northern Mariana Islands' (CNMI) Division of Coastal Resources Management (DCRM) has reviewed the U.S. Department of the Navy's Federal Consistency Determination (CD) submitted and received by our office on December 17, 2019 for the proposed activities in the Marianas Islands Training and Testing (MITT) Study Area within the Coastal Zone of the CNMI.

After carefully reviewing this CD, and as outlined further herein, DCRM finds that the proposed MITT activities as reflected in Alternative 2 of the Draft Supplemental Environmental Impact Statement / Overseas Impact Statement (DSEIS/OEIS) are not consistent with the enforceable policies of the CNMI Coastal Management Program. Therefore, DCRM recommends the Department of the Navy revise its CD to address data gaps, including inconsistencies and lack of up-to-date data, as well as detail and include further mitigation of potential effects on the CNMI's coastal resources.

To support DCRM's CD response, comments from both divisions under the Bureau of Environmental and Coastal Quality (BECQ) as well as the public comments received during the extended public commenting period of 30 days are enclosed and incorporated by reference here. Comments raised concerns that DCRM shares regarding the lack of inclusion of land-based training activities in this CD as it appears from the draft Environmental Impact Statement (DEIS) that changes in land-based training are indeed proposed.

The government of the CNMI recognizes the important training needs of the U.S. Military and hopes to accommodate those needs in a manner that is consistent with the federally approved coastal management policies of the CNMI Coastal Management Program. We look forward to the opportunity to discuss our concerns and how consistency with the policies of the CNMI Coastal Management Program can be achieved to the greatest extent practicable.

As detailed further herein, DCRM finds that the current DEIS/OEIS MITT proposal is not consistent with the enforceable policies of the CNMI Coastal Management Program as the submitted information is not sufficient for a complete and adequate analysis. In fact, it is not entirely evident from current submissions what mitigation measures are being proposed for review. Although Section 930.37 of Federal Consistency regulations provide for use of a DEIS to support a consistency determination, "a Federal agency's federal consistency obligations under the Act are independent of those required under NEPA and are not necessarily fulfilled by the NEPA document." As such, references to mitigation measures or conservation recommendations that will be implemented as results from initiated Endangered Species Act (ESA) and Marine Mammal Protection Act (MMPA) consultations cannot be considered as part of this CD as they have not yet been completed.

In order for MITT activities to achieve consistency with CNMI's enforceable policies, it is essential that the Navy clearly outline existing conditions, rigorously assess effects, and detail what monitoring and mitigation efforts will be implemented. It is encouraged that critical data gaps including lack of baseline information relating to water quality, species diversity and abundance within the training areas including wildlife populations around Saipan, Farallon de Medinilla (FDM), Tinian, and Rota be addressed through additional studies designed if not implemented in coordination with CNMI and that resulting data be shared in a timely manner to support review. As outlined in the Consistency with Enforceable Policies section of this letter, additional information is needed on the following items in order to assess the consistency of the MITT with the CNMI enforceable policies:

NMIAC § 15-10

- **Part 300 - Standards for CRM Permit Issuance**
  § 15-10-301, General Standards for all CRM Permits
  § 15-10-305, Standards for DCRM Permit Issuance General Criteria
  § 15-10-315, Specific Criteria; Areas of Particular Concern; Lagoons and Reefs
  § 15-10-325, Specific Criteria; Areas of Particular Concern; Coral Reefs
  § 15-10-335, Specific Criteria; Areas of Particular Concern; Shorelines
  § 15-10-340, Specific Criteria; Areas of Particular Concern; Ports and Industrial Areas:

  Provide substantial details as to why each of these Areas of Particular Concern (APC) will not be affected by the direct, indirect, or cumulative effects from the proposed activities including analysis of potential spillover impacts.

- **Part 500 - Standards for Determining Major Siting**
  § 15-10-501, Determination of Major Siting
  § 15-10-505, Specific Criteria for Major Siting

  Part 600 - CRM Permit Conditions

  Provide substantial details as to why the Navy's Proposed Action does not meet the criteria for a Major Siting, and analysis regarding how the Proposed Action would

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otherwise not have the potential to directly and significantly impact CNMI coastal resources with the potential for significant adverse effects .

Division of Environmental Quality (DEQ) Water Quality Standards: Classification and Establishment of Water Use Areas and Specific Water Quality Criteria

Data has not been provided to confirm baseline water quality in areas of proposed activities or to substantiate statements that there are no reasonably foreseeable effects. To achieve consistency please provide literature cited in the CD as well as any recent scientific studies which contain current and accurate scientific data and clear impacts criteria for direct and cumulative impacts incorporated into the CD analysis on water quality. If such data is lacking for activities in the study area, reasonable efforts to conduct such data collection and assessments to demonstrate that CNMI waters are kept "shall be free from toxic pollutants in concentrations that are lethal to, or that produce detrimental physiological responses in human, plant, or animal life" should be undertaken.

CNMI Public Law No. 3-47; Policy Elements 4, 10, 11, 12, 13, 15, 16, 17 & 21:

Provide a timeline, detailed analysis, and sufficient data for the discussion of mitigation measures outlined throughout these policy elements. To be consistent with enforceable policies of the CNMI, the Navy needs to specify monitoring and mitigation – including providing reasonable details regarding *how and when* impacts will be mitigated – and provide implementation timelines to ensure impacts of these activities are in fact being avoided, minimized, and mitigated to the greatest extent practicable.

Provide current detailed analysis and sufficient data for all applicable coastal resources, particularly coral and algae diversity, cover, and structural complexity; especially for ESA-listed corals in critical areas such as those listed in MITT Draft Supplemental EIS/OEIS Vol. 2 sites on Tinian (Unai Babui, Unai Dankulu, and Unai Chulu), and where training areas will overlap with nearshore habitats.

Provide current data or modeling that determines that emissions from the proposed activity will not lead to a violation of National Ambient Air Quality standards (NAAQS) in the coastal zones of Saipan, Tinian, and Rota. Please see attached BECQ comments for an in-depth description of these policy elements.

It is also critical that the Navy takes steps to provide meaningful analysis of data and standards of DCRM's enforceable policies. Details and analysis deficiencies noted in received comments that DCRM hopes the Navy can remedy include the following:

- **Policy Element 4** – "Plan for and manage any use or activity with the potential for causing a direct and significant impact on coastal resources. Significant adverse impacts shall be mitigated to the extent practicable."

  The Coastal Zone Management Act broadly defines the environment. Instead of considering impacts of increased activities to the people of the CNMI and the coastal

resources that comprise our home, the CD narrowly discusses potential impacts to marine mammals, coral, and fishes in water and does not reassess impacts of land-based activities on Saipan, Tinian, and Rota or FDM, stating that no changes in these activities are proposed. As previously mentioned, FDM activities appear to be significantly increasing, and mitigation measures proposed by DCRM to ensure consistency with land-based operations in the 2015 MITT do not appear to have been implemented regularly – particularly as they pertain to early coordination and data sharing with CNMI. It is unclear why the Navy states that mitigation measures are outside of the scope of this SEIS/OEIS (CD enclosure pg. 23), especially given the fact that the 2014 CD correspondence from DCRM noted that "[i]n order to comply with the enforceable polices of the CNMI, further measures are needed to protect the wildlife and habitats of the CNMI."

Similarly, in this CD request like the 2014 submission, the basis for finding that the MITT is consistent to the maximum extent practicable has not been established. The Navy must show how its proposed actions are fully consistent by providing data, not speculative conclusions such as that potential effects to endangered species will be addressed through pending biological opinions. As also noted previously, the statement that the "Navy's Proposed Action provides special protection to coastal resources and mitigates adverse impacts" is inadequate to demonstrate consistency as the SEIS/OEIS does not actually commit to mitigation measures or timelines for implementation of mitigation, making these assurances rather hollow and unenforceable. If the Navy plans to rely on the suite of mitigation options discussed in the Draft SEIS/OEIS to demonstrate compliance with CNMI's enforceable policies including the requirement of mitigation of adverse impacts, meaningful and enforceable commitments and timelines for implementation should be developed as part of this CD correspondence.

- **Policy Element 10** – "Maintain or improve coastal water quality through control of erosion, sedimentation, runoff, siltation, sewage and other discharges."

  Assessment of this policy element and supporting regulations is inadequate and this analysis should be revised to support DCRM's review of this CD request.

- **Policy Elements 11 and 12** – Impacts to cultural resources.

  Although Section 106 consultations are ongoing to support the reissuance of the expired Programmatic Agreement, the analysis of impacts to cultural resources referenced in Section 3.11 of the draft SEIS/OEIS does not include sufficient data to make any determination regarding likely significant impacts to cultural resources within CNMI waters and on FDM. Absence of evidence is not evidence of absence and the DoD has an obligation to implement reasonable assessment of resources that are likely to be impacted by MITT activities. Lacking that data, there is therefore no basis for the Navy's conclusion that this proposed action is consistent with these policy elements. Data gaps should be remedied to ensure consistency with these policies and the CNMI's significant and compelling interest to protect and preserve our cultural resources.

- **Policy Element 13** – "Require compliance with all local air and water quality laws and regulations and any applicable federal air and water quality standards."

  Data must be provided to support the conclusory statements that air emissions will be minimal on Saipan and Rota and will be "intermittent and short term, resulting in minimal impact on the air quality of Tinian". Models are available to assess these activities for compliance with local and federal air quality standards and should be included for review in this submission. Comments regarding water quality standards are incorporated by reference here.

- **Policy Elements 15 and 16** – Management of marine resources and consistency with other policies.

  As noted in the response to Policy Element 4, the Navy's analysis of impacts to coastal resources is overly narrow and does not meaningfully address impacts to the human environment. This is especially true regarding impacts to the integrity of our reefs and wildlife habitat (Policy 15) and the management and development of our local subsistence, sport, and commercial fisheries (Policy 16). The draft SEIS/OEIS contains insufficient assessment of the potential impacts to these resources and the "analysis" under Policy Element 4 does not address potential impacts to human uses such as fishing and traditional access to important fishing areas. Thus, it is unclear how the Navy can conclude their proposed actions are consistent when analysis is completely lacking. An updated CD should address this gap, preferably through a revised SEIS that provides meaningful analysis of impacts to these important coastal resources.

- **Policy Element 17** – "Protect all coastal resources, particularly sand, coral and fish from taking beyond sustainable levels and in the case of marine mammals and any species on the Commonwealth endangered species list, from any taking whatsoever."

  The Navy explains that "the Proposed Action has the potential to take marine mammals and species on the Commonwealth endangered species list" and that "[a]ny take occurring as a result of the Proposed Action would be incidental to, and not the purpose of, the Navy's otherwise lawful training and testing activities" and notes that protective measures intended to avoid and minimize the "take" of endangered species will be updated as appropriate upon completion of the Section 7 consultation. As noted previously, past promises of mitigation and monitoring have not been executed, or, if they have been, have not been shared with the CNMI, therefore, it is encouraged that any monitoring and mitigation agreements that are the basis for a consistency determination include timebound deliverables so that consistency can be demonstrated.

- **Policy Element 21** – "Encourage the preservation of traditional rights of public access to and along the shorelines consistent with the rights of private property owners."

  Contrary to the Navy's statement that the "MITT Draft Supplemental EIS/OEIS does not propose any change to the public access normally allowed on federally leased lands including FDM, which would remain restricted for security and safety reasons" and that

the "MITT Draft Supplemental EIS/OEIS does not propose a change to the ocean areas currently used by both the Navy and the public", increases in the intensity and use of CNMI lands and waters is more likely than not to have significant impacts to public access of shorelines and traditional fishing areas. Already, three nautical miles (nm) surrounding the abundant fishery surrounding FDM is periodically restricted and this SEIS proposes to extend that "danger zone" to 12 nm and increase the frequency of restricted use in this area. These restrictions can have direct and significant impacts to boaters and the fishing community by increasing travel time and forcing seagoing vessels to travel well out of their traditional navigation routes. Similarly, periodic exercises on Tinian significantly restrict community access to forests and shorelines that have been traditionally used for subsistence and commercial activities. The frequency and timing of these restrictions should be discussed further with the CNMI in order to maximize access for users of these ocean resources while ensuring the Navy can meet its training objectives. Given that assessment of impacts and commitment to reasonable mitigation measures are lacking in the SEIS/OEIS, meaningful commitments should be articulated in supplemental analysis in a revised CD in order to ensure consistency with this enforceable policy.

Consistency with Enforceable Policies

The CNMI has determined the MITT is inconsistent with the enforceable policies of the CNMI Coastal Management Program in the following ways:

NMIAC § 15-10 Part 300 - Standards for CRM Permit Issuance
§ 15-10-301, General Standards for all CRM Permits
§ 15-10- 305, Standards for DCRM Permit Issuance General Criteria

As stated in the CD, "Not Applicable. The Navy's Proposed Action does not include applying for permits with the CNMI". However, if these sections are not applicable, further details explaining why these proposed actions do not apply should be outlined to frame discussion regarding their applicability to DCRMs enforceable policies.

NMIAC § 15-10 Part 300 - Standards for CRM Permit Issuance
§ 15-10-315, Specific Criteria; Areas of Particular Concern; Lagoons and Reefs
§ 15-10-325, Specific Criteria; Areas of Particular Concern; Coral Reefs
§ 15-10-335, Specific Criteria; Areas of Particular Concern; Shorelines
§ 15-10-340, Specific Criteria; Areas of Particular Concern; Ports and Industrial Areas

The information stated in the CD does not provide substantial details as to why these Areas of Particular Concern (APC) will not be affected by the direct, indirect, or cumulative effects from the proposed action. DCRM has previously commented on portions of the Draft Supplemental Environmental Impact Statement/Overseas Impact Statement (DSEIS/OEIS), requesting best available scientific data and clear impacts criteria for direct, indirect and cumulative impact analysis. The current data outlined in the CD does not support meaningful analysis of the impacts and possible mitigation of these impacts.

NMIAC § 15-10 Part 500 - Standards for Determining Major Siting
§ 15-10-501: Determination of Major Siting
§ 15-10-505: Specific Criteria for Major Sitings

NMIAC § 15-10 Part 600 - CRM Permit Conditions

As stated in the CD, "Not Applicable. The Navy's Proposed Action does not meet the criteria for a major siting." Under the CNMI's enforceable policies, a "major siting" is defined as "any proposed project which has the potential to directly and significantly impact coastal resources" including "proposed projects with potential for significant adverse effects on submerged lands,…reefs, wetlands, beaches and lakes…and endangered or threatened species or marine mammal habitats" (§15-10-020(uu)(4)). Consistency with major siting standards of §15-10-505 should be assessed, especially in terms of how training and testing activities will affect the broadly defined coastal environment including fish and wildlife habitat, cultural resources, and the natural integrity of CNMI water bodies and what mitigation responses will be implement to ensure impacts are avoided, minimized, and mitigated. Moreover, based on the lack of data, substantive details, and meaningful analysis in the CD regarding the impacts to these coastal resources, DCRM believes the proposed MITT activities are likely to have significant adverse effects on the CNMI's coastal resources. Meaningful analysis of data and standards of enforceable policies are necessary to support a review of proposed activities to ensure consistency and should be included in revised documentation to facilitate this effort.

DEQ Water Quality Standards: Classification and Establishment of Water Use Areas and Specific Water Quality Criteria

The information stated in the CD does not provide critical details to adequately address DEQ Water Quality Standards. The literature cited is not included in full detail in the CD, and it appears that DoD has collected no water quality sampling, monitoring, or analysis within the Marianas Islands Range Complex. Additionally, information cited from the previous MITT does not provide current and accurate scientific data and clear impacts criteria for direct and cumulative impacts related to water quality. To ensure consistency, it is recommended that the Navy develop and implement a monitoring plan to ensure water quality stays within CNMI standards. To provide baseline data necessary to substantiate the conclusion that activities have had and will continue to have "no effects" on water quality, it is strongly encouraged that the Navy take reasonable steps to provide additional data on bio-accumulation of toxins associated with ordinance in marine life and localized effects within the monitoring plan, including assessment of fish and filter-feeding invertebrates around Saipan, FDM, Tinian, and Rota.

CNMI Public Law No. 3-47; Policy Elements 4, 10, 11, 12, 13, 15, 16, 17 & 21:

The information stated in the CD does not provide substantial details and data to adequately address Policy Elements 4, 10, 11, 12, 13, 15, 16, 17 & 21. Currently the CD does not look at the combined impacts of the MITT with other military activities in the study area and therefore does not present adequate information on direct, indirect, or cumulative impacts. There is also limited information regarding the duration, temporal, and spatial context of proposed activities, and

whether activities will occur in separate or simultaneous locations and times – critical details when discussing the context and intensity and therefore the "significance" of a proposed action and its effects. DCRM holds that additional information regarding proposed activities and mitigation measures are needed in order to comply with the enforceable policies of the CNMI.

Review Standards for Federal Consistency

Under the Coastal Zone Management Act (CZMA) of 1972, 16 USC § § 1451-1465, § 1456(c)(1), and Federal Consistency regulations, 15 CFR § § 930.30-930.46, Federal agency activities with reasonably foreseeable effects on the State's coastal zone must be consistent to the maximum extent practicable with the enforceable policies of the States' federally approved CZMA programs. Under 15 CFR §930.32(a)(1), the standard for "consistent to the maximum extent practicable" means fully consistent with the enforceable policies of the CNMI's management programs unless full consistency is prohibited by existing law applicable to the Federal agency. Thus, the Navy must show how existing law prohibits full consistency with the CNMI's Coastal Management Program. However, the Navy has not provided any description of any statutory provisions, legislative history, or other legal authority which limits the Navy's discretion to be fully consistent with the enforceable policies of CNMI's management program.

Furthermore, 15 CFR §930.32(a)(2) details that 16 USC § 1456(e), "construction with other laws", or "Section 307(e) of the Act does not relieve Federal agencies of the consistency requirements under the Act. The Act was intended to cause substantive changes in Federal agency decision making within the context of the discretionary powers residing in such agencies. Accordingly, ***whenever legally permissible, Federal agencies shall consider the enforceable policies of management programs as requirements to be adhered to in addition to existing Federal agency statutory mandates***. If a Federal agency asserts that full consistency with the management program is prohibited, it shall clearly describe, in writing, to the State agency the statutory provisions, legislative history, or other legal authority which limits the Federal agency's discretion to be fully consistent with the enforceable policies of the management program" (emphasis added).

As such, if there are impediments to achieving consistency as outlined here, DCRM encourages the Navy to work with the CNMI through the Bureau of Military Affairs and our office to discuss and remedy these challenges. Lacking such restraints, CNMI encourages the Navy to provide the requisite details to demonstrate full consistency with all applicable DCRM enforceable policies including:

- Full consistency with local permitting considerations;
- Application of CD analysis to all relevant enforceable policies;
- Reasonable collection and analysis of relevant data and standards to support assessment of impacts; and
- Time-bound commitments to proposed mitigation measures that will be implemented to ensure consistency to the maximum extent practicable.

In conclusion, insufficient information has been provided in this CD for DCRM to agree that the MITT activities are consistent with the CNMI's rules and regulations. Given these challenges, it would seem prudent that the Navy consider coordinating with the CNMI to address data gaps

further and submitting a revised Consistency Determination Request after an updated Final Supplemental EIS has been circulated and comments have been received and reviewed. The Coastal Zone Management Act does provide for flexibility in timelines to support robust review of impacts to coastal resources, and DCRM would welcome the opportunity to discuss a mutually agreeable timeline for revisions or resubmission of this determination request when a preferred alternative has been selected.

To achieve consistency with CNMI's enforceable policies, the Department of the Navy will need to modify its MITT proposal to provide reasonably sufficient details to support analysis as to why each of these sets of proposed actions will not cause significant direct, indirect, and/or cumulative effects including spillover impacts on the CNMI's coastal resources. Additionally, DCRM would welcome further clarification and discussion of specific mitigation measures and alternatives proposed by the Navy to support your timelines and ensure adverse impacts are being appropriately mitigated. The CNMI recognizes the critical mission and ongoing training needs of the U.S. Military and looks forward to discussing ways the MITT can become consistent with the CNMI's enforceable policies.

Please note the included comments from CNMI Bureau of Environmental and Coastal Quality, as well as public comments which are attached to this consistency determination. Should you have any questions or require further information, please contact (670) 664-8308 or fedcon@dcrm.gov.mp.

Sincerely,

JANICE E. CASTRO
Director
Division of Coastal Resources Management

Enclosures: Comments from BECQ-DCRM
Comments from BECQ-DEQ
Comments from Kathy Yuknavage
Comments from the CNMI Office of the Governor

cc: Jeffrey L. Payne, Director, Office for Coastal Management, NOAA
Ralph DLG. Torres, Governor, CNMI
Arnold I. Palacios, Lieutenant Governor, CNMI
Glenna SP Reyes, Special Assistant, Commonwealth Bureau of Military Affairs
Eliceo D. Cabrera, Administrator, BECQ
Kodep Ogumoro-Uludong, Director, Office of Planning and Development
CRM Agency Board

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CONSISTENCY DETERMINATION FOR COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS

PUBLIC LAW NO. 3-47

Policy Element 4. *Plan for and manage any use or activity with the potential for causing a direct and significant impact on coastal resources. Significant adverse impacts shall be mitigated to the extent practicable.*

Policy Element 15. *Manage ecologically significant resource areas for their contribution to marine productivity and value as wildlife habitats, and preserve the functions and integrity of reefs, marine meadows, salt ponds, mangroves and other significant natural areas.*

Policy Element 17. *Protect all coastal resources, particularly sand, coral and fish from taking beyond sustainable levels and in the case of marine mammals and any species on the Commonwealth endangered species list, from any taking whatsoever.*

Comment:

In regards to Public Law No.3-47, Policy Elements 4, 15, and 17, the impact on coastal resources, specifically coral reefs, is not adequately addressed. Table 1 of the consistency document lists several activities that will occur in the Marianas littorals and Tinian, which will overlap fringing reefs. Section 3.8-11 of the MITT Draft Supplemental EIS/OEIS Vol. 2 lists beaches on Tinian (Unai Babui, Unai Dankulu, and Unai Chulu), where training areas will overlap nearshore habitats and states:

"However, the combined consequences of all physical disturbance and strike stressors could degrade habitat quality at some locations. As stated above, combat swimmers and Marines may be required to walk through nearshore areas and reefs during these activities, potentially causing damage to coral species. As stated in the 2015 MITT Final EIS/OEIS and above, these activities could cause injury or mortality to individuals, but impacts on marine invertebrate populations, including ESA-listed corals, are unlikely."

Since the distribution of ESA-listed corals in the Marianas has not been mapped out, the statement that impacts to marine invertebrate populations and ESA-listed corals is not supported. We do share many coral species with other Pacific reefs, however, the Marianas region is isolated in terms of genetic connectivity to the rest of Micronesia, where the majority of coral and fish larvae originate from Saipan and Tinian (Kendall & Poti, 2014; Maynard et al., 2015; Randall, 1995). Therefore, any physical disturbance through accidental damage on reef structure can impede recovery for the coral reefs of the CNMI that are still recovering from mass bleaching events, two category 5 typhoons, and multiple crown-of thorns outbreaks.

In addition, assessing species or population level impacts of marine invertebrate populations for shallow coral reefs provides an incomplete analysis on the environmental impacts for our region. Coral and algae diversity, cover, and structural complexity are also important indicators of reef ecosystem function and health. The CNMI has suffered severe coral mortality from back to back bleaching events in 2013, 2014, 2016, and 2017 (Heron et al., 2016; Reynolds et al., 2014). For example, Unai Babui in Tinian is designated as a training area in the MITT EIS, and is one of CRM's long-term marine monitoring sites since 2001. Since 2009, Unai Babui has had a steady decline in coral cover with a large increase in macroalgae cover, and loss in crustose coralline algae (CCA). CCA is extremely important in

strengthening reef structure and are resistant to ocean acidification (Nash et al., 2013; Nelson, 2009). Coral cover at Unai Babui is hovering at less than 10% and for Unai Dankulu at less than 15% in 2018. Maintaining coral cover above 10% is a critical threshold for sustaining reef function (Darling et al., 2019). The shallow water reefs around Tinian are already vulnerable from past storm and bleaching disturbances, and decline in coral cover is now at a critical threshold where further loss can severely reduce chances of recovery. In addition, any damage to reef structure, whether live or dead coral, will degrade habitat quality by accelerating reef breakage and loss of structural complexity, resulting in loss of habitat for diverse species, potential loss of storm protection, and accelerates erosion of the reef. Therefore, proposed listed actions in Table 1, for the Mariana littoral zone and Tinian are not sustainable and would further put CNMI's coastal resources at risk of further degradation.

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December 2019 Consistency Determination
Air Quality Comments – Larry Maurin

COASTAL ZONE MANAGEMENT ACT – CONSISTENCY DETERMINATION FOR COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS

Public Law No. 3-47

Policy Element 13. Require compliance with all local air and water quality laws and regulations and any applicable federal air and water quality standards.

Page 24: Comments on Air Quality Impacts of the Proposed Action

- Air quality impacts of criteria and hazardous air pollutants from additional activities in the Proposed Action (i.e. Phase III) have not been quantified and included in the consistency determination, so the 2015 MITT Final EIS/OEIS is not representative of cumulative air emissions.
- Emissions of criteria and hazardous air pollutants that may affect the Rota and Saipan Coastal Zones have not been quantified, and no modeling has been done to determine if these emissions will lead to a violation of the National Ambient Air Quality Standards (NAAQS) and CNMI Ambient Air Quality Standards. There must be a basis for the claim that "air quality impacts attributable to the military training and testing activities" to the Saipan and Rota coastal zone "uses and resources would be minimal." No basis for this claim has been presented.
- Additional emissions of criteria and hazardous air pollutants from Phase III activities that may affect the coastal zone of Tinian have not been quantified. There must be a basis for the claim that "combined effects from air quality impacts attributable to the military training and testing activities to the Tinian coastal zone uses and resources would be minimal." No basis for this claim has been presented.
- There must be a basis for the claim that "the Proposed Action complies with all local air quality laws and regulation and any applicable federal air quality standards". No quantification of additional impacts from Phase III has been conducted and no modeling analysis has been submitted to ensure compliance with the NAAQS and CNMI Ambient Air Quality Standards.
- There must be a basis for the statement that "air emissions generated as a result of the Proposed Action would be minimal, intermittent, and short term. Thus, the Proposed Action would not have a significant impact on ambient air quality and is in compliance with local and federal air quality standards." No modeling analysis of the Proposed Action has been submitted to demonstrate that there would be no significant impact on the NAAQS or CNMI Ambient Air Quality Standards.

Comments - Military Training and Testing within the CZ of the CNMI Kathy Yuknavage

DESCRIPTION OF THE PROPOSED ACTION

Page: 2

Navy states that, "These training and testing activities include the use of active sonar and explosives at sea in the MIRC (the Navy is not proposing to use explosives at sea within the CNMI coastal zone)."

The use of sonar and explosives at sea around the MIRC and the transit corridor between the MIRC and the Hawaii Range Complex is of concern due to potential impacts to Cetacea and other aquatic mammals and organisms. These waters and those of the Marianas Trench Monument are high quality waters of ecological significance that provide an important migration marine corridor and breeding ground for these species. The Department of the Navy states that these 'active sonar and explosives at sea' will not cause harm to these or other aquatic life, without citing specific data from peer reviewed or defensible research studies.

It should also be noted that these marine species are important not only to the CNMI tourist economy, but also to the international community where they are known to migrate to, and from.

The CNMI Water Quality Standards (WQS) antidegradation policy states that, "Tier 3: ***High quality waters*** which constitute an outstanding Commonwealth resource, such as waters of National Parks, marine sanctuaries, wildlife refuges and ***waters of exceptional recreational or ecological significance shall be maintained and protected. Actions which would lower water quality in such waters are prohibited***, with the exception of temporary degradation deemed necessary for the construction of important Park infrastructure, pollution control devices, and BMPs designed to improve water quality.".

Pages: 3 - 4

The Navy states that for both the Islands of Tinian and Rota that, "Only those activities that are new and include the use of sonar are analyzed in this Consistency Determination. Other activities that include the use of sonar were previously analyzed in the 2014 Consistency Determination document, which determined the ***Proposed Action was consistent to the maximum extent practicable with applicable enforceable policies***."

Please define 'maximum extent practicable with applicable enforceable policies.'. Whose policies are these?

Provide evidence that no other alternatives could be used for tracking other than sonar in these waters given that recent studies have found sonar to have serious detrimental impacts on whales feeding modes and behavior. (2016. "Impacts of Sonar on Marine Mammals", SERDP ESTCP.; 2013. Goldbogen, et.al., "Blue whales respond to simulated mid-frequency military sonar": https://doi.org/10.1098/rspb.2013.0657; 2000. ECM Parsons, "Impacts of Navy sonar on whales and dolphins: Now beyond a smoking gun?" Env. Sci, and Policy, George Mason Univ. VA).

DEPARTMENT OF ENVIRONMENTAL QUALITY WATER QUALITY STANDARDS: CLASSIFICATION AND ESTABLISHMENT OF WATER USE AREAS AND SPECIFIC WATER QUALITY CRITERIA

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The Navy states that, "the majority of concerns regarding bioaccumulation are associated with urban coastal environments with specific point source and non-point source contributors of pollutants. ***The studies concerning military sites suggest that metals exposed to seawater are of less concern because of decreased bioavailability***."

There are still concerns regarding bioaccumulation of heavy metals and toxins from munition constituents associated with on-going live fire and bombing ranges.

Which studies are being discussed? None are cited to defend this claim. Please provide scientifically defensible research to support this statement.

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The Navy states that, "activities occurring beyond the CNMI coastal zone would not affect the land or water use, or natural resource of the coastal zone because **(1) most of the explosives would be consumed during detonation; (2) the frequency of low-order detonations would be low, and therefore the frequency of releases of explosives would be low; (3) the amounts of explosives used would be small relative to the area within which they would be distributed; and (4) the constituents of explosives would be subject to physical, chemical, and biological processes that would render the materials harmless or otherwise disperse them to undetectable levels**." This section sites the "2015 MITT Final EIS/OEIS as containing a detailed analysis of fate and transport of byproducts produced during military training and testing activities".

This citation from an EIS, produced five years ago is insufficient to substantiate the above claim. The findings from the MITT analysis that defends claims (1) – (4) should be described herein for new reviewers and to refresh those that took part in reviewing previous EIS and Federal Consistency Determinations. Specifically, to address potential pollution from "inert" munitions constituents, e.g., heavy metals, 2,4,6-Trinitrotoluene (TNT), Volatile Organic Compounds (VOC), Royal Demolition Explosive (RDX), other toxic propellants, and their by-products, and spills, and leaks of other pollutants from being transported and bound into the ocean floor's benthic habitats where a myriad of aquatic species live and breed.

Given the first EIS was provided to the CNMI in 1997, it is disconcerting to see that the Navy has still not conducted studies to provide defensible evidence that explosives and other munitions and their constituents will NOT become bioavailable. The Navy has had over two decades to conduct meaningful research and yet nothing is provided herein, or cited directly.

Given the evidence of bioaccumulation of heavy metals in biota and invertebrates found at WWII dumps sites around the island of Saipan, substantiates our concern that further accumulation from ongoing exercises may result in cumulative impacts to aquatic organisms. Some of Gary Denton's studies (University of Guam, Water Environmental Research Institute) are cited herein:

Denton, G.R.W., et.al, (2016). *Impact of WWII dumpsites on Saipan (CNMI): heavy metal status of soils and sediments,* Environ Sci Pollut Res, DOI 10.1007/s11356-016-6603-7.

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Denton, G.R.W., Starmer, J.A., Masga, R. (June 2013). *Environmental Impacts of FUDS and Brownfield Sties in Watershed on the Eastern Side of Saipan,* (CNMI). Phase 2: Impact on Aquatic Resources. *WERI Project Synopsis Report*.

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Denton, G.R.W., Bearden, B.G., Houk, P., Starmer J.A. & Wood H.R. (2008). *Heavy Metals in Biotic representatives from the Intertidal Zone and Nearshore Waters of Tanapag Lagoon, Saipan, Commonwealth of the Northern Mariana Islands (CNMI).* WERI Technical Report No. 123: 50 pp.

The Navy also states, "Metals released into the marine environment are not expected to exceed water quality standards in the CNMI coastal zone because corrosion and biological processes (e.g., colonization by marine organisms) would reduce exposure of military expended materials to seawater, decreasing the rate of leaching. Further, **leached metals would bind to sediments and other organic matter, thereby localizing the concentration to the site of deposition**."

The fact that heavy metals and other munition constituents may not be found in seawater at levels that would exceed the CNMI WQS is because of their octanol/water coefficient. In other words, these constituents instead partition into sediment and other organics. Heavy metal contaminants in the benthic habitat would be bioavailable to the fish and shellfish which results in bioaccumulation. Therein lies the issue. These pollutants would continue to be a source of contamination that may cause harm to aquatic marine life, and subsequently the people of the CNMI that rely heavily on subsistence fishing as significant part of their diet.

It is also the intent of the US Clean Water Act to protect our waters designated uses, which includes the protection and propagation of fish, shellfish and wildlife, and to ensure that fish in these waters are safe for human consumption.

A sediment study conducted in 2008-2009, off Saipan's west coast by Denton et.al., of University of Guam Water Environmental Research Institute found mercury "spikes" accompanied by increased CU, FE, MN and Zn enrichment, "which suggest they were remnant artifacts of the US invasion of Saipan in 1944. Mercury fulminate, for example, was the primary explosive used in primers and detonators of artillery shells and percussion caps of bullets during WWII (US Navy, 1947)."

In addition, this page also states that, "Some expended plastics from military readiness activities are unavoidable because they are used in ordnance or targets. Targets, however, would typically be recovered following training and testing activities. ***Chaff fibers are composed of nonreactive metals and glass, and would be dispersed by ocean currents as they float and slowly sink toward the bottom***. The fine, neutrally buoyant chaff streamers would act like particulates in the water, temporarily increasing the turbidity of the ocean's surface. The chaff fibers would quickly disperse, and turbidity readings would return to normal. Because activities would occur in areas outside of the CNMI coastal zone and the rapid settling and non-reactivity of materials not recovered after use, water quality standards in the CNMI coastal zone would not be exceeded."

However, the deposition of these nonrecoverable pollutants would contaminate the ocean bottom, benthic habitat, biota, and add to the growing volume of marine debris found in Pacific gyres, which have created the "Great Pacific Garbage Patch". The Department of the Navy is approaching these contaminants as being acceptable outcomes without explanation.

CNMI WQS stipulates that "all surface waters shall be free of substances attributable to domestic, industrial, or ***other controllable sources of pollutants and shall be capable of supporting desirable aquatic life*** and be suitable for recreation in and on the water." Waters are "subject to verification by monitoring as may be prescribed by the Administrator to assure freedom from any of the following conditions: ***……(2) floating debris***, oil, grease, scum, or other ***floating materials…… (4)*** High temperatures; biocides; pathogenic organisms; ***toxic, corrosive, or other deleterious substances at levels or in combinations sufficient to be toxic or harmful to human health or aquatic life***, of in amounts sufficient to interfere with any beneficial use of the water." Detrimental responses include ***significant alterations in water biota***.

The presence of marine debris has been shown to be harmful to aquatic life in peer reviewed research papers from NOAA, US and European government agencies, and non-government agencies. The accumulation of military exercise contaminants in the habitat where fish and other aquatic life live, feed and breed are also of concern. The CNMI WQS states that, "all waters shall be free from toxic pollutants **in concentrations that are lethal to, or produce detrimental physiological responses in human, *plant or animal life***."

With this in mind, we continue with our concerns with statements made in the following section:

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Pages: 20 - 22

Adverse physiological responses in marine animals were marginally evaluated. To quote, "**Acoustic Stressors**. Pursuant to the MMPA***, acoustic sources may result in Level A and Level B harassment of certain marine mammals.*** The analysis completed by ***the Navy predicts no mortalities*** and therefore the Navy is not requesting an incidental take under the MMPA for mortality. Pursuant to the ESA, sonar and other transducers, weapons noise, vessel noise, air guns, and aircraft may affect certain ESA-listed marine mammals. herein."

A similar stance was taken with other stressors discussed in this section. Only mortality is considered, not morbidity that may further weaken marine animals causing a cumulative affect leading to latent mortality from chronic exposure to these and other climate related stressors.

The CNMI has experienced two Super Typhoons in the last five (5) years, and increasing marine water temperatures. These climate related stressors alone have led to marine animal morbidity and death, and wide spread coral reef damage. Stressing marine plants and animals further with acoustic, explosive, physical disturbance from sonar, vessel strikes or near misses, entanglement and ingestion stressors, is indefensible, as morbidity furthers their vulnerability to an avoidable early death.

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Governor

ARNOLD I. PALACIOS
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COMMONWEALTH of the NORTHERN MARIANA ISLANDS
OFFICE OF THE GOVERNOR

February 7, 2020

Janice E. Castro
Director
Division of Coastal Resources Management
P.O. Box 501304
Saipan, MP 96950

Re: *Comment on Federal Consistency Determination Request for Military Training and Testing (MITT) Within the Coastal Zone of the Commonwealth of the Northern Mariana Islands*

Dear Director Castro,

Thank you for this opportunity to comment on the Federal Consistency Determination (CD) request currently under consideration by the Bureau of Environmental and Coastal Quality's Division of Coastal Resources Management (DCRM), dated Dec. 19, 2019 and submitted to the Commonwealth of the Northern Mariana Islands (CNMI) Bureau of Military Affairs (BMA). As you know, ensuring consistency of significant federal actions with requirements put in place to protect our coastal resources is a policy matter of utmost importance to the CNMI. For the reasons outlined below, the 2019 CD submission is inadequate and in many aspects in disagreement with land management policies and mandates established by the CNMI Constitution and the Covenant, as well as key enforceable policies of the CNMI's Coastal Zone Management Program. As such, I encourage you to work with the Navy to ensure these concerns are addressed and that a sufficient CD request is submitted to you, with the Commonwealth Bureau of Military Affairs (CBMA) copied as is required, for your review and determination upon this proposal.

Procedural Issues

- **Streamlined submission supports local review.** The Navy's inclusion of the CBMA in their CD request is appreciated, however, the process outlined in **16 U.S.C. § 1456(c)(1)(C) and reflected** on the DCRM website and federal consistency guidance does clearly state that these requests should be provided to the "relevant State agency designated under section 1455(d)(6)" and therefore CDs should be addressed to the DCRM Director. As outlined in Executive Order 2019-09, CBMA is a clearing house and coordinating entity that functions as a custodian to support Department of Defense (DoD) related activities in the Commonwealth, and the Special Assistant acts as a liaison between DoD and CNMI Agencies. As such we believe that a proper CD submission would be addressed to the DCRM Director who reviews such determinations, in care of the CBMA Special Assistant. The CBMA Special Assistant has concurred with this assessment in discussions regarding this submission. We hope that a revised CD might be provided to your office to address the substantive deficiencies outlined here and ensure timely processing, as well as to support meaningful public notice and comment and participation opportunities moving forward.

- **References to obscure supporting documents complicates local review.** Documents referenced in CD should be included in the request itself. Although your DCRM staff have helpfully provided additional background information, the CD from DCRM on record for the MITT was dated January 20, 2015, we do not have a copy of the Navy's original documents. These materials are necessary to support meaningful review of this request, which relies heavily on this past correspondence. Therefore, it is

requested that DoD provide this document and any other referenced supporting documents as links or digital files in a properly submitted CD request in advance of DCRM's final determination on this contention proposal.

- **Insufficient information is included in the Draft SEIS to support review at this time.** Data relied on in the SEIS is insufficient to assess likely impacts to coastal resources and as such, this CD request is not ripe for review. We encourage DCRM to request that the Navy treat the December 2019 as a draft and properly submit a revised CD request to you, the Director of the CNMI's Coastal Zone Program with the coordinating office of the BMA copied upon release of the updated draft or final SEIS. Where data gaps exist in terms of impacts to limited access, water quality, impacts to cetaceans and other marine life especially during spawning events, and mass wasting at FDM are not properly addressed, we hope DCRM can work with the Navy through this process to provide time bound conditions for execution of compliant activities as well as data sharing and coordination with local resource management agencies in CNMI.

Substantive Issues

- **Impacts to all CNMI lands and waters should be assessed for consistency.** Impacts to all CNMI land and coastal waters should be assessed for consistency with DCRM enforceable policies. The 2019 CD incorrectly excludes land-based activities proposed on FDM and Tinian from analysis based on the fact that "federally controlled lands are excluded from the coastal zone" (2019 CD, pg. 4). While CNMI does not dispute that the federal government has an interest in these lands, these lands have been "***made available to the Government of the United States by lease*** to enable it to carry out its defense responsibilities" and thus remain Commonwealth property which will revert to CNMI control when the leases terms expire (CNMI Covenant, Section 802, emphasis added). It is unclear on what basis the Navy states that these lands are not subject to federal consistency review, which should also include consideration of potential spillover effects to all CNMI-owned submerged lands and waters.

- **Details regarding activities and impacts are insufficient for review.** It is unclear from the description provided on page 2 of the 2019 CD what proposed activities would be occurring within three (3) nautical miles of the CNMI's shorelines. Thus, insufficient information has been provided to CNMI for DCRM to assess and determine whether the proposed MITT activities are consistent with applicable regulations as detailed further in discussion of application of specific enforceable policies below.

- **CD does not address direct, indirect, and cumulative impacts to lands and waters of the CNMI.** The CD incorrectly states that there are "no changes in land-based training proposal" (2019 CD, pg. 2). Assessment of activities in the 2019 Draft MITT Supplemental Environmental Impact Statement indicates that "[a]lternative 1 reflects a level of training and testing activities to be conducted at sea ***and on FDM***, with adjustments from the 2015 MITT Final EIS/OEIS that account for changes in the types and tempo of activities necessary to meet current and future military readiness requirements beyond 2020" and "Alternative 2 includes the same type of training and testing activities that would occur under Alternative 1. Alternative 2 also considers an increase in tempo of some training and testing activities, including additional Fleet exercises and associated unit-level activities, should unanticipated emergent world events require increased readiness levels" (2019 MITT Draft SEIS, Volume 1, pg. ES-5, emphasis added). In reviewing the "Summary of Impacts" table in the Draft Supplemental EIS/OEIS, additional details are provided indicating that:

  - Under Alternative 1, "more aircraft would fly over ***and land on FDM and more ordnance would be used on FDM***. The total increase, in terms of net explosive weight (NEW) under Alternative 1 would be less than 1 percent compared to ordnance use on FDM described in the 2015 MITT Final EIS/OEIS" and, "the number of training and testing activities under Alternative 2 would increase

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over what is proposed for Alternative 1. However, this increase would be a slight change and would not appreciably change the potential for impacts over what is analyzed for Alternative 1" (Draft SEIS, pg. ES-18, emphasis added). The basis for this statement is unclear, as Table 3.0-19 of the DEIS, *Annual Number of Munitions Used on Farallon de Medinilla* shows greater than 1 percent increases in use explosive missiles (85 missiles authorized in 2015 Final EIS, 115 proposed under Alternatives 1 and 2), explosive grenades and mortars (600 authorized in 2015 Final EIS, 1,000 proposed under Alternatives 1 and 2), as well as increases in use of small-caliber rounds and medium caliber projectiles (see DEIS pg. 3-28). It also appears that annual in-water and in-air explosives munitions detailed in Tables 3.0-7 and 3.0-8 of the DEIS (pg. 3-22 – 23) will include increasing use of "E8", "E9", and "E10" explosives. It is unclear what portion of these munitions are proposed for testing activities in areas around FDM or in proximity to other CNMI lands and territorial waters, however, it appears that the proposed change is rather substantial for some explosive categories (e.g. bombs with net explosive weight between 60 – 500 pounds). The DEIS notes that "[a]s described in the 2015 MITT Final EIS/OEIS, physical disturbance and strike stressors can result from the Navy's proposed use of aircraft and aerial targets, vessels, in-water devices, military expended materials, seafloor devices, and, on the island of FDM, ground disturbance and wildfires" (DEIS, pg. 3-25). It is suggested that the actual proposed changes and likely impacts of these changes be meaningfully discussed in the updated DEIS and corresponding revised CD to ensure consistency with enforceable policies in sea and on land.

- **As currently submitted, the proposed action is not consistent with DCRM Enforceable Policies.** Under the Coastal Zone Management Act (CZMA) of 1972, 16 USC § § 1451-1465, § 1456(c)(1), and Federal Consistency regulations, 15 CFR § § 930.30-930.46, Federal agency activities with reasonably foreseeable effects on the State's coastal zone must be consistent to the maximum extent practicable with the enforceable policies of the States' federally approved CZMA programs. Under 15 CFR §930.32(a)(1), the standard for "consistent to the maximum extent practicable" means fully consistent with the enforceable policies of the CNMI's management programs unless full consistency is prohibited by existing law applicable to the Federal agency. Thus, the Navy must show how existing law prohibits full consistency with the CNMI's Coastal Management Program. However, the Navy has not provided any description of any statutory provisions, legislative history, or other legal authority which limits the Navy's discretion to be fully consistent with the enforceable policies of CNMI's management program. Furthermore, 15 CFR §930.32(a)(2) details that 16 USC § 1456(e), "construction with other laws", or "Section 307(e) of the Act does not relieve Federal agencies of the consistency requirements under the Act. The Act was intended to cause substantive changes in Federal agency decision making within the context of the discretionary powers residing in such agencies. Accordingly, ***whenever legally permissible, Federal agencies shall consider the enforceable policies of management programs as requirements to be adhered to in addition to existing Federal agency statutory mandates***. If a Federal agency asserts that full consistency with the management program is prohibited, it shall clearly describe, in writing, to the State agency the statutory provisions, legislative history, or other legal authority which limits the Federal agency's discretion to be fully consistent with the enforceable policies of the management program" (emphasis added). Accordingly, for the reasons cited below, the proposed MITT is not fully consistent with enforceable policies of the CNMI's approved CZMA program:

  - **Full consistency with local permitting required**. The 2019 CD incorrectly states that General Provisions (15-10-020, 15-10-025) and Standards for CRM Permit Issuance (15-10-301, 305, 315, 320, 325, 335, 340, 345), Major Siting Standards (15-10-501, 505), and CRM Permit Conditions (15-10-610) and numerous policy elements of Public Law 3-47 do not apply. If the Navy feels that certain sections do not apply, details should be provided to further frame discussion regarding the applicability and extent of the enforceable policies for the CNMI's CZMP. That being said, these provisions have been applied to CD review and should continue to be applied to ensure consistency with CNMI's enforceable polices. Concerns regarding specific subsections are outlined further

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below. However, it is a misconstruction of the intent and letter of the CZMA to state that mandatory conditions and management standards of the CZMA are not applicable. Rather, proposed activities must comply with substantive local permitting requirements as they are incorporated through the DCRM Coastal Management Program. Given the extensive mitigation that should be implemented to address impacts of proposed increases in the activities outlined in Table 1 of the 2019 CD, the Navy should anticipate coordinating with local regulatory agencies to implement required clean up activities. Obtaining local permits, although it may not be required for all potential survey, clearing, and clean-up activities, would demonstrate the Navy's commitment to complying with local requirements and coordinating with our local agencies. This is a best practice that other federal agencies engage in and we encourage you to ask the Navy and other DoD branches to extend this courtesy to our regulatory and resource management partners. At minimum, the 2015 Federal Consistency Determination from DCRM conditioned coordination with local authorities which, to this day, has been insufficient and in some cases as resulted in avoidable losses of or damage to important CNMI assets that DoD has yet to remedy.

- **Application of CD analysis to all relevant enforceable policies is necessary.** Similar to the concerns raised in the Oct. 2014 DCRM response to the Sept. 2014 CD request, it appears that numerous elements of the currently proposed revised and expanded MITT are not consistent with DCRM's enforceable policies. These include:

  - Assessment of impacts for compliance with general standards (15-10-305), Areas of Particular Concern (15-10-315, 325, 335, 340) and specific criteria for major sitings (15-10-505).

    As stated in the Office of the Governor's comments on the MITT DEIS, there has been insufficient analysis of direct, indirect, and cumulative impacts of MITT activities. This analysis should include all reasonably foreseeable and related activities including but not limited to activities described in the Guam and CNMI Military Relocation FEIS/OEIS, Divert Activities and Exercises, the MITT expansion, and upcoming CNMI Joint Military Training DEIS/OEIS. If implemented these activities will undoubtedly have cumulative effects on CNMI's coastal resources. Thus far, insufficient information has been provided in supporting documents and in this CD request for CNMI assess consistency with this provision. As outlined in 15-10-305, criteria for development, which is defined to include activities relevant to the MITT "discharge or disposal of … any gaseous, liquid, solid, or thermal waste" (15-10-020(z)(2)); a "change in the density or intensity of use of land" (15-10-020(z)(4)); a "change in the intensity of use of water, the ecology related thereto, or the access thereto" (15-10-020(z)(5)); or the "removal of a significant amount of vegetation, whether native or non-native" (15-10-020(z)(7)), development criteria must include consideration of cumulative impacts, compatibility, alternatives, conservation, compliance with local and Federal laws, consistency with the CNMI's Constitutional right to a clean and healthful environment, effects on existing public services, adequate public access, setbacks, management measures for control of nonpoint source pollution, and buffers for environmentally sensitive areas (15-10-305). If the Navy feels that consistency with these standards is not legally permissible, they should detail their rationale for this position in their CD request – otherwise the applicable regulations appear to direct that these policies be considered and adhered to. Reasonably foreseeable impacts to Areas of Particular Concern should also be assessed for consistency, especially in terms of potential direct and spillover effects to lagoon and reefs (15-10-315), coral reefs (15-10-325), shorelines (15-10-335) and ports (15-10-345), categories which the CD summarily said were not applicable due to unnecessarily narrow interpretation of these areas and their management standards. Similarly, "major siting" is defined as "any proposed project which has the potential to directly and significantly impact coastal resources" which includes "[p]roposed projects with potential for significant adverse effects on submerged lands, groundwater recharge areas,

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cultural areas, historic or archeological sites and properties, designated conservation and pristine areas, or uninhabited islands, sparsely populated islands, mangroves, reefs, wetlands, beaches and lakes, areas of scientific interest, recreational areas, limestone, volcanic and cocos forest, and endangered or threatened species or marine mammal habitats" (15-10-020(uu)(4)). Given that this project clearly qualifies as a major siting, consistency with major siting standards of 15-10-505 should also be assessed.

- **Meaningful analysis of data and standards of enforceable policies is necessary.** In addition to lacking analysis noted above, as outlined herein, the CD analysis is currently inadequate in terms of assessment of impacts and analysis and application of enforceable policies in regards to discussion on water quality, Public Law 3-47 Policy Elements 4, 10, 11, 12, 13, 15, 16, 17, and 21.

  - Assessment of impacts to water quality. The CD states that "military readiness activities that generate stressors to water quality do not occur in the water use areas; rather, they occur outside of the CNMI coastal zone, and are analyzed in the context of their potential to induce reasonably foreseeable effects into Class "AA" or Class "A" water use areas." It goes on to restate conclusory statements that no effects are anticipated from explosives and explosive byproducts (Section 3.1.3.1), metals (Section 3.1.3.2), and other materials (Section 3.1.3.4) based on the analysis that activities would "occur in areas outside of the CNMI coastal zone" and in "rapid settling and non-reactivity of materials not recovered after use". Data has not been provided to confirm baseline water quality in areas of proposed activities or to substantiate these statements. This is especially disconcerting in regards to turbidity and total suspended solids where health and habitat protective standards aim to ensure that "[c]oncentrations of suspended matter at any point shall not be increased from ambient conditions at any time, and should not exceed 5 mg/l except when due to natural conditions" (for TSS) and "[t]urbidity at any point, as measured by NTU, shall not exceed 0.5 NTU over ambient conditions except when due to natural conditions." Additionally, the standard for all CNMI waters is that they "shall be free from toxic pollutants in concentrations that are lethal to, or that produce detrimental physiological responses in human, plant, or animal life. Detrimental responses include, but are not limited to: decreased growth rate and decreased reproductive success of resident or indicator species; or significant alterations in population, community ecology, or receiving water biota." Insufficient data has been provided to demonstrate that proposed increasing uses of weapons that will deposit explosives and explosive byproducts, metals, and other materials into CNMI waters will not violate this standard.

  - Policy Element 4 – "Plan for and manage any use or activity with the potential for causing a direct and significant impact on coastal resources. Significant adverse impacts shall be mitigated to the extent practicable." The Coastal Zone Management Act broadly defines the environment. Instead of considering impacts of increased activities to the people of the CNMI and the coastal resources that comprise our home, the CD narrowly discusses potential impacts to marine mammals, coral, and fishes in water and does not reassess impacts of land-based activities on Saipan, Tinian, and Rota or FDM, stating that no changes in these activities are proposed. As previously mentioned, FDM activities appear to be significantly increasing, and mitigation measures proposed by DCRM to ensure consistency with land-based operations in the 2015 MITT do not appear to have been implemented regularly – particularly as they pertain to early coordination and data sharing with CNMI. It is unclear why the Navy states that mitigation measures are outside of the scope of this SEIS/OEIS (CD enclosure pg. 23), especially given the fact that the 2014 CD correspondence from DCRM noted that "[i]n order to comply with the enforceable polices of the CNMI, further measures are needed to protect the wildlife and habitats of the CNMI". Similarly, in this CD request like the 2014 submission, the basis for finding that the MITT is consistent to the maximum extent practicable has not

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been established. The Navy must show how its proposed actions are fully consistent by providing data, not speculative conclusions such as that potential effects to endangered species will be addressed through pending biological opinions. As also noted previously, the statement that the "Navy's Proposed Action provides special protection to coastal resources and mitigates adverse impacts" is inadequate to demonstrate consistency as the SEIS/OEIS does not actually commit to mitigation measures or timelines for implementation of mitigation, making these assurances rather hollow and unenforceable. If the Navy plans to rely on the suite of mitigation options discussed in the Draft SEIS/OEIS to demonstrate compliance with CNMI's enforceable policies including the requirement of mitigation of adverse impacts, meaningful and enforceable commitments and timelines for implementation should be developed as part of this CD correspondence.

- Policy Element 10 – "Maintain or improve coastal water quality through control of erosion, sedimentation, runoff, siltation, sewage and other discharges." It is unclear how the Navy is able to state that proposed activities will not result in siltation, runoff, and other discharges given the use of munitions on land at FDM and in the CNMI's coastal waters. Assessment of this policy element and supporting regulations is inadequate and this analysis should be revised to support DCRM's review of this CD request.

- Policy Elements 11 and 12 – Impacts to cultural resources. Although Section 106 consultations are ongoing to support the reissuance of the expired Programmatic Agreement, the analysis of impacts to cultural resources referenced in Section 3.11 of the draft SEIS/OEIS does not include sufficient data to make any determination regarding likely significant impacts to cultural resources within CNMI waters and on FDM. Absence of evidence is not evidence of absence and the DoD has an obligation to implement reasonable assessment of resources that are likely to be impacted by MITT activities. Lacking that data, there is therefore no basis for the Navy's conclusion that this proposed action is consistent with these policy elements. Data gaps should be remedied to ensure consistency with these policies and the CNMI's significant and compelling interest to protect and preserve our cultural resources.

- Policy Element 13 – "Require compliance with all local air and water quality laws and regulations and any applicable federal air and water quality standards." Data must be provided to support the conclusory statements that air emissions will be minimal on Saipan and Rota and will be "intermittent and short term, resulting in minimal impact on the air quality of Tinian". Models are available to assess these activities for compliance with local and federal air quality standards and should be included for review in this submission. Comments regarding water quality standards are incorporated by reference here.

- Policy Elements 15 and 16 – Management of marine resources and consistency with other policies. As noted in the response to Policy Element 4, the Navy's analysis of impacts to coastal resources is overly narrow and does not meaningfully address impacts to the human environment. This is especially true regarding impacts to the integrity of our reefs and wildlife habitat (Policy 15) and the management and development of our local subsistence, sport, and commercial fisheries (Policy 16). The draft SEIS/OEIS contains insufficient assessment of the potential impacts to these resources and the "analysis" under Policy Element 4 does not address potential impacts to human uses such as fishing and traditional access to important fishing areas. Thus, it is unclear how the Navy can conclude their proposed actions are consistent when analysis is completely lacking. An updated CD should address this gap, preferably through a revised SEIS that provides meaningful analysis of impacts to these important coastal resources.

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- Policy Element 17 – "Protect all coastal resources, particularly sand, coral and fish from taking beyond sustainable levels and in the case of marine mammals and any species on the Commonwealth endangered species list, from any taking whatsoever." The Navy explains that "the Proposed Action has the potential to take marine mammals and species on the Commonwealth endangered species list" and that "[a]ny take occurring as a result of the Proposed Action would be incidental to, and not the purpose of, the Navy's otherwise lawful training and testing activities" and notes that protective measures intended to avoid and minimize the "take" of endangered species will be updated as appropriate upon completion of the Section 7 consultation. As noted previously, past promises of mitigation and monitoring have not been executed, or, if they have been, have not been shared with the CNMI, therefore, it is encouraged that any monitoring and mitigation agreements that are the basis for a consistency determination include timebound deliverables so that consistency can be demonstrated.

- Policy Element 21 – "Encourage the preservation of traditional rights of public access to and along the shorelines consistent with the rights of private property owners." Contrary to the Navy's statement that the "MITT Draft Supplemental EIS/OEIS does not propose any change to the public access normally allowed on federally leased lands including FDM, which would remain restricted for security and safety reasons" and that the "MITT Draft Supplemental EIS/OEIS does not propose a change to the ocean areas currently used by both the Navy and the public", increases in the intensity and use of CNMI lands and waters is more likely than not to have significant impacts to public access of shorelines and traditional fishing areas. Already, three nautical miles (nm) surrounding the abundant fishery surrounding FDM is periodically restricted and this SEIS proposes to extend that "danger zone" to 12 nm and increase the frequency of restricted use in this area. These restrictions can have direct and significant impacts to boaters and the fishing community by increasing travel time and forcing seagoing vessels to travel well out of their traditional navigation routes. Similarly, periodic exercises on Tinian significantly restrict community access to forests and shorelines that have been traditionally used for subsistence and commercial activities. The frequency and timing of these restrictions should be discussed further with the CNMI in order to maximize access for users of these ocean resources while ensuring the Navy can meet its training objectives. Given that assessment of impacts and commitment to reasonable mitigation measures are lacking in the SEIS/OEIS, meaningful commitments should be articulated in supplemental analysis in a revised CD in order to ensure consistency with this enforceable policy.

- **Enforceable commitments to proposed offsets and mitigations needed.** DCRM's October 2014 response to the September, 2014 CD (letter 5090 Ser N465/0926) outlines numerous mitigation measures that the Navy would need to implement to ensure consistency with CNMI enforceable policies. These include collection of baseline data on impacts to essential fish habitat areas, assessment of impacts to endangered bird, marine mammals, and sea turtle populations, water quality monitoring to ensure water quality stays within CNMI standards, and suggests addressing mass wasting concerns at Farallon de Medinilla as well as the removal of Rota for any activities. It does not appear these data gaps were ever addressed, or, if they were, that data was never shared with the CNMI. Additionally, in recent MITT discussions CNMI was informed that the Navy is unable to commit to mitigation actions or timelines due to lack of advance appropriations for these activities. The result of this procedural issue is ongoing activities with insufficient mitigation measures. Avoidance and minimization of impacts should be the first step in the scoping process, and mitigation actions that are agreed to should be implemented in a timely manner. As it stands, it appears that the majority of mitigation measures outlined in the 2014 CD correspondence have still not been implemented. Without these measures, the 2015 – 2020 MITT activities do not reflect good faith efforts to comply with conditions from the last CD process, let alone establish a record

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of performance that can be relied upon as a basis for ongoing and significantly expanded activities on land and at sea. Direct, indirect, and cumulative impacts must be meaningfully assessed in order to be avoided, minimized, and then actually mitigated. We believe an updated CD and revised draft SEIS will be necessary to address the substantial data gaps identified here and that time bound commitments for key mitigation measures will be needed to support substantive compliance with the federal consistency review process.

For the reasons outlined herein, our office encourages DCRM to work with the Navy to resolve the procedural and substantive concerns raised by the December 2019 CD. We strongly encourage a supplemental submission be considered when data gaps identified in the draft SEIS are resolved.

Thank you for your consideration of these concerns and your ongoing support of this process.

Sincerely,

GILBERT J. BIRNBRICH
Legal Counsel – Office of the Governor

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C.2.3 NAVY CONSISTENCY DETERMINATION LETTER – GOVERNMENT OF GUAM

DEPARTMENT OF THE NAVY
COMMANDER
UNITED STATES PACIFIC FLEET
250 MAKALAPA DRIVE
PEARL HARBOR, HAWAII 96860-3131

IN REPLY REFER TO:
5090
Ser N465/1462
December 09, 2019

Mr. Tyrone J. Taitano
Director
Bureau of Statistics and Plans
P.O. Box 2950
Hagatna, Guam 96932

Dear Mr. Taitano:

SUBJECT: CONSISTENCY DETERMINATION FOR MILITARY TRAINING AND TESTING WITHIN THE GUAM COASTAL ZONE

In accordance with the Federal Coastal Zone Management Act (CZMA) and 15 C.F.R. Part 930, the U.S. Navy submits the enclosed Federal Consistency Determination (CD) for proposed activities in the Mariana Islands Training and Testing (MITT) Study Area that have reasonably foreseeable coastal effects on the coastal use or resources of Guam.

Based on the enclosed consistency determination and the activities and analysis contained in the enclosed Draft Supplemental Environmental Impact Statement/Overseas Impact Statement (DSEIS/OEIS), the Navy finds that the proposed military training and testing activities presented in Alternative 2 are consistent to the maximum extent practicable with the enforceable policies of the Guam Coastal Management Program.

We look forward to your timely review of and concurrence with the Navy's determination. If you have any questions, please contact Mr. John Van Name at (808) 471-1714 or john.vanname@navy.mil or Ms. Suzanne Smith at (808) 471-4696 or suzanne.smith3@navy.mil.

Sincerely,

DANIEL McNAIR
Director, Fleet Environmental Readiness
By direction of the Commander

Enclosures: (1) CD for Guam
(2) CDROM – MITT DSEIS/OEIS

Copy to: COMNAVREGMARIANAS (w/o enclosure)
OPNAV N45 (w/o enclosure)

C.2.4 GOVERNMENT OF GUAM RESPONSE LETTER

Lourdes A. Leon Guerrero
Governor of Guam

Joshua F. Tenorio
Lieutenant Governor

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SAGAN PLANU SIHA YAN EMFOTMASION
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Tyrone J. Taitano
Director
Matthew Santos
Deputy Director

MAR 06 2020

John C. Aquilino
Commander
United States Pacific Fleet
Department of the Navy
250 Makalapa Drive
Pearl Harbor, Hawaii 96860

RE: Coastal Zone Management Act (CZMA) Federal Consistency Review for Department of the Navy's proposed activities in Mariana Islands Training and Testing (MITT) Study Area *(GCMP FC No. 2020-0001)*

Hafa adai! The Guam Coastal Management Program of the Bureau of Statistics and Plans (Bureau) has completed its review of the Federal Consistency Determination by the Department of the Navy received on January 8, 2020. The Department of the Navy ("the federal agency") has submitted its consistency determination relative to its proposed activities in Mariana Islands Training and Testing (MITT) Study Area.

The Bureau coordinated this review with partnering agencies, provided Public Notice, and received comments from Senator Sabina F. Perez, the Guam Environmental Protection Agency (GEPA), the Guam Waterworks Authority, the Department of Agriculture, and the Department of Parks and Recreation. Furthermore, the Bureau hereby concurs with the federal agency's determination that the proposal is consistent with the enforceable policies of the Bureau's Guam Coastal Management Program (GCMP) based upon the following comments and conditions:

Resource Policy. Conservation of Natural Resources—Overall Policy. *The value of Guam's natural resources as recreational areas, critical marine and wildlife habitats, the major source of drinking water, and the foundation of the island's economy shall be protected through policies and programs affecting such resources.*

According to the Draft Supplemental EIS/OEIS, the proposed activity is expected to result in the equivalent of at least 151,918 metric tons of carbon dioxide emissions per year (which would total 759,590 metric tons of carbon dioxide equivalent emissions over 5 years). As climate change is expected to result in sea level rises, potentially more damaging tropical storms, a reduction in the recharge rate of the Northern Guam Lens Aquifer, and other environmental and societal

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impacts, substantial increases in greenhouse gas emissions provide impacts in several of the different elements of this policy for the conservation of natural resources.

Pursuant to this resource policy, the federal agency is hereby advised to consider mitigation strategies to reduce the net carbon dioxide equivalent emissions of the proposed action, to the maximum extent practicable, which could include methods of reducing carbon dioxide equivalent emissions or methods of capturing carbon dioxide equivalent emissions through natural or other processes.

Resource Policy 1. Air Quality. *All activities and uses shall comply with all local air pollution regulations and all appropriate Federal air quality standards in order to ensure the maintenance of Guam's relatively high air quality.*

The federal agency's proposed actions are estimated to increase annual emissions from criteria pollutants within the study area of 77 tons per year for nitrogen oxide and 78 tons per year for carbon monoxide under Alternative 1 or 78 tons per year for nitrogen oxide and 79 tons per year for carbon monoxide under Alternative 2, both compared to baseline emissions. These are under the 250 ton per year prevention of significant deterioration (PSD) thresholds. Other criteria pollutants have significantly lower additional output under both alternatives. The federal agency further finds that the quantities of hazardous pollutants released would result in negligible quantities of hazardous air pollutants in localized areas not publicly accessible. According to the Draft Supplemental EIS/OEIS, the proposed activity is expected to result in the equivalent of at least 151,918 metric tons of carbon dioxide emissions per year (which would total 759,590 metric tons of carbon dioxide equivalent emissions over 5 years).

The conclusion based upon the detailed stressor analysis in the Draft Supplemental EIS/OEIS that air pollution is minimal, intermittent and short-term does not adequately address cumulative impacts of repeated exposure of the population to criteria air or hazardous pollutants and the potential health impacts. Moreover, the analysis does not adequately evaluate cascading and cumulative impacts of the deposition of air pollutants on land, water, terrestrial and aquatic organisms and the ecosystem.

Pursuant to Resource Policy 1, Air Quality, the federal agency shall, to the maximum extent practicable:

(1) be advised to establish an empirical baseline for the health of the population which are in or near the most likely areas to experience effects from repeated exposure to air pollution due to the proposed activities in or near the coastal zone and conduct occasional monitoring of the health of the population within the likely affected areas. If findings indicate significant deterioration of the health of the most likely affected populations, the federal agency should coordinate its response with local agencies.

(2) be advised to establish an empirical baseline for the health of terrestrial and aquatic species which are in or near the most likely areas to

experience effects from repeated exposure to air pollution due to the proposed activities in or near the coastal zone and conduct occasional monitoring of the health of such species within the likely affected areas. If findings indicate significant deterioration of the health of terrestrial or aquatic species, the federal agency should coordinate its response with local agencies.

Resource Policy 2. Water Quality. *Safe drinking water shall be assured and aquatic recreation sites shall be protected through the regulation of uses and discharges that pose a pollution threat to Guam's waters, particularly in estuarine, reef and aquifer areas.*

The federal agency stated in its consistency determination that activities including the use of explosives and explosion byproducts, military materials with metal components, and chemicals other than explosives would occur in federally owned submerged land, or more than 3 NM offshore, thus outside of Guam's coastal zone. Impacted sediments and water quality would only be immediately adjacent to the munitions, hence activities would have no significant effect on sediments and water quality within Guam's coastal zone. Furthermore, the Navy concluded that neither state nor federal standards or guidelines would be violated by the chemical, physical, or biological changes in sediment or water quality measurable at the detonation site.

The federal agency should continue to conduct water quality impact analysis to determine that explosives and explosive byproducts, metals and other materials expended during training and testing described in the MITT Final Supplemental EIS/OEIS would not exceed regulatory thresholds and guidelines [Sediment characterization methods in Guam Water Quality Standards (2017) and USEPA established criteria for concentrations of explosives, explosive byproducts and metal in saltwater] established for measuring impacts on sediment and water quality.

GEPA has expressed its concern that there was no discussion of marine debris cleanup as a result of the MITT activities once completed. The MITT Final EIS/OES 2015 (p. 3.1-55) discusses other materials as follows: Other military expended materials include plastics, marine markers, flares, and chaff. Some expended plastics from training and testing activities are unavoidable because they are used in ordnance or targets. (Although plastics are resistant to degradation, they do gradually break down into smaller particles because of sunlight and mechanical wear [Law et al. 2010]. Thompson et al, [2004] found that microscopic particles were common in marine sediments at 18 beaches around the United Kingdom. They noted that such particles were ingested by small filter and deposit feeders, with unknown effects.) Targets, however, would typically be recovered following training and testing activities. Chaff fibers are composed of nonreactive metals and glass, and would be dispersed by ocean currents as they float and slowly sink toward the bottom. The fine, neutrally buoyant chaff streamers would act like particulates in water, temporarily increasing the turbidity of the ocean's surface. The chaff fibers could quickly disperse, and turbidity readings would return to normal.

Section 2 of the 2019 MITT Draft Supplemental EIS/OEIS describes the annual Proposed Action and Alternatives. However, the MITT has a five-year term. Cumulative impacts of the Range activities, in terms of the amount of Ordnance (or other expended items, if any) should be considered over five years, on-going versus Alternative 1 and Alternative 2. Tables 2.5-1 and 2.5-2 compare the proposed SEIS/OEIS action alternatives with on-going training and testing activities. Each table describes the activities in terms of the activity name and where in the Study Area the federal agency proposes to conduct it. The next two columns show the annual occurrence and ordnance or other expended items (if any) involved in the activity as is currently ongoing (under the heading "2015 MITT EIS/OEIS Ongoing Activities"). The final two pairs of columns present the same information (annual occurrence and ordnance/items) as the activities are analyzed in the 2019 Supplemental EIS/OEIS for Alternative 1 and Alternative 2, respectively. As an example, page 2-33 has a Surface Warfare range activity located 12 NM from land. Ongoing activities list 242 events per year (1,210 over 5 years) and 48,040 small caliber rounds annually (or 240,200 small caliber rounds over 5 years) The number of rounds increases in the Alternative 1 & 2 scenarios by 128,400 small caliber rounds annually or 642,000 small caliber rounds over 5 years. The narrative in Section 4.4.1, Sediment and Water Quality, concludes that proposed changes in training and testing activities under Alternative 1 or Alternative 2 would be negligible.

In the 2019 Supplemental MITT, Section 3.1.2.3 Other Materials explains that detonations, explosions, and other activities may result in dispersal of glass, carbon fibers, plastics, rubber, steel, iron, concrete, etc. There is no discussion of any effort to clean up the marine debris as a result of the proposed activities.

In the 2019 Supplemental MITT, Section 5.1.2.2.1.1 Adaptive Management states that the adaptive management process is to help the federal agency have better knowledge of ecological systems. The process involves technical review meetings and ongoing discussions between the Department of the Navy, National Marine Fisheries Service, the Marine Mammal Commission, and other experts in the scientific community.

Pursuant to Resource Policy 2, Water Quality, the federal agency shall, to the maximum extent practicable:

(1) be advised to provide a map delineating the proposed Agat Bay and Piti underwater Mine Warfare detonation sites to the Bureau and Guam Environmental Protection Agency to clarify that those sites are outside of Guam's coastal zone, as represented.

(2) continue to conduct water quality impact analysis to determine that explosives and explosive byproducts, metals and other materials expended during training and testing described in the MITT Final Supplemental EIS/OEIS would not exceed regulatory thresholds and guidelines [Sediment characterization methods in Guam Water Quality Standards (2017) and USEPA established criteria for concentrations of explosives, explosive byproducts and metal in saltwater] established for measuring impacts on sediment and water quality.

(3) be advised to provide information on planned cleanup activities, if any, for marine debris to the Bureau and GEPA.

(4) be advised to include local stakeholders or local natural resource managers such as GEPA, Guam Department of Agriculture, and the Bureau.

Resource Policy 3. Fragile Areas. *Development in the following types of fragile areas shall be regulated to protect their unique character.*

- *historical and archeological sites*
- *wildlife habitats*
- *pristine marine and terrestrial communities*

As stated in the 2019 MITT Draft Supplemental EIS/OEIS, activities involving vessels and in-water devices are not intended to contact the seafloor. This would include amphibious and expeditionary events such as Amphibious Assaults, Amphibious Raids, Personnel, Insertion/Extraction/ and Underwater Surveys, which are proposed to continue in this SEIS/OEIS. As is current practice, coral and other hard bottom habitats would continue to be avoided to the greatest extent practical under the Proposed Action (see Section 2.3.3, Standard Operating Procedures and Chapter 5 – Mitigation). However, combat swimmers and Marines may be required to walk through nearshore areas during these activities. For example, as the boat approaches a beach, Marines may be required to exit the boat, stand up, and walk through the shallow water habitats. GEPA noted that in previous assaults on Guam, it has been observed that physical damages, including corals crushed or turned over, from these training activities occurred. As discussed in Section 5.4.1 (Mitigation Areas for Seafloor Resources), the Navy will implement mitigation to avoid or reduce impacts from precision anchoring and military expended materials on seafloor resources in mitigation areas throughout the Study Area.

Portions of the study area include marine communities. The Guam Department of Agriculture's Division of Aquatic and Wildlife Resources (DAWR) is the responsible local agency with the responsibility for protecting aquatic and wildlife resources, including marine preserves and sensitive areas.

Pursuant to Resource Policy 3, Fragile Areas, the federal agency shall, to the maximum extent practicable:

(1) be advised that any and all construction that is related to the proposed activities may be subject to permitting by GEPA and such permitted activity shall meet all relevant requirements of GEPA regulations and permitting by U.S. Army Corps of Engineers and subject to further federal consistency review.

(2) be advised to instruct swimmers and Marines to exercise caution when interacting with sensitive marine environments.

(3) be advised to communicate with DAWR in regards to planned activities involving sensitive areas.

(4) be advised to establish a coral damage response plan, which includes triage, restoration, and subsequent monitoring.

Resource Policy 4. Living Marine Resources. *All living resources within the territorial waters of Guam, particularly corals and fish, shall be protected from over harvesting and, in the case of marine mammals, from any taking whatsoever.*

GEPA finds that the proposed federal agency activities are consistent with the GCMP resource policies for marine invertebrates. Benthic invertebrates of the reef crest or flat, such as crabs, clams, and polychaete worms, within the disturbed area could be displaced, injured, or killed during amphibious operations. GEPA notes that the federal agency notifies local regulatory agencies of upcoming underwater Mine Detonation activities within Outer Apra Harbor and Agat Bay. Neither the public nor the regulatory agencies receive any form of after-action reporting on the outcome of these activities, specifically if any environmental damages occurred. There is not a current mechanism to evaluate whether the activities, quantities, and reported impacts met or exceeded the anticipated levels.

The Department of Agriculture finds that the presence of ESA-listed sperm whales is well-documented within 3-5 NM offshore in the Agat area. Recently there have been multiple instances of whale strandings, raising the concern that additional explosive impacts or sonar activities may result in an intensification of similar occurrences. Increased boat activity greatly increases the potential for boat strike of sperm whales. Navy lookouts undergo extensive training in order to qualify as a watch stander. The effectiveness of watch standers should be evaluated.

The Department of Agriculture is concerned about the impact of landing craft exercises on the dolphins that reside in Agat Bay. The federal agency has contended that there are unavoidable impacts and recognizes the common occurrence of spinner dolphins within Agat Bay and developed mitigation measures in consultation with the National Marine Fisheries Service under provisions of the Marine Mammal Protection Act. Beachmasters are shore-based observers with binoculars whose sole purpose is to ensure the safety of craft including avoidance of marine and terrestrial animals. Beachmasters are to work with environmental monitors and natural resource managers. The effectiveness of beachmasters should be evaluated.

While there is discussion of metals which will be introduced into the natural aquatic environment as a result of activities as well as bioaccumulation of pollutants in aquatic species, the possibility of biomagnification is not introduced into the discussion of potential impacts. Bioaccumulation is the accumulation of toxic chemicals in the tissues of an organism, while biomagnification is the increasing concentration of toxic chemicals for animals which are higher on the "food chain." This tends to mean that the highest concentrations of toxic chemicals which are capable of bioaccumulation may occur in aquatic animals that are apex predators. For this reason, one may expect that where bioaccumulation occurs that higher concentrations might be found in predatory fish such as mahi, various species of tuna, etc.

Pursuant to Resource Policy 4, Living Marine Resources, the federal agency shall, to the maximum extent practicable:

(1) be advised to provide some form of report outlining Mine Detonation activities and highlighting any issues regarding water quality, fish kills, protected species sightings, and marine debris to the public and/or local regulatory agencies.

(2) be advised to establish a standard operating procedure to resume, at least biannually, pre-coordination meetings on Mine Detonation activities with regulatory agencies.

(3) be advised to produce an annual report summarizing activities identified in the MITT to indicate whether activities and quantities reported in the MITT are met or exceeded and reporting on environmental impacts of such activities.

(4) refrain from taking any non-pelagic fishes within the Piti Marine Preserve Area.

(5) be advised to clarify and analyze the potential effects to marine animals and habitats from underwater demolition, including habitat mapping in a more detailed manner, identification of the cetacean species that utilize the proposed area, and include impacts to sea turtles.

(6) not engage in any takings of endangered species.

(7) be advised to evaluate the effectiveness of watch standers and beachmasters in their ability to detect marine mammals, such as sperm whales.

(8) be advised to investigate whether there is a connection between military training activities conducted in or near Guam and whale strandings. If there is found to be a likely connection between training and whale strandings, then the federal agency is advised to adjust its standard operating procedures to reduce the likelihood of continued adverse impacts to whales in the waters around Guam.

(9) be advised to establish an empirical baseline for the health of aquatic species for which biomagnification cause higher concentrations of toxic chemicals, especially those which are commonly used for fishing purposes. If findings indicate significant increases in toxic chemicals in the species of aquatic species, the federal agency should coordinate its response with local agencies.

Resource Policy 7. Public Access. *The public's right of unrestricted access shall be ensured to all non-federally owned beach areas and all territorial recreation areas, parks, scenic overlooks, designated conservation areas and their public lands; and agreements shall be encouraged with the owners of private and federal property for the provision of releasable access to and use of resources of public nature located on such land.*

Previous proposed military activities have indicated the closure of fishing areas such as Ritidian and Pati Point. Further restrictions on access to fishing areas within territorial waters, whether by actions inside or outside of the coastal zone, due to training activities within territorial waters must be mitigated. Other boaters, including divers and other recreational users frequent many areas within the MITT study area. There is no clear indication of how extensive closures will be.

Access to reefs and seashore areas can sometimes be accomplished merely by passage within the coastal zone, but sometimes passage over federally owned submerged lands, including surface danger zones, may be required due to the freeflowing nature of the coastal marine environment and the impracticality of passage outside of the 3 or more NM contour, as the case may be, in order to access territorial waters for the purpose or recreation, fishing, or for other reasons.

Pursuant to Resource Policy 7, Public Access, the federal agency shall, to the maximum extent practicable:

(1) clarify the period lengths of time for which closure of access to territorial waters may occur and to propose mitigation to compensate for loss of access.

(2) establish standard operating procedures that will avoid, where possible, or minimize, where unavoidable, disruption of public access to reefs and seashore areas.

(3) propose one or more mitigation measures to compensate for unavoidable disruption of public access to reefs and seashore areas, whether for fishing or for other purposes.

Therefore, based on the conditional concurrence stated above and the Bureau's review of all other information submitted, we find the application to be consistent with the approved development and resource policies of the Guam Coastal Management Program (GCMP), in accordance with the Coastal Zone Management Act of 1972, (P.L. 92-583) as amended, (P.L. 94-370). The Federal Consistency concurrence, however, does not preclude the need for securing other federal and Government of Guam permits, clearances and approvals prior to the start of this project.

Per 15 CFR §930.4(b), if the requirements for conditional concurrences specified in 15 CFR §930.4(a), (1) through (3), are not met, then all parties shall treat this conditional concurrence letter as an objection pursuant to 15 CFR Part 930 subpart D. Furthermore, if an objection is determined, you are hereby notified that, pursuant to 15 CFR §930.63(e) and 15 CFR Part 930, subpart H, you have the opportunity to appeal an objection resulting from not meeting the requirements of 15 CFR §930.4(a), (1) through (3), to the Secretary of Commerce within 30 days after receiving this conditional concurrence letter, or 30 days after receiving notice from the Federal agency that your application will not be approved as amended by the conditions required by this concurrence.

The proposed action shall be operated and completed as represented in the Coastal Zone Management (CZM) federal consistency determination. Significant changes to the subject proposal shall be submitted to the Bureau for review and approval and may require a full CZM federal consistency review, including publication of a public notice and provision for public review and comment. This condition is necessary to ensure that the proposed actions are implemented as reviewed for consistency with the enforceable policies of GCMP. Guam Land Use

GCMP FC No. 2020-0001
RE: Department of the Navy's proposed activities in Mariana Islands Training and Testing (MITT) Study Area Guam
Page 9 of 9

policies (E.O. 78-37), are the federally approved enforceable policies of GCMP that applies to this condition.

Please do not hesitate to contact Mr. Julian Janssen, Federal Consistency Coordinator at 475-9664 or email julian.janssen@bsp.guam.gov or Mr. Edwin Reyes, Coastal Program Administrator at 475-9672 or email edwin.reyes@bsp.guam.gov. *Si Yu'os Ma'åse'.*

Sincerely,

TYRONE TAITANO
Director

Attachments

Cc: NOAA-OCM
GEPA
GWA
DoAgr-DAWR
DLM
DPR-SHPO
DPW

OFFICE OF SENATOR SABINA FLORES PEREZ

I MINA'TRENTAI SINGKO NA LIHESLATURAN GUÅHAN
35TH GUAM LEGISLATURE

March 5, 2020

Tyrone Taitano
Director
Bureau of Statistics and Plans (BSP)
P.O. Box 2950
Hagåtña, Guam 96932

SUBJECT: Comments

Reference: Federal Consistency Review GCMP FC2020-0001 Memorandum and Consistency Determination for the Department of the Navy's proposed activities in Mariana Islands Training and Testing (MITT) Study Area

Håfa Adai Mr. Taitano,

After careful review, I find the Department of the Navy's GCMP application for Federal Consistency determination, referenced above, does not sufficiently and thoroughly address the cumulative impacts of the MITT, and other federal actions taken by the Department of Defense, to the integrity of our island's environmental and cultural resources; and to terrestrial and aquatic species and habits. Further, the referenced federal action is inconsistent with Government of Guam commitments to mitigating the effects of climate change, and our responsibility as environmental stewards of the land, air, and water.

I am therefore urging a review of the referenced federal action which, per 40 CFR § 1508.7, takes into consideration the incremental impacts of this federal action when added to other past, present, and reasonably foreseeable future actions taken by federal agencies operating in and around Guam.

The military buildup is one of the most pressing social, political, and environmental issues of our time; and its effects will undoubtedly be felt for decades. In making your determination, I ask that you consider the effects of the ongoing construction of the five live-fire training ranges at Northwest Field, which impact our sacred sites and irreplaceable natural and cultural resources.

RP 1. Air Quality
The Department of the Navy asserts, although most of the training and testing is offshore, where the Clean Air Act National Ambient Air Quality Standards do not apply, air quality of adjacent onshore areas may be impacted depending on the direction of the wind. The Department of the Navy states that "the reasonably foreseeable direct and indirect effect of military training and testing activities on Guam's air quality as a resource of the Guam coastal zone is an increase in air pollutants." The pollutants include regulated or hazardous chemicals derived from detonation of targets, expenditure of fuels that power various vessels, leaks of petroleum from mechanical devices, and use of flares, propellants, projectiles, explosives, and other devices. However, the

Department of the Navy argues that the impact would be minimal due to the distance of most of the activity from shore, "strong ventilation from regional meteorological conditions," and because testing and training activities will not occur simultaneously and continuously. The conclusion based on detailed stressor analysis in the MITT Draft Supplemental EIS that air pollution is minimal, intermittent and short-term does not adequately address cumulative impacts of repeated exposure of the population to criteria air or hazardous pollutants and the resulting health impacts. Moreover, the analysis does not adequately evaluate cascading and cumulative impacts of deposition of air pollutants on land, water, terrestrial and aquatic organisms, and the ecosystem as a whole. Further, my office urges that baseline health conditions of the population and the environment, pertaining to impacts of air pollution, are established at this time to adequately monitor future cumulative impacts.

Additionally, studies of proposed action at sites within the coastal zone of Guam outside of the non-attainment zone for sulfur dioxide and other criteria pollutants due to proposed activities were not addressed in the application. The methodology for determining *de minimus* needs to be clarified. I would highly recommend a determination based on bioaccumulation of pollutants as a means of determining cumulative impacts of air pollutants.

RP 2. Water Quality
This section lacks evidence to support the claim that impact would be in compliance with existing federal statutes and regulations in the context of Guam. The narrative provided focuses on limited studies conducted in non-jurisdictional locations that may or may not be applicable to local conditions. I recommend that local studies be conducted by different researches using different approaches and that results are shared for proper evaluation of the impacts to water quality.

RP 3. Fragile Areas
More than seventy-nine (79) ancestral and historic sites will be adversely impacted at or near *Litekyan*, fourteen (14) historic sites have already been destroyed, and eighteen (18) inadvertent discoveries of human remains have been found since 2018 in the course of the military buildup on Guam. Further, the construction of a fifth firing range requires the clearing of primary limestone forest that is habitat for at least eleven (11) endangered or threatened species, some of which are found nowhere else in the world—effectively jeopardizing the survival of these species.

RP 4. Living Marine Resources
The Department of the Navy lists stressors to marine mammals from the Proposed Action "include acoustic (sonar and other transducers, vessel noise, aircraft noise, weapons noise), explosives (in-water explosions), energy (in-water electromagnetic devices and high-energy lasers), physical disturbance and strike (vessels and in-water devices, military expended materials, seafloor devices), entanglement (wires and cables, decelerators/parachutes), ingestion (military expended materials - munitions, and military expended materials - other), and secondary (impacts on habitat, impacts on prey availability)" which will affect ESA-listed marine mammals. Despite recent studies indicating strandings of marine mammals in the Marians occurring within six (6) days of Navy sonar operations, the Department of the Navy concludes that "no mortalities" will occur from the Proposed Action. This is highly questionable, as is their assertion that the "maximum extent practicable" can sincerely provide protection for living marine resources in our waters.

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671.989.2968•office@senatorperez.org•

RP 7. Public Access

The Department of the Navy deems RP 7 "not applicable" to the Proposed Action. However, bearing in mind once more that such actions should be reviewed in context to cumulative impacts, I must object to this assertion and refer again to *Litekyan*, which is adjacent to the live-fire training ranges and designated as critical habitat for three protected species. The ranges, when fully operational, will limit public access to the area for up to 39 weeks of the year. As well, the Surface Danger Zone of the range extends beyond the land and up to five (5) miles from the shore, restricting access to the waters by Guam fishermen. With this in mind, I find the Department of the Navy's application insufficient.

With these comments in mind, I respectfully urge the Bureau of Statistics and Plans to review the Department of the Navy's GCMP application for Federal Consistency determination in context with the cumulative impacts of all past, present, and forseeable federal actions.

Sincerely,

Sabina F. Perez

Sabina F. Perez
Senator, 35th Guam Legislature

194 Hernan Cortes Avenue, Terlaje Professional Building, 1st Floor, *Hagåtña*, Guam 96910
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GUAM ENVIRONMENTAL PROTECTION AGENCY • *AHENSIAN PRUTEKSIÓN LINA'LA' GUÅHAN*
LOURDES A. LEON GUERRERO • GOVERNOR OF GUAM | JOSHUA F. TENORIO • LIEUTENANT GOVERNOR OF GUAM
WALTER S. LEON GUERRERO • ADMINISTRATOR | MICHELLE C. R. LASTIMOZA • DEPUTY ADMINISTRATOR

FEB 07 2020

MEMORANDUM

TO: Director, Bureau of Statistics and Plans (BSP)

FROM: Administrator

SUBJECT: Comments

Reference: Federal Consistency Review GCMP FC2020-0001 Memorandum and Consistency Determination for the Department of the Navy's proposed activities in Mariana Islands Training and Testing (MITT) Study Area

Hafa Adai Mr. Taitano,

The Guam Environmental Protection Agency has reviewed the Navy's GCMP application for Federal Consistency determination, referenced above, and provides the following comments:

RESOURCES POLICIES (RP):

RP 2. Water Quality

Reference is made to the comprehensive water quality impact analysis of the Proposed Action presented in Section 3.1 (Sediments and Water Quality) of the MITT Draft Supplemental EIS/OEIS. Additional supporting information regarding the water quality assessment is summarized in the application on pages 7-9. These cited research and case studies are used to demonstrate that the Proposed Action would be fully consistent with the GCMP enforceable policy to ensure safe drinking water and protection of aquatic recreation sites from uses and discharges that pose a pollution threat to Guam's waters, particularly in estuaries, reefs, and aquifer areas.

The Navy stated in its application that activities including the use of explosives and explosion byproducts, military materials with metal components, and chemicals other than explosives would occur in federally owned submerged land, or more than 3 NM off shore, thus outside of Guam's coastal zone. Impacted sediments and water quality would only be immediately adjacent to the munition, hence activities would have no significant effect on sediments and water quality within Guam's coastal zone. Furthermore, the Navy concluded that neither state nor federal standards or guidelines would be violated by the chemical, physical, or biological changes in sediment or water quality measureable at the detonation site. The Navy

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should provide a map delineating the Agat Bay and Piti underwater Mine Warfare detonation sites which it states are outside of Guam's coastal zone.

The Navy should continue to conduct water quality impact analysis to demonstrate that explosives and explosive byproducts, metals and other materials expended during training and testing described in the MITT Final Supplemental EIS/OEIS would not exceed regulatory thresholds and guidelines [Sediment chemical characterization methods in Guam Water Quality Standards (2017) and USEPA established criteria for concentrations of explosives, explosive byproducts and metal in saltwater] established for measuring impacts on sediment and water quality.

Guam EPA is concerned that there was no discussion of marine debris cleanup as a result of the MITT activities once completed. The MITT Final EIS/OEIS 2015 (p. 3.1-55) discusses other materials as follows: Other military expended materials include plastics, marine markers, flares, and chaff. Some expended plastics from training and testing activities are unavoidable because they are used in ordnance or targets. (Although plastics are resistant to degradation, they do gradually break down into smaller particles because of sunlight and mechanical wear (Law et al. 2010). Thompson et al. (2004) found that microscopic particles were common in marine sediments at 18 beaches around the United Kingdom. They noted that such particles were ingested by small filter and deposit feeders, with unknown effects.) Targets, however, would typically be recovered following training and testing activities. Chaff fibers are composed of nonreactive metals and glass, and would be dispersed by ocean currents as they float and slowly sink toward the bottom. The fine, neutrally buoyant chaff streamers would act like particulates in the water, temporarily increasing the turbidity of the ocean's surface. The chaff fibers would quickly disperse, and turbidity readings would return to normal.

Section 2 of the 2019 MITT Draft Supplemental EIS/OEIS describes the *annual* Proposed Action and Alternatives. However, the MITT has a five year term. Cumulative impacts of the Range activities, in terms of the number of Ordnances (or other expended items, if any) should be considered **over 5 years**, On-going versus Alternative 1 and Alternative 2. Tables 2.5-1 and 2.5-2 (beginning on page 2-26) compare the proposed SEIS/OEIS action alternatives (Alternative 1 and Alternative 2) with on-going training and testing activities. Each table describes the activities in terms of the activity name and where in the Study Area the Navy proposes to conduct it (first two columns). The next two columns show the **annual** occurrence and ordnance or other expended items (if any) involved in the activity as is currently ongoing (under the heading "2015 MITT EIS/OEIS Ongoing Activities".) The final two pairs of columns present the same information (**annual** occurrence and ordnance/items) as the activities are analyzed in the 2019 Supplemental EIS/OEIS for Alternative 1 and Alternative 2, respectively. As an example, page 2-33 has a Surface Warfare range activity located 12 NM from land. Ongoing activities list 242 events per year (1,210 over 5 years) and **48,040** small caliber rounds *annually* (or **240,200** small caliber rounds **over 5 years**). The number of rounds increases in the Alternative 1 & 2 scenarios to **128,400** small caliber rounds *annually* or **642,000 small caliber rounds over 5 years.** The narrative in Section 4.4.1, Sediment and Water Quality, concludes that proposed changes in training and testing activities under Alternative 1 or Alternative 2 would be *negligible*.

GUAM ENVIRONMENTAL PROTECTION AGENCY
1973

AHENSIAN PRUTEKSION LINA'LA GUÂHAN
LOURDES A. LEON GUERRERO, GOVERNOR OF GUAM • JOSHUA F. TENORIO, LIEUTENANT GOVERNOR OF GUAM
WALTER S. LEON GUERRERO, ADMINISTRATOR

MEMORANDUM

TO: The Honorable Lourdes A. Leon Guerrero, Maga'hågan Guhåhan

FROM: Acting Administrator, Guam EPA

SUBJECT: Agency's Comments to the 2019 Mariana Islands Training and Testing Supplemental EIS/OEIS (MITT).

Transmitted via hand delivery and email: tony.babauta@guam.gov

Hafa Adai Maga' Håga,

In response to the Governor's Circular (GC) #2019-018, requesting comments on the 2019 Mariana Islands Training and Testing Supplemental EIS/OEIS (MITT), below are the Agency's comments. Several comments pertain to the 2015 Mariana Islands Training and Testing EIS/OEIS (2015 MITT), as well as the 2019 MITT Supplemental, as we feel these issues have not been specifically addressed.

1. The Navy does a respectable job of notifying the local regulatory agencies of upcoming underwater Mine Detonation activities within Outer Apra Harbor and Agat Bay. But the public nor the regulatory agencies ever receive any form of feedback/after action reports on outcome of these activities. Specifically if any environmental damages occurred. Guam EPA request that some form of report be produce outlining these activities and highlight any issues regarding water quality, fish kills, protected species sightings, and marine debris be made available to the public and local agencies.

2. In the past, pre-coordination meetings on these activities were conducted with the local regulatory agencies. Guam EPA requests to make these meetings standard operating procedures, at a minimum of bi-annual basis.

3. At a minimum, a yearly report should be produced summarizing all activities identified in the MITT. There is no current mechanism to evaluate if the activities and quantities identified in the MITT are met or exceeded. Report should also address any impacts to stressor types.

4. Neither the 2015 MITT nor the 2019 Supplemental MITT have a discussion on the rational for an increase from a 10 lbs. underwater mine charge to the new standard of a 20 lbs. charge for the listed mine detonation activities. What is the justification for the increase? This needs to be further explained and justified.

5. In the 2015 MITT, page 3.1-18, Section 3.1.3, it states that Amphibious assaults and raids sediment plumes are temporary and since no military materials are expended, "…no further analysis of this

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Development and Operating Regulations, Part II: Guidelines for Water Works Development (22 GAR Chapter 7), and the Water and Wastewater Operator Certification Regulations (22 GAR Chapter 11

12. The 2019 MITT Supplemental states there have been no new information since the 2015 MITT, which identifies specific data gaps within the report about the environmental impact of previously used ammunition and/or the degradation products on the marine ecosystems in that area. There needs to be a discussion on this topic.

If you have any questions or concerns, please contact me directly by email at jesse.cruz@epa.guam.gov or by telephone at 671-300-4795.

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GUAM WATERWORKS AUTHORITY
"Better Water, Better Lives."
Gloria B. Aguon Public Service Building | Suite 200 688 Route 15, Mangilao, Guam 96913
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March 3, 2020

MEMORANDUM

To: Tyrone Taitano, Director, Bureau of Statistics and Plans (BSP)

From: Paul Kemp, Assistant Manager, Compliance and Safety

Subject: Federal Consistency Review: Department of the navy Proposed Activities in the Mariana Islands Training and Testing (MITT) Study Area GCMP FC- 2020-001

Håfa Adai,

The Guam Waterworks Authority has reviewed the 2019 Draft Mariana Islands Training and Testing (MITT) Supplemental Environmental Impact Statement/Overseas Environmental Impact Statement. The GWA reviews proposed planned military activity to ensure protection of the Northern Guam Lens Aquifer and wastewater discharge into Guam's waters.

Land based training located on Guam was covered under the 2015 MITT Final EIS/OEIS under the existing Mariana Island Range Complex (MIRC). This Supplemental EIS/OEIS considers activities conducted at sea and on Farallon de Medinilla (FDM). This supplemental EIS/OEIS incorporated new models, information, data and science as required by the Council on Environmental Quality Regulations. However, there are no changes made to land based activities proposed on Guam. The analysis on impacts on sedimentation and water quality are assessed for activities that will impact water quality off shore and not impacts to the Northern Guam Aquifer.

The proposed activities listed in this draft MITT Supplemental EIS/OEIS will not have an impact to the ability for GWA to provide safe drinking water to its customers and ensure that wastewater discharge is conducted in appropriate manner.

Sincerely,

Paul Kemp
Assistant General Manager – Compliance and Safety

Julian Janssen <julian.janssen@bsp.guam.gov>

MITT

Aguon Celestino F. <tinoaguon@gmail.com> Thu, Mar 5, 2020 at 6:01 AM
To: Julian Janssen <julian.janssen@bsp.guam.gov>
Cc: "Jay T. Gutierrez" <Jay.Gutierrez@doag.guam.gov>

Here is the document we had submitted in 2013. Just in case time runs out I included the draft-document.

Tino

2 attachments

MITT-2019.docx
73K

NewCoverltr-MITT.docx
137K

DOD March 2019

Re: Marianas Island Training and Technology- Comments

Hafa Adai,

The Division of Aquatic and Wildlife Resources has reviewed the proposed Marianas Island Training and Technology and provides the following comments:

1. The Draft Environmental Impact Statement (EIS) for the Marinas Islands Military Testing and Training (MITT) was released and available for public comment.

2. Please be aware that the island and its surrounding marine environment is inhabited by Endangered species of whales and dolphins, and any military activity should be aware of their presence.

3. The action should consider the impact to the marine mammals near Guam. The Division has recorded stranding's of these animals, and should take all precautions not to impact them

DRAFT

March 4,2020

DOD, Ms. Nora Macariola
Naval Facilities Engineering Command, Pacific 258 Makalapa Drive, Suite 100
Pearl Harbor, Hawaii 96860-3134.
Attn: MIIT EIS/OEIS Project Manager Email: Marianas. tap.eis@navy.mil

Subject: Comments on the Supplemental Draft Overseas Environmental Impact Statement/Overseas Environmental Impact Statement for the Mariana Islands Training and Testing Activities

Hafa Adai:

The Draft Environmental Impact Statement/Overseas Environmental Impact Statement for the Mariana Islands Military Testing and Training (MIITT DEIS) Volume I and II were released for public review September 13, 2013. The Guam Department of Agriculture, Division of Aquatic and Wildlife Resources requested and received a hard copy of the MIITT DEIS for review pursuant to the National Environmental Policy Act of 1969 [42 U.S.C. 4321 *et seq.;* 83 Stat.852] (NEPA) on November 12, 2013.

The initial action was discontinued. A subsequent was published, and a public hearing was held at the University of Guam's School of Business and Public Administration, Leon Guerero Building, on march 19, 2019, from 5pm-10pm. Public comments were accepted, and DAWR staff attended the meeting.

The proposed action by the US Department of the Navy (DON) includes reevaluation and reauthorization of the training and testing activities reviewed in the Marianas Islands Range Complex (MJRC) in May 2010, with an expansion of the study area to include high seas and transit corridors not previously approved, as well as adjustments to locations and tempo of training and testing activities. The actions are proposed to achieve and maintain military readiness, to support and to conduct current, emerging, and future training and Research, Development, Test and Evaluation activities, while enhancing training resources through investment in Guam and the Commonwealth of the Northern Marianas Islands. The draft MIIT DEIS commit sat-sea and land-based training areas on Guam and CNMI, as well as transit corridors between Guam and CNMI.

As the local state agency mandated to monitor and protect Guam's biological resources, the Guam Department of Agriculture (Dog) submits the following general comments to be addressed in the development of the MITT Final Environmental Impact Statement and Record of Decision. In addition, we have included comments in table form referencing specific document pages (see attachment).

1. First and foremost, DOD needs to provide a progressive, comprehensive plan for the recovery of native species on DOD property in consultation and coordination with DoAg. Without the ability to reintroduce federally endangered species on DOD property the cumulative impacts of DOD actions are jeopardizing the DoAg's ability to recover Guam's native species. Furthermore, DOD's failure to coordinate with DoAg as required by the Sikes Act of 1960 [16 U.S.C. *et seq.;* 74 stat. 1052], as amended, and recognize the DoAg's ability to assist DOD in meeting their Section 7 requirements under the Endangered Species Act of 1973 [16 U.S.C. 1531 *et seq.:* 87 Stat. 884], as amended, results in a waste of taxpayers' dollars. The DoAg further emphasizes the need to be consulted and notified in matters that may impact the natural resources of Guam.

2. Secondly, the Final EIS needs to outline how DON will address long-standing issues regarding timely access for the DoAg Division of Aquatic and Wildlife Resources (DAWR) staff to all DOD lands to monitor and manage Guam's natural resources. The DOAg-DAWR staff could complete monitoring of resources under annual federal funded grant objectives, without cost, or at a much lower cost to DON that is currently being contracted and assist with meeting Sikes Act coordination obligations. The current access requirements for DoAg-DA WR staff are cumbersome and prevent timely coordination as opposed to those procedures for federal employees and contractors.

3. All Navy contractors should communicate with the Division in regards to sensitive areas, resource-wise.

4. The Final MITT DEIS needs to address another long-standing issue that is DOD's failure to comply with local laws. The MITT activities and study area include the Piti Marine Preserve Area that extends to the 600-foot contour. Any take of non-pelagic fishes within this area is a violation of Guam law.

5. The Final MITT DEIS must mitigate the cumulative impacts to recreational fishing in the oceanic areas that will be impacted by the proposed action. The NEPA documents for other proposed military activities indicate the closure of important fishing areas such as Ritidian and Pati Point. The additional loss of key recreational fishing areas proposed in the Draft MITT EIA is unacceptable.

6. Other boaters, including divers and other recreational users, also frequent many areas within the MITT study area. There is no clear indication of how extensive closures will be -do events last for an hour, or a day, or a week? The Final EIS and ROD need to minimize closure of areas regularly used by recreational boaters and identify clearly the space and time of the closures.

DoAg Comments on Draft MITT F2019 OEIS

Page 2

7. When notices to mariners is sent out, DOD should insure that notices are sent out to all media source outlets, to inform the public of Surface-Danger –Zone activities as the actions are implemented. Prior to training exercises, the DON and USCG issue NOTMARs and NOTAMs to announce an exercise and to notify the public of potential hazards in the exercise area. DON must ensure these notices are adequately distributed to the public and with a much larger area proposed in the MITT distribution must be assessed for adequacy.

8. The ROD must clearly indicate how the Micronesia Biosecurity Plan will be implemented, including funding mechanisms, to prevent the spread of invasive alien species (IAS) throughout the region. For example, I 00% inspection rates for brown tree-snake (BTS) at ports of exit from Guam and entry points to other regional areas are necessary to ensure BTS does not impact bird, bat and lizard populations on other islands. These populations are necessary for the recovery of Guam's native ecosystem.

9.

DoAg Comments on Draft MITT F2019 OEIS

Page 2

10. Although there are currently BTS inspections of cargo and vessels from Guam, there is a potential for the system to be overwhelmed by the increase in tempo of activities. The MITT DEIS also needs to be mindful of other IAS that Guam could infect CNMI with that would be devastating to endangered wildlife and Its habitats, i.e., little fire ant and coconut rhinoceros beetle.

11. Consistent monitoring of behavior and distribution of Mariana fruit bat/island swiftlet/common moorhen/megapode (and other terrestrial species of regional concern) must be conducted prior to and after MITT related activities in-order-to evaluate the impact of activities, particularly on species of greatest conservation need. Appropriate measures must be incorporated to reduce impacts to terrestrial species, as well as measures to avoid impacting species that aggregate when feeding in open water ocean. Impacts to aggregations of individuals in the expanded areas of MIIT activities may impact species on a population level.

12. The assessment of potential effects to marine animals and habitat from underwater demolition needs more clarified and analyzed. The habitat mapping needs to be more detailed, the Cetacean species that utilize the area proposed for the MITT need to be identified, as well as the impacts such activity will have on these species. The analysis also needs to include the impacts to sea turtles. The presence of ESA-listed sperm whales is well documented within three to five miles offshore in the Agat area. Effects to this species and the m itigation for these actions are not addressed in the MITT DEIS. The increased boat activity greatly increases the potential for boat strike of sperm whales. Navy lookouts undergo extensive training in order o qualify as a watch stander. It seems the use of these watch standers been how successful & should be measured.

I0. DoAg is concerned about the impact of landing craft exercises on the dolphins that reside in Agat Bay. The DON contended unavoidable impacts. The Navy recognizes the common occurrence of spinner dolphins within Agat Bay and has developed mitigation measures in consultation with NMFS under provisions of the MMPA. Beachmasters are shore-based observers with binoculars whose sole purpose is to ensure safety of craft including avoidance of marine and terrestrial animals. Beachmasters were to work with environmental monitors and the natural resource managers. These measures have been utilized - how successful have they been and how has that success been measured?

The MITT DEIS must address impacts to the existing community of resource users and the need to mitigate economic impacts by avoiding near shore populations and their habitats. The training activities themselves present additional challenges that may alter

Lourdes A. Leon Guerrero
Governor
Joshua F. Tenorio
Lt. Governor

Department of Parks and Recreation
Dipattamentoti Plaset yan Dibuetsion
Government of Guam
Director's Office, Parks and Recreation Divisions
#1 Paseo de Susana, Hagåtña, Guam 96910
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(671) 475-6294/6355; Facsimile (671) 477-2822

Jesse G. Garcia
Acting Director
Victor R. Villagomez
Acting Deputy Director

In reply refer to:
RC2020-0361

February 27, 2020

MEMORANDUM

To: Director, Bureau of Statistics and Plans

From: Acting Director, Department of Parks and Recreation

Subject: Federal Consistency Review: Department of the Navy Proposed Activities in the Mariana Islands Training and Testing (MITT) Study Area GCMP FC2020-0001

Dear Mr. Taitano,

We have reviewed the subject Federal Consistency Application for the Department of the Navy proposed activities in the Mariana Islands Training and Testing (MITT) Study Area and have the following comments:

1. In response to your request we reviewed the enforceable policies pursuant to the Executive Order 78-37, Guam Land Use Policies. We are currently working to assess and mitigate any adverse effects to historic properties with the Department of the Navy (DoN).

2. We have had Section 106 consultations with the DoN, expressing our concerns with regards to the project's potential to affect historic and archaeological sites within the project's areas of potential effect (APE). At this time, we are working off of a 2009 Programmatic Agreement (PA) extension, while the affects to historic properties are being assessed by the DoN. We are working to have a new PA that will address any and all adverse effects to historic properties within the near future.

Based on the aforementioned, we have not completed our consultation on the affects to historic properties and, therefore, we cannot agree with a Federal Consistency Determination for the subject undertaking.

Should you have any questions with regards to our comments, please contact Mr. John Mark Joseph, State Archaeologist, at 475-6339.

Sincerely,

Jesse G. Garcia
PL

Cc: Julian Janssen, Federal Consistency Coordinator
Julian.janssen@bsp.guam.gov

C.3 ENDANGERED SPECIES ACT CONSULTATION

C.3.1 NAVY REQUEST LETTER FOR FORMAL CONSULTATION WITH NATIONAL MARINE FISHERIES SERVICE

DEPARTMENT OF THE NAVY
COMMANDER
UNITED STATES PACIFIC FLEET
250 MAKALAPA DRIVE
PEARL HARBOR, HAWAII 96860-3131

IN REPLY REFER TO:
5090
Ser N465/0703
18 June 2019

Director, Office of Protected Resources
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
B-SSMC3, Room 13821
1315 East-West Highway
Silver Spring, MD 20910-3282

Dear Director:

SUBJECT: REQUEST FOR INITIATION OF ENDANGERED SPECIES ACT SECTION 7 FORMAL CONSULTATION FOR COMMANDER, UNITED STATES PACIFIC FLEET TRAINING AND TESTING ACTIVITIES

In accordance with section 7 of the Endangered Species Act (ESA), the U.S. Navy requests initiation of formal consultation on the Mariana Islands Training and Testing (MITT) activities occurring within the Pacific Ocean in the surrounding waters of the Mariana Islands.

The proposed action may affect listed species that reside within the MITT Study Area by exposing them to sound and other environmental stressors associated with training and testing activities. The enclosed Biological Assessment (BA) is the Navy's primary document that provides the required information pursuant to 50 C.F.R. §402.12(f). The U.S. Navy is requesting formal consultation on Alternative 2 within the MITT Draft Supplemental Environmental Impact Statement/ Environmental Impact Statement (EIS/OEIS).

The Navy is requesting formal consultation on ESA-listed species including the blue whale (*Balaenoptera musculus*), fin whale (*Balaenoptera physalus*), humpback whale (*Megaptera novaeangliae*) from the Western North Pacific Distinct Population Segment (DPS), sei whale (*Balaenoptera borealis*), sperm whale (*Physeter macrocephalus*), green sea turtle (*Chelonia mydas*) from the Central West Pacific DPS, East Indian-West Pacific DPS, and North Central Pacific DPS, hawksbill sea turtle (*Eretmochelys imbricata*), leatherback sea turtle (*Dermochelys coriacea*), loggerhead sea turtle (*Caretta caretta*), olive ridley sea turtle (*Lepidochelys olivacea*), giant manta ray (*Manta birostris*), oceanic whitetip shark (*Carcharhinus longimanus*), scalloped hammerhead shark (*Sphyrna lewini*) from the Indo-West Pacific DPS, and three coral species *Acropora globiceps*, *Acropora retusa*, *Seriatopora aculeata* (no common name).

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18 June 2019

The Navy also seeks concurrence on our high-energy laser No Effect determinations for coral, giant manta rays, oceanic whitetip sharks, and hammerhead sharks.

High-energy lasers are a new testing activity not analyzed in previous consultations between the Navy and National Marine Fisheries Service (NMFS) within the MITT Study Area. High-energy laser weapons are designed to disable surface targets, rendering them immobile. These laser systems are extremely unlikely to strike the water directly, since that is not an aimpoint for the system. Even though the probability is very low, if there is a target miss by the laser, a laser beam would typically intersect the water surface in the 200 m (219 yds) to 6.5 km (3.5 NM) range or more. At these ranges, the low angles to the water will reflect most of the laser energy. The little remaining laser energy after reflection that might enter the water would do so at much lower power levels, reaching eye-safe levels within 0.3 m (12 in) of the surface at 200 m (219 yds) and within 0.18 m (7 in) at 1 km (0.5 NM). Unlike marine mammals and sea turtles that surface to breath, ESA-listed fish would normally be found at depths greater than 7-12 inches over most of their distribution.

There are additional layered safeguards on these systems that further reduce the probability of a water strike. First, the system will only fire when the operator pulls the trigger. Second, the system has provisions that only permit firing when locked onto a target and automatically interrupts firing if the target track is lost. This gives the operator time to reacquire the target lock before firing again. Third, the operator is also trained to stop firing when the laser aim point moves off the selected target in the event the automated system does not turn the laser off first. Even if at the water surface, such as when a shark's dorsal fin is above water, the depth of a given shark's body would still mean eyes and other sensitive organs would be deeper than 7-12 inches. Given these high-energy laser procedural measures and technological characteristics, the low probability of laser energy accidentally hitting the water surface, the low power of a laser if it did hit the water and limited penetration depth, effects on ESA-listed fish species are not expected to occur.

The Navy also seeks concurrence on our simulant No Effect determinations for all species. Simulants are another new testing activity not analyzed in previous consultations between the Navy and NMFS within the MITT Study Area.

The Navy uses compounds, referred to as simulants, as substitutes for chemical and biological warfare agents to test equipment intended to detect their presence. Simulants must have one or more characteristics of a real chemical or biological agent-size, density, or aerosol behavior to effectively mimic the agent, but must also pose a minimal risk to health and the environment in order to be used safely in outdoor tests. They are relatively benign compounds (e.g., oil of wintergreen) that disperse as an aerosol and are expected to dissipate before hitting the water. Exposure levels during testing activities would be well below concentrations associated with any adverse health or environmental effects. The degradation products of simulants used during testing would also be harmless. Given these characteristics of simulants used during testing activities, no effects are expected on any ESA-listed species.

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Analysis supporting the application is contained within the BA. Due to the large file size and page count of the MITT BA (>750 pages), the Navy will be electronically submitting the BA directly to the appropriate NMFS staff.

Please extend my thanks to your staff for their continued support of the U.S. Navy's compliance process. My point of contact for these matters is Mr. Chip Johnson at 619-767-1567 or chip.johnson@navy.mil

Sincerely,

D. A. McNAIR
Director, Environmental Readiness Division
By Direction of the Commander

Enclosure: Mariana Islands Training and Testing Biological Assessment

Copy to: Ms. Kris Peterson, NMFS Office of Protected Resources, F/PR5

C.4 Essential Fish Habitat Assessment

C.4.1 Navy Essential Fish Habitat Assessment Submission Transmittal Letter to National Marine Fisheries Service

DEPARTMENT OF THE NAVY
COMMANDER
UNITED STATES PACIFIC FLEET
250 MAKALAPA DRIVE
PEARL HARBOR, HAWAII 96860-3131

IN REPLY REFER TO:
5090
Ser N465/1397
21 November 2019

Assistant Regional Administrator, Habitat Conservation Division
Pacific Islands Regional Office, National Marine Fisheries Service
1845 Wasp Boulevard, Building 176
Honolulu, HI 96818-5007

Dear Director:

SUBJECT: SUBMISSION OF 2019 NAVY SUPPLEMENTAL ESSENTIAL FISH HABITAT ASSESSMENT IN SUPPORT OF THE MARIANA ISLANDS TRAINING AND TESTING SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT/ OVERSEAS ENVIRONMENTAL IMPACT STATEMENT

This letter provides the Pacific Islands Regional Office (PIRO) of the National Marine Fisheries Service with supplemental information for the U.S. Navy's continuing training and testing activities previously analyzed in the 2015 Mariana Islands Training and Testing (MITT) Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS).

In support of the 2015 EIS/OEIS, the Navy also prepared an Essential Fish Habitat Assessment (EFHA) in May 2014 analyzing potential impacts of Navy activities on designated EFH within the MITT Study Area in accordance with the Magnuson-Stevens Fisheries Conservation and Management Act of 1976, Public Law 94-265 as amended through January 12, 2007, section 305(b)(2) and 50 C.F.R 600. The 2015 EIS/OEIS and associated EFHA was subject to PIRO EFH consultation concluding in August 2014.

The U.S. Navy prepared a draft supplemental MITT EIS/OEIS using new information available after the release of the 2015 EIS/OEIS to cover similar activities from November 2020 and into the reasonably foreseeable future (https://mitt-eis.com). With few exceptions, there are no substantive changes to activities and their impacts, to the geographic extent of these activities, or to designated EFH areas in the MITT Study Area that would alter the conclusion from the 2014 EFHA or affect the basis for PIRO's previous EFH Conservation Recommendations.

The U.S. Navy requests reinitiation of a MITT supplemental EFH consultation pursuant to 50 C.F.R. 600.920(a)(1) to address only the changes in proposed activities that may adversely affect EFH as well as any new information that affects the basis for NMFS EFH Conservation Recommendations. A new supplemental EHFA has been prepared to support this request (Enclosure 1).

5090
Ser N465/1397
21 November 2019

Please extend my thanks to your staff for their continued support of the U.S. Navy's environmental stewardship and compliance process. If you need additional information or have questions, my point of contact is Mr. Chip Johnson (619-767-1567 or chip.johnson@navy.mil).

Sincerely,

D. A. McNAIR
Director, Environmental Readiness Division
By Direction of the Commander

Enclosures: 1. MITT Supplemental EFHA, October 2019
2. MITT EFHA, May 2014

Copy to: (w/enclosures)
Mr. Steve McKagan, Commonwealth of the Northern Mariana Islands Field Office
Dr. Kelly Ebert, Chief of Naval Operations (N454)

C.4.2 National Marine Fisheries Service Essential Fish Habitat Assessment Recommendation Letter

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
national marine fisheries service
Pacific Islands Regional Office
1845 Wasp Blvd., Bldg 176
Honolulu, Hawaii 96818
(808) 725-5000 · Fax: (808) 725-5215

Mr. D. A. McNair
Director, Environmental Readiness
Department of the Navy
United States Pacific Fleet
250 Makalapa Drive
Pearl Harbor, HI 96860-3131

December 19, 2019

Dear Mr. McNair:

The National Marine Fisheries Service, Pacific Islands Regional Office (NMFS), received a request from your staff at the Commander, U.S. Pacific Fleet (hereafter, Navy) to complete a supplemental essential fish habitat (EFH) consultation for updates to the Mariana Islands Training and Testing (MITT) Environmental Impact Statement (EIS)/Overseas EIS (OEIS). The scope of the supplemental consultation includes aspects of the proposed activities that have changed since the 2014 EFH consultation was completed, and incorporation of any new scientific information that changes the basis of prior conservation recommendations. The Navy requested that the consultation be completed by December 21, 2019, and NMFS appreciates this opportunity to coordinate with the Navy and provide revised conservation recommendations pursuant to the Magnuson-Stevens Fisheries Conservation and Management Act (Magnuson-Stevens Act), Section 305 (b) (2) and 50 C.F.R 600.920.

Overview

In order to streamline the MITT supplemental EFH consultation, all supporting materials and analysis from the 2014 consultation are incorporated by reference 50 CFR 600.920(e)(5). Project activities and methods are superseded only where new information has been provided by the Navy; however, NMFS will consider sources of scientific information that may be new. The ten conservation recommendations from 2014 still apply, and will be revised only where these new sources of supplemental information change the basis for NMFS determination.

Essential Fish Habitat

The marine water column from the surface to a depth of 1,000 m from shoreline to the outer boundary of the Exclusive Economic Zone (5,150 kilometers/200 nautical miles/230 miles), and the seafloor from the shoreline out to a depth of 400 m around each of the Mariana Islands, have been designated as EFH. As such, the water column and bottom and all surrounding waters and submerged lands within the Mariana's Archipelago are designated as EFH and support various life stages for the management unit species (MUS) identified under the Western Pacific Regional Fishery Management Council's, Pelagic and Mariana Archipelago Fishery Ecosystem Plans (hereafter, Mariana FEP). The MUS and life stages found specifically within the Mariana's Archipelago include eggs, larvae, juveniles, and adults for Bottomfish and Pelagic MUS. Habitat Areas of Particular Concern (HAPCs) only occur for these MUS within the Marianas. Specific types of habitat considered as EFH include coral reef, patch reefs, hard substrate, artificial substrate, seagrass beds, soft substrate, mangrove, lagoon, estuarine, surge zone, deep-slope terraces and pelagic/open ocean.

Ecological Roles

The principal benthic organisms provide ecological services (e.g., water filtration and maintaining balanced nutrient concentrations) and provide physical habitat at both micro- and macro-scales. At a micro scale, the shape of benthic organisms change water movement, which can influence the settlement (McDougall 1943) and behavior of larvae and the availability of planktonic prey (Williams 1964). Sessile organisms provide refuge from predators, particularly for larvae and small sized species (Russ 1980; Sutherland 1974). Sessile organisms provide new ecological niches increasing species diversity. At a macro-scale, corals are the primary habitat builders in the coral reef ecosystem that benefit juvenile, sub-adult, and adult life stages of the MUS that utilize this designated EFH. The morphology, shape, and composite features of benthic organisms can also influence feeding strategies of these MUS.

NMFS Concerns

Adverse Effect Determinations

This EFH supplemental consultation incorporates by reference all information previously provided from previous phases of MITT activities, except were new information has been provided. In addition, all previous determinations and conservations recommendations apply except where explicitly amended. NMFS has determined that the activities described within the Supplemental MITT EFHA may result in adverse effects to EFH, and has provided seven new conservation recommendations to help avoid, minimize, offset for, or otherwise mitigate potential impacts.

NMFS categorizes adverse effect types in four categories: temporary, short-term, long-term, and permanent. The severity is measured by intensity and spatial extent of the stressor, while the adverse effect type is based on the recovery rate from the impact and the pervasiveness of the impact at the

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ecological scale. Standard EFH effects analysis normally will use the most sensitive and hard-to-replace EFH resources based on the recovery time back to the baseline or the highest following stable state likely. Considering recruitment and growth rates of impacted fauna, oceanographic and geomorphologic features, and anticipated future conditions, living EFH resources which are altered or lost can be quantified as a debt. Non-living resources can also be adversely affected and lost, such as removal or impairment of feature to serve as shelter. These types of effects tend to be permanent.

The threshold for what effects are considered adverse to EFH is highly variable among the hundreds of species managed by the Western Pacific Fishery Management Council and NMFS. For example, multiple species included in each of the MUS in all FEPs have strong associations with the water column, especially the water surface in their egg and larval life stages. Those species typically have eggs that float very close to the surface (buoyant) and/or become planktonic as larvae. Therefore, physical disturbance of the surface (e.g., boat propeller churning) may be an adverse effect to the water column, which may reduce the fecundity of both MUS, their prey, and habitat forming organisms (e.g., coral). Both power generation studies (Schlezinger et al., 2013) and those that investigate the impacts of boating on zooplankton (Bickel et al., 2011) provide useful proxies in this respect. However, the severity of those potential adverse effects are dependent upon many factors that are complex to predict, including but not limited to: the reproductive cycles of a diverse assemblage of organisms potentially affected, oceanographic conditions (e.g., tides, prevailing currents, nearshore eddies), and the frequency of and forces generated by the vessels being operated.

The Navy provided a summary table of adverse effects determinations within the supplemental EFHA that are inconsistent with the definition of adverse effect in the Magnuson-Stevens Act (50 C.F.R. § 600.810). NMFS does not agree with the 'no effect' determinations made for acoustic, explosive, or physical disturbance and strike stressors. Below we list select stressors from Table 5-1 of the supplemental EFHA, followed by a description of how these stressors may impart temporary, short-term, long-term, permanent, and cumulative adverse effects on EFH (see *EFH Stressors* section below). My staff is willing to investigate more specific descriptions of adverse effects determinations for the stressors summarized in this document, if the Navy initiates an expanded EFH consultation.

Acoustic

The Navy lists sonar, vessel noise, and weapons noise as acoustic stressors. The Navy uses sonar (underwater sound) to navigate, communicate, or detect underwater objects. Active sonar emits sound waves which reflect off objects and returns to the receiver whereas passive sonar uses listening equipment to pick up underwater sounds (MITT EFH Assessment 2014). Vessels will be used for the majority of all proposed activities. Noise will be discharged from vessel engines during maneuvers and staging. Vessel noise can adversely affect fish and coral recruitment (see below). The use of sonar and weapons noise may result in temporary acoustic impacts to water column EFH, as it will alter the natural soundscape affecting the quality of water column EFH.

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Explosives

Underwater explosive and other impulsive activities include ordnance and munitions such as projectiles, missiles, bombs, and other munitions (e.g. demolition charges). Explosives detonated near the surface would result in a shock wave and recurring pressure waves in the water column Although most explosives would be at or below the water surface, charges associated with mine neutralization could occur near the ocean bottom. Temporary physical and acoustic effects to water column EFH will occur from explosives detonated near the surface. Explosives detonated near the bottom may result in physical impacts to benthic communities, increase in turbidity (through disturbance of seafloor), and increase in acoustic impact. Physical impacts to soft bottom will be short-term, including an increase in turbidity, whereas physical impact changes to hard bottom will be permanent. Temporary effects to fish may be change in fish behavior or distribution, and permanent effects may be fish mortality.

Physical Disturbance and Strike

The Navy includes vessel movement, in-water devices, military expended materials, seafloor devices, and personnel disturbance as stressors under this category. Vessels are used in nearly all training and testing activities and include multiple types of vessels such as aircraft carriers, surface combatant, amphibious warfare ships, support crafts, and submarines Vessels that approach the shore or beach such as amphibious vessels could cause physical effects to benthic communities; physical impacts to soft-bottom will be short-term, including an increase in turbidity, whereas physical impact changes to hard bottom will be permanent. In 2017 a French Navy vessel grounded at Jade Shoals on Guam during military exercises and damaged the reef, highlighting the need for a funded vessel grounding response plan to ensure quick removal of the vessel, documentation of damages and offset of any permanent loss.

Military expended materials include: non-explosive practice munitions, fragments from high explosive munitions; and expended materials other than ordnance, such as sonobuoys, ship hulls, expendable targets and aircraft stores (fuel tanks, carriages, dispensers, racks, carriages or similar types of support systems on aircraft which could be expended or recovered Materials that are not recovered will result in marine debris that will either sink to the bottom or float and be transported by wind and ocean currents. Debris that sinks will result in permanent physical impacts to benthic habitat. Although ingestion rates are lower than sea turtles and marine mammals, ingestion of marine debris has been documented in approximately 40 fish species (CBD 2012).

Seafloor devices are items that are deployed onto the seafloor and may later be recovered, including moored mine shapes, anchors, bottom placed instruments, and robotic vehicles referred to as "crawlers." Seafloor devices are either stationary or move very slowly along the bottom Physical impacts to soft bottom will be short-term, including an increase in turbidity, whereas physical impact changes to hard bottom will be permanent.

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Energy
Electromagnetic devices use magnetic influence in activities such as mine neutralization and mine countermeasure activities. The majority of the activities include towed or unmanned mine warfare systems that mimic the electromagnetic signature of a passing vessel which may result in temporary behavioral effects to susceptible fish and invertebrates.

EFH Stressors

The proposed MITT activities may result in adverse effects to EFH including physical impacts to benthic communities, enhanced sedimentation and turbidity, enhanced chemical contaminants, increase in acoustic and energy impacts, and introduction and propagation of invasive species. Any proposed activity that occurs within designated EFH may cause the following adverse effects, described generally in this section. The extent and severity of individual stressors will be highly variable across the spectrum of MITT activities, and the adverse effects may not be consistent from year to year even though the activities remain the same, due to external factors (i.e., climate change).

Physical Impacts to Benthic Communities – Physical damage to coral or coral reefs is often associated with the breaking of colonies or in the form of abrasion. The amount of damage is dependent on many factors, but is mostly due to the nature of the physical force and the types of corals being impacted (Storlazzi *et al.* 2005, Shimabukuro 2014). Corals, which are primarily responsible for the structural complexity of coral reefs, are particularly vulnerable to physical damage because their slow-growing carbonate skeleton is relatively brittle and their polyps are easily damaged. In general, lobate, encrusting, and other massive colony morphologies tend to withstand breakage better than foliose, table, plating, and branching morphologies; more fragile forms tend to have higher growth rates (Rützler 2001). Reduction of topographic complexity in the habitats of the coral reef ecosystem reduces biodiversity and productivity (Alvarez-Filip et al. 2009). In 2017, a MITT-related vessel grounding occurred in the nearshore coral reef ecosystem of Guam, resulting in the long-term to permanent loss of coral ecosystem services and function due to the absence of contingency/response planning and sufficient offset.

NMFS has reviewed the Navy's approach to managing the risk from physical impacts to EFH, including corals, associated with explosive stressors, vessel movements, and personnel disturbance. NMFS agrees that the proposed BMPs will help to avoid and minimize some impacts. However, NMFS still has concerns regarding the proposed increased usage and the lack of updated benthic mapping and surveys at the Guam UNDET site. We are also concerned about the ability of personnel and small boats to consistently remain within designated approach pathways during beach assault training activities. We also see a need to formalize planning and funding for response, assessment, and mitigation following potential vessel grounding events. In addition to direct physical damage from a grounding, these events break down the reef into rubble, which then becomes a long-term scouring hazard with the potential to induce further physical damage to corals due to wave action.

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Increase in Sedimentation and Turbidity – Suspended sediment can elicit short- and long-term responses from aquatic organisms depending on the quantity, quality, and duration of suspended sediment exposure (Kjelland et al. 2015, Philipp and Fabricius 2003). Coral reef organisms are easily smothered by sediment (Golbuu et al. 2003), and rates >100 milligrams/centimeter^2/day can kill exposed coral tissue within a few days (Riegl and Branch 1995), although corals show considerable interspecific variability. Sedimentation can also reduce photosynthetic rates (Philipp and Fabricius 2003), disrupt polyp gas exchange, inhibit nutrient acquisition (Richmond 1996), cause tissue damage (Rogers, 1990), reduce recruitment success (Gilmour 1999) and increase metabolic costs due to enhanced mucus production (Telesnicki and Goldberg 1995).

NMFS has reviewed the Navy's approach to managing the risk from sediment and turbidity to EFH, including corals. We remain particularly concerned about these stressors at the Guam UNDET site due to the proposed increase in tempo and usage in the nearshore ecosystem, where there is a lack of updated benthic habitat mapping and coral reef surveys. Due to uncertainty from the lack of recent, quantitative resource survey assessment and geomorphologic information, NMFS must assume that enhanced sedimentation and turbidity will result in potential mortality and the degradation in the condition of corals present. New surveys and updated benthic habitat maps may help to alleviate these concerns.

Increase in Noise – Noise has a broad range of potential effects, especially when it is very loud and has high amplitude (Casper *et al.* 2016), or when it is less intense but long-lasting (Popper and Hastings 2009). Behavioral changes can occur, resulting in animals leaving feeding or reproduction grounds (Slabbekoorn et al., 2012) or becoming more susceptible to mortality through decreased predator-avoidance responses (Simpson et al., 2016). Less intense but chronic noise can cause a general increase in background noise over a large area. Chronic noise will not likely result in mortality, but may mask biologically important sounds and alter the natural soundscape, cause hearing loss, and/or have an adverse effect on an organism's stress levels and immune system (Minton 2017). Masking of the normal reef sounds by artificial sounds may have an impact on species abundances and numbers on coral reefs. Research has shown that larvae of several reef fish families preferentially select traps emitting high frequency sounds over traps emitting sounds similar in frequency to normal background frequencies (Simpson *et al.* 2008). Studies on an invertebrate species has shown that chronic exposure to noise may lead to increased metabolic rates, causing a reduction in growth and reproduction (Lagardère 1982). Recent advances in passive acoustic technology and analysis indicates that coral reef larvae are using lower frequency sounds such as those made by grunting fishes. These daily sounds are primarily produced at night and during dusk and dawn. However, these types of sounds are produced most abundantly during spawning. Corals exposed to enhanced anthropogenic noise, including that from vessel engines, will have disrupted settlement of their planulae (Lecchini et al. 2018).

NMFS disagrees with the Navy's conclusion that noise generated as part of MITT activities will have no effect on EFH. There are reasonable avoidance and minimization measures that can be

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implemented to reduce adverse effects to coral, bottomfish life history stages, and organisms that serve as prey-base for bottomfish. Some of these measures include establishing avoidance/buffer zones and turning off vessel engines (particularly small vessels in nearshore ecosystems) and sonar when not needed.

Invasive Species – Introduced species are organisms that have been moved, intentionally or unintentionally, into areas where they do not naturally occur. Species can be introduced to new biogeographies, typically via transport on vessel hulls or in ballast water, such as those that may be used in the Applicant's cable laying and trenching operations. Invasive species rapidly increase in abundance to the point that they come to dominate their new environment, creating adverse ecological effects to other species of the ecosystem and the functions and services it may provide (Goldberg and Wilkinson 2004). Invasive species can decrease species diversity, change trophic structure, and diminish physical structure, but adverse effects are highly variable and species-specific.

NMFS is concerned that the increase in vessel movements and personnel disturbances proposed within the MITT may also increase the risk of introducing and spreading invasive species within the region through direct physical introduction or transportation resulting from hull fouling and ballast water. A description of how the Navy plans to avoid and control for the possible spread of invasive species during these activities would help alleviate this concern.

Cumulative Adverse Effects

A cumulative effects analysis must consider the changes to the marine environment that are expected to occur under our current climate trajectory. Considering that many effects in marine ecosystems have long durations due to slow ecosystem recovery (e.g., corals), activities proposed today could result in significant and irreversible damage to EFH in coming decades. In addition, individual adverse effects (stresses) often interact in ways that increase adverse effects (Brown 1997, Negri and Hooganbloom 2011). For example, elevated seawater temperatures can cause coral bleaching, but the temperature threshold at which coral bleaching occurs is lowered under elevated nutrient conditions. In another example, nutrient enrichment combined with large-scale physical damage can increase the probability of a shift in dominance from coral to algae, known as "phase-shifts."

Crain *et al.* (2008) reviewed over 200 studies examining cumulative effects for multiple stressors in intertidal and nearshore marine ecosystems to elucidate general patterns in cumulative stressor effects. The cumulative effects of any two stressors were distributed among all interaction types with 26% being additive, *i.e.*, no interaction, 36% synergistic and 38% antagonistic. In 62% of all cases, interactions between stressors resulted in an adverse effect on the species or ecosystem that was at least additive. In cases where a third stressor was considered, over two-thirds of the interaction became more negative, and the number of synergistic interactions increased to 66% of the cases.

The amount of Navy materials being deposited (i.e., MEM) is planned to continue for the foreseeable future. At an unidentified inflection point adverse effects to EFH from the continual deposition of these materials over the same footprint will be reached. As that point is approached it will become more difficult to mitigate and restore ecological functions and services. We expect that the Navy will calculate the deposition rates and decomposition rates to determine maximum MEM loads as this action becomes decadal, since offset may become appropriate if MEM loading impairs the habitat function. In addition, there may be cumulative adverse effects from personnel usage and unexpected vessel groundings in the absence of proper contingency planning, including resources for regular and on-the-spot survey damage assessments at all sites used for amphibious assaults.

NMFS is concerned about past, present, and future adverse effects to EFH resources from these stressors. The concerns about MEM can be assessed through the Navy's calculation of deposition and decomposition rates to determine maximum MEM loads as this action becomes decadal; this would inform potential offset. Quantitative resource survey assessments, updated benthic habitat substrate and biological cover mapping, and vessel grounding planning and contingencies would help to avoid, minimize, offset for, or otherwise mitigate potential cumulative adverse effects from these stressors.

Revised Conservation Recommendations

NMFS provides the following supplemental EFH conservation recommendations in accordance with the EFH provisions of the Magnuson-Stevens Act (50 C.F.R. 600.920) to help Navy ensure that adverse effects to EFH including coral reef resources are avoided, minimized, and offset. These recommendations are additions to the ten original conservation recommendations provided as part of the 2014 consultation.

Conservation Recommendation 11: The Navy should work with NMFS and local agencies to develop a vessel grounding response plan that includes a funding mechanism and protocols for expedited vessel removal, damage assessment surveys, and strategies to offset any unavoidable loss to EFH resources (e.g., corals, seagrass, etc.). This would also inform and minimize potential cumulative adverse effects from unexpected groundings as MITT continues into the future.

Conservation Recommendation 12: Surveys should be performed annually at the Apra Harbor UNDET site to include georeferenced status and condition information for habitat forming EFH resources (e.g., corals and seagrass) within a 100-ft buffer surrounding the site. This will help to document potential adverse effects associated with both direct physical impacts and suspension of sediments to inform potential minimization (i.e., transplantation) and offset.

Conservation Recommendation 13: Shallow reef areas and reef flats that are being used for amphibious assaults should be surveyed immediately following each training exercise to document physical impacts, quantify coral condition, and stabilize and/or translocate any broken corals. NMFS is ready and willing to assist with such planning.

Conservation Recommendation 14: Implement a 300-yard buffer around coral reef habitats and as much as practicable avoid continuous emission of sounds (i.e., turn off vessel engines and sonar when not needed or in use) in these habitats. This would minimize potential adverse effects of chronic noise on corals (e.g., disruption of coral planulae settlement), Bottomfish MUS life history stages (e.g., hearing, immune system disruption, etc.), and reef fish (e.g., hearing, immune system disruption, etc.) that serve as prey-base for juvenile and adult Bottomfish MUS.

Conservation Recommendation 15: The Navy should ensure that in-water activities minimize potential introduction of nuisance or invasive species. Any vessels coming from outside of the CNMI's EEZ should comply with U.S. Coast Guard ballast water discharge standards (i.e. no ballast water discharge within 12 nautical miles or use approved ballast water management system) to prevent introduction of new invasive species. Any equipment, materials and gear entering the nearshore waters of Rota should also be checked prior to deployment.

Conservation Recommendation 16: The Navy should calculate MEM deposition and decomposition rates to determine maximum loads as this action becomes decadal. This would inform potential offset for potential cumulative adverse effects.

Conservation Recommendation 17: The Navy should conduct regular (i.e., every 3-5 years) quantitative resource survey assessments and updated benthic habitat substrate and biological cover mapping at representative nearshore sites to document cumulative impacts over time. This would reduce uncertainty, quantify changes in coral condition and state due to ongoing MITT activities, inform potential offset, and minimize cumulative adverse effects by informing adaptive management.

Conclusion

NMFS supports the need for military readiness and believes the mission of the Pacific Fleet is of utmost national security importance. NMFS supports Navy's intent to be good resource stewards and appreciate Navy's future effort in working with us to ensure that any unavoidable impacts to our trust resources are adequately mitigated. We therefore highlight the importance of continued cooperation and coordination to resolve NMFS's concerns. Also, NMFS is enclosing a report (Minton 2017) that provides a comprehensive review of typical adverse effects to EFH in the Pacific Islands region, which will be helpful to the Navy for future consultations. NMFS believes that our positive working relationship and mutual desire for a meaningful outcome for NOAA trust resources at risk while meeting the needs of the Fleet can be achieved. Please do not hesitate to contact Steve McKagan at 670-234-0004 and/or steven.mckagan@noaa.gov with any questions or to request further technical assistance.

9

Sincerely,

Gerry Davis
Assistant Regional Administrator
Habitat Conservation Division

cc by e-mail:
Ms. Arlene Pangilinan, NMFS
Dr. Malia Chow, NMFS
Barbara Prine, Navy
Chip Johnston, Navy

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Enclosures

Minton, D. 2017. Non-fishing effects that may adversely affect essential fish habitat in the Pacific Islands Region. National Oceanic and Atmospheric Administration Final Report for contract AB-133F-15-CQ-0014.

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C.4.3 NAVY RESPONSE LETTER TO NATIONAL MARINE FISHERIES SERVICE ESSENTIAL FISH HABITAT RECOMMENDATIONS

DEPARTMENT OF THE NAVY
COMMANDER
UNITED STATES PACIFIC FLEET
250 MAKALAPA DRIVE
PEARL HARBOR, HAWAII 96860-3131

IN REPLY REFER TO:
5090
Ser N465/0145
29 January 2020

Assistant Regional Administrator, Habitat Conservation Division
Pacific Islands Regional Office, National Marine Fisheries Service
1845 Wasp Boulevard, Building 176
Honolulu, HI 96818-5007

Dear Mr. Davis:

SUBJECT: NAVY FINAL RESPONSE TO THE NATIONAL MARINE FISHERIES SERVICE LETTER ON THE NAVY'S 2019 SUPPLEMENTAL ESSENTIAL FISH HABITAT ASSESSMENT IN SUPPORT OF THE MARIANA ISLANDS TRAINING AND TESTING SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT/OVERSEAS ENVIRONMENTAL IMPACT STATEMENT

The Navy thanks you for the comments provided in your letter of December 19, 2019, as well as the prompt review from your office of our supplemental Essential Fish Habitat Assessment for the Mariana Islands Training and Testing Supplemental Environmental Impact Statement/Overseas Environmental Impact Statement.

This letter contains enclosures that responds to the seven additional conservation recommendations to avoid, minimize, offset for, or otherwise mitigate potential impacts in your letter.

We thank you for your continued support of this critical project.

Sincerely,

D. A. McNAIR
Director, Environmental Readiness Division
By direction of the Commander

Enclosure: Navy Response To NMFS' December 19, 2019 Essential Fish Habitat Letter

Copy to: (w/enclosure)
Mr. Steve McKagan, Commonwealth of the Northern Mariana Islands Field Office
Dr. Kelly Ebert, Chief of Naval Operations (N454)
Mr. Dana Lujan, Joint Region Marianas
Michael Noah, Joint Region Mari

Enclosure: Navy Response To NMFS' December 19, 2019 Essential Fish Habitat Letter

The U.S. Navy (Navy) addressed National Marine Fisheries Service Conservation Recommendations from the 2014 consultation in Table 4-2 of the Navy's 2019 supplemental Essential Fish Habitat Assessment (EFHA). This included incorporation of the Navy's original 2014 response to NMFS, as well as updated information addressing how some of the recommendations had been addressed.

The below text contains the Navy's response to the additional Conservation Recommendations from the NMFS letter to the Navy of December 19, 2019.

***NMFS Conservation Recommendation 11**: The Navy should work with NMFS and local agencies to develop a vessel grounding response plan that includes a funding mechanism and protocols for expedited vessel removal, damage assessment surveys, and strategies to offset any unavoidable loss to EFH resources (e.g., corals, seagrass, etc.). This would also inform and minimize potential cumulative adverse effects from unexpected groundings MITT continues into the future.*

Navy Response to Recommendation 11: Although a naval vessel grounded in 2017, the Navy asserts such events are not reasonably foreseeable impacts from the proposed action. Vessel groundings are rare and typically result from a series of unusual and unpredictable circumstances. The Navy is already prepared to respond to such events. The Navy maintains salvage and towing response capability through the employment of Navy assets and through worldwide salvage contracts. Contingency planning is required for preparedness, and the Navy can ensure that baseline conditions of natural resources within the management control of the Navy are identified and kept current through implementation of the 2019 Joint Region Marianas Integrated Natural Resources Management Plan to which NMFS is a signatory partner. Furthermore, the INRMP identifies strategies and actions to address Marine Habitat Management (Sections 5.4.2.1, 8.4.2.1, and 9.4.2.1) and Marine Protected Species Management (Section 5.4.2.3), specifically:

- "Develop protocol for immediate assessment and response to reef damage caused by unanticipated events such as ship groundings and anchor damage. The protocol will outline responsible parties, coordination process, and initial reef damage assessment requirements. This protocol will inform the long-term response plan."
- "Ensure no impact to coral or hard substrates during MITT training activities occurring within or adjacent to reef habitats by implementing appropriate avoidance measures."

Enclosure: Navy Response To NMFS' December 19, 2019 Essential Fish Habitat Letter

NMFS Conservation Recommendation 12: Surveys should be performed annually at the Apra Harbor UNDET site to include georeferenced status and condition information for habitat forming EFH resources (e.g., corals and seagrass) within a 100-ft buffer surrounding the site. This will help to document potential adverse effects associated with both direct physical impacts and suspension of sediments to inform potential minimization (i.e., transplantation) and offset.

Navy Response to Recommendation 12: The Navy asserts this recommendation is already being satisfied under the mandates of the Joint Region Marianas INRMP, to which the NMFS is a signatory, as briefly summarized in the Navy's 2019 supplemental EFHA (page 5-2).. Details specific to previous surveys in Apra Harbor including the Outer Apra Harbor UNDET site can be found in the INRMP starting in Section 5.3. Continued similar efforts are recommended and planned in Sections 5.4.2 (Marine Ecosystems Management) as well as in Chapter 13 (Planning, Integration, and Implementation). Specific INRMP activities include:

- "Enhance coral habitat by monitoring health and acute impacts and through focused reef restoration efforts."
- "Establish long-term monitoring programs to track changes in the health of corals and water quality that are compatible with existing monitoring programs in Guam and the region. JRM has programmed for active/continuous remote monitoring of water quality parameters at select locations starting in FY19."
- "Work with regulatory partners and local subject matter experts to identify priority resilience indicators….The measures for assessing resilience include: macroalgae percent cover (to be obtained as coarse level data in the benthic habitat mapping project), coral community (available for some sites from past studies), bleaching resistance, coral recruitment and connectivity, coral diversity (available for some sites from past studies), herbivorous fish community (available for some of Apra Harbor from past studies), herbivore average functional group biomass, temperature variability, land-based sources of pollution, and accessibility due to wave exposure."
- "JRM will coordinate with local partners and subject matter experts (SMEs) to determine appropriate locations and methods for coral population enhancement and restoration efforts. JRM will align projects with the proposed Guam Restoration Strategy (in development). This may include projects that include sexual propagation that collect gametes, settle them on tiles, and eventually outplant new colonies, but can also include out-planting colonies, clones, or asexual propagation from fragments, or other restoration strategies such as algal removal."
- "Update and continuously maintain existing centralized GIS database to effectively inform and guide future management of marine natural resources on NBG Main Base and meet natural resources goals and objectives. Readily available GIS data will be used to develop natural resources constraints maps for use in current and future JRM management and planning decisions for NBG Main Base."

Enclosure: Navy Response To NMFS' December 19, 2019 Essential Fish Habitat Letter

Figure 1. UNDET activities at the Outer Apra Harbor UNDET site. The substrate is mostly sand and contains little coral or seagrass

Enclosure: Navy Response To NMFS' December 19, 2019 Essential Fish Habitat Letter

NMFS Conservation Recommendation 13: Shallow reef areas and reef flats that are being used for amphibious assaults should be surveyed immediately following each training exercise to document physical impacts, quantify coral condition, and stabilize and/or translocate any broken corals. NMFS is ready and willing to assist with such planning.

Navy Response to Recommendation 13: The Navy asserts this recommendation is already being satisfied under the mandates of the Joint Region Marianas INRMP, to which the NMFS is a signatory, as briefly summarized in the Navy's 2019 supplemental EFHA (page 5-2).. While not tied to specific training events, the INRMP directs repeated surveys across all submerged Navy controlled areas in the Mariana Islands. This would include beaches used for landing events. Cumulative impacts, if any can, be assessed over time as the program evolves. Additionally, the INRMP includes the previously described plans to develop protocols to respond to reef damage (Marine Habitat Management (Sections 5.4.2.1, 8.4.2.1, and 9.4.2 and Marine Protected Species Management Section 5.4.2.3). Specific INRMP activities include:

- "Enhance coral habitat by monitoring health and acute impacts and through focused reef restoration efforts."
- "Establish long-term monitoring programs to track changes in the health of corals and water quality that are compatible with existing monitoring programs in Guam and the region. JRM has programmed for active/continuous remote monitoring of water quality parameters at select locations starting in FY19."
- "Work with regulatory partners and local subject matter experts to identify priority resilience indicators….The measures for assessing resilience include: macroalgae percent cover (to be obtained as coarse level data in the benthic habitat mapping project), coral community (available for some sites from past studies), bleaching resistance, coral recruitment and connectivity, coral diversity (available for some sites from past studies), herbivorous fish community (available for some of Apra Harbor from past studies), herbivore average functional group biomass, temperature variability, land-based sources of pollution, and accessibility due to wave exposure."
- "JRM will coordinate with local partners and subject matter experts (SMEs) to determine appropriate locations and methods for coral population enhancement and restoration efforts. JRM will align projects with the proposed Guam Restoration Strategy (in development). This may include projects that include sexual propagation that collect gametes, settle them on tiles, and eventually outplant new colonies, but can also include out-planting colonies, clones, or asexual propagation from fragments, or other restoration strategies such as algal removal."
- "Develop protocol for immediate assessment and response to reef damage caused by unanticipated events such as ship groundings and anchor damage. The protocol will outline responsible parties, coordination process, and initial reef damage assessment requirements. This protocol will inform the long-term response plan."
- "Ensure no impact to coral or hard substrates during MITT training activities occurring within or adjacent to reef habitats by implementing appropriate avoidance measures."

While unrelated to specific training events, the 2019 JRM INRMP identifies the strategies and actions across all Navy submerged lands, to include coastal beaches, in the Mariana Islands. Cumulative impacts, if any, can, be assessed continually as the program evolves.

Enclosure: Navy Response To NMFS' December 19, 2019 Essential Fish Habitat Letter

Conservation Recommendation 14: *Implement a 300-yard buffer around coral reef habitats and as much as practicable avoid continuous emission of sounds (i.e., turn off vessel engines and sonar when not needed or in use) in these habitats. This would minimize potential adverse effects of chronic noise on corals (e.g., disruption of coral planulae settlement), Bottomfish MUS life history stages (e.g., hearing, immune system disruption, etc.), and reef fish (e.g., hearing, immune system disruption, etc.) that serve as prey-base for juvenile and adult Bottomfish MUS.*

Navy Response to Recommendation 14: The Navy asserts meeting this recommendation is impractical and would jeopardize navigational safety, which could increase potential groundings. In practice, large naval vessels such as amphibious assault ships rarely close within 300 yards of a coastline. The NMFS recommendation would apply to landing craft, amphibious assault vehicles, and combat rubber raiding craft approaching or departing from a given landing location. However, these types of craft always need to maintain steerage way. In fact, the main objective is transporting personnel to and from a beach beyond a reef as quickly as possible; therefore, engines cannot be turned off. These types of craft would delay their approach, increasing the potential for drifting or potential grounding, which could present navigational hazards depending on the sea state (e.g., swamping). The Navy's 2019 Supplemental EFHA lists (in Table 4-2) ongoing standard operating procedures limiting the spatial spread of a landing (landing craft approaching in a line), as well as some engine noise (turning off combat rubber raiding craft motors to paddle across reefs to the beach). Finally, the Navy would not characterize the spatially and temporarily limited use of vessels during discreet training events as a chronic noise. There would be significant time between events (e.g., weeks or months) when landing events close to shore would not occur.

High-power sonar used for antisubmarine warfare would not generally occur within 3 NM of land, and hence would be well beyond the 300-yard buffer.

Enclosure: Navy Response To NMFS' December 19, 2019 Essential Fish Habitat Letter

***NMFS Conservation Recommendation 15**: The Navy should ensure that in-water activities minimize potential introduction of nuisance or invasive species. Any vessels coming from outside of the CNMI's EEZ should comply with U.S. Coast Guard ballast water discharge standards (i.e. no ballast water discharge within 12 nautical miles or use approved ballast water management system) to prevent introduction of new invasive species. Any equipment, materials and gear entering the nearshore waters of Rota should also be checked prior to deployment.*

Navy Response to Recommendation 15: The Navy asserts this recommendation is already being satisfied under the mandates of the Navy's internal compliance with established regulations. The Navy implements strict ballast water discharge requirements, consistent with the U.S. Environmental Protection Agency, U.S. Coast Guard, and adheres to applicable international regulations, through internal instructions, directions, and guidance. Vessels not equipped with ballast water treatment systems are required to perform exchanges greater than 12 NM from land or hold discharges, when appropriate and practicable, to minimize the introduction of invasive species.

The NMFS is a signatory to the 2019 JRM INRMP which identifies strategies and actions to address Marine Invasive Species Management (Sections 5.4.2.2, 8.4.2.2, 9.4.2.2, and 11.4.2.2), specifically:

- "Develop and maintain a Marine Invasive Species Management Plan for NBG Main Base, NCTS, AAFB, and Tinian MLA."
- "JRM will work with appropriate U.S. Navy commands to determine if updates are warranted for Navy hull husbandry standards (Naval Sea Systems Command S9086-CQ STM-010) (U.S. Navy 2006) and ballast water requirements (Note: The U.S. Navy adopts USCG standards)."
- "Participate in the quarterly Guam Invasive Species Advisory Council meetings and coordinate regularly with the territorial marine invasive species coordinator once hired."

Enclosure: Navy Response To NMFS' December 19, 2019 Essential Fish Habitat Letter

NMFS Conservation Recommendation 16: The Navy should calculate MEM deposition and decomposition rates to determine maximum loads as this action becomes decadal. This would inform potential offset for potential cumulative adverse effects.

Navy Response to Recommendation 16: The Navy would reiterate that MEM use is across a very large spatial extent and rarely sequentially concentrated in small areas. Furthermore, the total cumulative MEM footprint as listed in Table 2-1 of the Navy's 2019 supplemental EFHA, is only 132,930 m^2 which is actually 37,866 m^2 less than the Navy's 2014 EFHA MEM footprint (170,796 m^2). Potential MEM footprint, 132,930 m^2 or 0.133 km^2, represents less than 0.0000001% of the total MITT study area (1,721,376 km^2).

Although absent in the MITT Draft Supplemental Environmental Impact Statement/Oversea Environmental Impact Statement (EIS/OEIS), the Navy has updated Appendix J (Statistical Probability Analysis for Estimating Direct Strike Impact and Number of Potential Exposures from Military Expended Materials) for the pending MITT final supplemental EIS/OEIS. This update will show the anticipated footprint of estimated annual MEM use, which can be summed across multiple years, or at least until a new supplemental EIS/OEIS is required. At that time, MEM usage would be re-evaluated. The Navy can provide the revised Appendix J to the NMFS as soon as final edits are complete. Finally, while the exact decomposition rates for all material in MEM is unknown, it is likely that major components such as aluminum and steel will corrode slowly in deep ocean waters. Overtime MEM would either be incorporated into sediments (i.e., buried) or remain on the ocean bottom subject to corrosion (Ocean News 2016, Edwards and Beldowski 2016[1]). Edwards and Beldowski 2016, alone with various contributing authors have documented the fate and condition of WWII munitions and post-war disposed items. Their work includes assessments corrosion of items deposited at a 300-600 m deep-water disposal site south of Oahu[2] (Figure 2).

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[1] Edwards, M, and J. Beldowski, ed. 2016. Chemical Munitions Dumped at Sea-Special Edition. Deep Sea Research II 128. 136 pg. https://www.sciencedirect.com/journal/deep-sea-research-part-ii-topical-studies-in-oceanography/vol/128 ; Ocean News. 2016. WWII Bombs Provide Living Laboratories for Cold-Water Coral Reefs. Online published 01 June 2016.

[2] The site had military munitions and items dumps from post-World War II through 1972. The site also had civilian dredged material dumped from Pearl Harbor, Honolulu Harbor, and Ali Wai Canal.

Enclosure: Navy Response To NMFS' December 19, 2019 Essential Fish Habitat Letter

J.A.K. Silva, T. Chock / Deep-Sea Research II 128 (2016) 14–24

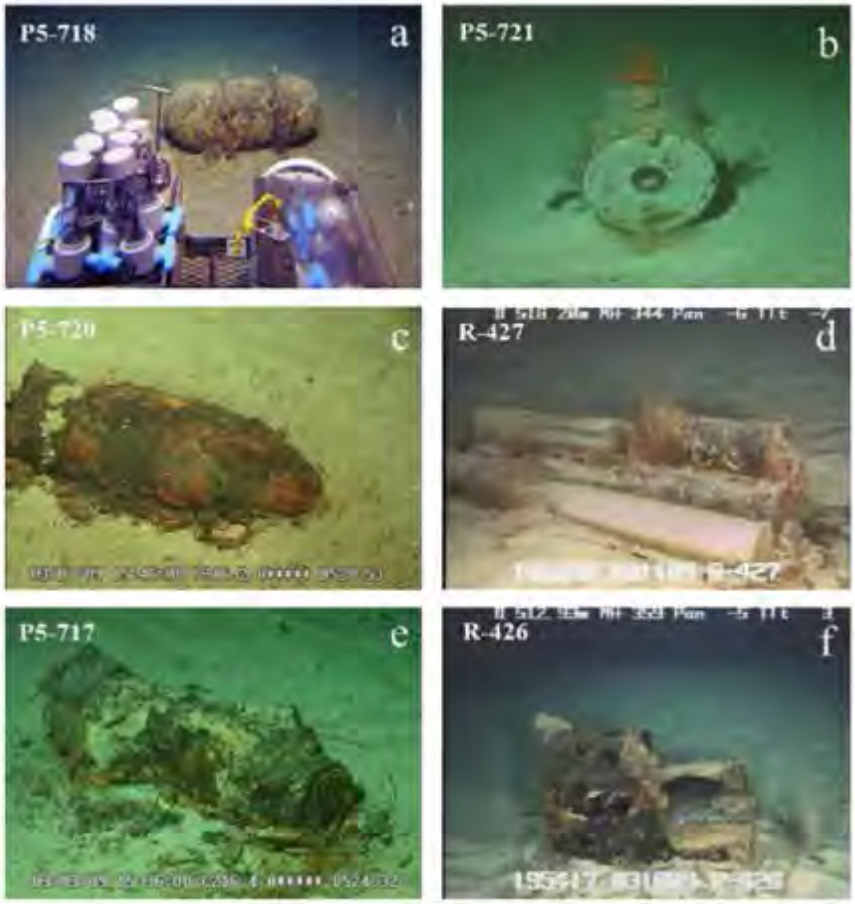

Fig. 2. Examples of DMM corrosion observed:(a) moderately corroded aerial bomb,(b) depth charge exhibiting mild corrosion,(c) significantly corroded artillery projectile, (d) bundle of brass artillery cartridges with significantly corroded projectiles,(e) severely corroded cluster bomb, and (f) severely corroded depth charge.
From: Silva and Chock. 2016. Munitions integrity and corrosion features observed during the HUMMA deep-sea munitions disposal site investigations. Deep Sea Research II 128:14-24.

Figure 2. Representative images from Deep Sea Research II Vol 128- Chemical Munitions At Sea-CORROSION (Edwards and Beldowski, ed. 2016)

Enclosure: Navy Response To NMFS' December 19, 2019 Essential Fish Habitat Letter

NMFS Conservation Recommendation 17: The Navy should conduct regular (i.e., every 3-5 years) quantitative resource survey assessments and updated benthic habitat substrate and biological cover mapping at representative nearshore sites to document cumulative impacts over time. This would reduce uncertainty, quantify changes in coral condition and state due to ongoing MITT activities, inform potential offset, and minimize cumulative adverse effects by informing adaptive management.

Navy Response to Recommendation 17: The Navy asserts this recommendation has been identified in the 2019 JRM INRMP, as briefly summarized in the Navy's 2019 supplemental EFHA (page 5-2). The NMFS is a signatory to the 2019 JRM INRMP which identifies strategies and actions to address Marine Habitat Management (Sections 5.4.2.1, 8.4.2.1, 9.4.2.1, 11.4.2.1, and 12.4.2.1) and Marine Protected Species Management (Sections 5.4.2.3 and 11.4.2.3), specifically:

- "Enhance coral habitat by monitoring health and acute impacts and through focused reef restoration efforts."
- "Establish long-term monitoring programs to track changes in the health of corals and water quality that are compatible with existing monitoring programs in Guam and the region. JRM has programmed for active/continuous remote monitoring of water quality parameters at select locations starting in FY19."
- "Work with regulatory partners and local subject matter experts to identify priority resilience indicators….The measures for assessing resilience include: macroalgae percent cover (to be obtained as coarse level data in the benthic habitat mapping project), coral community (available for some sites from past studies), bleaching resistance, coral recruitment and connectivity, coral diversity (available for some sites from past studies), herbivorous fish community (available for some of Apra Harbor from past studies), herbivore average functional group biomass, temperature variability, land-based sources of pollution, and accessibility due to wave exposure."
- "JRM will coordinate with local partners and subject matter experts (SMEs) to determine appropriate locations and methods for coral population enhancement and restoration efforts. JRM will align projects with the proposed Guam Restoration Strategy (in development). This may include projects that include sexual propagation that collect gametes, settle them on tiles, and eventually outplant new colonies, but can also include out-planting colonies, clones, or asexual propagation from fragments, or other restoration strategies such as algal removal."
- "Develop protocol for immediate assessment and response to reef damage caused by unanticipated events such as ship groundings and anchor damage. The protocol will outline responsible parties, coordination process, and initial reef damage assessment requirements. This protocol will inform the long-term response plan."
- "Ensure no impact to coral or hard substrates during MITT training activities occurring within or adjacent to reef habitats by implementing appropriate avoidance measures."

Enclosure: Navy Response To NMFS' December 19, 2019 Essential Fish Habitat Letter

Additionally, the 2019 JRM INRMP identifies planning, integration, and implementation strategies to coordinate natural resources requirements with other federal, territorial, or commonwealth agencies, including the acquisition of INRMP mutual agreements between the DON, USFWS, NOAA-NMFS, and territorial and commonwealth fish and wildlife agencies (see Chapter 13).

C.4.4 National Marine Fisheries Service Response Letter to the Navy

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Pacific Islands Regional Office
1845 Wasp Blvd., Bldg 176
Honolulu, Hawaii 96818
(808) 725-5000 · Fax: (808) 725-5215

Mr. D. A. McNair
Director, Environmental Readiness
Department of Navy
United States Pacific Fleet
250 Makalapa Drive
Pearl Harbor, HI 96860-3131

February 7, 2020

Dear Mr. McNair:

On January 29, 2020, the National Marine Fisheries Service, Pacific Islands Regional Office, Habitat Conservation Division (NMFS) received your letter by direction of the Commander, U.S. Pacific Fleet (hereafter, Navy) titled 'Navy Final Response To The National Marine Fisheries Service Letter On Navy's 2019 Supplemental Essential Fish Habitat Assessment In Support Of The Mariana Islands Training And Testing Supplemental Environmental Impact Statement/Overseas Environmental Impact Statement'. The Navy's letter provides individual responses to each of the Essential Fish Habitat (EFH) conservation recommendations that we provided in response to the supplemental Mariana Islands Training and Testing (MITT) EHF consultation.

NMFS would like to thank the Navy for taking a close look at each of the new conservation recommendations that we put forward as part of this Supplemental Environmental Impact Statement (SEIS) for MITT activities. Furthermore, NMFS is proud of the progress we have made as a partner and signatory on the Joint Region Marianas (JRM) Integrated Natural Resource Management Plan (INRMP), which was completed in June 2019. The INRMP, as referenced in your letter, is full of progressive strategies and actions which have the potential to address many of our conservation concerns if implemented in an effective and coordinated fashion. NMFS agrees with Navy that the JRM INRMP will be an important tool in the avoidance, minimization, and offset of adverse effects to EFH resulting from MITT activities. However, we are not comfortable deferring each of the proposed conservation recommendations to the INRMP. We request to continue our ongoing coordination to better understand a) the current status of INRMP projects directly related to our MITT-specific EFH concerns, and b) future planning and funding of INRMP projects to better understand how and when the products of these projects could be applied to our MITT-specific EFH concerns.

NMFS Responses

Navy has opted not to accept any of the seven new conservation recommendations provided as part of the supplemental EFH consultation and has instead asserted that NMFS concerns are already addressed through existing procedures (CR#'s 11, 15), are covered by the INRMP (CR#'s 11, 12, 13, 15, 17), are impractical (CR#14), or are minimal at large spatial scales (CR#16). Below, we restate all conservation recommendations, Navy responses; and the subsequent responses by NMFS either accepting the responses by Navy, maintaining our position, or providing opportunities for ongoing partnership to meet our shared conservation goals.

Below, and pursuant to the EFH provisions of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act, Section 305(b) as described by 50 CFR 600.920), NMFS evaluates the sufficiency of Navy responses.

Conservation Recommendation 11 (CR#11): Navy should work with NMFS and local agencies to develop a vessel grounding response plan that includes a funding mechanism and protocols for expedited vessel removal, damage assessment surveys, and strategies to offset any unavoidable loss to EFH resources (e.g., corals, seagrass, etc.). This would also inform and minimize potential cumulative adverse effects from unexpected groundings MITT continues into the future.

Navy Response: Although a naval vessel grounded in 2017, Navy asserts such events are not reasonably foreseeable impacts from the proposed action. Vessel groundings are rare and typically result from a series of unusual and unpredictable circumstances. Navy is already prepared to respond to such events. Navy maintains salvage and towing response capability through the employment of Navy assets and through worldwide salvage contracts. Contingency planning is required for preparedness, and Navy can ensure that baseline conditions of natural resources within the management control of Navy are identified and kept current through implementation of the 2019 Joint Region Marianas Integrated Natural Resources Management Plan to which NMFS is a signatory partner. Furthermore, the INRMP identifies strategies and actions to address Marine Habitat Management (Sections 5.4.2.1, 8.4.2.1, and 9.4.2.1) and Marine Protected Species Management (Section 5.4.2.3), specifically:

- "Develop protocol for immediate assessment and response to reef damage caused by unanticipated events such as ship groundings and anchor damage. The protocol will outline responsible parties, coordination process, and initial reef damage assessment requirements. This protocol will inform the long-term response plan."
- "Ensure no impact to coral or hard substrates during MITT training activities occurring within or adjacent to reef habitats by implementing appropriate avoidance measures."

NMFS Response: We appreciate Navy's readiness to respond to grounding events and intent to better integrate damage assessment and mitigation protocols through the INRMP. We agree that the INRMP provides an opportunity to address this conservation recommendation, but would like to further coordinate with the Navy to ensure that our MITT-specific EFH concerns are proactively integrated into the projects currently being developed within the INRMP while working collectively to help enable funding of these projects and their deliverables. NMFS would like to suggest that we schedule a meeting with the MITT Environmental Readiness Division, INRMP project leads and other stakeholders to discuss how to ensure the strategies and activities stemming

2

from the new INRMP translate to projects and outcomes that satisfy this conservation recommendation.

Conservation Recommendation 12 (CR#12): Surveys should be performed annually at the Apra Harbor UNDET site to include georeferenced status and condition information for habitat forming EFH resources (e.g., corals and seagrass) within a 100-ft buffer surrounding the site. This will help to document potential adverse effects associated with both direct physical impacts and suspension of sediments to inform potential minimization (i.e., transplantation) and offset.

Navy Response: The Navy asserts this recommendation is already being satisfied under the mandates of the Joint Region Marianas INRMP, to which the NMFS is a signatory, as briefly summarized in the Navy's 2019 supplemental EFHA (page 5-2).. Details specific to previous surveys in Apra Harbor including the Outer Apra Harbor UNDET site can be found in the INRMP starting in Section 5.3. Continued similar efforts are recommended and planned in Sections 5.4.2 (Marine Ecosystems Management) as well as in Chapter 13 (Planning, Integration, and Implementation). Specific INRMP activities include:

- "Enhance coral habitat by monitoring health and acute impacts and through focused reef restoration efforts."
- "Establish long-term monitoring programs to track changes in the health of corals and water quality that are compatible with existing monitoring programs in Guam and the region. JRM has programmed for active/continuous remote monitoring of water quality parameters at select locations starting in FY19."
- "Work with regulatory partners and local subject matter experts to identify priority resilience indicators….The measures for assessing resilience include: macroalgae percent cover (to be obtained as coarse level data in the benthic habitat mapping project), coral community (available for some sites from past studies), bleaching resistance, coral recruitment and connectivity, coral diversity (available for some sites from past studies), herbivorous fish community (available for some of Apra Harbor from past studies), herbivore average functional group biomass, temperature variability, land-based sources of pollution, and accessibility due to wave exposure."
- "JRM will coordinate with local partners and subject matter experts (SMEs) to determine appropriate locations and methods for coral population enhancement and restoration efforts. JRM will align projects with the proposed Guam Restoration Strategy (in development). This may include projects that include sexual propagation that collect gametes, settle them on tiles, and eventually outplant new colonies, but can also include out-planting colonies, clones, or asexual propagation from fragments, or other restoration strategies such as algal removal."
- "Update and continuously maintain existing centralized GIS database to effectively inform and guide future management of marine natural resources on NBG Main Base and meet natural resources goals and objectives. Readily available GIS data will be used to develop natural resources constraints maps for use in current and future JRM management and planning decisions for NBG Main Base."

NMFS Response: We agree that the INRMP provides an opportunity to address this conservation recommendation, but would like to further coordinate with the Navy to ensure that our MITT-

3

specific EFH concerns are proactively integrated into the projects currently being developed within the INRMP while working collectively to help enable funding of these projects and their deliverables. NMFS would like to suggest that we schedule a meeting with the MITT Environmental Readiness Division, INRMP project leads and other stakeholders to discuss how to ensure the strategies and activities stemming from the new INRMP translate to projects and outcomes that satisfy this conservation recommendation.

Conservation Recommendation 13 (CR#13): Shallow reef areas and reef flats that are being used for amphibious assaults should be surveyed immediately following each training exercise to document physical impacts, quantify coral condition, and stabilize and/or translocate any broken corals. NMFS is ready and willing to assist with such planning.

Navy Response: The Navy asserts this recommendation is already being satisfied under the mandates of the Joint Region Marianas INRMP, to which the NMFS is a signatory, as briefly summarized in the Navy's 2019 supplemental EFHA (page 5-2).. While not tied to specific training events, the INRMP directs repeated surveys across all submerged Navy controlled areas in the Mariana Islands. This would include beaches used for landing events. Cumulative impacts, if any can, be assessed over time as the program evolves. Additionally, the INRMP includes the previously described plans to develop protocols to respond to reef damage (Marine Habitat Management (Sections 5.4.2.1, 8.4.2.1, and 9.4.2 and Marine Protected Species Management Section 5.4.2.3). Specific INRMP activities include:

- "Enhance coral habitat by monitoring health and acute impacts and through focused reef restoration efforts."
- "Establish long-term monitoring programs to track changes in the health of corals and water quality that are compatible with existing monitoring programs in Guam and the region.
- JRM has programmed for active/continuous remote monitoring of water quality parameters at select locations starting in FY19."
- "Work with regulatory partners and local subject matter experts to identify priority resilience indicators….The measures for assessing resilience include: macroalgae percent cover (to be obtained as coarse level data in the benthic habitat mapping project), coral community (available for some sites from past studies), bleaching resistance, coral recruitment and connectivity, coral diversity (available for some sites from past studies), herbivorous fish community (available for some of Apra Harbor from past studies), herbivore average functional group biomass, temperature variability, land-based sources of pollution, and accessibility due to wave exposure."
- "JRM will coordinate with local partners and subject matter experts (SMEs) to determine appropriate locations and methods for coral population enhancement and restoration efforts. JRM will align projects with the proposed Guam Restoration Strategy (in development). This may include projects that include sexual propagation that collect gametes, settle them on tiles, and eventually outplant new colonies, but can also include out-planting colonies, clones, or asexual propagation from fragments, or other restoration strategies such as algal removal."
- "Develop protocol for immediate assessment and response to reef damage caused by unanticipated events such as ship groundings and anchor damage. The protocol will

4

outline responsible parties, coordination process, and initial reef damage assessment requirements.

- This protocol will inform the long-term response plan."
- "Ensure no impact to coral or hard substrates during MITT training activities occurring within or adjacent to reef habitats by implementing appropriate avoidance measures."

While unrelated to specific training events, the 2019 JRM INRMP identifies the strategies and actions across all Navy submerged lands, to include coastal beaches, in the Mariana Islands. Cumulative impacts, if any, can, be assessed continually as the program evolves.

NMFS Response: We agree that the INRMP provides an opportunity to address this conservation recommendation, but would like to further coordinate with the Navy to ensure that our MITT-specific EFH concerns are proactively integrated into the projects currently being developed within the INRMP while working collectively to help enable funding of these projects and their deliverables. NMFS would like to suggest that we schedule a meeting with the MITT Environmental Readiness Division, INRMP project leads and other stakeholders to discuss how to ensure the strategies and activities stemming from the new INRMP translate to projects and outcomes that satisfy this conservation recommendation.

Conservation Recommendation 14 (CR#14): Implement a 300-yard buffer around coral reef habitats and as much as practicable avoid continuous emission of sounds (i.e., turn off vessel engines and sonar when not needed or in use) in these habitats. This would minimize potential adverse effects of chronic noise on corals (e.g., disruption of coral planulae settlement), Bottomfish MUS life history stages (e.g., hearing, immune system disruption, etc.), and reef fish (e.g., hearing, immune system disruption, etc.) that serve as prey-base for juvenile and adult Bottomfish MUS.

Navy Response: The Navy asserts meeting this recommendation is impractical and would jeopardize navigational safety, which could increase potential groundings. In practice, large naval vessels such as amphibious assault ships rarely close within 300 yards of a coastline. The NMFS recommendation would apply to landing craft, amphibious assault vehicles, and combat rubber raiding craft approaching or departing from a given landing location. However, these types of craft always need to maintain steerage way. In fact, the main objective is transporting personnel to and from a beach beyond a reef as quickly as possible; therefore, engines cannot be turned off. These types of craft would delay their approach, increasing the potential for drifting or potential grounding, which could present navigational hazards depending on the sea state (e.g., swamping). The Navy's 2019 Supplemental EFHA lists (in Table 4-2) ongoing standard operating procedures limiting the spatial spread of a landing (landing craft approaching in a line), as well as some engine noise (turning off combat rubber raiding craft motors to paddle across reefs to the beach). Finally, the Navy would not characterize the spatially and temporarily limited use of vessels during discreet training events as a chronic noise. There would be significant time between events (e.g., weeks or months) when landing events close to shore would not occur.

High-power sonar used for antisubmarine warfare would not generally occur within 3 NM of land, and hence would be well beyond the 300-yard buffer.

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NMFS Response: We agree that Navy should not jeopardize personnel or marine resources in an effort to minimize sound emissions and should only consider sound reduction strategies when engines and/or sonar are not needed or actively in use.

Conservation Recommendation 15 (CR#15): The Navy should ensure that in-water activities minimize potential introduction of nuisance or invasive species. Any vessels coming from outside of the CNMI's EEZ should comply with U.S. Coast Guard ballast water discharge standards (i.e. no ballast water discharge within 12 nautical miles or use approved ballast water management system) to prevent introduction of new invasive species. Any equipment, materials and gear entering the nearshore waters of Rota should also be checked prior to deployment.

NAVY Response: The Navy asserts this recommendation is already being satisfied under the mandates of the Navy's internal compliance with established regulations. The Navy implements strict ballast water discharge requirements, consistent with the U.S. Environmental Protection Agency, U.S. Coast Guard, and adheres to applicable international regulations, through internal instructions, directions, and guidance. Vessels not equipped with ballast water treatment systems are required to perform exchanges greater than 12 NM from land or hold discharges, when appropriate and practicable, to minimize the introduction of invasive species.
The NMFS is a signatory to the 2019 JRM INRMP which identifies strategies and actions to address Marine Invasive Species Management (Sections 5.4.2.2, 8.4.2.2, 9.4.2.2, and 11.4.2.2), specifically:

- "Develop and maintain a Marine Invasive Species Management Plan for NBG Main Base,
- NCTS, AAFB, and Tinian MLA."
- "JRM will work with appropriate U.S. Navy commands to determine if updates are warranted for Navy hull husbandry standards (Naval Sea Systems Command S9086-CQ STM-010) (U.S. Navy 2006) and ballast water requirements (Note: The U.S. Navy adopts USCG standards)."
- "Participate in the quarterly Guam Invasive Species Advisory Council meetings and coordinate regularly with the territorial marine invasive species coordinator once hired."

NMFS Response: We appreciate Navy's adherence to all local and federal requirements regarding ballast water and ongoing efforts to control the spread of invasive species through biosecurity protocols outlined within the INRMP. The INRMP biosecurity project has done an excellent job managing terrestrial invasive species risks and has shown a growing awareness of marine threats. NMFS would like to suggest that we schedule a meeting with the MITT Environmental Readiness Division, INRMP project leads and other stakeholders to discuss how to ensure the strategies and activities stemming from the new INRMP translate to projects and outcomes that continue to reduce the risk of marine invaders.

Conservation Recommendation 16 (CR#16): The Navy should calculate MEM deposition and decomposition rates to determine maximum loads as this action becomes decadal. This would inform potential offset for potential cumulative adverse effects.

NAVY Response: The Navy would reiterate that MEM use is across a very large spatial extent and rarely sequentially concentrated in small areas. Furthermore, the total cumulative MEM

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footprint as listed in Table 2-1 of the Navy's 2019 supplemental EFHA, is only 132,930 m^2 which is actually 37,866 m^2 less than the Navy's 2014 EFHA MEM footprint (170,796 m^2). Potential MEM footprint, 132,930 m^2 or 0.133 km^2, represents less than 0.0000001% of the total MITT study area (1,721,376 km^2).

Although absent in the MITT Draft Supplemental Environmental Impact Statement/Oversea Environmental Impact Statement (EIS/OEIS), the Navy has updated Appendix J (Statistical Probability Analysis for Estimating Direct Strike Impact and Number of Potential Exposures from Military Expended Materials) for the pending MITT final supplemental EIS/OEIS. This update will show the anticipated footprint of estimated annual MEM use, which can be summed across multiple years, or at least until a new supplemental EIS/OEIS is required. At that time, MEM usage would be re-evaluated. The Navy can provide the revised Appendix J to the NMFS as soon as final edits are complete. Finally, while the exact decomposition rates for all material in MEM is unknown, it is likely that major components such as aluminum and steel will corrode slowly in deep ocean waters. Overtime MEM would either be incorporated into sediments (i.e., buried) or remain on the ocean bottom subject to corrosion (Ocean News 2016, Edwards and Beldowski 2016). Edwards and Beldowski 2016, alone with various contributing authors have documented the fate and condition of WWII munitions and post-war disposed items. Their work includes assessments corrosion of items deposited at a 300-600 m deep-water disposal site south of Oahu2 (Figure 2).

NMFS Response: NMFS understands the Navy's position, and appreciates that the MEM footprint will be reduced. We are still concerned about the size of the MEM footprint (132,930 m^2) and do not consider this negligible. Therefore, we maintain our position in CR#16 if the distribution of those items is not better characterized and monitored at longer time scales.

Conservation Recommendation 17 (CR#17): The Navy should conduct regular (i.e., every 3-5 years) quantitative resource survey assessments and updated benthic habitat substrate and biological cover mapping at representative nearshore sites to document cumulative impacts over time. This would reduce uncertainty, quantify changes in coral condition and state due to ongoing MITT activities, inform potential offset, and minimize cumulative adverse effects by informing adaptive management.

NAVY Response: The Navy asserts this recommendation has been identified in the 2019 JRM INRMP, as briefly summarized in the Navy's 2019 supplemental EFHA (page 5-2). The NMFS is a signatory to the 2019 JRM INRMP which identifies strategies and actions to address Marine Habitat Management (Sections 5.4.2.1, 8.4.2.1, 9.4.2.1, 11.4.2.1, and 12.4.2.1) and Marine Protected Species Management (Sections 5.4.2.3 and 11.4.2.3), specifically:

- "Enhance coral habitat by monitoring health and acute impacts and through focused reef restoration efforts."
- "Establish long-term monitoring programs to track changes in the health of corals and water quality that are compatible with existing monitoring programs in Guam and the region.
- JRM has programmed for active/continuous remote monitoring of water quality parameters at select locations starting in FY19."

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- "Work with regulatory partners and local subject matter experts to identify priority resilience indicators….The measures for assessing resilience include: macroalgae percent cover (to be obtained as coarse level data in the benthic habitat mapping project), coral community (available for some sites from past studies), bleaching resistance, coral recruitment and connectivity, coral diversity (available for some sites from past studies), herbivorous fish community (available for some of Apra Harbor from past studies), herbivore average functional group biomass, temperature variability, land-based sources of pollution, and accessibility due to wave exposure."
- "JRM will coordinate with local partners and subject matter experts (SMEs) to determine appropriate locations and methods for coral population enhancement and restoration efforts. JRM will align projects with the proposed Guam Restoration Strategy (in development). This may include projects that include sexual propagation that collect gametes, settle them on tiles, and eventually outplant new colonies, but can also include out-planting colonies, clones, or asexual propagation from fragments, or other restoration strategies such as algal removal."
- "Develop protocol for immediate assessment and response to reef damage caused by unanticipated events such as ship groundings and anchor damage. The protocol will outline responsible parties, coordination process, and initial reef damage assessment requirements. This protocol will inform the long-term response plan."
- "Ensure no impact to coral or hard substrates during MITT training activities occurring within or adjacent to reef habitats by implementing appropriate avoidance measures."

Additionally, the 2019 JRM INRMP identifies planning, integration, and implementation strategies to coordinate natural resources requirements with other federal, territorial, or commonwealth agencies, including the acquisition of INRMP mutual agreements between the DON, USFWS, NOAA-NMFS, and territorial and commonwealth fish and wildlife agencies (see Chapter 13).

NMFS Response: We agree that the INRMP provides an opportunity to address this conservation recommendation, but would like to further coordinate with the Navy to ensure that our MITT-specific EFH concerns are proactively integrated into the projects currently being developed within the INRMP while working collectively to help enable funding of these projects and their deliverables.. NMFS would like to suggest that we schedule a meeting with the MITT Environmental Readiness Division, INRMP project leads and other stakeholders to discuss how to ensure the strategies and activities stemming from the new INRMP translate to projects and outcomes that satisfy this conservation recommendation.

Conclusion

NMFS has addressed each of Navy responses to individual EFH conservation recommendations provided in our December 21, 2019 letter pertaining to the supplemental MITT Environmental Impact Statement. NMFS maintains our stated positions on CR#16 and believes that we can meet the intent of all our other conservation recommendations through increased coordination and integration into ongoing INRMP activities. We appreciate the opportunity to provide comments on Navy's response to our EFH conservation recommendations for this proposed project. We are committed to providing continued cooperation and subject matter technical expertise as identified

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in the conservation recommendations, and as requested, to Navy in order to achieve the project goals and sufficiently comply with the EFH provisions of the Magnuson-Stevens Act. Please do not hesitate to contact me with any comments, questions or to request further technical assistance.

Sincerely,

Gerry Davis
Assistant Regional Administrator
Habitat Conservation Division

cc by e-mail:
Ms. Arlene Pangilinan, NMFS
Dr. Malia Chow, NMFS
Ms. Barbara Prine, Navy
Mr. Chip Johnston, Navy
Mr. Steven McKagan, NMFS
Dr. Kelly Ebert, Chief of Naval Operations (N454)
Mr. Dana Lujan, Joint Region Marianas
Mr. Michael Noah, Joint Region Marinas

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C.5 National Historic Preservation Act Compliance

C.5.1 Navy Section 106 Consultation Letters – Commonwealth of the Northern Mariana Islands

DEPARTMENT OF THE NAVY
COMMANDER
UNITED STATES PACIFIC FLEET
250 MAKALAPA DRIVE
PEARL HARBOR, HAWAII 96860-3131

IN REPLY REFER TO:
5090
Ser N465/0006
January 4, 2019

Ms. Rita Chong
CNMI Historic Preservation Office
Department of Community and Cultural Affairs
P.O. Box 10007
Saipan, MP 96950

Dear Ms. Chong:

SUBJECT: NATIONAL HISTORIC PRESERVATION ACT, SECTION 106 CONSULTATION FOR PROPOSED MARIANA ISLANDS TRAINING AND TESTING ACTIVITIES

In accordance with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, the United States Department of the Navy (Navy) is initiating consultation on the CNMI portion of the proposed continuation of Mariana Islands Training and Testing (MITT) activities. A supplemental analysis of the activities included in the 2015 MITT Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) is being prepared to support ongoing and future activities conducted at sea and on Farallon de Medinilla beyond 2020. The proposed continuation of MITT activities is generally consistent with those analyzed in the 2015 Final EIS/OEIS and are representative of training and testing the military has conducted for decades. However, reanalysis of the activities is being completed using new information available after the release of the 2015 Final EIS/OEIS. In part, this supplemental document will support the renewal of regulatory permits and authorizations under the Marine Mammal Protection Act and Endangered Species Act for training and testing activities. As defined by 36 CFR §800.16(y), the Navy has determined that the proposed activities represent an undertaking requiring consultation.

The current 2009 Programmatic Agreement (PA) among the Department of Defense Representative Guam, Commonwealth of the Northern Marianas Islands (CNMI), Federated States of Micronesia and Republic of Palau, Commander Joint Region Marianas (JRM), Commander 36th Wing Andersen Air Force Base, the Guam Historic Preservation Officer, and the CNMI Preservation Officer expires on December 11, 2019. The PA as written provides NHPA compliance for military activities associated with the Mariana Islands Range Complex (MIRC), including at-sea training and testing, as well as a myriad of land-based activities, most of which are associated with JRM installation actions. The Navy's undertaking for this consultation will be limited to the activities described in our 2015 MITT EIS/OEIS and as proposed in our MITT supplemental EIS/OEIS. The JRM installation-type activities are independent of the MITT and thus, will not be covered under this consultation.

5090
Ser N465/0006
January 4, 2019

The Navy will hold its initial Section 106 consultation meetings from January 22-25, 2019. We welcome your attendance and participation. Ms. Carly Antone of the Naval Facilities Engineering Command, Pacific's Environmental Business Line will be my point of contact for coordination of location, dates, and times. Ms. Antone may be reached by telephone at (808) 472-1464 or by email at carly.antone@navy.mil.

Sincerely,

Timothy C. Liberatore
Captain, Civil Engineer Corps, U.S. Navy
By direction of the Commander

Copy to:
Katharine Kerr, Advisory Council on Historic Preservation
John Salas, Commander, Joint Region Marianas

2

DEPARTMENT OF THE NAVY
COMMANDER
UNITED STATES PACIFIC FLEET
250 MAKALAPA DRIVE
PEARL HARBOR, HAWAII 96860-3131

IN REPLY REFER TO:
5090
Ser N465/0024
January 9, 2019

Dear Sir/Madam:

SUBJECT: NATIONAL HISTORIC PRESERVATION ACT, SECTION 106 CONSULTATION MEETING FOR PROPOSED CONTINUATION OF MARIANA ISLANDS TRAINING AND TESTING ACTIVITIES

In accordance with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, the United States Department of the Navy (Navy) is initiating consultation on the CNMI portion of the proposed continuation of Mariana Islands Training and Testing (MITT) activities. A supplemental analysis of the activities included in the 2015 MITT Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) is being prepared to support ongoing and future activities conducted at sea and on Farallon de Medinilla beyond 2020. The proposed continuation of MITT activities is generally consistent with those analyzed in the 2015 Final EIS/OEIS and are representative of training and testing the military has conducted for decades. However, reanalysis of the activities is being completed using new information available after the release of the 2015 Final EIS/OEIS. In part, this supplemental document will support the renewal of regulatory permits and authorizations under the Marine Mammal Protection Act and Endangered Species Act for training and testing activities. As defined by 36 CFR §800.16(y), the Navy has determined that the proposed activities represent an undertaking requiring consultation.

The current 2009 Programmatic Agreement (PA) among the Department of Defense Representative Guam, Commonwealth of the Northern Marianas Islands (CNMI), Federated States of Micronesia and Republic of Palau, Commander Joint Region Marianas (JRM), Commander 36th Wing Andersen Air Force Base, the Guam Historic Preservation Officer, and the CNMI Preservation Officer expires on December 11, 2019. The PA as written provides NHPA compliance for military activities associated with the Mariana Islands Range Complex (MIRC), including at-sea training and testing, as well as a myriad of land-based activities, most of which are associated with JRM installation actions. The Navy's undertaking for this consultation will be limited to the activities described in our 2015 MITT EIS/OEIS and as proposed in our MITT supplemental EIS/OEIS. The JRM installation-type activities are independent of the MITT and thus, will not be covered under this consultation.

The current list of consulting parties for this undertaking includes the State Historic Preservation Officer, National Park Service, and other interested parties identified through previous consultations. We invite you to attend and participate in the Navy's initial Section 106 consultation meetings in Saipan and Tinian being held on January 24 and 25, 2019, respectively.

5090
Ser N465/0024
January 9, 2019

Should you be aware of an interested entity/individual not included in the "Copy to" section of this letter, please forward the invitation accordingly.

On Saipan, we will meet at the Kanoa Resort, Latte Stone Room, from 4:00-7:00 pm. On Tinian, we will meet at the Mayor's Offices, from 10:00 am – to 1230 pm.

The meetings will focus on the following:

1) Explanation of the NHPA Section 106 process;
2) Details about the Undertaking;
3) Development of the Area of Potential Effects;
4) Identification of Historic Properties
5) Potential effects of the Undertaking on Historic Properties

To attend, please respond no later than January 18, 2019 to give us an opportunity to ensure accommodations for all attendees at the meeting venues. Ms. Carly Antone of the Naval Facilities Engineering Command, Pacific's Environmental Business Line will be my point of contact for coordination. Ms. Antone may be reached by telephone at (808) 472-1464 or by email at carly.antone@navy.mil.

Sincerely,

Timothy C. Liberatore
Captain, Civil Engineer Corps, U.S. Navy
By direction of the Commander

Copy to:
David M. Apatang, Mayor of Saipan
Stanley Austin, Pacific West Region, National Park Service
Bonnie Borja, Department of Community and Cultural Affairs, Office of the Mayor, Tinian
John Castro
Don Farrell
Walt Goodridge
Robert Hunter, CNMI Department of Community and Cultural Affairs
Stanley Iakopo, Civil Military Liaison Office, Office of the Governor, CNMI
Katharine Kerr, Advisory Council on Historic Preservation
Gregorio Kilili Camacho Sablan, Congressman, CNMI
Polly DLG Masga, Northern Marianas Humanities Council
Randel Sablan, Joint Region Marianas (Saipan)
John F. Salas, Regional Environmental Director (J45), Joint Region Marianas
Joey Patrick San Nicholas, Mayor of Tinian
Oscar C. Torres, Military Liaison and Veterans Affairs, Office of the Governor, CNMI

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C.5.2 NAVY SECTION 106 CONSULTATION LETTERS – GUAM

DEPARTMENT OF THE NAVY
COMMANDER
UNITED STATES PACIFIC FLEET
250 MAKALAPA DRIVE
PEARL HARBOR, HAWAII 96860-3131

IN REPLY REFER TO:
5090
Ser N465/0005
January 4, 2019

Ms. Lynda Bordallo Aguon
State Historic Preservation Officer
Department of Parks & Recreation
490 Chalan Palasyo
Agaña Heights, Guam 96910

Dear Ms. Aguon:

SUBJECT: NATIONAL HISTORIC PRESERVATION ACT, SECTION 106 CONSULTATION FOR PROPOSED MARIANA ISLANDS TRAINING AND TESTING ACTIVITIES

In accordance with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, the United States Department of the Navy (Navy) is initiating consultation on the Guam portion of the proposed continuation of Mariana Islands Training and Testing (MITT) activities. A supplemental analysis of the activities included in the 2015 MITT Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) is being prepared to support ongoing and future activities conducted at sea beyond 2020. The proposed continuation of MITT activities is generally consistent with those analyzed in the 2015 Final EIS/OEIS and are representative of training and testing the military has conducted for decades. However, reanalysis of the activities is being completed using new information available after the release of the 2015 Final EIS/OEIS. In part, this supplemental document will support the renewal of regulatory permits and authorizations under the Marine Mammal Protection Act and Endangered Species Act for training and testing activities. As defined by 36 CFR §800.16(y), the Navy has determined that the proposed activities represent an undertaking requiring consultation.

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5090
Ser N465/0005
January 4, 2019

The Navy will hold its initial Section 106 consultation meetings from January 22-25, 2019. We welcome your attendance and participation. Ms. Carly Antone of the Naval Facilities Engineering Command, Pacific's Environmental Business Line will be my point of contact for coordination of location, dates, and times. Ms. Antone may be reached by telephone at (808) 472-1464 or by email at carly.antone@navy.mil.

Sincerely,

Timothy C. Liberatore
Captain, Civil Engineer Corps, U.S. Navy
By direction of the Commander

Copy to:
Katharine Kerr, Advisory Council on Historic Preservation
John Salas, Commander, Joint Region Marianas

2

DEPARTMENT OF THE NAVY
COMMANDER
UNITED STATES PACIFIC FLEET
250 MAKALAPA DRIVE
PEARL HARBOR, HAWAII 96860-3131

IN REPLY REFER TO:
5090
Ser N465/0025
January 10, 2019

Dear Sir/Madam:

SUBJECT: NATIONAL HISTORIC PRESERVATION ACT, SECTION 106 CONSULTATION MEETING FOR PROPOSED CONTINUATION OF MARIANA ISLANDS TRAINING AND TESTING ACTIVITIES

In accordance with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, the United States Department of the Navy (Navy) is initiating consultation on the Guam portion of the proposed continuation of Mariana Islands Training and Testing (MITT) activities. A supplemental analysis of the activities included in the 2015 MITT Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) is being prepared to support ongoing and future activities conducted at sea and on beyond 2020. The proposed continuation of MITT activities is generally consistent with those analyzed in the 2015 Final EIS/OEIS and are representative of training and testing the military has conducted for decades. However, reanalysis of the activities is being completed using new information available after the release of the 2015 Final EIS/OEIS. In part, this supplemental document will support the renewal of regulatory permits and authorizations under the Marine Mammal Protection Act and Endangered Species Act for training and testing activities. As defined by 36 CFR §800.16(y), the Navy has determined that the proposed activities represent an undertaking requiring consultation.

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The current list of consulting parties for this undertaking includes the State Historic Preservation Officer, National Park Service, and other interested parties identified through previous consultations. We invite you to attend and participate in the Navy's initial Section 106 consultation meetings in Guam being held on January 22 and 23, 2019. Should you be aware of an interested entity/individual not included in the "Copy to" section of this letter, please forward the invitation accordingly.

On January 22, we will meet at the Daniel L. Perez Elementary School cafeteria from 3:30-6:00 pm. On January 23, we will meet at the Guam Museum multi-purpose room, from 4:00-7:00 pm.

The meetings will focus on the following:

1) Explanation of the NHPA Section 106 process;
2) Details about the Undertaking;
3) Development of the Area of Potential Effects;
4) Identification of Historic Properties
5) Potential effects of the Undertaking on Historic Properties

5090
Ser N465/0025
January 10, 2019

To attend, please respond no later than January 18, 2019 to give us an opportunity to ensure accommodations for all attendees at the meeting venues. Ms. Carly Antone of the Naval Facilities Engineering Command, Pacific's Environmental Business Line will be my point of contact for coordination. Ms. Antone may be reached by telephone at (808) 472-1464 or by email at carly.antone@navy.mil.

Sincerely,

Timothy C. Liberatore
Captain, Civil Engineer Corps, U.S. Navy
By direction of the Commander

Copy to:
Julian Aguon
Stanley Austin, Pacific West Region, National Park Service
Michael Lujan Bevacqua, Famomsaiyan
Chamorro Land Trust Commission
Hope A. Cristobal, Guahan Coalition for Peace and Justice
Jose Ulloa Garrido, Commission on Decolonization
Galaide Group
Guam Ancestral Lands Commission
Victoria-Lola Leon Guerrero, Reclaim Guahan Collective
Leonard Iriarte, I Fanlalai'an Oral History Project
Danny Jackson, Nasion Chamoru
Ramona Jones, Jones and Guerrero, Inc.
Katharine Kerr, Advisory Council on Historic Preservation

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Appendix D: Air Quality Emissions Calculations

Supplemental Environmental Impact Statement/

Overseas Environmental Impact Statement

Mariana Islands Training and Testing

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APPENDIX D Air Quality Emissions Calculations and Record of Non-Applicability

This appendix discusses emission factor development, calculations, and assumptions used in the air quality analyses presented in the Air Quality section of Chapter 3 (Section 3.2). Section D-5 of this Appendix contains the Record of Applicability (RONA) for the Preferred Alternative.

D.1 Surface Activities Emissions

Surface activities are associated with vessel movements. Fleet training activities use a variety of marine vessels, including cruisers, destroyers, frigates, carriers, submarines, amphibious vessels, and small boats. Testing activities use a variety of marine vessels, including various testing support vessels, work boats, torpedo recovery vessels, unmanned surface vehicles, and small boats. These vessels use a variety of propulsion methods, including marine outboard engines, diesel engines, and gas turbines.

Marine Outboard Engines:

Emission factors for small surface craft involved in amphibious training and testing activities were obtained from the Navy and Military Sealift Command (MSC) Marine Engine Fuel Consumption & Emission Calculator database. Emissions for surface craft using outboard engines were calculated using Navy and MSC emission factors which are provided in terms of emissions per hour, and multiplied by the hours of operation.

$$Emissions = HR/YR \times EF \times ENG$$

Where:

Emissions = surface craft emissions (pounds [lb.])
HR/YR = hours per year
EF = emission factor for specific engine type (lb./hour [hr.])
ENG = number of engines

To obtain the total criteria pollutant emissions for the Proposed Action, emissions were calculated for each training or testing activity, type of surface vessel, and criteria pollutant. These individual estimates of emissions, in units of tons per year, were then summed by criteria pollutant to obtain the aggregate emissions for surface vessel emissions activities.

Diesel Engines:

Emission factors for small surface craft involved in amphibious training and testing activities were obtained from the Navy and MSC Marine Engine Fuel Consumption & Emission Calculator database. Diesel was assumed to be the primary fuel to ensure a conservative estimate. Calculation methods similar to those described for Marine Outboard Engines were used to obtain emissions estimates for diesel engines.

$$Emissions = HR/YR \times EF \times ENG$$

Where:

Emissions = surface craft emissions (lb.)
HR/YR = hours per year
EF = emission factor for specific engine type (lb./hr.)
ENG = number of engines

Diesel engine emission factors were multiplied by the annual hours of operation to calculate the pollutant emissions per year.

D.2 Air Activities Emissions

Fleet training and Naval Air Systems Command testing consists of the activities of various aircraft, including the F/A-18, P-8, SH-60B, MH-53, MH-60S, and Lear jet. Research Development Testing & Evaluation air activities consist of various aircraft, including the 1UH-1N, SH-60B, MH-53, MH-60S, and Cessna-172. Aircraft activities of concern are those that occur from ground level up to 3,000 feet (ft.) above ground level (AGL). The 3,000 ft. AGL ceiling was assumed to be the atmospheric mixing height above which any pollutant generated would not contribute to increased pollutant concentrations at ground level (known as the mixing zone). All criteria pollutant emissions from aircraft generated above 3,000 ft. AGL are excluded from analysis of compliance with National Ambient Air Quality Standards. The pollutant emission rate is a function of the aircraft engine's fuel flow rate and efficiency. Emissions for one complete training activity for a particular aircraft are calculated by knowing the specific engine pollutant emission factors for each mode of operation.

For this Supplemental Environmental Impact Statement (SEIS)/Overseas EIS (OEIS), emission factors for most military engines were obtained from Navy's Aircraft Environmental Support Office memoranda and previous Navy Environmental Impact Statement (EIS)/OEIS documentation (primarily citing the Federal Aviation Administration's Emissions and Dispersion Modeling System model). For those aircraft for which engine data were unavailable, an applicable surrogate was used. Pollutant emissions for each aircraft/organization were calculated by applying the equation below.

$$Emissions = TIM \times FF \times EF \times ENG \times CF$$

Where:

Emissions = aircraft emissions (lb.)
TIM = time-in-mode at a specified power setting (hr./operation).
FF = fuel flow at a specified power setting (gal./hr./engine)
EF = emission factor for specific engine type and power setting (lb./1,000 gal. of fuel used)
ENG = number of engines on aircraft
CF = conversion factor (0.001)

D.3 Ordnance and Munitions Emissions

Available emissions factors (AP-42, *Compilation of Air Pollutant Emission Factors*) were used. These factors were then multiplied by the net weight of the explosive and the number of items that were used per year. This calculation provides estimates of annual emissions.

$$Emissions = EXP/YR \times EF \times Net\ Wt$$

Where:

Emissions = ordnance emissions (lb.)
EXP/YR = explosives, propellants, and pyrotechnics used per year
EF = emissions factor (lb./item)
Net Wt = net weight of explosive (lb.)

D.4 EMISSIONS ESTIMATES SPREADSHEETS

The following spreadsheets show the emissions calculations for ships, aircraft, and ordnance involved in training and testing activities. These spreadsheets were developed for each range complex and testing area. The spreadsheets show the calculations developed for each alternative analyzed in this SEIS/OEIS.

Table D-1: Summary of Emissions Released Within 3 Nautical Miles of the Coast

Source	*Emissions by Air Pollutant (TPY)*					
	CO	*NO_X*	*VOC*	*SO_X*	*PM_{10}*	*$PM_{2.5}$*
Baseline Emissions	404	461	118	237	97	88
Alternative 1 Emissions	467	528	166	254	119	107
Alternative 2 Emissions	473	549	168	313	131	119

[1] Table includes criteria pollutant precursors (e.g., volatile organic compounds). Individual values may not add exactly to total values due to rounding.
Notes: NM = nautical miles, CO = carbon monoxide, NO_X = nitrogen oxides, $PM_{2.5}$ = particulate matter ≤ 2.5 microns in diameter, PM_{10} = particulate matter ≤ 10 microns in diameter, SO_X = sulfur oxides, TPY = tons per year, VOC = volatile organic compounds

Table D-2: Vessel Emissions Factors

Vessel Mode	Emissions Factors (lb/hr) Propulsion Engines + Generators				
	CO	NOx	HC	SOx	PM10
CG-3	61.51	79.58	4.32	77.63	2.79
DDG-3	60.16	114.52	4.01	88.53	3.64
FFG-3	32.94	47.16	3	34.92	2.31
TRB-3	6.47	56.22	1.55	7.40	1.18
AOE-2	109.76	311.31	10.6	119.99	10.41
USCG	5.74	57.91	0.88	11.55	0.21
LHA-1	7.38	43.53	5.53	130.97	26.29
LHD-2	8.08	47.83	5.77	135.50	28.58
LPD-2	3.48	21.00	2.58	60.82	12.85
LCAC	18.32	114.53	3.49	54.61	5.14
LCU	5.06	15.7	1.27	2.91	0.75
AAV-2	0.76	6.22	0.82	1.25	0.26
AAAV					
PC-2	37.36	74.17	6.02	23.42	2.6
MK V-2	3.86	29.49	0.99	4.73	0.40
RIB-4	0.34	9.14	0.06	1.44	0.15
CRRC-5		0.15	12.90		
AE-2	2.61	15.84	1.94	45.83	9.67
BW-3	111.75	1.60	45.89	0.31	0.08
SSN	0	0.00	0.00	0	0
SSGN	0	0.00	0.00	0	0
T-AGO(LFA)	6.67	39.37	5.00	119.43	23.77
CG-PARTNER	107.79	47.10	9.90	21	2.6
DDG-PARTNER	103.99	49.90	9.00	17.9	2.5
SS-PARTNER	2.94	17.32	2.20	52.11	10.46
LCS	727.98	171.04	2.82	67.28	6.94
LSD	21.25	334.51	10.84	35.04	2.71

Table D-3: Aircraft Emissions Factors

Aircraft	Emission Indices, lb/1,000 lb fuel					Emissions Factors (lb/hr)				
	CO	NOx	VOC	SOx	PM	CO	NOx	VOC	SOx	PM
AH-1W	11.21	5.44	0.57	0.40	4.20	9.10	4.42	0.46	0.32	3.41
AV-8B	7.70	8.60	0.54	0.40	3.80	46.20	51.60	3.24	2.40	22.80
C-130 F/R/T	2.07	8.16	0.47	0.40	3.97	9.32	36.72	2.12	1.80	17.87
CH-46	17.04	4.12	2.64	0.40	1.78	20.45	4.94	3.17	0.48	2.14
CH-53	2.13	8.08	0.15	0.40	2.21	9.51	36.07	0.67	1.79	9.87
E-2 / E-2C	2.54	10.04	0.36	0.40	0.94	5.59	22.09	0.79	0.88	2.07
EA-18G	0.72	14.75	0.12	0.40	6.56	7.44	152.49	1.24	4.14	67.82
EA-6B	7.99	5.71	1.09	0.40	12.12	51.06	36.49	6.97	2.56	77.45
EP-3	2.51	7.73	0.58	0.40	3.97	10.57	32.56	2.44	1.68	16.72
F-15	3.62	46.72	0.65	0.40	8.15	22.43	289.48	4.03	2.48	50.50
FA-18A/C	2.44	6.74	0.44	0.40	6.36	16.19	44.73	2.92	2.65	42.20
FA-18E/F	0.72	14.75	0.12	0.40	6.56	7.44	152.49	1.24	4.14	67.82
HH-60	6.25	6.40	0.55	0.40	4.20	7.50	7.68	0.66	0.48	5.04
Learjet	22.38	5.90	4.26	0.40	1.27	23.81	6.28	4.53	0.43	1.35
MH-60R/S	6.25	6.40	0.55	0.40	4.20	7.50	7.68	0.66	0.48	5.04
P-3C	2.51	7.73	0.58	0.40	3.97	12.05	37.10	2.78	1.92	19.06
P-8 MMA	1.24	9.26	0.28	0.40	0.56	4.05	30.21	0.91	1.31	1.83
S-3	14.10	4.07	1.86	0.40	3.62	32.29	9.32	4.26	0.92	8.29
S-3B	14.10	4.07	1.86	0.40	3.62	32.29	9.32	4.26	0.92	8.29
SH-60	6.25	6.40	0.55	0.40	4.20	7.50	7.68	0.66	0.48	5.04
SH-60B	6.25	6.40	0.55	0.40	4.20	7.50	7.68	0.66	0.48	5.04
SH-60B/F	6.25	6.40	0.55	0.40	4.20	7.50	7.68	0.66	0.48	5.04
SH-60F	6.25	6.40	0.55	0.40	4.20	7.50	7.68	0.66	0.48	5.04
UH-1N	3.34	4.72	0.17	0.40	4.20	1.80	2.55	0.09	0.22	2.27
A-10	4	8.83	0.4	0.4	2.67	12.104	26.71958	1.2104	1.2104	8.07942
B-1B	0.84	13.12	0.11	0.4	0.14	5.5776	87.1168	0.7304	2.656	0.9296
E-2	0.65	10.45	0.16	0.4	3.97	2.8847	46.3771	0.71008	1.7752	17.61886
E-3	2.07	8.45	0.31	0.4	0.26	67.65588	276.1798	10.13204	13.0736	8.49784
KC-135	1.34	13.5	0.03	0.4	0.13	30.66992	308.988	0.68664	9.1552	2.97544
MQ-4C						2.1	38.84	0.66	3.54	0.61
MV-22	19.74	3.94	3.43	0.40	1.78	22.1088	4.4128	3.8416	0.448	1.9936

Table D-4: Ordnance Emissions Factors

Ordnance Type	Ordnance	Emission Factor (lb per lb)							Emission Factor (lb/item)						
		CO_2	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	Lead	CO_2	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	Lead
BOMB	CBU MK20 ROCKEYE									0.00					
	GBU32I JDAM		0.1482							57.06					
	LGTR									0.00					
	MK76		0.085							0.26					
	BDU 48		0.085							0.26					
	MK82 HE		0.3184							61					
	GBU12 - Paveway II		0.3184							61					
	MK82 INERT		0.085							0.26					
	BDU 45		0.085							0.26					
	MK83 HE		0.1482							62					
	GBU 16		0.1482							66					
	MK84		0.1482							140					
	MK83 INERT		0.085							0.26					
OTHER ORD	Type														
	EER/IEER AN/SQQ-110	1.2	0.0044	0.011				0.00004		0.02					
	BLASTING CAP MK11								1.80E-03	3.10E-04	4.50E-05	4.60E-04	2.90E-04		1.30E-04
	Detonator														
	FIRING DEVICE														
	FUSE														
	GRENADE SIMULATOR								4.10E-03	0.0004	5.60E-03	0.12		4.70E-04	1.40E-06
	Grenades	6.30E-01	0.021	6.30E-03	2.10E-02	1.50E-02	1.20E-04	1.40E-04		0.00					
	Haversacks	6.30E-01	0.021	6.30E-03	2.10E-02	1.50E-02	1.20E-04	1.40E-04		0.42					
	K143 Antipersonnel Mine	6.30E-01	0.021	6.30E-03	2.10E-02	1.50E-02	1.20E-04	1.40E-04		0.03					
	M1A2 BANGALORE TORP	6.30E-01	0.021	6.30E-03	2.10E-02	1.50E-02	1.20E-04	1.40E-04		0.21					
	M7 BANDOLEER MK57 (Claymore mine)		0.15108												

Table D-4: Ordnance Emissions Factors (continued)

Ordnance Type	Ordnance	Emission Factor (lb per lb)							Emission Factor (lb/item)						
		CO_2	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	Lead	CO_2	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	Lead
	M112 DEMO CHARGE								7.90E-01	2.60E-02	7.90E-03	2.60E-02	1.90E-02		1.70E-04
	M700 BLASTING FUSE		0.149						0.0008	0.0003	0.0002	0.00009	0.00009	0.000002	0
	Flare, Aircraft Parachute														
		0.039	0.021	0.054	0.1	0.092	0.00018			5.91E-05	0.000152	0.000282	0.000259	5.07E-07	
	Chaff	0.039	0.021	0.054	0.1	0.092	0.00018			5.91E-05	0.000152	0.000282	0.000259	5.07E-07	
	MK36 M0 DEMO CHARGE														
	MK75 CHARGE														
	MK84 [86] EOD Shaped Charge														
	MK120 NONELEC DET (ft)														
	MK123 NONELEC DET (ft)														
	MK138 DEMO CHG ASSEMBLY	6.30E-01	0.021	6.30E-03	2.10E-02	1.50E-02	1.20E-04	1.40E-04							
	MK140 FLEXIBLE CHARGE														
	PBXN-109 TEST Det Cord														
	SIGNAL MK 18(G950) SMOKE														
	C4 1.25 LB	6.30E-01	0.021	6.30E-03	2.10E-02	1.50E-02	1.20E-04	1.40E-04		0.02625	0.007875	0.02625	0.01875	0.00015	
	C4 5 LB	6.30E-01	0.021	6.30E-03	2.10E-02	1.50E-02	1.20E-04	1.40E-04		0.105	0.0315	0.105	0.075	0.0006	
	C4 15 LB	6.30E-01	0.021	6.30E-03	2.10E-02	1.50E-02	1.20E-04	1.40E-04		0.315	0.0945	0.315	0.225	0.0018	
	C4 40 LB	6.30E-01	0.021	6.30E-03	2.10E-02	1.50E-02	1.20E-04	1.40E-04		0.84	0.252	0.84	0.6	0.0048	0.0056
	C4 100 LB	6.30E-01	0.021	6.30E-03	2.10E-02	1.50E-02	1.20E-04	1.40E-04		2.1	0.63	2.1	1.5	0.012	0.014

Table D-4: Ordnance Emissions Factors (continued)

Ordnance Type	Ordnance	Emission Factor (lb per lb)							Emission Factor (lb/item)						
		CO_2	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	Lead	CO_2	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	Lead
	C4 300 LB	6.30E-01	0.021	6.30E-03	2.10E-02	1.50E-02	1.20E-04	1.40E-04		0.021	0.0063	0.021	0.015	0.00012	0.00014
	C4 500 LB	6.30E-01	0.021	6.30E-03	2.10E-02	1.50E-02	1.20E-04	1.40E-04		0.021	0.0063	0.021	0.015	0.00012	0.00014
	TNT Blocks 0.5 lbd		0.398												
	DEMO SHEET														
	DETONATING CORD														
	DEMO CHARGE														
	SIMULATED ARTILLERY	6.30E-01	0.021	6.30E-03	2.10E-02	1.50E-02	1.20E-04	1.40E-04		0.002888	0.000866	0.002888	0.002063	1.65E-05	
PROJECTILE (LARGE)	155MM HE	6.51	2.35E+01	1.43E+00	0.496	0.2418		2.26E-03							
	155MM ILL								6.00	8.63	0.087	3.44	0.13	0.0027	0.029
	5"/54 Inert	2.60E-04	3.50E-04	3.60E-05	2.60E-05	2.30E-05		6.70E-04		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5"/54	5"/54 BLP	1.60E-02	2.00E-02		1.20E-03	9.30E-04		6.00E-06							
	5"/54 HCVT+32 (EOD)	1.60E-02	2.00E-02		1.20E-03	9.30E-04		6.00E-06		0.16	0	0.0096	0.00744	0	0.000048
	5"/54 HECVT	1.60E-02	2.00E-02		1.20E-03	9.30E-04		6.00E-06		0.1280	0.1600	0.0096	0.0074		
	5"/54 HEPD	1.60E-02	2.00E-02		1.20E-03	9.30E-04		6.00E-06		0.16	0	0.0096	0.00744	0	0.000048
	5"/54 HEVT	1.60E-02	2.00E-02		1.20E-03	9.30E-04		6.00E-06		1.60E-01	0.00E+00	9.60E-03	7.44E-03	0.00E+00	4.80E-05
	5"/54 ILL	1.50E-02	1.40E-02	3.60E-04	9.20E-04	7.60E-04		1.30E-06		1.12E-01	2.88E-03	7.36E-03	6.08E-03	0.00E+00	1.04E-05
	5"54/54 VTNF	1.60E-02	2.00E-02		1.20E-03	9.30E-04		6.00E-06		1.60E-01	0.00E+00	9.60E-03	7.44E-03	0.00E+00	4.80E-05
5"/62	5"/62	1.60E-02	2.00E-02		1.20E-03	9.30E-04		6.00E-06		1.60E-01	0.00E+00	9.60E-03	7.44E-03	0.00E+00	4.80E-05
	5"/62 HE-MFF	1.60E-02	2.00E-02		1.20E-03	9.30E-04		6.00E-06		1.60E-01	0.00E+00	9.60E-03	7.44E-03	0.00E+00	4.80E-05
	5"/62 HECVT	1.60E-02	2.00E-02		1.20E-03	9.30E-04		6.00E-06		1.60E-01	0.00E+00	9.60E-03	7.44E-03	0.00E+00	4.80E-05
	5"/62 HEET	1.60E-02	2.00E-02		1.20E-03	9.30E-04		6.00E-06		1.60E-01	0.00E+00	9.60E-03	7.44E-03	0.00E+00	4.80E-05
	5"/62 KEET	1.60E-02	2.00E-02		1.20E-03	9.30E-04		6.00E-06		1.60E-01	0.00E+00	9.60E-03	7.44E-03	0.00E+00	4.80E-05
60mm	60MM								0.4	0.06	0.005	0.062	0.03		0.0004
	60MM WP								0.13	0.154	0.0124	0.221	0.494	0.00014	0.001
76mm	76MM BLP	1.44E-02	1.80E-02		1.08E-03	8.37E-04		5.40E-06							
	81MM HE								1.48	0.14	0.016	0.173	0.096		0.0007
	81MM ILL								1.48	0.14	0.016	0.173	0.096		0.0007
CAS	GAU-17 30mm														
PROJECTILE (SMALL)	20MM	0.19	0.38	0.0049	0.0075	0.0053		0.00026	0.016	0.033	0.00043	0.00066	0.00046		0.000023

Table D-4: Ordnance Emissions Factors (continued)

Ordnance Type	Ordnance	Emission Factor (lb per lb)							Emission Factor (lb/item)						
		CO_2	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	Lead	CO_2	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	Lead
	25MM								0.11	0.019	0.00067	0.0027	0.0017		0.000055
	30MM EFV Main Gun	0.14	0.028	0.0063	0.13	0.08		0.00037		7.28E-03	1.64E-03	3.38E-02	2.08E-02	0.00E+00	9.62E-05
	40MM	5.70E-01	6.00E-02	1.30E-02	1.10E-01	5.60E-02		6.20E-04	4.90E-02	4.00E-03	1.30E-03	9.50E-03	5.10E-03	0.00E+00	8.00E-05
	40MM HE	5.70E-01	6.00E-02	1.30E-02	1.10E-01	5.60E-02		6.20E-04	4.90E-02	4.00E-03	1.30E-03	9.50E-03	5.10E-03	0.00E+00	8.00E-05
	40MM ILL	7.20E-02	2.40E-02	6.50E-03	1.40E-01	1.20E-01	0.00019	7.90E-04	0.015	0.005	0.0014	0.029	0.025	0.00004	1.60E-04
	40MM PRACTICE	2.60E-01	2.50E-01	9.50E-03	1.40E-02	1.10E-02		1.10E-03	2.70E-03	2.60E-03	9.70E-05	1.40E-04	1.20E-04	0.00E+00	1.10E-05
	.45 CAL	2.80E-01	3.40E-01	1.00E-02	4.70E-02	4.00E-02		1.60E-02	2.20E-04	2.60E-04	8.10E-06	3.70E-05	3.10E-05		1.20E-05
	5.56	2.40E-01	4.40E-01	1.30E-02	9.20E-03	7.60E-03		3.20E-03	8.70E-04	1.60E-03	8.50E-05	3.90E-05	2.80E-05		5.10E-06
	5.56 BLANK	2.60E-01	3.20E-01	2.30E-02	7.80E-03	6.80E-03	0.00011	1.10E-03	2.30E-04	2.80E-04	2.00E-05	6.90E-06	6.00E-06	9.80E-09	9.70E-07
	.50CAL	1.50E-01	3.30E-01	3.60E-02	9.60E-03	5.60E-03		4.00E-04	5.10E-03	1.10E-02	1.20E-03	3.10E-04	1.90E-04		1.30E-05
	.50CAL	1.50E-01	3.30E-01	3.60E-02	9.60E-03	5.60E-03		4.00E-04	5.10E-03	1.10E-02	1.20E-03	3.10E-04	1.90E-04		1.30E-05
	.50CAL BLANK	3.10E-01	2.70E-01	4.10E-03	1.40E-02	1.30E-02		1.70E-03	5.10E-03	1.10E-02	1.20E-03	3.10E-04	1.90E-04		1.30E-05
	7.62	3.50E-01	2.50E-01	1.60E-02	6.10E-03	5.60E-03	0.00013	9.70E-04	1.20E-03	2.30E-03	9.70E-05	5.10E-05	3.80E-05		4.90E-06
	7.62	3.50E-01	2.50E-01	1.60E-02	6.10E-03	5.60E-03	0.00013	9.70E-04	1.20E-03	2.30E-03	9.70E-05	5.10E-05	3.80E-05		4.90E-06
	9MM								2.00E-04	3.10E-04	1.50E-05	2.40E-05	2.00E-05	8.20E-08	6.80E-06
	.300 WIN MAG								1.90E-03	3.00E-03	1.50E-05	9.40E-05	7.30E-05		1.80E-05
	.223 Rifle Rounds								7.50E-05	8.00E-05	5.00E-06	3.40E-06	2.60E-06		1.90E-06
	.22 Magnum								7.50E-05	8.00E-05	5.00E-06	3.40E-06	2.60E-06		1.90E-06
	.22 Long Rifle								7.50E-05	8.00E-05	5.00E-06	3.40E-06	2.60E-06		1.90E-06
	12 Guage Shotgun	5.10E-03	1.10E-02	1.20E-03	3.10E-04	1.90E-04		1.30E-05							
MINE SHAPE	M18A1	1.6	2.00E-02	1.80E-02	4.90E-02	2.60E-02		5.70E-05							
	MK76														
MISSILE	AGM-114B														
	AGM-65 Maverick														
	AGM-84	0.4		0.06	0.1025	0.1025			140	30.62356	35.574	61.795	61.795		
	AIM-120														
	AIM-7														
	AIM-9														
	BGM-71E TOW-A														
	GBU-9														

Table D-4: Ordnance Emissions Factors (continued)

Ordnance Type	Ordnance	Emission Factor (lb per lb)							Emission Factor (lb/item)						
		CO_2	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	Lead	CO_2	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	Lead
	AGM-88 HARM														
	NSM														
	JSOW														
	Japanese Missile Tests														
	Tactical Tomahawk														
	Seasparrow Missile														
	SLAM ER														
	SM2 or equivalent														
ROCKET	2.75" RKT	4.50E-01	5.60E-02	7.10E-03	6.10E-02	3.80E-02		1.20E-03							
	2.75" RKT HE	3.00E-01	1.70E-01	2.40E-03	1.00E-01	5.30E-02		2.60E-04	5.5	0.93	0.0056	0.4	0.29		0.07
	2.75" RKT I	4.50E-01	5.60E-02	7.10E-03	6.10E-02	3.80E-02		1.20E-03							
PYROTECHNICS	MK58 Marine Location Marker	1	1.30E-02	1.20E-02	3.20E-02	1.70E-02	6.10E-05	3.80E-05							
	Smoke Grenade AN-M8								3.30E-02	4.60E-02	1.00E-03	6.80E-01	1.10E-01	1.20E-04	4.70E-04

Table D-5: Vessel Emissions – No Action Alternative

Type Training	Training Ops (#)	OPERATIONAL INFORMATION - VESSELS									EMISSIONS/YEAR (lb) BY JURISDICTION												EMISSIONS/YEAR (lb) BY JURISDICTION												GHG Emissions (lb)					
		Ship / Vessel / Boat			Range Time (hr)			Distribution (hr)			State (0-3 nm offshore)						Waters of U S (3-12 nm)						Int Waters (> 12 nm)						Total Emissions											
		Number	Ship Type	Participation	Per Ship	Time at Each Power Level (%)	Total	0-3 nm from shore	3-12 nm from shore	>12 nm from shore	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	Fuel Flow (GPH)	Annual Fuel Consumption (gal)	CO_2	N_2O	CH_4	CO_{2-e}
AIR WARFARE																																								
Air Combat Maneuver	4800																																							
Air Defense Exercise	100																																							
Air Intercept Control	4800																																							
Gunnery Exercise, A-A (Medium Caliber)	36																																							
Missile Exercise, A-A	18																																							
Gunnery Exercise, S-A (Large Caliber)	5	10	FFG	2.00	2.0	100%	20.0	0.0	0.0	20.0	0	0	0	0	0	0	0	0	0	0	0	0	659	943	60	698	46	42	659	943	60	698	46	42	79	1,580	33,265	1	1	33,620
Gunnery Exercise, S-A (Medium Caliber)	12	24	FFG	2.00	2.0	100%	48.0	0.0	0.0	48.0	0	0	0	0	0	0	0	0	0	0	0	0	1,581	2,264	144	1,676	111	100	1,581	2,264	144	1,676	111	100	79	3,792	79,837	3	2	80,687
Missile Exercise, S-A	15	30	FFG	2.00	2.0	100%	60.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	79	0	0	0	0	0
STRIKE WARFARE																																								
Bombing Exercise, A-G	2300																																							
Missile Exercise, A-G	85																																							
Gunnery Exercise, A-G	96																																							
AMPHIBIOUS WARFARE																																								
Fire Support Exercise - Land-Based target	10	10	CG	1	8.0	100%	80.00	80.0	0.0	0.0	4,921	6,366	346	6,210	223	201	0	0	0	0	0	0	0	0	0	0	0	0	4,921	6,366	346	6,210	223	201	184	14,720	309,915	10	9	313,215
Amphibious Rehearsal, No Landing – Marine Air Ground Task Force	12	48	LSD	4	24.0	100%	1152.0	1152.0	0.0	0.0	24,480	385,356	12,488	40,366	3,122	2,810	0	0	0	0	0	0	0	0	0	0	0	0	24,480	385,356	12,488	40,366	3,122	2,810	184	1,461,888	30,778,590	998	870	31,106,382
		48	LHA/LHD	4	24.0	100%	1152.0	1152.0	0.0	0.0	9,308	55,100	6,647	156,096	32,924	29,632	0	0	0	0	0	0	0	0	0	0	0	0	9,308	55,100	6,647	156,096	32,924	29,632	373	1,461,888	30,778,590	998	870	31,106,382
		48	LPD	4	24.0	100%	1152.0	1152.0	0.0	0.0	4,009	24,192	2,972	70,065	14,803	13,323	0	0	0	0	0	0	0	0	0	0	0	0	4,009	24,192	2,972	70,065	14,803	13,323	373	1,461,888	30,778,590	998	870	31,106,382
Amphibious Assault - Marine Air Ground Task Force	6	6	CG	1	8.0	100%	48.0	48.0	0.0	0.0	2,952	3,820	207	3,726	134	121	0	0	0	0	0	0	0	0	0	0	0	0	2,952	3,820	207	3,726	134	121	184	60,912	1,282,441	42	36	1,296,099
		6	LHA	1	8.0	100%	48.0	48.0	0.0	0.0	354	2,089	265	6,287	1,262	1,136	0	0	0	0	0	0	0	0	0	0	0	0	354	2,089	265	6,287	1,262	1,136	373	60,912	1,282,441	42	36	1,296,099
		12	LPD	2	8.0	100%	96.0	96.0	0.0	0.0	334	2,016	248	5,839	1,234	1,110	0	0	0	0	0	0	0	0	0	0	0	0	334	2,016	248	5,839	1,234	1,110	373	121,824	2,564,882	83	72	2,592,198
		12	FFG	2	8.0	100%	96.0	96.0	0.0	0.0	3,162	4,527	288	3,352	222	200	0	0	0	0	0	0	0	0	0	0	0	0	3,162	4,527	288	3,352	222	200	79	121,824	2,564,882	83	72	2,592,198
Amphibious Raid - Special Purpose Marine Air Ground Task Force	6	6	LHA	1	6.0	100%	36.0	36.0	0.0	0.0	266	1,567	199	4,715	946	852	0	0	0	0	0	0	0	0	0	0	0	0	266	1,567	199	4,715	946	852	373	45,684	961,831	31	27	972,074
		12	LPD	2	2.5	100%	30.0	30.0	0.0	0.0	104	630	77	1,825	386	347	0	0	0	0	0	0	0	0	0	0	0	0	104	630	77	1,825	386	347	373	38,070	801,526	26	23	810,062
Non-Combatant Evacuation Operation	5	5	LHA	1	80.0	100%	400.0	400.0	0.0	0.0	2,952	17,412	2,212	52,388	10,516	9,464	0	0	0	0	0	0	0	0	0	0	0	0	2,952	17,412	2,212	52,388	10,516	9,464	373	149,200	3,141,257	102	89	3,174,711
		10	LPD	2	80.0	100%	800.0	800.0	0.0	0.0	2,784	16,800	2,064	48,656	10,280	9,252	0	0	0	0	0	0	0	0	0	0	0	0	2,784	16,800	2,064	48,656	10,280	9,252	373	298,400	6,282,514	204	178	6,349,422
		5	LCU	1	80.0	100%	400.0	400.0	0.0	0.0	7,328	45,812	1,396	21,844	2,056	1,850	0	0	0	0	0	0	0	0	0	0	0	0	7,328	45,812	1,396	21,844	2,056	1,850	611	244,400	5,145,598	167	145	5,200,398
Humanitarian Assistance/ Disaster Relief Operations	5	5	LHA	1	8.0	100%	40.0	40.0	0.0	0.0	295	1,741	221	5,239	1,052	946	0	0	0	0	0	0	0	0	0	0	0	0	295	1,741	221	5,239	1,052	946	373	50,760	1,068,701	35	30	1,080,083
		10	LPD	2	8.0	100%	80.0	80.0	0.0	0.0	278	1,680	206	4,866	1,028	925	0	0	0	0	0	0	0	0	0	0	0	0	278	1,680	206	4,866	1,028	925	373	101,520	2,137,402	69	60	2,160,165
		5	LCAC	1	8.0	100%	40.0	40.0	0.0	0.0	733	4,581	140	2,184	206	185	0	0	0	0	0	0	0	0	0	0	0	0	733	4,581	140	2,184	206	185	611	50,760	1,068,701	35	30	1,080,083
Unmanned Aerial Vehicle - Intelligence, Surveillance, and Reconaissance	100																																							

Table D-5: Vessel Emissions – No Action Alternative (continued)

Type Training	Training Ops (#)	OPERATIONAL INFORMATION - VESSELS									EMISSIONS/YEAR (lb) BY JURISDICTION												EMISSIONS/YEAR (lb) BY JURISDICTION												GHG Emissions (lb)					
		Ship / Vessel / Boat			Range Time (hr)			Distribution (hr)			State (0-3 nm offshore)						Waters of U S (3-12 nm)						Int Waters (> 12 nm)						Total Emissions											
		Number	Ship Type	Participation	Per Ship	Time at Each Power Level (%)	Total	0-3 nm from shore	3-12 nm from shore	>12 nm from shore	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	Fuel Flow (GPH)	Annual Fuel Consumption (gal)	CO_2	N_2O	CH_4	CO_{2-e}
SURFACE WARFARE																																							
Gunnery Exercise, A-S (Small Caliber) - Ship	242																																						
Gunnery Exercise, A-S (Medium Caliber) - Ship	295																																						
Missile Exercise (A-S) - Rocket	3																																						
Missile Exercise (A-S)	20																																						
Laser Targeting	600																																						
Bombing Exercise (A-S)	37																																						
Torpedo Exercise (Submarine to Surface)	5																																						
Missile Exercise (S-S)	12	24	FFG	2.00	2.0	100%	48.0	0.0	0.0	48.0	0	0	0	0	0	0	0	0	0	0	0	0	1,581	2,264	144	1,676	111	100	1,581	2,264	144	1,676	111	100	79	3,792	79,837	3	2	80,687
Gunner Exercise (Surface-to-Surface) Ship – Large-caliber	140	30.8	CG	0.22	2.5	100%	77.00	0.0	21.6	55.4	0	0	0	0	0	0	1,326	1,716	93	1,674	60	54	3,410	4,412	240	4,304	155	139	4,736	6,128	333	5,978	215	193	184	14,168	298,293	10	8	301,470
		63	DDG	0.45	2.5	100%	157.5	0.0	44.1	113.4	0	0	0	0	0	0	2,653	5,050	177	3,904	161	144	6,822	12,987	455	10,039	413	371	9,475	18,037	632	13,943	573	516	187	29,453	620,093	20	18	626,697
		21	FFG	0.15	2.5	100%	52.5	0.0	14.7	37.8	0	0	0	0	0	0	484	693	44	513	34	31	1,245	1,783	113	1,320	87	79	1,729	2,476	158	1,833	121	109	79	4,148	87,321	3	2	88,251
		16.8	USCG	0.12	2.5	100%	42.0	0.0	11.8	30.2	0	0	0	0	0	0	68	681	10	136	2	2	174	1,751	27	349	6	6	241	2,432	37	485	9	8	66	2,772	58,362	2	2	58,983
Gunner Exercise (Surface-to-Surface) Ship – Medium-caliber	100	22	CG	0.22	2.5	100%	55.00	0.0	15.4	39.6	0	0	0	0	0	0	947	1,226	67	1,196	43	39	2,436	3,151	171	3,074	110	99	3,383	4,377	238	4,270	153	138	184	10,120	213,066	7	6	215,336
		45	DDG	0.45	2.5	100%	112.5	0.0	31.5	81.0	0	0	0	0	0	0	1,895	3,607	126	2,789	115	103	4,873	9,276	325	7,171	295	265	6,768	12,884	451	9,960	410	369	187	21,038	442,924	14	13	447,641
		15	FFG	0.15	2.5	100%	37.5	0.0	10.5	27.0	0	0	0	0	0	0	346	495	32	367	24	22	889	1,273	81	943	62	56	1,235	1,769	113	1,310	87	78	79	2,963	62,372	2	2	63,037
		1	LPD	0.01	2.5	100%	2.5	0.0	0.7	1.8	0	0	0	0	0	0	2	15	2	43	9	8	6	38	5	109	23	21	9	53	6	152	32	29	373	933	19,633	1	1	19,842
		12	USCG	0.12	2.5	100%	30.0	0.0	8.4	21.6	0	0	0	0	0	0	48	486	7	97	2	2	124	1,251	19	249	5	4	172	1,737	26	347	6	6	66	1,980	41,687	1	1	42,131
Sinking Exercise (SINKEX)	2	10	FFG	5.00	16.0	100%	160.0	0.0	0.0	160.0	0	0	0	0	0	0	0	0	0	0	0	0	5,270	7,546	480	5,587	370	333	5,270	7,546	480	5,587	370	333	79	12,640	266,123	9	8	268,957
Gunnery Exercise (S-S) Boat – Medium-caliber	10	50	FFG	5.00	3.0	100%	150.0	0.0	0.0	150.0	0	0	0	0	0	0	0	0	0	0	0	0	4,941	7,074	450	5,238	347	312	4,941	7,074	450	5,238	347	312	79	11,850	249,490	8	7	252,147
Gunnery Exercise (S-S) Small-caliber	40	80	CRRC	2	3.0	100%	240.0	0.0	0.0	240.0	0	0	0	0	0	0	0	0	0	0	0	0	0	36	3,096	0	0	0	0	36	3,096	0	0	0	3	720	15,159	0	0	15,320
Maritime Security Operations (MSO)	40	40	FFG	1	8.0	100%	320.0	0.0	0.0	320.0	0	0	0	0	0	0	0	0	0	0	0	0	10,541	15,091	960	11,174	739	665	10,541	15,091	960	11,174	739	665	79	25,280	532,245	17	15	537,914
		40	RHIB	1	8.0	100%	320.0	0.0	0.0	320.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0	108.8	2924.8	19.2	460.8	48.0	43	109	2,925	19	461	48	43	14	4,480	94,322	3	3	95,326
		40	CRRC	1	8.0	100%	320.0	0.0	0.0	320.0	0	0	0	0	0	0	0	0	0	0	0	0	0	48	4,128	0	0	0	0	48	4,128	0	0	0	3	960	20,212	1	1	20,427
ANTI-SUBMARINE WARFARE																																							
Tracking Exercise-Helo	62																																						
Torpedo Exercise-Helo	4																																						
Tracking Exercise-Maritime Patrol Advanced Extended Echo Ranging Sonobuoys	11																																						
Tracking Exercise -Maritime Patrol Aircraft	34																																						
Torpedo Exercise-Maritime Patrol Aircraft	4																																						
Tracking Exercise –Surface	132	30	FFG	0.23	2.0	100%	60.7	0.0	30.4	30.4	0	0	0	0	0	0	1,000	1,432	91	1,060	70	63	1,000	1,432	91	1,060	70	63	2,000	2,864	182	2,120	140	126	79	4,797	100,994	3	3	102,069
		92	DDG	0.7	2.0	100%	184.8	0.0	92.4	92.4	0	0	0	0	0	0	5,559	10,582	371	8,180	336	303	5,559	10,582	371	8,180	336	0	11,118	21,163	741	16,360	673	303	187	34,558	727,576	24	21	735,324
		10	LCS	0.075	2.0	100%	19.8	0.0	9.9	9.9	0	0	0	0	0	0	7,207	1,693	28	666	69	62	7,207	1,693	28	666	69	0	14,414	3,387	56	1,332	137	62	66	1,307	27,513	1	1	27,806
Torpedo Exercise-Surface	3	3	FFG	1	2.0	100%	6.0	0.0	3.0	3.0	0	0	0	0	0	0	99	141	9	105	7	6	99	141	9	105	7	6	198	283	18	210	14	12	79	474	9,980	0	0	10,086
Tracking Exercise– Submarine	12																																						
Torpedo Exercise – Submarine	10																																						

Table D-5: Vessel Emissions – No Action Alternative (continued)

Type Training	Training Ops (#)	OPERATIONAL INFORMATION - VESSELS									EMISSIONS/YEAR (lb) BY JURISDICTION												EMISSIONS/YEAR (lb) BY JURISDICTION												GHG Emissions (lb)					
		Ship / Vessel / Boat			Range Time (hr)			Distribution (hr)			State (0-3 nm offshore)						Waters of U S (3-12 nm)						Int Waters (> 12 nm)						Total Emissions											
		Number	Ship Type	Participation	Per Ship	Time at Each Power Level (%)	Total	0-3 nm from shore	3-12 nm from shore	>12 nm from shore	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	Fuel Flow (GPH)	Annual Fuel Consumption (gal)	CO_2	N_2O	CH_4	CO_{2-e}
MAJOR TRAINING EXERCISES																																							
Joint Expeditionary Exercise	1	1.0	CVN	1	80.0	100%	80.0	0.0	80.0	0.0																													
		1.0	CG	1	80.0	100%	80.0	0.0	80.0	0.0	0	0	0	0	0	0	4,921	6,366	346	6,210	223	201	0	0	0	0	0	0	4,921	6,366	346	6,210	223	201	184	14,720	309,915	10	9	313,215
		2.0	FFG	2	80.0	100%	160.0	0.0	160.0	0.0	0	0	0	0	0	0	5,270	7,546	480	5,587	370	333	0	0	0	0	0	0	5,270	7,546	480	5,587	370	333	79	12,640	266,123	9	8	268,957
		5.0	DDG	5	80.0	100%	400.0	0.0	400.0	0.0	0	0	0	0	0	0	24,064	45,808	1,604	35,412	1,456	1,310	0	0	0	0	0	0	24,064	45,808	1,604	35,412	1,456	1,310	187	74,800	1,574,839	51	45	1,591,611
		1.0	LHD/LHA	1	80.0	100%	80.0	0.0	80.0	0.0	0	0	0	0	0	0	590	3,482	442	10,478	2,103	1,893	0	0	0	0	0	0	590	3,482	442	10,478	2,103	1,893	373	29,840	628,251	20	18	634,942
		2.0	LSD	2	80.0	100%	160.0	0.0	160.0	0.0	0	0	0	0	0	0	3,400	53,522	1,734	5,606	434	390	0	0	0	0	0	0	3,400	53,522	1,734	5,606	434	390	373	59,680	1,256,503	41	36	1,269,884
		1.0	LPD	1	80.0	100%	80.0	0.0	80.0	0.0	0	0	0	0	0	0	278	1,680	206	4,866	1,028	925	0	0	0	0	0	0	278	1,680	206	4,866	1,028	925	373	29,840	628,251	20	18	634,942
		1.0	TAOE	1	80.0	100%	80.0	0.0	80.0	0.0	0	0	0	0	0	0	8,781	24,905	848	9,599	833	750	0	0	0	0	0	0	8,781	24,905	848	9,599	833	750	1,865	149,200	3,141,257	102	89	3,174,711
		1.0	SSN	1	80.0	100%	80.0	0.0	80.0	0.0																													
		1.0	SSGN	1	80.0	100%	80.0	0.0	80.0	0.0																													
		2.0	T-AGO(LF	2	80.0	100%	160.0	0.0	160.0	0.0	0	0	0	0	0	0	1,067	6,299	800	19,109	3,803	3,423	0	0	0	0	0	0	1,067	6,299	800	19,109	3,803	3,423	1,865	298,400	6,282,514	204	178	6,349,422
		1.0	CG-PARTI	1	80.0	100%	80.0	0.0	80.0	0.0	0	0	0	0	0	0	8,623	3,768	792	1,680	208	187	0	0	0	0	0	0	8,623	3,768	792	1,680	208	187	184	14,720	309,915	10	9	313,215
		2.0	DDG-PART	2	80.0	100%	160.0	0.0	160.0	0.0	0	0	0	0	0	0	16,638	7,984	1,440	2,864	400	360	0	0	0	0	0	0	16,638	7,984	1,440	2,864	400	360	187	29,920	629,936	20	18	636,644
		1.0	SS-PARTI	1	80.0	100%	80.0	0.0	80.0	0.0	0	0	0	0	0	0	235	1,386	176	4,169	837	753	0	0	0	0	0	0	235	1,386	176	4,169	837	753	373	29,840	628,251	20	18	634,942
		5.0	LCAC	5	80.0	100%	400.0	0.0	400.0	0.0	0	0	0	0	0	0	7,328	45,812	1,396	21,844	2,056	1,850	0	0	0	0	0	0	7,328	45,812	1,396	21,844	2,056	1,850	611	507,600	10,687,010	347	302	10,800,827
		2.0	LCU	2	80.0	100%	160.0	0.0	160.0	0.0	0	0	0	0	0	0	2,931	18,325	558	8,738	822	740	0	0	0	0	0	0	2,931	18,325	558	8,738	822	740	611	97,760	2,058,239	67	58	2,080,159
		19.0	CRRC	19	80.0	100%	1520.0	0.0	1520.0	0.0	0	0	0	0	0	0	0	226	19,610	0	0	0	0	0	0	0	0	0	0	226	19,610	0	0	0	3	4,560	96,006	3	3	97,029
		2.0	RHIB	2	80.0	100%	160.0	0.0	160.0	0.0	0	0	0	0	0	0	54	1,462	10	230	24	22	0	0	0	0	0	0	54	1,462	10	230	24	22	373	59,680	1,256,503	41	36	1,269,884
		14.0	AAV	14	80.0	100%	1120.0	0.0	1120.0	0.0	0	0	0	0	0	0	851	6,966	918	1,400	291	262	0	0	0	0	0	0	851	6,966	918	1,400	291	262	3	3,360	70,741	2	2	71,495
Joint Multi-Strike Group Exercise	1	3.0	CVN	3	80.0	100%	240.0	0.0	0.0	240.0																													
		3.0	CG	3	80.0	100%	240.0	0.0	0.0	240.0	0	0	0	0	0	0	0	0	0	0	0	0	14,762	19,099	1,037	18,631	670	603	14,762	19,099	1,037	18,631	670	603	184	44,160	929,745	30	26	939,646
		3.0	FFG	3	80.0	100%	240.0	0.0	0.0	240.0	0	0	0	0	0	0	0	0	0	0	0	0	7,906	11,318	720	8,381	554	499	7,906	11,318	720	8,381	554	499	79	18,960	399,184	13	11	403,435
		12.0	DDG	12	80.0	100%	960.0	0.0	0.0	960.0	0	0	0	0	0	0	0	0	0	0	0	0	57,754	109,939	3,850	84,989	3,494	3,145	57,754	109,939	3,850	84,989	3,494	3,145	187	179,520	3,779,614	123	107	3,819,867
		3.0	TAOE	3	80.0	100%	240.0	0.0	0.0	240.0	0	0	0	0	0	0	0	0	0	0	0	0	26,342	74,714	2,544	28,798	2,498	2,249	26,342	74,714	2,544	28,798	2,498	2,249	1,865	447,600	9,423,770	306	266	9,524,134
		5.0	SSN	5	80.0	100%	400.0	0.0	0.0	400.0																													
		2.0	T-AGO(LF	2	80.0	100%	160.0	0.0	0.0	160.0	0	0	0	0	0	0	0	0	0	0	0	0	1,067	6,299	800	19,109	3,803	3,423	1,067	6,299	800	19,109	3,803	3,423	1,865	298,400	6,282,514	204	178	6,349,422
		1.0	SS-PARTI	1	80.0	100%	80.0	0.0	0.0	80.0	0	0	0	0	0	0	0	0	0	0	0	0	235	1,386	176	4,169	837	753	235	1,386	176	4,169	837	753	373	29,840	628,251	20	18	634,942
ELECTRONIC WARFARE																																							
Electronic Warfare Operations	480	480	FFG	1	4	100%	1920.0	0.0	0.0	1920.0	0	0	0	0	0	0	0	0	0	0	0	0	63,245	90,547	5,760	67,046	4,435	3,992	63,245	90,547	5,760	67,046	4,435	3,992	79	151,680	3,193,471	104	90	3,227,481
Flare Exercise	3200																																						
Chaff Exercise - Ship	40	40	FFG	1	4	100%	160.0	0.0	0.0	160.0	0	0	0	0	0	0	0	0	0	0	0	0	5,270	7,546	480	5,587	370	333	5,270	7,546	480	5,587	370	333	79	12,640	266,123	9	8	268,957
Chaff Exercise - Aircraft	3200																																						
MINE WARFARE																																							
Civilian Port Defense	1	1	RHIB	1	24.0	100%	24.0	24.0	0.0	0.0	8.2	219.4	1.4	34.6	3.6	3	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0	8	219	1	35	4	3	14	336	7,074	0	0	7,149
Mine Laying - Aircraft	4																																						
Mine Neutralization – Explosive Ordnance Disposal	20	60	RHIB	3	12.0	100%	720.0	720.0	0.0	0.0	244.8	6580.8	43.2	1036.8	108.0	97	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0	245	6,581	43	1,037	108	97	14	10,080	212,224	7	6	214,485
Limpet Mine Neutralization System/Shock Wave Generator	40	40	RHIB	1	4.0	100%	160.0	160.0	0.0	0.0	54.4	1462.4	9.6	230.4	24.0	22	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0	54	1,462	10	230	24	22	14	2,240	47,161	2	1	47,663
Airborne Mine Countermeasure – Mine Detection	4																																						
Mine Countermeasure Exercise – Towed Sonar (AQS-20,LCS)	4																																						
Mine Countermeasure Exercise – Surface (SMCMEX) Sonar (SQQ-32, MCM)	4																																						
Mine Neutralization – Remotely Operated Vehicle Soanr (ASQ-235 [AQS-20], SLQ-48)	4																																						
Mine Countermeasure – Towed Mine Detection	4																																						
Underwater Demolition Qualification/Certification	30	30	CRRC	1	8.0	100%	240.0	0.0	240.0	0.0	0	0	0	0	0	0	0	36	3,096	0	0	0	0	0	0	0	0	0	0	36	3,096	0	0	0	3	720	15,159	0	0	15,320
Submarine Mine Exercise	16																																						
NAVAL SPECIAL WARFARE																																							
Personnel I&E	240	1200	RHIB	5	8.0	100%	9600.0	9600.0	0.0	0.0	3264.0	87744.0	576.0	13824.0	1440.0	1,296	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0	3,264	87,744	576	13,824	1,440	1,296	48	460,800	9,701,683	315	274	9,805,006
		1440	CRRC	6	8.0	100%	11520.0	11520.0	0.0	0.0	0	1,711	148,625	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,711	148,625	0	0	0	3	34,560	727,626	24	21	735,375
Parachute Insertion	20																																						

Table D-5: Vessel Emissions – No Action Alternative (continued)

Type Training	Training Ops (#)	OPERATIONAL INFORMATION - VESSELS									EMISSIONS/YEAR (lb) BY JURISDICTION												EMISSIONS/YEAR (lb) BY JURISDICTION												GHG Emissions (lb)					
		Ship / Vessel / Boat			Range Time (hr)			Distribution (hr)			State (0-3 nm offshore)						Waters of U S (3-12 nm)						Int Waters (> 12 nm)						Total Emissions											
		Number	Ship Type	Participation	Per Ship	Time at Each Power Level (%)	Total	0-3 nm from shore	3-12 nm from shore	>12 nm from shore	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	Fuel Flow (GPH)	Annual Fuel Consumption (gal)	CO_2	N_2O	CH_4	CO_{2-e}
OTHER																																								
Direct Action (Tactical Air Control Party)	18																																							
Intelligence, Surveillance, Reconnaissance	16																																							
Search and Rescue At Sea	0																																							
Surface Ship Sonar Maintenance	42	42	FFG	1	4.0	100%	168.0	168.0	0.0	0.0	5,534	7,923	504	5,867	388	349	0	0	0	0	0	0	0	0	0	0	0	0	5,534	7,923	504	5,867	388	349	79	13,272	279,429	9	8	282,405
Submarine Sonar Maintenance	48																																							
Small Boat Attack	18	18	CRRC	1	4.0	100%	72.0	0.0	72.0	0.0	0	0	0	0	0	0	0	11	929	0	0	0	0	0	0	0	0	0	0	11	929	0	0	0	3	216	4,548	0	0	4,596
Sub Navigation / Sub Nav Under Ice	8																																							
Precision Anchoring	18	18	FFG	1	4.0	100%	72.0	72.0	0.0	0.0	2,372	3,396	216	2,514	166	150	0	0	0	0	0	0	0	0	0	0	0	0	2,372	3,396	216	2,514	166	150	79	5,688	119,755	4	3	121,031
Underwater Survey	32	96	RHIB	3	8.0	100%	768.0	768.0	0.0	0.0	261.1	7019.5	46.1	1105.9	115.2	104	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0	261	7,020	46	1,106	115	104	48	36,864	776,135	25	22	784,400
		96	CRRC	3	8.0	100%	768.0	768.0	0.0	0.0	0	114	9,908	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	114	9,908	0	0	0	3	2,304	48,508	2	1	49,025
Unmanned Aerial Vehicle Operation	1000																																							
Unmanned Underwater Vehicle Training	0																																							
TOTAL TRAINING (lbs per year)								**29,450**	**5,726**	**6,810**	**76,000**	**689,860**	**189,906**	**458,270**	**82,638**	**74,374**	**106,668**	**263,401**	**36,443**	**158,521**	**15,820**	**14,238**	**235,108**	**408,808**	**26,782**	**300,791**	**20,071**	**17,700**	**417,775**	**1,362,069**	**253,131**	**917,582**	**118,529**	**106,312**		**9,104,892**	**191,694,392**	**6,219**	**5,417**	**193,735,936**
TOTAL TRAINING (tons per year)											**38**	**345**	**95**	**229**	**41**	**37**	**53**	**132**	**18**	**79**	**8**	**7**	**118**	**204**	**13**	**150**	**10**	**9**	**209**	**681**	**127**	**459**	**59**	**53**			**95,847**	**3**	**3**	**96,868**
ANTI-SUBMARINE WARFARE TESTING																																								
Anti-submarine Warfare Tracking Test - MPA	188																																							
LIFECYCLE ACTIVITIES TESTING																																								
Littoral Combat Ship (LCS) Mission Package Testing-ASW	0	0	LCS	1	60.0	100%	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	79	0	0	0	0	0
Ship Signature Testing	0	0	FFG	1	4.0	100%	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	79	0	0	0	0	0
SURFACE WARFARE / ANTI-SUBMARINE WARFARE TESTING																																								
Torpedo Testing (Explosive and Non-explosive)	2	6.0	DDG	3	4.0	100%	24.0	0.0	0.0	24.0	0	0	0	0	0	0	0	0	0	0	0	0	1,444	2,748	96	2,125	87	79	1,444	2,748	96	2,125	87	79	187	4,488	94,490	3	3	95,497
Countermeasure / Acoustic Systems Testing	0	0.0	DDG	2	2.0	100%	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	187	0	0	0	0	0
At-Sea Sonar Testing	0	0.0	SSN	4	2.0	100%	0.0	0.0	0.0	0.0																														
		0.0	CG	1	2.0	100%	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	184	0	0	0	0	0
		0.0	DDG	4	2.0	100%	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	187	0	0	0	0	0
SHIPBOARD PROTECTION SYSTEMS AND SWIMMER DEFENSE TESTING																																								
Pierside Integrated Swimmer Defense	0	0	FFG	1	8.0	100%	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	79	0	0	0	0	0
MINE WARFARE TESTING																																								
Mine Detection and Classification Testing	4	4	FFG	1	4	100%	16.0	5.3	5.3	5.4	174	249	16	184	12	11	174	249	16	184	12	11	179	257	16	190	13	11	527	755	48	559	37	33	79	1,264	26,612	1	1	26,896
UNMANNED VEHICLE TESTING																																								
Unmanned Vehicle Development and Payload Testing	0																																							
OFFICE OF NAVAL RESEARCH																																								
North Pacific Acoustic Lab Philippine Sea 2018-19 Experiment (Deep Water)	1																																							
TOTAL TESTING (lbs per year)								**5**	**5**	**29**	**174**	**249**	**16**	**184**	**12**	**11**	**174**	**249**	**16**	**184**	**12**	**11**	**1,623**	**3,005**	**113**	**2,315**	**100**	**90**	**1,971**	**3,503**	**144**	**2,683**	**124**	**112**		**5,752**	**121,103**	**4**	**3**	**122,392**
TOTAL TESTING (tons per year)											**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**2**	**0**	**1**	**0**	**0**	**1**	**2**	**0**	**1**	**0**	**0**			**61**	**0**	**0**	**61**

Table D-6: Aircraft Emissions – No Action Alternative

Type Training	Training Ops (#)	OPERATIONAL INFORMATION - AIRCRAFT: Aircraft			Time		Altitude		Distribution (%)			Distribution (hr)			EMISSIONS/YEAR (lb) BY JURISDICTION: State (0-3 nm offshore)						Waters of U S (3-12 nm)						EMISSIONS/YEAR (lb) BY JURISDICTION: Int Waters (> 12 nm)						Total Emissions						Training Platform		Annual Fuel Use (total)		GHG Emissions (lb)			
		Distribution	A/C Sorties (#)	Type	Ave Time on Range (hr)	Total Time on Range (hr)	Time < 3,000 ft (%)	Time < 3,000 ft (hr)	0-3 nm from shore	3-12 nm from Shore	>12 nm from Shore	Total Time 0-3 nm from shore	Total Time 3-12 nm from shore	Total Time >12 nm from shore	CO	NOx	HC	SOx	PM	$PM_{2.5}$	CO	NOx	HC	SOx	PM	$PM_{2.5}$	CO	NOx	HC	SOx	PM	$PM_{2.5}$	CO	NOx	HC	SOx	PM	$PM_{2.5}$	Engines (#)	Fuel Flow (lb/hr)	Pounds	Gallons	CO_2	N_2O	CH_4	CO_{2-e}
AIR WARFARE																																													
Air Combat Maneuv	4800	1	4800	FA-18E/F	1.0	4800.0	0%	0.0	0%	0%	100%	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	10,338	49622400	7297412	153639707	4984	4342	155,275,969
		1	4800	AV-8B	1.0	4800.0	0%	0.0	0%	0%	100%	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	6,000	28800000	4235294	89169882	2893	2520	90,119,541
Air Defense Exercis	100	2	200	FA-18E/F	1.0	200.0	50%	100.0	0%	0%	100%	0.00	0.00	100.00	0	0	0	0	0	0	0	0	0	0	0	0	744	15249	124	414	6782	6104	744	15249	124	414	6782	6104	2	10,338	2067600	304059	6401654	208	181	6,469,832
Air Intercept Control	4800	2	9600	FA-18E/F	1.0	9600.0	50%	4800.0	0%	0%	100%	0.00	0.00	4800.00	0	0	0	0	0	0	0	0	0	0	0	0	35728	731930	5955	19849	325523	292971	35728	731930	5955	19849	325523	292971	2	10,338	99244800	14594824	307279415	9968	8684	310,551,939
Gunnery Exercise, A-A (Medium Caliber)	36	1	36	AV-8B	1.0	36.0	0%	0.0	0%	0%	100%	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	6,000	216000	31765	668774	22	19	675,897
		1	36	FA-18E/F	1.0	36.0	0%	0.0	0%	0%	100%	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	10,338	372168	54731	1152298	37	33	1,164,570
Missile Exercise, A-	18	1	18	AV-8B	1.0	18.0	0%	0.0	0%	0%	100%	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	6,000	108000	15882	334387	11	9	337,948
		1	18	FA-18E/F	1.0	18.0	0%	0.0	0%	0%	100%	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	10,338	186084	27365	576149	19	16	582,285
Gunnery Exercise, S-A (Large Caliber)	5																																												
Gunnery Exercise, S-A (Medium Caliber)	12																																												
Missile Exercise, S-A	15																																												
STRIKE WARFARE																																													
Bombing Exercise, A-G	2300	1	2300	FA-18E/F	1.0	2300.0	10%	230.0	0%	0%	100%	0.00	0.00	230.00	0	0	0	0	0	0	0	0	0	0	0	0	1712	35072	285	951	15598	14038	1712	35072	285	951	15598	14038	2	10,338	23777400	3496676	73619026	2388	2081	74,403,069
Missile Exercise, A-G	85	0.5	43	FA-18E/F	2.0	85.0	10%	8.5	0%	0%	100%	0.00	0.00	8.50	0	0	0	0	0	0	0	0	0	0	0	0	63	1296	11	35	576	519	63	1296	11	35	576	519	2	10,338	878730	129225	2720703	88	77	2,749,679
		0.5	43	SH-60B	2.0	85.0	100%	85.0	0%	0%	100%	0.00	0.00	85.00	0	0	0	0	0	0	0	0	0	0	0	0	638	653	56	41	428	386	638	653	56	41	428	386	2	1200	102000	15000	315810	10	9	319,173
Gunnery Exercise, A-G	96	0.5	48	FA-18E/F	2.0	96.0	10%	9.6	0%	0%	100%	0.00	0.00	9.60	0	0	0	0	0	0	0	0	0	0	0	0	71	1464	12	40	651	586	71	1464	12	40	651	586	2	10,338	992448	145948	3072794	100	87	3,105,519
		0.5	48	SH-60B	2.0	96.0	100%	96.0	0%	0%	100%	0.00	0.00	96.00	0	0	0	0	0	0	0	0	0	0	0	0	720	737	63	46	484	435	720	737	63	46	484	435	2	1200	115200	16941	356680	12	10	360,478

Table D-6: Aircraft Emissions – No Action Alternative (continued)

Type Training	Training Ops (#)	OPERATIONAL INFORMATION - AIRCRAFT: Aircraft: Distribution	Aircraft: A/C Sorties (#)	Aircraft: Type	Time: Ave Time on Range (hr)	Time: Total Time on Range (hr)	Altitude: Time < 3,000 ft (%)	Altitude: Time < 3,000 ft (hr)	Distribution (%): 0-3 nm from shore	Distribution (%): 3-12 nm from Shore	Distribution (%): >12 nm from Shore	Distribution (hr): Total Time 0-3 nm from shore	Distribution (hr): Total Time 3-12 nm from shore	Distribution (hr): Total Time >12 nm from shore
AMPHIBIOUS WARFARE														
Fire Support Exercise - Land-Based target	10													
Amphibious Rehearsal, No Landing – Marine Air Ground Task Force	12	4	48.0	CH-53	18.0	864.0	100%	864.0	100%	0%	0%	864.00	0.00	0.00
		10	120.0	MV-22	18.0	2160.0	100%	2160.0	100%	0%	0%	2160.00	0.00	0.00
		2	24.0	UH-1	18.0	432.0	100%	432.0	100%	0%	0%	432.00	0.00	0.00
		4	48.0	AH-1	18.0	864.0	100%	864.0	100%	0%	0%	864.00	0.00	0.00
		4	48.0	AV-8	18.0	864.0	0%	0.0	100%	0%	0%	0.00	0.00	0.00
Amphibious Assault - Marine Air Ground Task Force	6	4	24.0	CH-53	18.0	432.0	100%	432.0	100%	0%	0%	432.00	0.00	0.00
		10	60.0	MV-22	18.0	1080.0	100%	1080.0	100%	0%	0%	1080.00	0.00	0.00
		2	12.0	UH-1	18.0	216.0	100%	216.0	100%	0%	0%	216.00	0.00	0.00
		4	24.0	AH-1	18.0	432.0	100%	432.0	100%	0%	0%	432.00	0.00	0.00
		4	24.0	AV-8	18.0	432.0	0%	0.0	100%	0%	0%	0.00	0.00	0.00
Amphibious Raid - Special Purpose Marine Air Ground Task Force	6	4	24.0	H-53	12.0	288.0	100%	288.0	100%	0%	0%	288.00	0.00	0.00
		10	60.0	MV-22	12.0	720.0	100%	720.0	100%	0%	0%	720.00	0.00	0.00
		2	12.0	UH-1	12.0	144.0	100%	144.0	100%	0%	0%	144.00	0.00	0.00
		4	24.0	AH-1	12.0	288.0	100%	288.0	100%	0%	0%	288.00	0.00	0.00
		4	24.0	AV-8	12.0	288.0	0%	0.0	100%	0%	0%	0.00	0.00	0.00
Non-Combatant Evacuation Operation	5	10	50	MV-22	20.0	1000.0	100%	1000.0	100%	0%	0%	1000.00	0.00	0.00
		4	20	H-53	20.0	400.0	100%	400.0	100%	0%	0%	400.00	0.00	0.00
		2	10	UH-1	20.0	200.0	100%	200.0	100%	0%	0%	200.00	0.00	0.00
		4	20	AH-1	20.0	400.0	100%	400.0	100%	0%	0%	400.00	0.00	0.00
		4	20	AV-8	20.0	400.0	0%	0.0	100%	0%	0%	0.00	0.00	0.00
Humanitarian Assistance/ Disaster Relief Operations	5	10	50	MV-22	20.0	1000.0	100%	1000.0	100%	0%	0%	1000.00	0.00	0.00
		4	20	H-53	20.0	400.0	100%	400.0	100%	0%	0%	400.00	0.00	0.00
		2	10	UH-1	20.0	200.0	100%	200.0	100%	0%	0%	200.00	0.00	0.00
		4	20	AH-1	20.0	400.0	100%	400.0	100%	0%	0%	400.00	0.00	0.00
		4	20	AV-8	20.0	400.0	0%	0.0	100%	0%	0%	0.00	0.00	0.00
Unmanned Aerial Vehicle - Intelligence, Surveillance, and Reconaissance	100	1	100.0	MQ-4C	4.0	400.0	100%	400.0	100%	0%	0%	400.00	0.00	0.00

Type Training	EMISSIONS/YEAR (lb) BY JURISDICTION: State (0-3 nm offshore): CO	NOx	HC	SOx	PM	PM2.5	Waters of U S (3-12 nm): CO	NOx	HC	SOx	PM	PM2.5
AMPHIBIOUS WARFARE												
Fire Support Exercise - Land-Based target												
Amphibious Rehearsal, No Landing – Marine Air Ground Task Force	8215	31164	579	1543	8524	7671	0	0	0	0	0	0
	47755	9532	8298	968	4306	3876	0	0	0	0	0	0
	779	1101	40	93	980	882	0	0	0	0	0	0
	7865	3817	400	281	2947	2652	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
Amphibious Assault - Marine Air Ground Task Force	4108	15582	289	771	4262	3836	0	0	0	0	0	0
	23878	4766	4149	484	2153	1938	0	0	0	0	0	0
	390	551	20	47	490	441	0	0	0	0	0	0
	3932	1908	200	140	1473	1326	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
Amphibious Raid - Special Purpose Marine Air Ground Task Force	2738	10388	193	514	2841	2557	0	0	0	0	0	0
	15918	3177	2766	323	1435	1292	0	0	0	0	0	0
	260	367	13	31	327	294	0	0	0	0	0	0
	2622	1272	133	94	982	884	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
Non-Combatant Evacuation Operation	22109	4413	3842	448	1994	1794	0	0	0	0	0	0
	3803	14428	268	714	3946	3552	0	0	0	0	0	0
	361	510	18	43	454	408	0	0	0	0	0	0
	3641	1767	185	130	1364	1228	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
Humanitarian Assistance/ Disaster Relief Operations	22109	4413	3842	448	1994	1794	0	0	0	0	0	0
	3803	14428	268	714	3946	3552	0	0	0	0	0	0
	361	510	18	43	454	408	0	0	0	0	0	0
	3641	1767	185	130	1364	1228	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
Unmanned Aerial Vehicle - Intelligence, Surveillance, and Reconaissance	840	15536	264	1416	244	220	0	0	0	0	0	0

Type Training	EMISSIONS/YEAR (lb) BY JURISDICTION: Int Waters (> 12 nm): CO	NOx	HC	SOx	PM	PM2.5	Total Emissions: CO	NOx	HC	SOx	PM	PM2.5
AMPHIBIOUS WARFARE												
Fire Support Exercise - Land-Based target												
Amphibious Rehearsal, No Landing – Marine Air Ground Task Force	0	0	0	0	0	0	8215	31164	579	1543	8524	7671
	0	0	0	0	0	0	47755	9532	8298	968	4306	3876
	0	0	0	0	0	0	779	1101	40	93	980	882
	0	0	0	0	0	0	7865	3817	400	281	2947	2652
	0	0	0	0	0	0	0	0	0	0	0	0
Amphibious Assault - Marine Air Ground Task Force	0	0	0	0	0	0	4108	15582	289	771	4262	3836
	0	0	0	0	0	0	23878	4766	4149	484	2153	1938
	0	0	0	0	0	0	390	551	20	47	490	441
	0	0	0	0	0	0	3932	1908	200	140	1473	1326
	0	0	0	0	0	0	0	0	0	0	0	0
Amphibious Raid - Special Purpose Marine Air Ground Task Force	0	0	0	0	0	0	2738	10388	193	514	2841	2557
	0	0	0	0	0	0	15918	3177	2766	323	1435	1292
	0	0	0	0	0	0	260	367	13	31	327	294
	0	0	0	0	0	0	2622	1272	133	94	982	884
	0	0	0	0	0	0	0	0	0	0	0	0
Non-Combatant Evacuation Operation	0	0	0	0	0	0	22109	4413	3842	448	1994	1794
	0	0	0	0	0	0	3803	14428	268	714	3946	3552
	0	0	0	0	0	0	361	510	18	43	454	408
	0	0	0	0	0	0	3641	1767	185	130	1364	1228
	0	0	0	0	0	0	0	0	0	0	0	0
Humanitarian Assistance/ Disaster Relief Operations	0	0	0	0	0	0	22109	4413	3842	448	1994	1794
	0	0	0	0	0	0	3803	14428	268	714	3946	3552
	0	0	0	0	0	0	361	510	18	43	454	408
	0	0	0	0	0	0	3641	1767	185	130	1364	1228
	0	0	0	0	0	0	0	0	0	0	0	0
Unmanned Aerial Vehicle - Intelligence, Surveillance, and Reconaissance	0	0	0	0	0	0	840	15536	264	1416	244	220

Type Training	Training Platform: Engines (#)	Fuel Flow (lb/hr)	Annual Fuel Use (total): Pounds	Gallons	GHG Emissions (lb): CO_2	N_2O	CH_4	CO_{2-e}
AMPHIBIOUS WARFARE								
Fire Support Exercise - Land-Based target								
Amphibious Rehearsal, No Landing – Marine Air Ground Task Force	3	4,464	3856896	567191	11941631	387	337	12,068,809
	2	2240	4838400	711529	14980540	486	423	15,140,083
	2	540	233280	34306	722276	23	20	729,968
	2	812	701568	103172	2172178	70	61	2,195,312
	1	6,000	5184000	762353	16050579	521	454	16,221,517
Amphibious Assault - Marine Air Ground Task Force	3	4,464	1928448	283595	5970815	194	169	6,034,404
	2	2240	2419200	355765	7490270	243	212	7,570,041
	2	540	116640	17153	361138	12	10	364,984
	2	812	350784	51586	1086089	35	31	1,097,656
	1	6,000	2592000	381176	8025289	260	227	8,110,759
Amphibious Raid - Special Purpose Marine Air Ground Task Force	3	4,464	1285632	189064	3980544	129	112	4,022,936
	2	2240	1612800	237176	4993513	162	141	5,046,694
	2	540	77760	11435	240759	8	7	243,323
	2	812	233856	34391	724059	23	20	731,771
	1	6,000	1728000	254118	5350193	174	151	5,407,172
Non-Combatant Evacuation Operation	2	2240	2240000	329412	6935435	225	196	7,009,298
	3	4,464	1785600	262588	5528533	179	156	5,587,412
	2	540	108000	15882	334387	11	9	337,948
	2	812	324800	47765	1005638	33	28	1,016,348
	1	6,000	2400000	352941	7430824	241	210	7,509,962
Humanitarian Assistance/ Disaster Relief Operations	2	2240	2240000	329412	6935435	225	196	7,009,298
	3	4,464	1785600	262588	5528533	179	156	5,587,412
	2	540	108000	15882	334387	11	9	337,948
	2	812	324800	47765	1005638	33	28	1,016,348
	1	6,000	2400000	352941	7430824	241	210	7,509,962
Unmanned Aerial Vehicle - Intelligence, Surveillance, and Reconaissance	1	2,532	1012800	148941	3135808	102	89	3,169,204

Table D-6: Aircraft Emissions – No Action Alternative (continued)

Type Training	Training Ops (#)	OPERATIONAL INFORMATION - AIRCRAFT: Aircraft			Time		Altitude		Distribution (%)			Distribution (hr)			EMISSIONS/YEAR (lb) BY JURISDICTION: State (0-3 nm offshore)						Waters of U S (3-12 nm)						EMISSIONS/YEAR (lb) BY JURISDICTION: Int Waters (> 12 nm)						Total Emissions						Training Platform		Annual Fuel Use (total)		GHG Emissions (lb)			
		Distribution	A/C Sorties (#)	Type	Ave Time on Range (hr)	Total Time on Range (hr)	Time < 3,000 ft (%)	Time < 3,000 ft (hr)	0-3 nm from shore	3-12 nm from Shore	>12 nm from Shore	Total Time 0-3 nm from shore	Total Time 3-12 nm from shore	Total Time >12 nm from shore	CO	NOx	HC	SOx	PM	PM2.5	CO	NOx	HC	SOx	PM	PM2.5	CO	NOx	HC	SOx	PM	PM2.5	CO	NOx	HC	SOx	PM	PM2.5	Engines (#)	Fuel Flow (lb/hr)	Pounds	Gallons	CO_2	N_2O	CH_4	CO_{2-e}
SURFACE WARFARE																																														
Gunnery Exercise, A-S (Small Caliber) - Ship	242	0.25	60.5	FA-18E/F	2.0	121.0	10%	12.1	0%	0%	100%	0.00	0.00	12.10	0	0	0	0	0	0	0	0	0	0	0	0	90	1845	15	50	821	739	90	1845	15	50	821	739	2	10,338	1250898	183956	3873001	126	109	3,914,248
		0.75	181.5	SH-60B	2.0	363.0	100%	363.0	0%	0%	100%	0.00	0.00	363.00	0	0	0	0	0	0	0	0	0	0	0	0	2723	2788	240	174	1830	1647	2723	2788	240	174	1830	1647	2	1200	435600	64059	1348694	44	38	1,363,058
Gunnery Exercise, A-S (Medium Caliber) - Ship	295	0.25	73.75	FA-18E/F	2.0	147.5	10%	14.8	0%	0%	100%	0.00	0.00	14.75	0	0	0	0	0	0	0	0	0	0	0	0	110	2249	18	61	1000	900	110	2249	18	61	1000	900	2	10,338	1524855	224243	4721220	153	133	4,771,501
		0.75	221.25	SH-60B	2.0	442.5	100%	442.5	0%	0%	100%	0.00	0.00	442.50	0	0	0	0	0	0	0	0	0	0	0	0	3319	3398	292	212	2230	2007	3319	3398	292	212	2230	2007	2	1200	531000	78088	1644070	53	46	1,661,579
Missile Exercise (A-S) - Rocket	3	0.33	0.99	FA-18E/F	2.0	2.0	10%	0.2	0%	0%	100%	0.00	0.00	0.20	0	0	0	0	0	0	0	0	0	0	0	0	1	30	0	1	13	12	1	30	0	1	13	12	2	10,338	20469.24	3010	63376	2	2	64,051
		0.66	1.98	SH-60B	2.0	4.0	100%	4.0	0%	0%	100%	0.00	0.00	3.96	0	0	0	0	0	0	0	0	0	0	0	0	30	30	3	2	20	18	30	30	3	2	20	18	2	1200	4752	699	14713	0	0	14,870
Missile Exercise (A-S)	20	0.5	10	FA-18E/F	2.0	20.0	10%	2.0	0%	0%	100%	0.00	0.00	2.00	0	0	0	0	0	0	0	0	0	0	0	0	15	305	2	8	136	122	15	305	2	8	136	122	2	10,338	206760	30406	640165	21	18	646,983
		0.5	10	SH-60B	2.0	20.0	100%	20.0	0%	0%	100%	0.00	0.00	20.00	0	0	0	0	0	0	0	0	0	0	0	0	150	154	13	10	101	91	150	154	13	10	101	91	2	1200	24000	3529	74308	2	2	75,100
Laser Targeting	600	0.5	300	FA-18E/F	1.0	300.0	10%	30.0	0%	0%	100%	0.00	0.00	30.00	0	0	0	0	0	0	0	0	0	0	0	0	223	4575	37	124	2035	1831	223	4575	37	124	2035	1831	2	10,338	3101400	456088	9602482	312	271	9,704,748
		0.5	300	SH-60B	1.0	300.0	100%	300.0	0%	0%	100%	0.00	0.00	300.00	0	0	0	0	0	0	0	0	0	0	0	0	2250	2304	198	144	1512	1361	2250	2304	198	144	1512	1361	2	1200	360000	52941	1114624	36	32	1,126,494
Bombing Exercise (A-S)	37	0.5	19	FA-18E/F	1.0	18.5	10%	1.9	0%	0%	100%	0.00	0.00	1.85	0	0	0	0	0	0	0	0	0	0	0	0	14	282	2	8	125	113	14	282	2	8	125	113	2	10,338	191253	28125	592153	19	17	598,459
		0.5	19	P-3	1.0	18.5	10%	1.9	0%	0%	100%	0.00	0.00	1.85	0	0	0	0	0	0	0	0	0	0	0	0	22	69	5	4	35	32	22	69	5	4	35	32	4	4,800	88800	13059	274940	9	8	277,869
Torpedo Exercise (Submarine to Surface)	5																																													
Missile Exercise (S-S)	12																																													
Sinking Exercise (SINKEX)	2	2	4	FA-18E/F	8.0	32.0	10%	3.2	0%	0%	100%	0.00	0.00	3.20	0	0	0	0	0	0	0	0	0	0	0	0	24	488	4	13	217	195	24	488	4	13	217	195	2	10,338	330816	48649	1024265	33	29	1,035,173
		1	2	P-3	8.0	16.0	10%	1.6	0%	0%	100%	0.00	0.00	1.60	0	0	0	0	0	0	0	0	0	0	0	0	19	59	4	3	30	27	19	59	4	3	30	27	4	4,800	76800	11294	237786	8	7	240,319
		1	2	SH-60B	8.0	16.0	100%	16.0	0%	0%	100%	0.00	0.00	16.00	0	0	0	0	0	0	0	0	0	0	0	0	120	123	11	8	81	73	120	123	11	8	81	73	2	1200	19200	2824	59447	2	2	60,080
Gunnery Exercise (S-S) Boat – Medium-caliber	10																																													
Gunnery Exercise (S-S) Small-caliber	40																																													
Maritime Security Operations (MSO)	40	1	40	SH-60B	4.0	160.0	100%	160.0	100%	0%	0%	160.00	0.00	0.00	1200	1229	106	77	806	726	0	0	0	0	0	0	0	0	0	0	0	0	1200	1229	106	77	806	726	2	1200	192000	28235	594466	19	17	600,797
ANTI-SUBMARINE WARFARE																																														
Tracking Exercise-Helo	62	3	186	SH-60B	4.0	744.0	100%	744.0	0%	100%	0%	0.00	744.00	0.00	0	0	0	0	0	0	5580	5714	491	357	3750	3375	0	0	0	0	0	0	5580	5714	491	357	3750	3375	2	1200	892800	131294	2764266	90	78	2,793,706
Torpedo Exercise-Helo	4	3	12	SH-60B	4.0	48.0	100%	48.0	0%	100%	0%	0.00	48.00	0.00	0	0	0	0	0	0	360	369	32	23	242	218	0	0	0	0	0	0	360	369	32	23	242	218	2	1200	57600	8471	178340	6	5	180,239
Tracking Exercise-Maritime Patrol Advanced Extended Echo Ranging Sonobuoys	11	1	11	P-3	6.0	66.0	75%	49.5	0%	100%	0%	0.00	49.50	0.00	0	0	0	0	0	0	596	1837	138	95	943	849	0	0	0	0	0	0	596	1837	138	95	943	849	4	4,800	316800	46588	980869	32	28	991,315
Tracking Exercise - Maritime Patrol Aircraft	34	1	34	P-3	6.0	204.0	75%	153.0	0%	100%	0%	0.00	153.00	0.00	0	0	0	0	0	0	1843	5677	426	294	2916	2624	0	0	0	0	0	0	1843	5677	426	294	2916	2624	4	4,800	979200	144000	3031776	98	86	3,064,064
Torpedo Exercise-Maritime Patrol Aircraft	4	1	4	P-3	6.0	24.0	75%	18.0	0%	100%	0%	0.00	18.00	0.00	0	0	0	0	0	0	217	668	50	35	343	309	0	0	0	0	0	0	217	668	50	35	343	309	4	4,800	115200	16941	356680	12	10	360,478
Tracking Exercise –Surface	132																																													
Torpedo Exercise-Surface	3																																													
Tracking Exercise–Submarine	12																																													
Torpedo Exercise – Submarine	10																																													

Table D-6: Aircraft Emissions – No Action Alternative (continued)

Type Training	Training Ops (#)	OPERATIONAL INFORMATION - AIRCRAFT: Aircraft			Time		Altitude		Distribution (%)			Distribution (hr)			EMISSIONS/YEAR (lb) BY JURISDICTION: State (0-3 nm offshore)						Waters of U S (3-12 nm)						EMISSIONS/YEAR (lb) BY JURISDICTION: Int Waters (> 12 nm)						Total Emissions						Training Platform		Annual Fuel Use (total)		GHG Emissions (lb)			
		Distribution	A/C Sorties (#)	Type	Ave Time on Range (hr)	Total Time on Range (hr)	Time < 3,000 ft (%)	Time < 3,000 ft (hr)	0-3 nm from shore	3-12 nm from Shore	>12 nm from Shore	Total Time 0-3 nm from shore	Total Time 3-12 nm from shore	Total Time >12 nm from shore	CO	NOx	HC	SOx	PM	PM2.5	CO	NOx	HC	SOx	PM	PM2.5	CO	NOx	HC	SOx	PM	PM2.5	CO	NOx	HC	SOx	PM	PM2.5	Engines (#)	Fuel Flow (lb/hr)	Pounds	Gallons	CO_2	N_2O	CH_4	CO_{2-e}
MAJOR TRAINING EXERCISES																																														
Joint Expeditionary Exercise	1	48	48	FA-18E/F	8.0	384.0	10%	38.4	0%	100%	0%	0.00	38.40	0.00	0	0	0	0	0	0	286	5855	48	159	2604	2344	0	0	0	0	0	0	286	5855	48	159	2604	2344	2	10,338	3969792	583793	12291177	399	347	12,422,078
		4	4	EA-6B	8.0	32.0	10%	3.2	0%	100%	0%	0.00	3.20	0.00	0	0	0	0	0	0	148	165	10	8	73	66	0	0	0	0	0	0	148	165	10	8	73	66	1	6,000	192000	28235	594466	19	17	600,797
		4	4	E-2	8.0	32.0	10%	3.2	0%	100%	0%	0.00	3.20	0.00	0	0	0	0	0	0	18	71	3	3	7	6	0	0	0	0	0	0	18	71	3	3	7	6	1	1,100	35200	5176	108985	4	3	110,146
		3	3	P-3	8.0	24.0	10%	2.4	0%	100%	0%	0.00	2.40	0.00	0	0	0	0	0	0	29	89	7	5	46	41	0	0	0	0	0	0	29	89	7	5	46	41	4	4,800	115200	16941	356680	12	10	360,478
		6	6	AV-8B	8.0	48.0	10%	4.8	0%	100%	0%	0.00	4.80	0.00	0	0	0	0	0	0	222	248	16	12	109	98	0	0	0	0	0	0	222	248	16	12	109	98	1	6,000	288000	42353	891699	29	25	901,195
		2	2	C-130	8.0	16.0	10%	1.6	0%	100%	0%	0.00	1.60	0.00	0	0	0	0	0	0	15	59	3	3	29	26	0	0	0	0	0	0	15	59	3	3	29	26	4	4,500	72000	10588	222925	7	6	225,299
		4	4	A-10	8.0	32.0	10%	3.2	0%	100%	0%	0.00	3.20	0.00	0	0	0	0	0	0	39	86	4	4	26	23	0	0	0	0	0	0	39	86	4	4	26	23	2	6,052	193664	28480	599618	19	17	606,004
		1	1	E-3	8.0	8.0	10%	0.8	0%	100%	0%	0.00	0.80	0.00	0	0	0	0	0	0	54	221	8	10	7	6	0	0	0	0	0	0	54	221	8	10	7	6	4	######	1045888	153807	3238254	105	92	3,272,741
		1	1	KC-135	8.0	8.0	10%	0.8	0%	100%	0%	0.00	0.80	0.00	0	0	0	0	0	0	25	247	1	7	2	2	0	0	0	0	0	0	25	247	1	7	2	2	4	91,552	732416	107708	2267689	74	64	2,291,840
		15	15	SH-60B	8.0	120.0	100%	120.0	0%	100%	0%	0.00	120.00	0.00	0	0	0	0	0	0	900	922	79	58	605	544	0	0	0	0	0	0	900	922	79	58	605	544	2	1200	144000	21176	445849	14	13	450,598
		4	4	CH-53	8.0	32.0	100%	32.0	0%	100%	0%	0.00	32.00	0.00	0	0	0	0	0	0	304	1154	21	57	316	284	0	0	0	0	0	0	304	1154	21	57	316	284	3	4,464	142848	21007	442283	14	12	446,993
		12	12	CH-46	8.0	96.0	100%	96.0	0%	100%	0%	0.00	96.00	0.00	0	0	0	0	0	0	2454	593	380	58	256	231	0	0	0	0	0	0	2454	593	380	58	256	231	2	1200	144000	21176	445849	14	13	450,598
		4	4	AH-1	8.0	32.0	100%	32.0	0%	100%	0%	0.00	32.00	0.00	0	0	0	0	0	0	291	141	15	10	109	98	0	0	0	0	0	0	291	141	15	10	109	98	2	812	25984	3821	80451	3	2	81,308
		2	2	UH-1	8.0	16.0	100%	16.0	0%	100%	0%	0.00	16.00	0.00	0	0	0	0	0	0	29	41	1	3	36	33	0	0	0	0	0	0	29	41	1	3	36	33	2	540	8640	1271	26751	1	1	27,036
		10	10	MV-22	8.0	80.0	100%	80.0	0%	100%	0%	0.00	80.00	0.00	0	0	0	0	0	0	1769	353	307	36	159	144	0	0	0	0	0	0	1769	353	307	36	159	144	2	2240	179200	26353	554835	18	16	560,744
Joint Multi-Strike Group Exercise	1	144	144	FA-18E/F	8.0	1152.0	10%	115.2	0%	0%	100%	0.00	0.00	115.20	0	0	0	0	0	0	0	0	0	0	0	0	857	17566	143	476	7813	7031	857	17566	143	476	7813	7031	2	10,338	11909376	1751379	36873530	1196	1042	37,266,233
		12	12	EA-6B	8.0	96.0	10%	9.6	0%	0%	100%	0.00	0.00	9.60	0	0	0	0	0	0	0	0	0	0	0	0	444	495	31	23	219	197	444	495	31	23	219	197	1	6,000	576000	84706	1783398	58	50	1,802,391
		12	12	E-2	8.0	96.0	10%	9.6	0%	0%	100%	0.00	0.00	9.60	0	0	0	0	0	0	0	0	0	0	0	0	54	212	8	8	20	18	54	212	8	8	20	18	1	1,100	105600	15529	326956	11	9	330,438
		5	5	P-3	8.0	40.0	10%	4.0	0%	0%	100%	0.00	0.00	4.00	0	0	0	0	0	0	0	0	0	0	0	0	48	148	11	8	76	69	48	148	11	8	76	69	4	4,800	192000	28235	594466	19	17	600,797
		1	1	E-3	8.0	8.0	10%	0.8	0%	0%	100%	0.00	0.00	0.80	0	0	0	0	0	0	0	0	0	0	0	0	54	221	8	10	7	6	54	221	8	10	7	6	4	######	1045888	153807	3238254	105	92	3,272,741
		2	2	KC-135	8.0	16.0	10%	1.6	0%	0%	100%	0.00	0.00	1.60	0	0	0	0	0	0	0	0	0	0	0	0	49	494	1	15	5	4	49	494	1	15	5	4	4	91,552	1464832	215416	4535378	147	128	4,583,680
		6	6	B-1B	8.0	48.0	10%	4.8	0%	0%	100%	0.00	0.00	4.80	0	0	0	0	0	0	0	0	0	0	0	0	27	418	4	13	4	4	27	418	4	13	4	4	4	26,560	1274880	187482	3947253	128	112	3,989,292
		24	24	F-15	8.0	192.0	10%	19.2	0%	0%	100%	0.00	0.00	19.20	0	0	0	0	0	0	0	0	0	0	0	0	431	5558	77	48	970	873	431	5558	77	48	970	873	2	6196	1189632	174946	3683311	119	104	3,722,538
		45	45	SH-60B	8.0	360.0	100%	360.0	0%	0%	100%	0.00	0.00	360.00	0	0	0	0	0	0	0	0	0	0	0	0	2700	2765	238	173	1814	1633	2700	2765	238	173	1814	1633	2	1200	432000	63529	1337548	43	38	1,351,793
ELECTRONIC WARFARE																																														
Electronic Warfare Operations	480	1	480	FA-18E/F	2.0	960.0	0%	0.0	0%	0%	100%	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	10,338	9924480	1459482	30727941	997	868	31,055,194
Flare Exercise	3200	0.9	2880	F-15	3.0	8640.0	0%	0.0	0%	0%	100%	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	6196	53533440	7872565	165748977	5377	4684	167,514,203
		0.06	192	FA-18E/F	3.0	576.0	0%	0.0	0%	0%	100%	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	10,338	5954688	875689	18436765	598	521	18,633,116
		0.04	128	SH-60B	3.0	384.0	100%	384.0	0%	0%	100%	0.00	0.00	384.00	0	0	0	0	0	0	0	0	0	0	0	0	2880	2949	253	184	1935	1742	2880	2949	253	184	1935	1742	2	1200	460800	67765	1426718	46	40	1,441,913
Chaff Exercise - Shi	40																																													
Chaff Exercise - Aircraft	3200	0.9	2880	F-15	3.0	8640.0	0%	0.0	0%	0%	100%	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	6196	53533440	7872565	165748977	5377	4684	167,514,203
		0.06	192	FA-18E/F	3.0	576.0	0%	0.0	0%	0%	100%	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	10,338	5954688	875689	18436765	598	521	18,633,116
		0.04	128	SH-60B	3.0	384.0	100%	384.0	0%	0%	100%	0.00	0.00	384.00	0	0	0	0	0	0	0	0	0	0	0	0	2880	2949	253	184	1935	1742	2880	2949	253	184	1935	1742	2	1200	460800	67765	1426718	46	40	1,441,913
MINE WARFARE																																														
Mine Laying - Aircraft	4	0.5	2	FA-18E/F	0.5	1.0	0%	0.0	0%	0%	100%	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	10,338	10338	1520	32008	1	1	32,349
		0.5	2	P-3	1.0	2.0	0%	0.0	0%	0%	100%	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4,800	9600	1412	29723	1	1	30,040
																																									0	0	0	0.00	0.00	0
Mine Neutralization – Explosive Ordnance Disposal	20																																													
Limpet Mine Neutralization System/Shock Wave Generator	40																																													
NAVAL SPECIAL WARFARE																																														
Personnel I&E	240	4	960	H-60	8.0	7680.0	100%	7680.0	100%	0%	0%	7680.00	0.00	0.00	57600	58982	5069	3686	38707	34836	0	0	0	0	0	0	0	0	0	0	0	0	57600	58982	5069	3686	38707	34836	2	1200	9216000	1355294	28534362	926	806	28,838,253
		2	480	MV-22	8.0	3840.0	100%	3840.0	100%	0%	0%	3840.00	0.00	0.00	84898	16945	14752	1720	7655	6890	0	0	0	0	0	0	0	0	0	0	0	0	84898	16945	14752	1720	7655	6890	2	2240	8601600	1264941	26632072	864	753	26,915,703
Parachute Insertion	20	1	20	C-130	4.0	80.0	100%	80.0	100%	0%	0%	80.00	0.00	0.00	745	2938	169	144	1429	1286	0	0	0	0	0	0	0	0	0	0	0	0	745	2938	169	144	1429	1286	4	4,500	360000	52941	1114624	36	32	1,126,494
		1	20	CH-46	4.0	80.0	100%	80.0	100%	0%	0%	80.00	0.00	0.00	1636	0	253	38	171	154	0	0	0	0	0	0	0	0	0	0	0	0	1636	0	253	38	171	154	2	1200	96000	14118	297233	10	8	300,398
		1	20	H-60	4.0	80.0	100%	80.0	100%	0%	0%	80.00	0.00	0.00	600	614	53	38	403	363	0	0	0	0	0	0	0	0	0	0	0	0	600	614	53	38	403	363	2	1200	96000	14118	297233	10	8	300,398

Table D-6: Aircraft Emissions – No Action Alternative (continued)

Type Training	Training Ops (#)	OPERATIONAL INFORMATION - AIRCRAFT: Aircraft: Distribution	Aircraft: A/C Sorties (#)	Aircraft: Type	Time: Ave Time on Range (hr)	Time: Total Time on Range (hr)	Altitude: Time < 3,000 ft (%)	Altitude: Time < 3,000 ft (hr)	Distribution (%): 0-3 nm from shore	Distribution (%): 3-12 nm from Shore	Distribution (%): >12 nm from Shore	Distribution (hr): Total Time 0-3 nm from shore	Distribution (hr): Total Time 3-12 nm from shore	Distribution (hr): Total Time >12 nm from shore
OTHER														
Surface Ship Sonar Maintenance	42													
Submarine Sonar Maintenance	48													
Small Boat Attack	18													
Sub Navigation / Sub Nav Under Ice	8													
Precision Anchoring	18													
Unmanned Aerial Vehicle Operation	1000													
Direct Action (TAC-P)	18													
Intelligence, Surveillance, Reconnaissance	16	1	16.0	MQ-4C	4.0	64.0	100%	64.0	0%	50%	50%	0.00	32.00	0.00
Underwater Survey	16	1	16	SH-60B	2.0	32.0	100%	32.0	100%	0%	0%	32.00	0.00	0.00
Unmanned Underwater Vehicle Training	0													
TOTAL TRAINING (lbs per year)														
TOTAL TRAINING (tons per year)														
ANTI-SUBMARINE WARFARE TESTING														
Anti-submarine Warfare Tracking Test - MPA	33	1	33	P-3	6.0	198.0	75%	148.5	0%	100%	0%	0.00	148.50	0.00
LIFECYCLE ACTIVITIES TESTING														
Littoral Combat Ship (LCS) Mission Package Testing-ASW	0													
Ship Signature Testing	0													
SURFACE WARFARE / ANTI-SUBMARINE WARFARE TESTING														
Torpedo Testing (Explosive and Non-explosive)	6													
Countermeasure / Acoustic Systems Testing	0													
At-Sea Sonar Testing	0													
SHIPBOARD PROTECTION SYSTEMS AND SWIMMER DEFENSE TESTING														
Pierside Integrated Swimmer Defense	0													
MINE WARFARE TESTING														
Mine Detection and Classification Testing	4	1	4	SH-60B	2.0	8.0	100%	8.0	33%	33%	34%	2.64	2.64	2.72
UNMANNED VEHICLE TESTING														
Unmanned Vehicle Development and Payload Testing	0													
OFFICE OF NAVAL RESEARCH														
North Pacific Acoustic Lab Philippine Sea 2018-19 Experiment (Deep Water)	1													
TOTAL TESTING (lbs per year)														
TOTAL TESTING (tons per year)														

Type Training	EMISSIONS/YEAR (lb) BY JURISDICTION: State (0-3 nm offshore): CO	NOx	HC	SOx	PM	PM2.5	Waters of U S (3-12 nm): CO	NOx	HC	SOx	PM	PM2.5
OTHER												
Surface Ship Sonar Maintenance												
Submarine Sonar Maintenance												
Small Boat Attack												
Sub Navigation / Sub Nav Under Ice												
Precision Anchoring												
Unmanned Aerial Vehicle Operation												
Direct Action (TAC-P)												
Intelligence, Surveillance, Reconnaissance	0	0	0	0	0	0	67	1243	21	113	20	18
Underwater Survey	240	246	21	15	161	145	0	0	0	0	0	0
Unmanned Underwater Vehicle Training												
TOTAL TRAINING (lbs per year)	326,045	222,348	46,392	15,094	95,812	86,231	15,245	25,751	2,061	1,349	12,597	11,338
TOTAL TRAINING (tons per year)	163	111	23	8	48	43	8	13	1	1	6	6
ANTI-SUBMARINE WARFARE TESTING												
Anti-submarine Warfare Tracking Test - MPA	0	0	0	0	0	0	1789	5510	413	285	2830	2547
LIFECYCLE ACTIVITIES TESTING												
Littoral Combat Ship (LCS) Mission Package Testing-ASW												
Ship Signature Testing												
SURFACE WARFARE / ANTI-SUBMARINE WARFARE TESTING												
Torpedo Testing (Explosive and Non-explosive)												
Countermeasure / Acoustic Systems Testing												
At-Sea Sonar Testing												
SHIPBOARD PROTECTION SYSTEMS AND SWIMMER DEFENSE TESTING												
Pierside Integrated Swimmer Defense												
MINE WARFARE TESTING												
Mine Detection and Classification Testing	20	20	2	1	13	12	20	20	2	1	13	12
UNMANNED VEHICLE TESTING												
Unmanned Vehicle Development and Payload Testing												
OFFICE OF NAVAL RESEARCH												
North Pacific Acoustic Lab Philippine Sea 2018-19 Experiment (Deep Water)												
TOTAL TESTING (lbs per year)	20	20	2	1.2672	13.3056	11.97504	1808.928	5530.219	415.166	286.39	2843.122	2558.81
TOTAL TESTING (tons per year)	0.0099	0.0101376	0.000871	0.000634	0.006653	0.005988	0.904464	2.76511	0.20758	0.1432	1.421561	1.2794

Type Training	EMISSIONS/YEAR (lb) BY JURISDICTION: Int Waters (> 12 nm): CO	NOx	HC	SOx	PM	PM2.5	Total Emissions: CO	NOx	HC	SOx	PM	PM2.5	Training Platform: Engines (#)	Fuel Flow (lb/hr)	Annual Fuel Use (total): Pounds	Gallons	GHG Emissions (lb): CO_2	N_2O	CH_4	CO_{2-e}
OTHER																				
Surface Ship Sonar Maintenance																				
Submarine Sonar Maintenance																				
Small Boat Attack																				
Sub Navigation / Sub Nav Under Ice																				
Precision Anchoring																				
Unmanned Aerial Vehicle Operation																				
Direct Action (TAC-P)																				
Intelligence, Surveillance, Reconnaissance	0	0	0	0	0	0	67	1243	21	113	20	18	1	2,532	162048	23831	501729	16	14	507,073
Underwater Survey	0	0	0	0	0	0	240	246	21	15	161	145	2	1200	38400	5647	118893	4	3	120,159
Unmanned Underwater Vehicle Training																				
TOTAL TRAINING (lbs per year)	59,210	838,876	8,378	23,339	375,026	337,524	400,193	1,085,487	56,789	39,654	483,255	434,930			432,983,259	63,674,009	1,339,971,957	43,469	37,868	1,354,242,652
TOTAL TRAINING (tons per year)	30	419	4	12	188	169	200	543	28	20	242	217			216,492	63,674,009	669,986	22	19	677,121
ANTI-SUBMARINE WARFARE TESTING																				
Anti-submarine Warfare Tracking Test - MPA	0	0	0	0	0	0	1789	5510	413	285	2830	2547	4	4,800	950400	139765	2942606	95	83	2,973,945
LIFECYCLE ACTIVITIES TESTING																				
Littoral Combat Ship (LCS) Mission Package Testing-ASW																				
Ship Signature Testing																				
SURFACE WARFARE / ANTI-SUBMARINE WARFARE TESTING																				
Torpedo Testing (Explosive and Non-explosive)																				
Countermeasure / Acoustic Systems Testing																				
At-Sea Sonar Testing																				
SHIPBOARD PROTECTION SYSTEMS AND SWIMMER DEFENSE TESTING																				
Pierside Integrated Swimmer Defense																				
MINE WARFARE TESTING																				
Mine Detection and Classification Testing	20	21	2	1	14	12	60	61	5	4	40	36	2	1200	9600	1412	29723	1	1	30,040
UNMANNED VEHICLE TESTING																				
Unmanned Vehicle Development and Payload Testing																				
OFFICE OF NAVAL RESEARCH																				
North Pacific Acoustic Lab Philippine Sea 2018-19 Experiment (Deep Water)																				
TOTAL TESTING (lbs per year)	20.4	20.8896	1.7952	1.3056	13.7088	12.33792	1849.128	5571.384	418.704	288.96	2870.136	2583.1224			960000	141176.4706	2972329.412	96.423529	84	3003984.706
TOTAL TESTING (tons per year)	0.0102	0.0104448	0.0009	0.0006528	0.0068544	0.00616896	0.924564	2.785692	0.209352	0.14448	1.435068	1.2915612				141176.4706	1486.164706	0.0482118	0.042	1501.992353

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Table D-7: Emissions from Ordnance – No Action Alternative

MEM Category	Location	Training MEM	Testing MEM	Emissions (lb/year) Training						Emissions (lb/year) Testing					
		#/yr	#/yr	CO	NOx	VOC	SOx	PM10	PM2.5	CO	NOx	VOC	SOx	PM10	PM2.5
BOMBS															
Bombs (H-E)	MITT	6,454	0	394,551.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bombs (N-E)	MITT	3,038	0	774.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PROJECTILES															
Small Caliber	MITT	138,640	0	318.9	13.4	0.0	0.0	7.1	5.3	0.0	0.0	0.0	0.0	0.0	0.0
Medium Caliber (H-E)	MITT	25,500	2040	102.0	33.2	0.0	0.0	242.3	130.1	8.2	2.7	0.0	0.0	19.4	10.4
Medium Caliber (N-E)	MITT	179,650	2040	467.1	17.4	0.0	0.0	25.2	21.6	5.3	0.2	0.0	0.0	0.3	0.2
Large Caliber (H-E)	MITT	2,500	3290	320.0	400.0	0.0	0.0	24.0	18.6	421.1	526.4	0.0	0.0	31.6	24.5
Large Caliber (N-E)	MITT	7,038	2310	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Missiles (H-E)	MITT	210	12	6,430.9	7,470.5	0.0	0.0	12,977.0	12,977.0	367.5	426.9	0.0	0.0	741.5	741.5
Missiles (N-E)	MITT	0	12	0.0	0.0	0.0	0.0	0.0	0.0	367.5	426.9	0.0	0.0	741.5	741.5
Rockets (H-E)	MITT	2,114	8	1,966.0	11.8	0.0	0.0	845.6	613.1	7.4	0.0	0.0	0.0	3.2	2.3
Rockets (N-E)	MITT	0	8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
COUNTERMEASURES															
Chaff	MITT	25,840	0	1.5	3.9	0.0	0.0	7.3	6.7	0.0	0.0	0.0	0.0	0.0	0.0
Flares	MITT	25,600	0	1.5	3.9	0.0	0.0	7.2	6.6	0.0	0.0	0.0	0.0	0.0	0.0
TARGETS															
Airborne targets	MITT	12	0												
Surface targets	MITT	200	0												
Expendable sub-surface targets	MITT	87	0												
TOTAL EMISSIONS (lbs per year)				404,934	7,954	0	0	14,136	13,779	1,177	1,383	0	0	1,538	1,521
TOTAL EMISSIONS (tons per year)				202.5	4.0	0.0	0.0	7.1	6.9	0.6	0.7	0.0	0.0	0.8	0.8

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Table D-8: Vessel Emissions – Alternative 1

Type Training	Training Ops (#)	OPERATIONAL INFORMATION - VESSELS										EMISSIONS/YEAR (lb) BY JURISDICTION												EMISSIONS/YEAR (lb) BY JURISDICTION												GHG Emissions (lb)					
		Ship / Vessel / Boat				Range Time (hr)				Distribution (hr)																															
		Number	Ship Type	Type	Participation	Per Ship	Time at Each Power Level (%)	Total	0-3 nm from shore	3-12 nm from shore	>12 nm from shore	State (0-3 nm offshore)						Waters of U S (3-12 nm)						Int Waters (> 12 nm)						Total Emissions						Fuel Flow (GPH)	Annual Fuel Consumption (gal)				
												CO	NO_x	HC	SO_x	PM_{10}	PM2.5	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	CO	NO_x	HC	SO_x	PM_{10}	PM2.5			CO_2	N_2O	CH_4	CO_{2-e}
AIR WARFARE																																									
Air Combat Maneuver	3600																																								
Air Defense Exercise	100																																								
Air Intercept Control	5300																																								
Gunnery Exercise, A-A (Medium Caliber)	36																																								
Missile Exercise, A-A	18																																								
Gunnery Exercise, S-A (Large Caliber)	6	12	FFG	Guided Missile Frigate	2.00	2.0	100%	24.0	0.0	0.0	24.0	0	0	0	0	0	0	0	0	0	0	0	0	791	1,132	72	838	55	50	791	1,132	72	838	55	50	79	1,896	39,918	1	1	40,344
Gunnery Exercise, S-A (Medium Caliber)	13	26	FFG	Guided Missile Frigate	2.00	2.0	100%	52.0	0.0	0.0	52.0	0	0	0	0	0	0	0	0	0	0	0	0	1,713	2,452	156	1,816	120	108	1,713	2,452	156	1,816	120	108	79	4,108	86,490	3	2	87,411
Missile Exercise, S-A	18	36	FFG	Guided Missile Frigate	2.00	2.0	100%	72.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	79	0	0	0	0	0
STRIKE WARFARE																																									
Bombing Exercise, A-G	2300																																								
Missile Exercise, A-G	115																																								
Gunnery Exercise, A-G	96																																								
AMPHIBIOUS WARFARE																																									
Fire Support Exercise - Land-Based target	10	10	CG	Cruiser	1	8.0	100%	80.00	80.0	0.0	0.0	4,921	6,366	346	6,210	223	201	0	0	0	0	0	0	0	0	0	0	0	0	4,921	6,366	346	6,210	223	201	184	14,720	309,915	10	9	313,215
Amphibious Rehearsal, No Landing – Marine Air Ground Task Force	12	48	LSD	Cruiser	4	24.0	100%	1152.0	1152.0	0.0	0.0	24,480	385,356	12,488	40,366	3,122	2,810	0	0	0	0	0	0	0	0	0	0	0	0	24,480	385,356	12,488	40,366	3,122	2,810	184	1,461,888	30,778,590	998	870	31,106,382
		48	LHA/LHD	Amphib. Assault Ship - Tarawa	4	24.0	100%	1152.0	1152.0	0.0	0.0	9,308	55,100	6,647	156,096	32,924	29,632	0	0	0	0	0	0	0	0	0	0	0	0	9,308	55,100	6,647	156,096	32,924	29,632	373	1,461,888	30,778,590	998	870	31,106,382
		48	LPD	Amphibious Transport Dock - Wasp	4	24.0	100%	1152.0	1152.0	0.0	0.0	4,009	24,192	2,972	70,065	14,803	13,323	0	0	0	0	0	0	0	0	0	0	0	0	4,009	24,192	2,972	70,065	14,803	13,323	373	1,461,888	30,778,590	998	870	31,106,382
Amphibious Assault - Marine Air Ground Task Force	12	12	CG	Cruiser	1	8.0	100%	96.0	96.0	0.0	0.0	5,905	7,640	415	7,452	268	241	0	0	0	0	0	0	0	0	0	0	0	0	5,905	7,640	415	7,452	268	241	184	121,824	2,564,882	83	72	2,592,198
		12	LHA	Amphib. Assault Ship - Tarawa	1	8.0	100%	96.0	96.0	0.0	0.0	708	4,179	531	12,573	2,524	2,271	0	0	0	0	0	0	0	0	0	0	0	0	708	4,179	531	12,573	2,524	2,271	373	121,824	2,564,882	83	72	2,592,198
		24	LPD	Amphibious Transport Dock - Wasp	2	8.0	100%	192.0	192.0	0.0	0.0	668	4,032	495	11,677	2,467	2,220	0	0	0	0	0	0	0	0	0	0	0	0	668	4,032	495	11,677	2,467	2,220	373	243,648	5,129,765	166	145	5,184,397
		24	FFG	Guided Missile Frigate	2	8.0	100%	192.0	192.0	0.0	0.0	6,324	9,055	576	6,705	444	399	0	0	0	0	0	0	0	0	0	0	0	0	6,324	9,055	576	6,705	444	399	79	243,648	5,129,765	166	145	5,184,397
Amphibious Raid - Special Purpose Marine Air Ground Task Force	6	6	LHA	Amphib. Assault Ship - Tarawa	1	6.0	100%	36.0	36.0	0.0	0.0	266	1,567	199	4,715	946	852	0	0	0	0	0	0	0	0	0	0	0	0	266	1,567	199	4,715	946	852	373	45,684	961,831	31	27	972,074
		12	LPD	Amphibious Transport Dock - Wasp	2	2.5	100%	30.0	30.0	0.0	0.0	104	630	77	1,825	386	347	0	0	0	0	0	0	0	0	0	0	0	0	104	630	77	1,825	386	347	373	38,070	801,526	26	23	810,062
Non-Combatant Evacuation Operation	5	5	LHA	Amphib. Assault Ship - Tarawa	1	80.0	100%	400.0	400.0	0.0	0.0	2,952	17,412	2,212	52,388	10,516	9,464	0	0	0	0	0	0	0	0	0	0	0	0	2,952	17,412	2,212	52,388	10,516	9,464	373	149,200	3,141,257	102	89	3,174,711
		10	LPD	Amphibious Transport Dock - Wasp	2	80.0	100%	800.0	800.0	0.0	0.0	2,784	16,800	2,064	48,656	10,280	9,252	0	0	0	0	0	0	0	0	0	0	0	0	2,784	16,800	2,064	48,656	10,280	9,252	373	298,400	6,282,514	204	178	6,349,422
		5	LCU	Landing Craft Utility	1	80.0	100%	400.0	400.0	0.0	0.0	7,328	45,812	1,396	21,844	2,056	1,850	0	0	0	0	0	0	0	0	0	0	0	0	7,328	45,812	1,396	21,844	2,056	1,850	611	244,400	5,145,598	167	145	5,200,398
Humanitarian Assistance/ Disaster Relief Operations	5	5	LHA	Amphib. Assault Ship - Tarawa	1	8.0	100%	40.0	40.0	0.0	0.0	295	1,741	221	5,239	1,052	946	0	0	0	0	0	0	0	0	0	0	0	0	295	1,741	221	5,239	1,052	946	373	50,760	1,068,701	35	30	1,080,083
		10	LPD	Amphibious Transport Dock - Wasp	2	8.0	100%	80.0	80.0	0.0	0.0	278	1,680	206	4,866	1,028	925	0	0	0	0	0	0	0	0	0	0	0	0	278	1,680	206	4,866	1,028	925	373	101,520	2,137,402	69	60	2,160,165
		5	LCAC	Landing Craft Air Cushioned	1	8.0	100%	40.0	40.0	0.0	0.0	733	4,581	140	2,184	206	185	0	0	0	0	0	0	0	0	0	0	0	0	733	4,581	140	2,184	206	185	611	50,760	1,068,701	35	30	1,080,083
Unmanned Aerial Vehicle - Intelligence, Surveillance, and Reconaissance	100																																								

Table D-8: Vessel Emissions – Alternative 1 (continued)

Type Training	Training Ops (#)	OPERATIONAL INFORMATION - VESSELS										EMISSIONS/YEAR (lb) BY JURISDICTION												EMISSIONS/YEAR (lb) BY JURISDICTION												GHG Emissions (lb)					
		Ship / Vessel / Boat				Range Time (hr)			Distribution (hr)			State (0-3 nm offshore)						Waters of U S (3-12 nm)						Int Waters (> 12 nm)						Total Emissions											
		Number	Ship Type	Type	Participation	Per Ship	Time at Each Power Level (%)	Total	0-3 nm from shore	3-12 nm from shore	>12 nm from shore	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	Fuel Flow (GPH)	Annual Fuel Consumption (gal)	CO_2	N_2O	CH_4	CO_{2-e}
SURFACE WARFARE																																									
Gunnery Exercise, A-S (Small Caliber) - Ship	321																																								
Gunnery Exercise, A-S (Medium Caliber) - Ship	120																																								
Missile Exercise (A-S) - Rocket	110																																								
Missile Exercise (A-S)	10																																								
Laser Targeting	600																																								
Bombing Exercise (A-S)	37																																								
Torpedo Exercise (Submarine to Surface)	0																																								
Missile Exercise (S-S)	19	38	FFG	Guided Missile Frigate	2.00	2.0	100%	76.0	0.0	0.0	76.0	0	0	0	0	0	0	0	0	0	0	0	0	2,503	3,584	228	2,654	176	158	2,503	3,584	228	2,654	176	158	79	6,004	126,408	4	4	127,754
Gunner Exercise (Surface-to-Surface) Ship – Large-caliber	140	30.8	CG	Cruiser	0.22	2.5	100%	77.00	0.0	21.6	55.4	0	0	0	0	0	0	1,326	1,716	93	1,674	60	54	3,410	4,412	240	4,304	155	139	4,736	6,128	333	5,978	215	193	184	14,168	298,293	10	8	301,470
		63	DDG		0.45	2.5	100%	157.5	0.0	44.1	113.4	0	0	0	0	0	0	2,653	5,050	177	3,904	161	144	6,822	12,987	455	10,039	413	371	9,475	18,037	632	13,943	573	516	187	29,453	620,093	20	18	626,697
		21	FFG	Guided Missile Frigate	0.15	2.5	100%	52.5	0.0	14.7	37.8	0	0	0	0	0	0	484	693	44	513	34	31	1,245	1,783	113	1,320	87	79	1,729	2,476	158	1,833	121	109	79	4,148	87,321	3	2	88,251
		16.8	USCG	US Coast Guard	0.12	2.5	100%	42.0	0.0	11.8	30.2	0	0	0	0	0	0	68	681	10	136	2	2	174	1,751	27	349	6	6	241	2,432	37	485	9	8	66	2,772	58,362	2	2	58,983
Gunner Exercise (Surface-to-Surface) Ship – Medium-caliber	100	22	CG	Cruiser	0.22	2.5	100%	55.00	0.0	15.4	39.6	0	0	0	0	0	0	947	1,226	67	1,196	43	39	2,436	3,151	171	3,074	110	99	3,383	4,377	238	4,270	153	138	184	10,120	213,066	7	6	215,336
		45	DDG		0.45	2.5	100%	112.5	0.0	31.5	81.0	0	0	0	0	0	0	1,895	3,607	126	2,789	115	103	4,873	9,276	325	7,171	295	265	6,768	12,884	451	9,960	410	369	187	21,038	442,924	14	13	447,641
		15	FFG	Guided Missile Frigate	0.15	2.5	100%	37.5	0.0	10.5	27.0	0	0	0	0	0	0	346	495	32	367	24	22	889	1,273	81	943	62	56	1,235	1,769	113	1,310	87	78	79	2,963	62,372	2	2	63,037
		1	LPD	Amphibious Transport Dock - Wasp	0.01	2.5	100%	2.5	0.0	0.7	1.8	0	0	0	0	0	0	2	15	2	43	9	8	6	38	5	109	23	21	9	53	6	152	32	29	373	933	19,633	1	1	19,842
		12	USCG	US Coast Guard	0.12	2.5	100%	30.0	0.0	8.4	21.6	0	0	0	0	0	0	48	486	7	97	2	2	124	1,251	19	249	5	4	172	1,737	26	347	6	6	66	1,980	41,687	1	1	42,131
Sinking Exercise (SINKEX)	21	105	FFG	Guided Missile Frigate	5.00	16.0	100%	1680.0	0.0	0.0	1680.0	0	0	0	0	0	0	0	0	0	0	0	0	55,339	79,229	5,040	58,666	3,881	3,493	55,339	79,229	5,040	58,666	3,881	3,493	79	132,720	2,794,287	91	79	2,824,046
Gunnery Exercise (S-S) Boat – Medium-caliber	20	100	FFG	Guided Missile Frigate	5.00	3.0	100%	300.0	0.0	0.0	300.0	0	0	0	0	0	0	0	0	0	0	0	0	9,882	14,148	900	10,476	693	624	9,882	14,148	900	10,476	693	624	79	23,700	498,980	16	14	504,294
Gunnery Exercise (S-S) Small-caliber	43	86	CRRC	Combat Rubber Raiding Craft	2	3.0	100%	258.0	0.0	0.0	258.0	0	0	0	0	0	0	0	0	0	0	0	0	0	38	3,329	0	0	0	0	38	3,329	0	0	0	3	774	16,296	1	0	16,469
Maritime Security Operations (MSO)	40	40	FFG	Guided Missile Frigate	1	8.0	100%	320.0	0.0	0.0	320.0	0	0	0	0	0	0	0	0	0	0	0	0	10,541	15,091	960	11,174	739	665	10,541	15,091	960	11,174	739	665	79	25,280	532,245	17	15	537,914
		40	RHIB	Rigid Hulled Inflatable Boat	1	8.0	100%	320.0	0.0	0.0	320.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0	108.8	2924.8	19.2	460.8	48.0	43	109	2,925	19	461	48	43	14	4,480	94,322	3	3	95,326
		40	CRRC	Combat Rubber Raiding Craft	1	8.0	100%	320.0	0.0	0.0	320.0	0	0	0	0	0	0	0	0	0	0	0	0	0	48	4,128	0	0	0	0	48	4,128	0	0	0	3	960	20,212	1	1	20,427
ANTI-SUBMARINE WARFARE																																									
Tracking Exercise-Helo	65																																								
Torpedo Exercise-Helo	4																																								
Tracking Exercise-Maritime Patrol Advanced Extended Echo Ranging Sonobuoys	0																																								
Tracking Exercise -Maritime Patrol Aircraft	36																																								
Torpedo Exercise-Maritime Patrol Aircraft	4																																								
Tracking Exercise –Surface	91	91	FFG	Guided Missile Frigate	1	2.0	100%	182.0	0.0	91.0	91.0	0	0	0	0	0	0	2,998	4,292	273	3,178	210	189	2,998	4,292	273	3,178	210	189	5,995	8,583	546	6,355	420	378	79	14,378	302,714	10	9	305,938
Torpedo Exercise-Surface	4	4	FFG	Guided Missile Frigate	1	2.0	100%	8.0	0.0	4.0	4.0	0	0	0	0	0	0	132	189	12	140	9	8	132	189	12	140	9	8	264	377	24	279	18	17	79	632	13,306	0	0	13,448
Tracking Exercise– Submarine	4																																								
Torpedo Exercise – Submarine	6																																								
Small Joint Coordinated ASW exercise (Multi-Sail/GUAMEX)	2																																								

Table D-8: Vessel Emissions – Alternative 1 (continued)

Type Training	Training Ops (#)	OPERATIONAL INFORMATION - VESSELS										EMISSIONS/YEAR (lb) BY JURISDICTION												EMISSIONS/YEAR (lb) BY JURISDICTION												GHG Emissions (lb)					
		Ship / Vessel / Boat				Range Time (hr)				Distribution (hr)		State (0-3 nm offshore)						Waters of U S (3-12 nm)						Int Waters (> 12 nm)						Total Emissions											
		Number	Ship Type	Type	Participation	Per Ship	Time at Each Power Level (%)	Total	0-3 nm from shore	3-12 nm from shore	>12 nm from shore	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	Fuel Flow (GPH)	Annual Fuel Consumption (gal)	CO_2	N_2O	CH_4	CO_{2-e}
MAJOR TRAINING EXERCISES																																									
Joint Expeditionary Exercise	1	1.0	CVN	Nuclear Carrier (No emissions)	1	80.0	100%	80.0	0.0	80.0	0.0																														
		1.0	CG		1	80.0	100%	80.0	0.0	80.0	0.0	0	0	0	0	0	0	4,921	6,366	346	6,210	223	201	0	0	0	0	0	0	4,921	6,366	346	6,210	223	201	184	14,720	309,915	10	9	313,215
		2.0	FFG		2	80.0	100%	160.0	0.0	160.0	0.0	0	0	0	0	0	0	5,270	7,546	480	5,587	370	333	0	0	0	0	0	0	5,270	7,546	480	5,587	370	333	79	12,640	266,123	9	8	268,957
		5.0	DDG		5	80.0	100%	400.0	0.0	400.0	0.0	0	0	0	0	0	0	24,064	45,808	1,604	35,412	1,456	1,310	0	0	0	0	0	0	24,064	45,808	1,604	35,412	1,456	1,310	187	74,800	1,574,839	51	45	1,591,611
		1.0	LHD/LHA		1	80.0	100%	80.0	0.0	80.0	0.0	0	0	0	0	0	0	590	3,482	442	10,478	2,103	1,893	0	0	0	0	0	0	590	3,482	442	10,478	2,103	1,893	373	29,840	628,251	20	18	634,942
		2.0	LSD		2	80.0	100%	160.0	0.0	160.0	0.0	0	0	0	0	0	0	1,293	7,653	923	21,680	4,573	4,116	0	0	0	0	0	0	1,293	7,653	923	21,680	4,573	4,116	373	59,680	1,256,503	41	36	1,269,884
		1.0	LPD		1	80.0	100%	80.0	0.0	80.0	0.0	0	0	0	0	0	0	278	1,680	206	4,866	1,028	925	0	0	0	0	0	0	278	1,680	206	4,866	1,028	925	373	29,840	628,251	20	18	634,942
		1.0	TAOE		1	80.0	100%	80.0	0.0	80.0	0.0	0	0	0	0	0	0	8,781	24,905	848	9,599	833	750	0	0	0	0	0	0	8,781	24,905	848	9,599	833	750	1,865	149,200	3,141,257	102	89	3,174,711
		1.0	SSN	Nuclear Carrier (No emissions)	1	80.0	100%	80.0	0.0	80.0	0.0																														
		1.0	SSGN	Nuclear Carrier (No emissions)	1	80.0	100%	80.0	0.0	80.0	0.0																														
		2.0	T-AGO(LFA)		2	80.0	100%	160.0	0.0	160.0	0.0	0	0	0	0	0	0	1,067	6,299	800	19,109	3,803	3,423	0	0	0	0	0	0	1,067	6,299	800	19,109	3,803	3,423	1,865	298,400	6,282,514	204	178	6,349,422
		1.0	CG-PARTNER		1	80.0	100%	80.0	0.0	80.0	0.0	0	0	0	0	0	0	8,623	3,768	792	1,680	208	187	0	0	0	0	0	0	8,623	3,768	792	1,680	208	187	184	14,720	309,915	10	9	313,215
		2.0	DDG-PARTNER		2	80.0	100%	160.0	0.0	160.0	0.0	0	0	0	0	0	0	16,638	7,984	1,440	2,864	400	360	0	0	0	0	0	0	16,638	7,984	1,440	2,864	400	360	187	29,920	629,936	20	18	636,644
		1.0	SS-PARTNER		1	80.0	100%	80.0	0.0	80.0	0.0	0	0	0	0	0	0	235	1,386	176	4,169	837	753	0	0	0	0	0	0	235	1,386	176	4,169	837	753	373	29,840	628,251	20	18	634,942
		5.0	LCAC		5	80.0	100%	400.0	0.0	400.0	0.0	0	0	0	0	0	0	7,328	45,812	1,396	21,844	2,056	1,850	0	0	0	0	0	0	7,328	45,812	1,396	21,844	2,056	1,850	611	507,600	10,687,010	347	302	10,800,827
		2.0	LCU		2	80.0	100%	160.0	0.0	160.0	0.0	0	0	0	0	0	0	2,931	18,325	558	8,738	822	740	0	0	0	0	0	0	2,931	18,325	558	8,738	822	740	611	97,760	2,058,239	67	58	2,080,159
		19.0	CRRC		19	80.0	100%	1520.0	0.0	1520.0	0.0	0	0	0	0	0	0	0	226	19,610	0	0	0	0	0	0	0	0	0	0	226	19,610	0	0	0	3	4,560	96,006	3	3	97,029
		2.0	RHIB		2	80.0	100%	160.0	0.0	160.0	0.0	0	0	0	0	0	0	54	1,462	10	230	24	22	0	0	0	0	0	0	54	1,462	10	230	24	22	373	59,680	1,256,503	41	36	1,269,884
		14.0	AAV		14	80.0	100%	1120.0	0.0	1120.0	0.0	0	0	0	0	0	0	851	6,966	918	1,400	291	262	0	0	0	0	0	0	851	6,966	918	1,400	291	262	3	3,360	70,741	2	2	71,495
Joint Multi-Strike Group Exercise	1	3.0	CVN		3	80.0	100%	240.0	0.0	0.0	240.0																														
		3.0	CG		3	80.0	100%	240.0	0.0	0.0	240.0	0	0	0	0	0	0	0	0	0	0	0	0	14,762	19,099	1,037	18,631	670	603	14,762	19,099	1,037	18,631	670	603	184	44,160	929,745	30	26	939,646
		3.0	FFG		3	80.0	100%	240.0	0.0	0.0	240.0	0	0	0	0	0	0	0	0	0	0	0	0	7,906	11,318	720	8,381	554	499	7,906	11,318	720	8,381	554	499	79	18,960	399,184	13	11	403,435
		12.0	DDG		12	80.0	100%	960.0	0.0	0.0	960.0	0	0	0	0	0	0	0	0	0	0	0	0	57,754	109,939	3,850	84,989	3,494	3,145	57,754	109,939	3,850	84,989	3,494	3,145	187	179,520	3,779,614	123	107	3,819,867
		3.0	TAOE		3	80.0	100%	240.0	0.0	0.0	240.0	0	0	0	0	0	0	0	0	0	0	0	0	26,342	74,714	2,544	28,798	2,498	2,249	26,342	74,714	2,544	28,798	2,498	2,249	1,865	447,600	9,423,770	306	266	9,524,134
		5.0	SSN		5	80.0	100%	400.0	0.0	0.0	400.0																														
		2.0	T-AGO(LFA)		2	80.0	100%	160.0	0.0	0.0	160.0	0	0	0	0	0	0	0	0	0	0	0	0	1,067	6,299	800	19,109	3,803	3,423	1,067	6,299	800	19,109	3,803	3,423	1,865	298,400	6,282,514	204	178	6,349,422
		1.0	SS-PARTNER		1	80.0	100%	80.0	0.0	0.0	80.0	0	0	0	0	0	0	0	0	0	0	0	0	235	1,386	176	4,169	837	753	235	1,386	176	4,169	837	753	373	29,840	628,251	20	18	634,942
ELECTRONIC WARFARE																																									
Electronic Warfare Operations	522	522	FFG	Guided Missile Frigate	1	4	100%	2088.0	0.0	0.0	2088.0	0	0	0	0	0	0	0	0	0	0	0	0	68,779	98,470	6,264	72,913	4,823	4,341	68,779	98,470	6,264	72,913	4,823	4,341	79	164,952	3,472,899	113	98	3,509,886
Flare Exercise	2200																																								
Chaff Exercise - Ship	41	41	FFG	Guided Missile Frigate	1	4	100%	164.0	0.0	0.0	164.0	0	0	0	0	0	0	0	0	0	0	0	0	5,402	7,734	492	5,727	379	341	5,402	7,734	492	5,727	379	341	79	12,956	272,776	9	8	275,681
Chaff Exercise - Aircraft	2200																																								
MINE WARFARE																																									
Civilian Port Defense	1	1	RHIB	Rigid Hulled Inflatable Boat	1	24.0	100%	24.0	24.0	0.0	0.0	8.2	219.4	1.4	34.6	3.6	3	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0	8	219	1	35	4	3	14	336	7,074	0	0	7,149
Mine Laying - Aircraft	4																																								
Mine Neutralization – Explosive Ordnance Disposal	20	60	RHIB	Rigid Hulled Inflatable Boat	3	12.0	100%	720.0	720.0	0.0	0.0	244.8	6580.8	43.2	1036.8	108.0	97	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0	245	6,581	43	1,037	108	97	14	10,080	212,224	7	6	214,485
Limpet Mine Neutralization System/Shock Wave Generator	60	60	RHIB	Rigid Hulled Inflatable Boat	1	4.0	100%	240.0	240.0	0.0	0.0	81.6	2193.6	14.4	345.6	36.0	32	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0	82	2,194	14	346	36	32	14	3,360	70,741	2	2	71,495
Airborne Mine Countermeasure – Mine Detection	4																																								
Mine Countermeasure Exercise – Towed Sonar (AQS-20,LCS)	4																																								
Mine Countermeasure Exercise – Surface (SMCMEX) Sonar (SQQ-32, MCM)	4																																								
Mine Neutralization – Remotely Operated Vehicle Soanr (ASQ-235 [AQS-20], SLQ-48)	4																																								
Mine Countermeasure – Towed Mine Detection	4																																								
Underwater Demolition Qualification/Certification	45	45	CRRC	Combat Rubber Raiding Craft	1	8.0	100%	360.0	0.0	360.0	0.0	0	0	0	0	0	0	0	53	4,645	0	0	0	0	0	0	0	0	0	0	53	4,645	0	0	0	3	1,080	22,738	1	1	22,980
Submarine Mine Exercise	1																																								

Table D-8: Vessel Emissions – Alternative 1 (continued)

Type Training	Training Ops (#)	OPERATIONAL INFORMATION - VESSELS										EMISSIONS/YEAR (lb) BY JURISDICTION												EMISSIONS/YEAR (lb) BY JURISDICTION												GHG Emissions (lb)					
		Ship / Vessel / Boat				Range Time (hr)			Distribution (hr)			State (0-3 nm offshore)						Waters of U S (3-12 nm)						Int Waters (> 12 nm)						Total Emissions											
		Number	Ship Type	Type	Participation	Per Ship	Time at Each Power Level (%)	Total	0-3 nm from shore	3-12 nm from shore	>12 nm from shore	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	Fuel Flow (GPH)	Annual Fuel Consumption (gal)	CO_2	N_2O	CH_4	CO_{2-e}
NAVAL SPECIAL WARFARE																																									
Personnel I&E	365	1825	RHIB	Rigid Hulled Inflatable Boat	5	8.0	100%	14600.0	14600.0	0.0	0.0	4964.0	133444.0	876.0	21024.0	2190.0	1,971	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0	4,964	133,444	876	21,024	2,190	1,971	48	700,800	14,754,643	479	417	14,911,780
		2190	CRRC	Combat Rubber Raiding Craft	6	8.0	100%	17520.0	17520.0	0.0	0.0	0	2,603	226,033	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,603	226,033	0	0	0	3	52,560	1,106,598	36	31	1,118,384
Parachute Insertion	64																																								
Embassy Reinforcement	0	0	LCAC	Landing Craft Air Cushioned	1	24.0	100%	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	611	0	0	0	0	0
Underwater Demolition Qualifications	0	0	CRRC	Combat Rubber Raiding Craft	1	8.0	100%	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0
Intelligence, Surveillance, Reconnaissance	44																																								
Urban Warfare Training	0	0.0	LHA	Amphib. Assault Ship - Tarawa	1	40.0	100%	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	373	0	0	0	0	0
		0.0	LPD	Amphibious Transport Dock - Wasp	2	40.0	100%	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	373	0	0	0	0	0
OTHER																																									
Direct Action (Tactical Air Control Party)	30																																								
Intelligence, Surveillance, Reconnaissance	44																																								
Surface Ship Sonar Maintenance	44	44	FFG	Guided Missile Frigate	1	4.0	100%	176.0	176.0	0.0	0.0	5,797	8,300	528	6,146	407	366	0	0	0	0	0	0	0	0	0	0	0	0	5,797	8,300	528	6,146	407	366	79	13,904	292,735	9	8	295,852
Submarine Sonar Maintenance	32																																								
Small Boat Attack	18	18	CRRC	Combat Rubber Raiding Craft	1	4.0	100%	72.0	0.0	72.0	0.0	0	0	0	0	0	0	0	11	929	0	0	0	0	0	0	0	0	0	0	11	929	0	0	0	3	216	4,548	0	0	4,596
Sub Navigation / Sub Nav Under Ice	8																																								
Precision Anchoring	18	18	FFG	Guided Missile Frigate	1	4.0	100%	72.0	72.0	0.0	0.0	2,372	3,396	216	2,514	166	150	0	0	0	0	0	0	0	0	0	0	0	0	2,372	3,396	216	2,514	166	150	79	5,688	119,755	4	3	121,031
Unmanned Aerial Vehicle Operation	950																																								
Search and Rescue At Sea	45																																								
Underwater Survey	32	96	RHIB	Rigid Hulled Inflatable Boat	3	8.0	100%	768.0	768.0	0.0	0.0	261.1	7019.5	46.1	1105.9	115.2	104	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0	261	7,020	46	1,106	115	104	48	36,864	776,135	25	22	784,400
		96	CRRC	Combat Rubber Raiding Craft	3	8.0	100%	768.0	768.0	0.0	0.0	0	114	9,908	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	114	9,908	0	0	0	3	2,304	48,508	2	1	49,025
Unmanned Underwater Vehicle Training	64																																								
TOTAL TRAINING (lbs per year)									**40,826**	**5,806**	**8,665**	**84,793**	**750,012**	**268,652**	**485,068**	**86,270**	**77,643**	**93,825**	**208,182**	**36,967**	**167,900**	**19,696**	**17,727**	**286,234**	**488,009**	**32,434**	**359,677**	**24,147**	**21,732**	**464,852**	**1,446,204**	**338,053**	**1,012,646**	**130,113**	**117,102**		**9,852,767**	**207,440,146**	**6,729**	**5,862**	**209,649,382**
TOTAL TRAINING (tons per year)												**42**	**375**	**134**	**243**	**43**	**39**	**47**	**104**	**18**	**84**	**10**	**9**	**143**	**244**	**16**	**180**	**12**	**11**	**232**	**723**	**169**	**506**	**65**	**59**			**103,720**	**3**	**3**	**104,825**

Table D-8: Vessel Emissions – Alternative 1 (continued)

Type Training	Training Ops (#)	OPERATIONAL INFORMATION - VESSELS										EMISSIONS/YEAR (lb) BY JURISDICTION												EMISSIONS/YEAR (lb) BY JURISDICTION												GHG Emissions (lb)					
		Ship / Vessel / Boat				Range Time (hr)			Distribution (hr)			State (0-3 nm offshore)						Waters of U S (3-12 nm)						Int Waters (> 12 nm)						Total Emissions											
		Number	Ship Type	Type	Participation	Per Ship	Time at Each Power Level (%)	Total	0-3 nm from shore	3-12 nm from shore	>12 nm from shore	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	Fuel Flow (GPH)	Annual Fuel Consumption (gal)	CO_2	N_2O	CH_4	CO_{2-e}
LIFECYCLE ACTIVITIES TESTING																																									
Littoral Combat Ship (LCS) Mission Package Testing-ASW	2	2	LCS		1	60.0	100%	120.0	0.0	120.0	0.0	0	0	0	0	0	0	3,953	5,659	360	4,190	277	249	0	0	0	0	0	0	3,953	5,659	360	4,190	277	249	79	152,280	3,206,103	104	91	3,240,248
Ship Signature Testing	40	40	FFG	Guided Missile Frigate	1	4.0	100%	160.0	52.8	52.8	54.4	1,739	2,490	158	1,844	122	110	1,739	2,490	158	1,844	122	110	1,792	2,566	163	1,900	126	113	5,270	7,546	480	5,587	370	333	79	203,040	4,274,804	139	121	4,320,331
ANTI-SUBMARINE WARFARE TESTING																																									
Anti-submarine Warfare Tracking Test - MPA	26																																								
Torpedo (Explosive) Testing	2	6.0	DDG		3	4.0	100%	24.0	0.0	0.0	24.0	0	0	0	0	0	0	0	0	0	0	0	0	1,444	2,748	96	2,125	87	79	1,444	2,748	96	2,125	87	79	187	4,488	94,490	3	3	95,497
Torpedo (Non-explosive Testing)	6																																								
Countermeasure / Acoustic Systems Testing	2	4.0	DDG		2	2.0	100%	8.0	4.0	4.0	0.0	241	458	16	354	15	13	241	458	16	354	15	13	0	0	0	0	0	0	481	916	32	708	29	26	187	1,496	31,497	1	1	31,832
At-Sea Sonar Testing	27	108.0	SSN	Nuclear Carrier (No emissions)	4	2.0	100%	216.0	0.0	0.0	216.0																														
		27.0	CG		1	2.0	100%	54.0	0.0	0.0	54.0	0	0	0	0	0	0	0	0	0	0	0	0	3,322	4,297	233	4,192	151	136	3,322	4,297	233	4,192	151	136	184	9,936	209,193	7	6	211,420
		108.0	DDG		4	2.0	100%	216.0	0.0	0.0	216.0	0	0	0	0	0	0	0	0	0	0	0	0	12,995	24,736	866	19,122	786	708	12,995	24,736	866	19,122	786	708	187	40,392	850,413	28	24	859,470
SHIPBOARD PROTECTION SYSTEMS AND SWIMMER DEFENSE TESTING																																									
Pierside Integrated Swimmer Defense	0	0	FFG	Guided Missile Frigate	1	8.0	100%	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	79	0	0	0	0	0
MINE WARFARE TESTING																																									
Mine Detection and Classification Testing	4	4	FFG	Guided Missile Frigate	1	4	100%	16.0	5.3	5.3	5.4	174	249	16	184	12	11	174	249	16	184	12	11	179	257	16	190	13	11	527	755	48	559	37	33	79	1,264	26,612	1	1	26,896
UNMANNED VEHICLE TESTING																																									
Unmanned Vehicle Development and Payload Testing	0																																								
OFFICE OF NAVAL RESEARCH																																									
North Pacific Acoustic Lab Philippine Sea 2018-19 Experiment (Deep Water)	1																																								
TOTAL TESTING (lbs per year)									**62**	**182**	**570**	**2,154**	**3,197**	**190**	**2,382**	**149**	**134**	**6,107**	**8,856**	**550**	**6,573**	**426**	**383**	**19,731**	**34,604**	**1,375**	**27,529**	**1,162**	**1,046**	**27,991**	**46,658**	**2,116**	**36,484**	**1,737**	**1,563**		**412,896**	**8,693,112**	**282**	**246**	**8,785,694**
TOTAL TESTING (tons per year)												**1**	**2**	**0**	**1**	**0**	**0**	**3**	**4**	**0**	**3**	**0**	**0**	**10**	**17**	**1**	**14**	**1**	**1**	**14**	**23**	**1**	**18**	**1**	**1**			**4,347**	**0**	**0**	**4,393**

Table D-9: Aircraft Emissions – Alternative 1

Type Training	Training Ops (#)	OPERATIONAL INFORMATION - AIRCRAFT: Aircraft: Distribution	Aircraft: A/C Sorties (#)	Aircraft: Type	Time: Ave Time on Range (hr)	Time: Total Time on Range (hr)	Altitude: Time < 3,000 ft (%)	Altitude: Time < 3,000 ft (hr)	Distribution (%): 0-3 nm from shore	Distribution (%): 3-12 nm from Shore	Distribution (%): >12 nm from Shore	Distribution (hr): Total Time 0-3 nm from shore	Distribution (hr): Total Time 3-12 nm from shore	Distribution (hr): Total Time >12 nm from shore	EMISSIONS/YEAR (lb) BY JURISDICTION: State (0-3 nm offshore): CO	NOx	HC	SOx	PM	PM2.5	Waters of U S (3-12 nm): CO	NOx	HC	SOx	PM	PM2.5	EMISSIONS/YEAR (lb) BY JURISDICTION: Int Waters (> 12 nm): CO	NOx	HC	SOx	PM	PM2.5	Total Emissions: CO	NOx	HC	SOx	PM	PM2.5	Training Platform: Engines (#)	Fuel Flow (lb/hr)	Annual Fuel Use (total): Pounds	Gallons	GHG Emissions (lb): CO_2	N_2O	CH_4	CO_{2-e}
AIR WARFARE																																																
Air Combat Maneuver	3600	1	3600	FA-18E/F	1.0	3600.0	0%	0.0	0%	0%	100%	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	10,338	37216800	5473059	115229780	3738	3256	116,456,977
		1	3600	AV-8B	1.0	3600.0	0%	0.0	0%	0%	100%	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	6,000	21600000	3176471	66877412	2170	1890	67,589,656
Air Defense Exercise	100	2	200	FA-18E/F	1.0	200.0	50%	100.0	0%	0%	100%	0.00	0.00	100.00	0	0	0	0	0	0	0	0	0	0	0	0	744	15249	124	414	6782	6104	744	15249	124	414	6782	6104	2	10,338	2067600	304059	6401654	208	181	6,469,832
Air Intercept Control	5300	2	10600	FA-18E/F	1.0	10600.0	50%	5300.0	0%	0%	100%	0.00	0.00	5300.00	0	0	0	0	0	0	0	0	0	0	0	0	39450	808173	6575	21917	359432	323488	39450	808173	6575	21917	359432	323488	2	10,338	109582800	16115118	339287687	11007	9588	342,901,099
Gunnery Exercise, A-A (Medium Caliber)	36	1	36	AV-8B	1.0	36.0	0%	0.0	0%	0%	100%	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	6,000	216000	31765	668774	22	19	675,897
		1	36	FA-18E/F	1.0	36.0	0%	0.0	0%	0%	100%	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	10,338	372168	54731	1152298	37	33	1,164,570
Missile Exercise, A-A	18	1	18	AV-8B	1.0	18.0	0%	0.0	0%	0%	100%	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	6,000	108000	15882	334387	11	9	337,948
		1	18	FA-18E/F	1.0	18.0	0%	0.0	0%	0%	100%	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	10,338	186084	27365	576149	19	16	582,285
Gunnery Exercise, S-A (Large Caliber)	6																																															
Gunnery Exercise, S-A (Medium Caliber)	13																																															
Missile Exercise, S-A	18																																															
STRIKE WARFARE																																																
Bombing Exercise, A-G	2300	1	2300	FA-18E/F	1.0	2300.0	10%	230.0	0%	0%	100%	0.00	0.00	230.00	0	0	0	0	0	0	0	0	0	0	0	0	1712	35072	285	951	15598	14038	1712	35072	285	951	15598	14038	2	10,338	23777400	3496676	73619026	2388	2081	74,403,069
Missile Exercise, A-G	115	0.5	58	FA-18E/F	2.0	115.0	10%	11.5	0%	0%	100%	0.00	0.00	11.50	0	0	0	0	0	0	0	0	0	0	0	0	86	1754	14	48	780	702	86	1754	14	48	780	702	2	10,338	1188870	174834	3680951	119	104	3,720,153
		0.5	58	SH-60B	2.0	115.0	100%	115.0	0%	0%	100%	0.00	0.00	115.00	0	0	0	0	0	0	0	0	0	0	0	0	863	883	76	55	580	522	863	883	76	55	580	522	2	1200	138000	20294	427272	14	12	431,823
Gunnery Exercise, A-G	96	0.5	48	FA-18E/F	2.0	96.0	10%	9.6	0%	0%	100%	0.00	0.00	9.60	0	0	0	0	0	0	0	0	0	0	0	0	71	1464	12	40	651	586	71	1464	12	40	651	586	2	10,338	992448	145948	3072794	100	87	3,105,519
		0.5	48	SH-60B	2.0	96.0	100%	96.0	0%	0%	100%	0.00	0.00	96.00	0	0	0	0	0	0	0	0	0	0	0	0	720	737	63	46	484	435	720	737	63	46	484	435	2	1200	115200	16941	356680	12	10	360,478

Table D-9: Aircraft Emissions – Alternative 1 (continued)

Type Training	Training Ops (#)	OPERATIONAL INFORMATION - AIRCRAFT: Aircraft: Distribution	Aircraft: A/C Sorties (#)	Aircraft: Type	Time: Ave Time on Range (hr)	Time: Total Time on Range (hr)	Altitude: Time < 3,000 ft. (%)	Altitude: Time < 3,000 ft. (hr)	Distribution (%): 0-3 nm from shore	Distribution (%): 3-12 nm from Shore	Distribution (%): >12 nm from Shore	Distribution (hr): Total Time 0-3 nm from shore	Distribution (hr): Total Time 3-12 nm from shore	Distribution (hr): Total Time >12 nm from shore	EMISSIONS/YEAR (lb) BY JURISDICTION: State (0-3 nm offshore): CO	NOx	HC	SOx	PM	PM2.5	Waters of U S (3-12 nm): CO	NOx	HC	SOx	PM	PM2.5	EMISSIONS/YEAR (lb) BY JURISDICTION: Int Waters (> 12 nm): CO	NOx	HC	SOx	PM	PM2.5	Total Emissions: CO	NOx	HC	SOx	PM	PM2.5	Training Platform: Engines (#)	Fuel Flow (lb/hr)	Annual Fuel Use (total): Pounds	Gallons	GHG Emissions (lb): CO_2	N_2O	CH_4	CO_{2-e}
AMPHIBIOUS WARFARE																																																
Fire Support Exercise - Land-Based target	10																																															
Amphibious Rehearsal, No Landing – Marine Air Ground Task Force	12	4	48.0	CH-53	18.0	864.0	100%	864.0	100%	0%	0%	864.00	0.00	0.00	8215	31164	579	1543	8524	7671	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8215	31164	579	1543	8524	7671	3	4,464	3856896	567191	11941631	387	337	12,068,809
		10	120.0	MV-22	18.0	2160.0	100%	2160.0	100%	0%	0%	2160.00	0.00	0.00	47755	9532	8298	968	4306	3876	0	0	0	0	0	0	0	0	0	0	0	0	0	0	47755	9532	8298	968	4306	3876	2	2240	4838400	711529	14980540	486	423	15,140,083
		2	24.0	UH-1	18.0	432.0	100%	432.0	100%	0%	0%	432.00	0.00	0.00	779	1101	40	93	980	882	0	0	0	0	0	0	0	0	0	0	0	0	0	0	779	1101	40	93	980	882	2	540	233280	34306	722276	23	20	729,968
		4	48.0	AH-1	18.0	864.0	100%	864.0	100%	0%	0%	864.00	0.00	0.00	7865	3817	400	281	2947	2652	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7865	3817	400	281	2947	2652	2	812	701568	103172	2172178	70	61	2,195,312
		4	48.0	AV-8	18.0	864.0	0%	0.0	100%	0%	0%	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	6,000	5184000	762353	16050579	521	454	16,221,517
Amphibious Assault Marine Air Ground Task Force	12	4	48.0	CH-53	18.0	864.0	100%	864.0	100%	0%	0%	864.00	0.00	0.00	8215	31164	579	1543	8524	7671	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8215	31164	579	1543	8524	7671	3	4,464	3856896	567191	11941631	387	337	12,068,809
		10	120.0	MV-22	18.0	2160.0	100%	2160.0	100%	0%	0%	2160.00	0.00	0.00	47755	9532	8298	968	4306	3876	0	0	0	0	0	0	0	0	0	0	0	0	0	0	47755	9532	8298	968	4306	3876	2	2240	4838400	711529	14980540	486	423	15,140,083
		2	24.0	UH-1	18.0	432.0	100%	432.0	100%	0%	0%	432.00	0.00	0.00	779	1101	40	93	980	882	0	0	0	0	0	0	0	0	0	0	0	0	0	0	779	1101	40	93	980	882	2	540	233280	34306	722276	23	20	729,968
		4	48.0	AH-1	18.0	864.0	100%	864.0	100%	0%	0%	864.00	0.00	0.00	7865	3817	400	281	2947	2652	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7865	3817	400	281	2947	2652	2	812	701568	103172	2172178	70	61	2,195,312
		4	48.0	AV-8	18.0	864.0	0%	0.0	100%	0%	0%	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	6,000	5184000	762353	16050579	521	454	16,221,517
Amphibious Raid - Special Purpose Marine Air Ground Task Force	6	4	24.0	H-53	12.0	288.0	100%	288.0	100%	0%	0%	288.00	0.00	0.00	2738	10388	193	514	2841	2557	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2738	10388	193	514	2841	2557	3	4,464	1285632	189064	3980544	129	112	4,022,936
		10	60.0	MV-22	12.0	720.0	100%	720.0	100%	0%	0%	720.00	0.00	0.00	15918	3177	2766	323	1435	1292	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15918	3177	2766	323	1435	1292	2	2240	1612800	237176	4993513	162	141	5,046,694
		2	12.0	UH-1	12.0	144.0	100%	144.0	100%	0%	0%	144.00	0.00	0.00	260	367	13	31	327	294	0	0	0	0	0	0	0	0	0	0	0	0	0	0	260	367	13	31	327	294	2	540	77760	11435	240759	8	7	243,323
		4	24.0	AH-1	12.0	288.0	100%	288.0	100%	0%	0%	288.00	0.00	0.00	2622	1272	133	94	982	884	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2622	1272	133	94	982	884	2	812	233856	34391	724059	23	20	731,771
		4	24.0	AV-8	12.0	288.0	0%	0.0	100%	0%	0%	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	6,000	1728000	254118	5350193	174	151	5,407,172
Non-Combatant Evacuation Operation	5	10	50	MV-22	20.0	1000.0	100%	1000.0	100%	0%	0%	1000.00	0.00	0.00	22109	4413	3842	448	1994	1794	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22109	4413	3842	448	1994	1794	2	2240	2240000	329412	6935435	225	196	7,009,298
		4	20	H-53	20.0	400.0	100%	400.0	100%	0%	0%	400.00	0.00	0.00	3803	14428	268	714	3946	3552	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3803	14428	268	714	3946	3552	3	4,464	1785600	262588	5528533	179	156	5,587,412
		2	10	UH-1	20.0	200.0	100%	200.0	100%	0%	0%	200.00	0.00	0.00	361	510	18	43	454	408	0	0	0	0	0	0	0	0	0	0	0	0	0	0	361	510	18	43	454	408	2	540	108000	15882	334387	11	9	337,948
		4	20	AH-1	20.0	400.0	100%	400.0	100%	0%	0%	400.00	0.00	0.00	3641	1767	185	130	1364	1228	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3641	1767	185	130	1364	1228	2	812	324800	47765	1005638	33	28	1,016,348
		4	20	AV-8	20.0	400.0	0%	0.0	100%	0%	0%	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	6,000	2400000	352941	7430824	241	210	7,509,962
Humanitarian Assistance/ Disaster Relief Operations	5	10	50	MV-22	20.0	1000.0	100%	1000.0	100%	0%	0%	1000.00	0.00	0.00	22109	4413	3842	448	1994	1794	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22109	4413	3842	448	1994	1794	2	2240	2240000	329412	6935435	225	196	7,009,298
		4	20	H-53	20.0	400.0	100%	400.0	100%	0%	0%	400.00	0.00	0.00	3803	14428	268	714	3946	3552	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3803	14428	268	714	3946	3552	3	4,464	1785600	262588	5528533	179	156	5,587,412
		2	10	UH-1	20.0	200.0	100%	200.0	100%	0%	0%	200.00	0.00	0.00	361	510	18	43	454	408	0	0	0	0	0	0	0	0	0	0	0	0	0	0	361	510	18	43	454	408	2	540	108000	15882	334387	11	9	337,948
		4	20	AH-1	20.0	400.0	100%	400.0	100%	0%	0%	400.00	0.00	0.00	3641	1767	185	130	1364	1228	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3641	1767	185	130	1364	1228	2	812	324800	47765	1005638	33	28	1,016,348
		4	20	AV-8	20.0	400.0	0%	0.0	100%	0%	0%	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	6,000	2400000	352941	7430824	241	210	7,509,962
Unmanned Aerial Vehicle - Intelligence, Surveillance, and Reconaissance	100	1	100.0	MQ-4C	4.0	400.0	100%	400.0	100%	0%	0%	400.00	0.00	0.00	840	15536	264	1416	244	220	0	0	0	0	0	0	0	0	0	0	0	0	0	0	840	15536	264	1416	244	220	1	2,532	1012800	148941	3135808	102	89	3,169,204

Table D-9: Aircraft Emissions – Alternative 1 (continued)

Type Training	Training Ops (#)	OPERATIONAL INFORMATION - AIRCRAFT: Aircraft			Time		Altitude		Distribution (%)			Distribution (hr)			EMISSIONS/YEAR (lb) BY JURISDICTION: State (0-3 nm offshore)						Waters of U S (3-12 nm)						EMISSIONS/YEAR (lb) BY JURISDICTION: Int Waters (> 12 nm)						Total Emissions						Training Platform		Annual Fuel Use (total)		GHG Emissions (lb)			
		Distribution	A/C Sorties (#)	Type	Ave Time on Range (hr)	Total Time on Range (hr)	Time < 3,000 ft. (%)	Time < 3,000 ft. (hr)	0-3 nm from shore	3-12 nm from Shore	>12 nm from Shore	Total Time 0-3 nm from shore	Total Time 3-12 nm from shore	Total Time >12 nm from shore	CO	NOx	HC	SOx	PM	PM2.5	CO	NOx	HC	SOx	PM	PM2.5	CO	NOx	HC	SOx	PM	PM2.5	CO	NOx	HC	SOx	PM	PM2.5	Engines (#)	Fuel Flow (lb/hr)	Pounds	Gallons	CO_2	N_2O	CH_4	CO_{2-e}
SURFACE WARFARE																																													
Gunnery Exercise, A-S (Small Caliber) - Ship	321	0.25	80.25	FA-18E/F	2.0	160.5	10%	16.1	0%	0%	100%	0.00	0.00	16.05	0	0	0	0	0	0	0	0	0	0	0	0	119	2447	20	66	1088	980	119	2447	20	66	1088	980	2	10,338	1659249	244007	5137328	167	145	5,192,040
		0.75	240.75	SH-60B	2.0	481.5	100%	481.5	0%	0%	100%	0.00	0.00	481.50	0	0	0	0	0	0	0	0	0	0	0	0	3611	3698	318	231	2427	2184	3611	3698	318	231	2427	2184	2	1200	577800	84971	1788971	58	51	1,808,023
Gunnery Exercise, A-S (Medium Caliber) - Ship	120	0.25	30	FA-18E/F	2.0	60.0	10%	6.0	0%	0%	100%	0.00	0.00	6.00	0	0	0	0	0	0	0	0	0	0	0	0	45	915	7	25	407	366	45	915	7	25	407	366	2	10,338	620280	91218	1920496	62	54	1,940,950
		0.75	90	SH-60B	2.0	180.0	100%	180.0	0%	0%	100%	0.00	0.00	180.00	0	0	0	0	0	0	0	0	0	0	0	0	1350	1382	119	86	907	816	1350	1382	119	86	907	816	2	1200	216000	31765	668774	22	19	675,897
Missile Exercise (A-S) - Rocket	110	0.33	36.3	FA-18E/F	2.0	72.6	10%	7.3	0%	0%	100%	0.00	0.00	7.26	0	0	0	0	0	0	0	0	0	0	0	0	54	1107	9	30	492	443	54	1107	9	30	492	443	2	10,338	750538.8	110373	2323801	75	66	2,348,549
		0.66	72.6	SH-60B	2.0	145.2	100%	145.2	0%	0%	100%	0.00	0.00	145.20	0	0	0	0	0	0	0	0	0	0	0	0	1089	1115	96	70	732	659	1089	1115	96	70	732	659	2	1200	174240	25624	539478	18	15	545,223
Missile Exercise (A-S)	10	0.5	5	FA-18E/F	2.0	10.0	10%	1.0	0%	0%	100%	0.00	0.00	1.00	0	0	0	0	0	0	0	0	0	0	0	0	7	152	1	4	68	61	7	152	1	4	68	61	2	10,338	103380	15203	320083	10	9	323,492
		0.5	5	SH-60B	2.0	10.0	100%	10.0	0%	0%	100%	0.00	0.00	10.00	0	0	0	0	0	0	0	0	0	0	0	0	75	77	7	5	50	45	75	77	7	5	50	45	2	1200	12000	1765	37154	1	1	37,550
Laser Targeting	600	0.5	300	FA-18E/F	1.0	300.0	10%	30.0	0%	0%	100%	0.00	0.00	30.00	0	0	0	0	0	0	0	0	0	0	0	0	223	4575	37	124	2035	1831	223	4575	37	124	2035	1831	2	10,338	3101400	456088	9602482	312	271	9,704,748
		0.5	300	SH-60B	1.0	300.0	100%	300.0	0%	0%	100%	0.00	0.00	300.00	0	0	0	0	0	0	0	0	0	0	0	0	2250	2304	198	144	1512	1361	2250	2304	198	144	1512	1361	2	1200	360000	52941	1114624	36	32	1,126,494
Bombing Exercise (A-S)	37	0.5	19	FA-18E/F	1.0	18.5	10%	1.9	0%	0%	100%	0.00	0.00	1.85	0	0	0	0	0	0	0	0	0	0	0	0	14	282	2	8	125	113	14	282	2	8	125	113	2	10,338	191253	28125	592153	19	17	598,459
		0.5	19	P-3	1.0	18.5	10%	1.9	0%	0%	100%	0.00	0.00	1.85	0	0	0	0	0	0	0	0	0	0	0	0	22	69	5	4	35	32	22	69	5	4	35	32	4	4,800	88800	13059	274940	9	8	277,869
Torpedo Exercise (Submarine to Surface)	0																																												
Missile Exercise (S-S)	19																																												
Sinking Exercise (SINKEX)	1	2	2	FA-18E/F	8.0	16.0	10%	1.6	0%	0%	100%	0.00	0.00	1.60	0	0	0	0	0	0	0	0	0	0	0	0	12	244	2	7	109	98	12	244	2	7	109	98	2	10,338	165408	24325	512132	17	14	517,587
		1	1	P-3	8.0	8.0	10%	0.8	0%	0%	100%	0.00	0.00	0.80	0	0	0	0	0	0	0	0	0	0	0	0	10	30	2	2	15	14	10	30	2	2	15	14	4	4,800	38400	5647	118893	4	3	120,159
		1	1	SH-60B	8.0	8.0	100%	8.0	0%	0%	100%	0.00	0.00	8.00	0	0	0	0	0	0	0	0	0	0	0	0	60	61	5	4	40	36	60	61	5	4	40	36	2	1200	9600	1412	29723	1	1	30,040
Gunnery Exercise (S-S) Boat – Medium-caliber	20																																												
Gunnery Exercise (S-S) Small-caliber	43																																												
Maritime Security Operations (MSO)	40	1	40	SH-60B	4.0	160.0	100%	160.0	100%	0%	0%	160.00	0.00	0.00	1200	1229	106	77	806	726	0	0	0	0	0	0	0	0	0	0	0	0	1200	1229	106	77	806	726	2	1200	192000	28235	594466	19	17	600,797
ANTI-SUBMARINE WARFARE																																													
Tracking Exercise-Helo	65	3	195	SH-60B	4.0	780.0	100%	780.0	0%	100%	0%	0.00	780.00	0.00	0	0	0	0	0	0	5850	5990	515	374	3931	3538	0	0	0	0	0	0	5850	5990	515	374	3931	3538	2	1200	936000	137647	2898021	94	82	2,928,885
Torpedo Exercise-Helo	4	3	12	SH-60B	4.0	48.0	100%	48.0	0%	100%	0%	0.00	48.00	0.00	0	0	0	0	0	0	360	369	32	23	242	218	0	0	0	0	0	0	360	369	32	23	242	218	2	1200	57600	8471	178340	6	5	180,239
Tracking Exercise-Maritime Patrol Advanced Extended Echo Ranging Sonobuoys	0	1	0	P-3	6.0	0.0	75%	0.0	0%	100%	0%	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4,800	0	0	0	0	0	0
Tracking Exercise - Maritime Patrol Aircraft	36	1	36	P-3	6.0	216.0	75%	162.0	0%	100%	0%	0.00	162.00	0.00	0	0	0	0	0	0	1952	6011	451	311	3087	2778	0	0	0	0	0	0	1952	6011	451	311	3087	2778	4	4,800	1036800	152471	3210116	104	91	3,244,303
Torpedo Exercise-Maritime Patrol Aircraft	4	1	4	P-3	6.0	24.0	75%	18.0	0%	100%	0%	0.00	18.00	0.00	0	0	0	0	0	0	217	668	50	35	343	309	0	0	0	0	0	0	217	668	50	35	343	309	4	4,800	115200	16941	356680	12	10	360,478
Tracking Exercise –Surface	91																																												
Torpedo Exercise-Surface	4																																												
Tracking Exercise–Submarine	4																																												
Torpedo Exercise – Submarine	6																																												

Table D-9: Aircraft Emissions – Alternative 1 (continued)

Type Training	Training Ops (#)	OPERATIONAL INFORMATION - AIRCRAFT: Aircraft: Distribution	A/C Sorties (#)	Type	Time: Ave Time on Range (hr)	Total Time on Range (hr)	Altitude: Time < 3,000 ft. (%)	Time < 3,000 ft. (hr)	Distribution (%): 0-3 nm from shore	3-12 nm from Shore	>12 nm from Shore	Distribution (hr): Total Time 0-3 nm from shore	Total Time 3-12 nm from shore	Total Time >12 nm from shore	EMISSIONS/YEAR (lb) BY JURISDICTION: State (0-3 nm offshore): CO	NOx	HC	SOx	PM	PM2.5	Waters of U S (3-12 nm): CO	NOx	HC	SOx	PM	PM2.5	EMISSIONS/YEAR (lb) BY JURISDICTION: Int Waters (> 12 nm): CO	NOx	HC	SOx	PM	PM2.5	Total Emissions: CO	NOx	HC	SOx	PM	PM2.5	Training Platform: Engines (#)	Fuel Flow (lb/hr)	Annual Fuel Use (total): Pounds	Gallons	GHG Emissions (lb): CO_2	N_2O	CH_4	CO_{2-e}
MAJOR TRAINING EVENTS																																																
Joint Expeditionary Exercise	1	48	48	FA-18E/I	8.0	384.0	10%	38.4	0%	100%	0%	0.00	38.40	0.00	0	0	0	0	0	0	286	5855	48	159	2604	2344	0	0	0	0	0	0	286	5855	48	159	2604	2344	2	10,338	3969792	583793	12291177	399	347	12,422,078
		4	4	EA-6B	8.0	32.0	10%	3.2	0%	100%	0%	0.00	3.20	0.00	0	0	0	0	0	0	148	165	10	8	73	66	0	0	0	0	0	0	148	165	10	8	73	66	1	6,000	192000	28235	594466	19	17	600,797
		4	4	E-2	8.0	32.0	10%	3.2	0%	100%	0%	0.00	3.20	0.00	0	0	0	0	0	0	18	71	3	3	7	6	0	0	0	0	0	0	18	71	3	3	7	6	1	1,100	35200	5176	108985	4	3	110,146
		3	3	P-3	8.0	24.0	10%	2.4	0%	100%	0%	0.00	2.40	0.00	0	0	0	0	0	0	29	89	7	5	46	41	0	0	0	0	0	0	29	89	7	5	46	41	4	4,800	115200	16941	356680	12	10	360,478
		6	6	AV-8B	8.0	48.0	10%	4.8	0%	100%	0%	0.00	4.80	0.00	0	0	0	0	0	0	222	248	16	12	109	98	0	0	0	0	0	0	222	248	16	12	109	98	1	6,000	288000	42353	891699	29	25	901,195
		2	2	C-130	8.0	16.0	10%	1.6	0%	100%	0%	0.00	1.60	0.00	0	0	0	0	0	0	15	59	3	3	29	26	0	0	0	0	0	0	15	59	3	3	29	26	4	4,500	72000	10588	222925	7	6	225,299
		4	4	A-10	8.0	32.0	10%	3.2	0%	100%	0%	0.00	3.20	0.00	0	0	0	0	0	0	39	86	4	4	26	23	0	0	0	0	0	0	39	86	4	4	26	23	2	6,052	193664	28480	599618	19	17	606,004
		1	1	E-3	8.0	8.0	10%	0.8	0%	100%	0%	0.00	0.80	0.00	0	0	0	0	0	0	54	221	8	10	7	6	0	0	0	0	0	0	54	221	8	10	7	6	4	130,736	1045888	153807	3238254	105	92	3,272,741
		1	1	KC-135	8.0	8.0	10%	0.8	0%	100%	0%	0.00	0.80	0.00	0	0	0	0	0	0	25	247	1	7	2	2	0	0	0	0	0	0	25	247	1	7	2	2	4	91,552	732416	107708	2267689	74	64	2,291,840
		15	15	SH-60B	8.0	120.0	100%	120.0	0%	100%	0%	0.00	120.00	0.00	0	0	0	0	0	0	900	922	79	58	605	544	0	0	0	0	0	0	900	922	79	58	605	544	2	1200	144000	21176	445849	14	13	450,598
		4	4	CH-53	8.0	32.0	100%	32.0	0%	100%	0%	0.00	32.00	0.00	0	0	0	0	0	0	304	1154	21	57	316	284	0	0	0	0	0	0	304	1154	21	57	316	284	3	4,464	142848	21007	442283	14	12	446,993
		12	12	CH-46	8.0	96.0	100%	96.0	0%	100%	0%	0.00	96.00	0.00	0	0	0	0	0	0	2454	593	380	58	256	231	0	0	0	0	0	0	2454	593	380	58	256	231	2	1200	144000	21176	445849	14	13	450,598
		4	4	AH-1	8.0	32.0	100%	32.0	0%	100%	0%	0.00	32.00	0.00	0	0	0	0	0	0	291	141	15	10	109	98	0	0	0	0	0	0	291	141	15	10	109	98	2	812	25984	3821	80451	3	2	81,308
		2	2	UH-1	8.0	16.0	100%	16.0	0%	100%	0%	0.00	16.00	0.00	0	0	0	0	0	0	29	41	1	3	36	33	0	0	0	0	0	0	29	41	1	3	36	33	2	540	8640	1271	26751	1	1	27,036
		10	10	MV-22	8.0	80.0	100%	80.0	0%	100%	0%	0.00	80.00	0.00	0	0	0	0	0	0	1769	353	307	36	159	144	0	0	0	0	0	0	1769	353	307	36	159	144	2	2240	179200	26353	554835	18	16	560,744
Joint Multi-Strike Group Exercise	1	144	144	FA-18E/I	8.0	1152.0	10%	115.2	0%	0%	100%	0.00	0.00	115.20	0	0	0	0	0	0	0	0	0	0	0	0	857	17566	143	476	7813	7031	857	17566	143	476	7813	7031	2	10,338	11909376	1751379	36873530	1196	1042	37,266,233
		12	12	EA-6B	8.0	96.0	10%	9.6	0%	0%	100%	0.00	0.00	9.60	0	0	0	0	0	0	0	0	0	0	0	0	444	495	31	23	219	197	444	495	31	23	219	197	1	6,000	576000	84706	1783398	58	50	1,802,391
		12	12	E-2	8.0	96.0	10%	9.6	0%	0%	100%	0.00	0.00	9.60	0	0	0	0	0	0	0	0	0	0	0	0	54	212	8	8	20	18	54	212	8	8	20	18	1	1,100	105600	15529	326956	11	9	330,438
		5	5	P-3	8.0	40.0	10%	4.0	0%	0%	100%	0.00	0.00	4.00	0	0	0	0	0	0	0	0	0	0	0	0	48	148	11	8	76	69	48	148	11	8	76	69	4	4,800	192000	28235	594466	19	17	600,797
		1	1	E-3	8.0	8.0	10%	0.8	0%	0%	100%	0.00	0.00	0.80	0	0	0	0	0	0	0	0	0	0	0	0	54	221	8	10	7	6	54	221	8	10	7	6	4	130,736	1045888	153807	3238254	105	92	3,272,741
		2	2	KC-135	8.0	16.0	10%	1.6	0%	0%	100%	0.00	0.00	1.60	0	0	0	0	0	0	0	0	0	0	0	0	49	494	1	15	5	4	49	494	1	15	5	4	4	91,552	1464832	215416	4535378	147	128	4,583,680
		6	6	B-1B	8.0	48.0	10%	4.8	0%	0%	100%	0.00	0.00	4.80	0	0	0	0	0	0	0	0	0	0	0	0	27	418	4	13	4	4	27	418	4	13	4	4	4	26,560	1274880	187482	3947253	128	112	3,989,292
		24	24	F-15	8.0	192.0	10%	19.2	0%	0%	100%	0.00	0.00	19.20	0	0	0	0	0	0	0	0	0	0	0	0	431	5558	77	48	970	873	431	5558	77	48	970	873	2	6196	1189632	174946	3683311	119	104	3,722,538
		45	45	SH-60B	8.0	360.0	100%	360.0	0%	0%	100%	0.00	0.00	360.00	0	0	0	0	0	0	0	0	0	0	0	0	2700	2765	238	173	1814	1633	2700	2765	238	173	1814	1633	2	1200	432000	63529	1337548	43	38	1,351,793
ELECTRONIC WARFARE																																																
Electronic Warfare Operations	522	1	522	FA-18E/I	2.0	1044.0	0%	0.0	0%	0%	100%	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	10,338	10792872	1587187	33416636	1084	944	33,772,523
Flare Exercise	2200	0.9	1980	F-15	3.0	5940.0	0%	0.0	0%	0%	100%	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	6196	36804240	5412388	113952422	3697	3220	115,166,015
		0.06	132	FA-18E/I	3.0	396.0	0%	0.0	0%	0%	100%	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	10,338	4093848	602036	12675276	411	358	12,810,267
		0.04	88	SH-60B	3.0	264.0	100%	264.0	0%	0%	100%	0.00	0.00	264.00	0	0	0	0	0	0	0	0	0	0	0	0	1980	2028	174	127	1331	1198	1980	2028	174	127	1331	1198	2	1200	316800	46588	980869	32	28	991,315
Chaff Exercise - Ship	41																																															
Chaff Exercise - Aircraft	2200	0.9	1980	F-15	3.0	5940.0	0%	0.0	0%	0%	100%	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	6196	36804240	5412388	113952422	3697	3220	115,166,015
		0.06	132	FA-18E/I	3.0	396.0	0%	0.0	0%	0%	100%	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	10,338	4093848	602036	12675276	411	358	12,810,267
		0.04	88	SH-60B	3.0	264.0	100%	264.0	0%	0%	100%	0.00	0.00	264.00	0	0	0	0	0	0	0	0	0	0	0	0	1980	2028	174	127	1331	1198	1980	2028	174	127	1331	1198	2	1200	316800	46588	980869	32	28	991,315
MINE WARFARE																																																
Mine Laying - Aircraft	4	0.5	2	FA-18E/I	0.5	1.0	0%	0.0	0%	0%	100%	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	10,338	10338	1520	32008	1	1	32,349
		0.5	2	P-3	1.0	2.0	0%	0.0	0%	0%	100%	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4,800	9600	1412	29723	1	1	30,040
																																									0	0	0	0.00	0.00	0
Mine Neutralization – Explosive Ordnance Disposal	20																																															
Limpet Mine Neutralization System/Shock Wave Generator	60																																															
NAVAL SPECIAL WARFARE																																																
Personnel I&E	364	4	1456	H-60	8.0	11648.0	100%	11648.0	100%	0%	0%	11648.00	0.00	0.00	87360	89457	7688	5591	58706	52835	0	0	0	0	0	0	0	0	0	0	0	0	87360	89457	7688	5591	58706	52835	2	1200	13977600	2055529	43277116	1404	1223	43,738,017
		2	728	MV-22	8.0	5824.0	100%	5824.0	100%	0%	0%	5824.00	0.00	0.00	128762	25700	22373	2609	11611	10450	0	0	0	0	0	0	0	0	0	0	0	0	128762	25700	22373	2609	11611	10450	2	2240	13045760	1918494	40391975	1310	1142	40,822,149
Parachute Insertion	64	1	64	C-130	4.0	256.0	100%	256.0	100%	0%	0%	256.00	0.00	0.00	2385	9400	541	461	4573	4116	0	0	0	0	0	0	0	0	0	0	0	0	2385	9400	541	461	4573	4116	4	4,500	1152000	169412	3566795	116	101	3,604,782
		1	64	CH-46	4.0	256.0	100%	256.0	100%	0%	0%	256.00	0.00	0.00	5235	0	811	123	547	492	0	0	0	0	0	0	0	0	0	0	0	0	5235	0	811	123	547	492	2	1200	307200	45176	951145	31	27	961,275
		1	64	H-60	4.0	256.0	100%	256.0	100%	0%	0%	256.00	0.00	0.00	1920	1966	169	123	1290	1161	0	0	0	0	0	0	0	0	0	0	0	0	1920	1966	169	123	1290	1161	2	1200	307200	45176	951145	31	27	961,275

Table D-9: Aircraft Emissions – Alternative 1 (continued)

Type Training	Training Ops (#)	OPERATIONAL INFORMATION - AIRCRAFT: Aircraft: Distribution	Aircraft: A/C Sorties (#)	Aircraft: Type	Time: Ave Time on Range (hr)	Time: Total Time on Range (hr)	Altitude: Time < 3,000 ft. (%)	Altitude: Time < 3,000 ft. (hr)	Distribution (%): 0-3 nm from shore	Distribution (%): 3-12 nm from Shore	Distribution (%): >12 nm from Shore	Distribution (hr): Total Time 0-3 nm from shore	Distribution (hr): Total Time 3-12 nm from shore	Distribution (hr): Total Time >12 nm from shore
OTHER														
Surface Ship Sonar Maintenance	44													
Submarine Sonar Maintenance	32													
Small Boat Attack	18													
Sub Navigation / Sub Nav Under Ice	8													
Precision Anchoring	18													
Intelligence, Surveillance, Reconnaissance	44	1	44.0	MQ-4C	4.0	176.0	100%	176.0	0%	50%	50%	0.00	88.00	0.00
Underwater Survey	32	1	32	SH-60B	2.0	64.0	100%	64.0	100%	0%	0%	64.00	0.00	0.00
Unmanned Underwater Vehicle Training	64													
Unmanned Aerial Vehicle Operation	950													
TOTAL TRAINING (lbs per year)														
TOTAL TRAINING (tons per year)														
ANTI-SUBMARINE WARFARE TESTING														
Anti-submarine Warfare Tracking Test - MPA	26	1	26	P-3	6.0	156.0	75%	117.0	0%	100%	0%	0.00	117.00	0.00
LIFECYCLE ACTIVITIES TESTING														
Littoral Combat Ship (LCS) Mission Package Testing-ASW	2													
Ship Signature Testing	40													
SURFACE WARFARE / ANTI-SUBMARINE WARFARE TESTING														
Torpedo Testing (Explosive and Non-explosive)	6													
Countermeasure / Acoustic Systems Testing	2													
At-Sea Sonar Testing	27													
SHIPBOARD PROTECTION SYSTEMS AND SWIMMER DEFENSE TESTING														
Pierside Integrated Swimmer Defense	0													
MINE WARFARE TESTING														
Mine Detection and Classification Testing	4	1	4	SH-60B	2.0	8.0	100%	8.0	33%	33%	34%	2.64	2.64	2.72
UNMANNED VEHICLE TESTING														
Unmanned Vehicle Development and Payload Testing	0													
OFFICE OF NAVAL RESEARCH														
North Pacific Acoustic Lab Philippine Sea 2018-19 Experiment (Deep Water)	1													
TOTAL TESTING (lbs per year)														
TOTAL TESTING (tons per year)														

Type Training	EMISSIONS/YEAR (lb) BY JURISDICTION: State (0-3 nm offshore): CO	NOx	HC	SOx	PM	PM2.5	Waters of U S (3-12 nm): CO	NOx	HC	SOx	PM	PM2.5
OTHER												
Surface Ship Sonar Maintenance												
Submarine Sonar Maintenance												
Small Boat Attack												
Sub Navigation / Sub Nav Under Ice												
Precision Anchoring												
Intelligence, Surveillance, Reconnaissance	0	0	0	0	0	0	185	3418	58	312	54	48
Underwater Survey	480	492	42	31	323	290	0	0	0	0	0	0
Unmanned Underwater Vehicle Training												
Unmanned Aerial Vehicle Operation												
TOTAL TRAINING (lbs per year)	438,775	292,444	62,357	19,831	132,713	119,442	15,145	26,700	2,009	1,487	12,041	10,837
TOTAL TRAINING (tons per year)	219	146	31	10	66	60	8	13	1	1	6	5
ANTI-SUBMARINE WARFARE TESTING												
Anti-submarine Warfare Tracking Test - MPA	0	0	0	0	0	0	1410	4341	326	225	2230	2007
LIFECYCLE ACTIVITIES TESTING												
Littoral Combat Ship (LCS) Mission Package Testing-ASW												
Ship Signature Testing												
SURFACE WARFARE / ANTI-SUBMARINE WARFARE TESTING												
Torpedo Testing (Explosive and Non-explosive)												
Countermeasure / Acoustic Systems Testing												
At-Sea Sonar Testing												
SHIPBOARD PROTECTION SYSTEMS AND SWIMMER DEFENSE TESTING												
Pierside Integrated Swimmer Defense												
MINE WARFARE TESTING												
Mine Detection and Classification Testing	20	20	2	1	13	12	20	20	2	1	13	12
UNMANNED VEHICLE TESTING												
Unmanned Vehicle Development and Payload Testing												
OFFICE OF NAVAL RESEARCH												
North Pacific Acoustic Lab Philippine Sea 2018-19 Experiment (Deep Water)												
TOTAL TESTING (lbs per year)	19.8	20.3	1.7	1.3	13.3	12.0	1429.4	4361.4	327.5	225.9	2242.9	2018.6
TOTAL TESTING (tons per year)	0.0	0.0	0.0	0.0	0.0	0.0	0.7	2.2	0.2	0.1	1.1	1.0

Type Training	EMISSIONS/YEAR (lb) BY JURISDICTION: Int Waters (> 12 nm): CO	NOx	HC	SOx	PM	PM2.5	Total Emissions: CO	NOx	HC	SOx	PM	PM2.5
OTHER												
Surface Ship Sonar Maintenance												
Submarine Sonar Maintenance												
Small Boat Attack												
Sub Navigation / Sub Nav Under Ice												
Precision Anchoring												
Intelligence, Surveillance, Reconnaissance	0	0	0	0	0	0	185	3418	58	312	54	48
Underwater Survey	0	0	0	0	0	0	480	492	42	31	323	290
Unmanned Underwater Vehicle Training												
Unmanned Aerial Vehicle Operation												
TOTAL TRAINING (lbs per year)	61,211	913,723	8,847	25,306	407,937	367,144	515,130	1,232,868	73,214	46,623	552,692	497,422
TOTAL TRAINING (tons per year)	31	457	4	13	204	184	258	616	37	23	276	249
ANTI-SUBMARINE WARFARE TESTING												
Anti-submarine Warfare Tracking Test - MPA	0	0	0	0	0	0	1410	4341	326	225	2230	2007
LIFECYCLE ACTIVITIES TESTING												
Littoral Combat Ship (LCS) Mission Package Testing-ASW												
Ship Signature Testing												
SURFACE WARFARE / ANTI-SUBMARINE WARFARE TESTING												
Torpedo Testing (Explosive and Non-explosive)												
Countermeasure / Acoustic Systems Testing												
At-Sea Sonar Testing												
SHIPBOARD PROTECTION SYSTEMS AND SWIMMER DEFENSE TESTING												
Pierside Integrated Swimmer Defense												
MINE WARFARE TESTING												
Mine Detection and Classification Testing	20	21	2	1	14	12	60	61	5	4	40	36
UNMANNED VEHICLE TESTING												
Unmanned Vehicle Development and Payload Testing												
OFFICE OF NAVAL RESEARCH												
North Pacific Acoustic Lab Philippine Sea 2018-19 Experiment (Deep Water)												
TOTAL TESTING (lbs per year)	20.4	20.9	1.8	1.3	13.7	12.3	1469.6	4402.6	331.0	228.5	2269.9	2042.9
TOTAL TESTING (tons per year)	0.0	0.0	0.0	0.0	0.0	0.0	0.7	2.2	0.2	0.1	1.1	1.0

Type Training	Training Platform: Engines (#)	Fuel Flow (lb/hr)	Annual Fuel Use (total): Pounds	Gallons	GHG Emissions (lb): CO_2	N_2O	CH_4	CO_{2-e}
OTHER								
Surface Ship Sonar Maintenance								
Submarine Sonar Maintenance								
Small Boat Attack								
Sub Navigation / Sub Nav Under Ice								
Precision Anchoring								
Intelligence, Surveillance, Reconnaissance	1	2,532	445632	65534	1379755	45	39	1,394,450
Underwater Survey	2	1200	76800	11294	237786	8	7	240,319
Unmanned Underwater Vehicle Training								
Unmanned Aerial Vehicle Operation								
TOTAL TRAINING (lbs per year)			405,297,073	59,602,511	1,254,871,260	40,709	35,463	1,268,235,633
TOTAL TRAINING (tons per year)			202,649	59,602,511	627,436	20	18	634,118
ANTI-SUBMARINE WARFARE TESTING								
Anti-submarine Warfare Tracking Test - MPA	4	4,800	748800	110118	2318417	75	66	2,343,108
LIFECYCLE ACTIVITIES TESTING								
Littoral Combat Ship (LCS) Mission Package Testing-ASW								
Ship Signature Testing								
SURFACE WARFARE / ANTI-SUBMARINE WARFARE TESTING								
Torpedo Testing (Explosive and Non-explosive)								
Countermeasure / Acoustic Systems Testing								
At-Sea Sonar Testing								
SHIPBOARD PROTECTION SYSTEMS AND SWIMMER DEFENSE TESTING								
Pierside Integrated Swimmer Defense								
MINE WARFARE TESTING								
Mine Detection and Classification Testing	2	1200	9600	1412	29723	1	1	30,040
UNMANNED VEHICLE TESTING								
Unmanned Vehicle Development and Payload Testing								
OFFICE OF NAVAL RESEARCH								
North Pacific Acoustic Lab Philippine Sea 2018-19 Experiment (Deep Water)								
TOTAL TESTING (lbs per year)			758400.0	111529.4	2348140.2	76.2	66.4	2373147.9
TOTAL TESTING (tons per year)				111529.4	1174.1	0.0	0.0	1186.6

Table D-10: Emissions from Ordnance – Alternative 1

MEM Category	Location	Training MEM	Testing MEM	Emissions (lb/year) Training						Emissions (lb/year) Testing					
		#/yr	#/yr	CO	NOx	VOC	SOx	PM10	PM2.5	CO	NOx	VOC	SOx	PM10	PM2.5
BOMBS															
Bombs (H-E)	MITT	6,454	0	394,551.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bombs (N-E)	MITT	2,820	0	719.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PROJECTILES															
Small Caliber	MITT	307,105	0	706.3	29.8	0.0	0.0	15.7	11.7	0.0	0.0	0.0	0.0	0.0	0.0
Medium Caliber (H-E)	MITT	22,780	4082	91.1	29.6	0.0	0.0	216.4	116.2	16.3	5.3	0.0	0.0	38.8	20.8
Medium Caliber (N-E)	MITT	218,855	0	569.0	21.2	0.0	0.0	30.6	26.3	0.0	0.0	0.0	0.0	0.0	0.0
Large Caliber (H-E)	MITT	5,102	240	653.1	816.3	0.0	0.0	49.0	38.0	30.7	38.4	0.0	0.0	2.3	1.8
Large Caliber (N-E)	MITT	16,370	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Missiles (H-E)	MITT	240	20	7,349.7	8,537.8	0.0	0.0	14,830.8	14,830.8	612.5	711.5	0.0	0.0	1,235.9	1,235.9
Missiles (N-E)	MITT	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rockets (H-E)	MITT	4,100	16	3,813.0	23.0	0.0	0.0	1,640.0	1,189.0	14.9	0.1	0.0	0.0	6.4	4.6
Rockets (N-E)	MITT	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
COUNTERMEASURES															
Chaff	MITT	17,844	0	1.1	2.7	0.0	0.0	5.0	4.6	0.0	0.0	0.0	0.0	0.0	0.0
Flares	MITT	17,600	0	1.0	2.7	0.0	0.0	5.0	4.6	0.0	0.0	0.0	0.0	0.0	0.0
TARGETS															
Airborne targets	MITT	16	0												
Surface targets	MITT	240	0												
Expendable sub-surface targets	MITT	261	0												
TOTAL EMISSIONS (lbs per year)				408,454	9,463	0	0	16,792	16,221	674	755	0	0	1,283	1,263
TOTAL EMISSIONS (tons per year)				204.2	4.7	0.0	0.0	8.4	8.1	0.3	0.4	0.0	0.0	0.6	0.6

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Table D-11: Vessel Emissions – Alternative 2

Type Training	Training Ops (#)	OPERATIONAL INFORMATION - VESSELS										EMISSIONS/YEAR (lb) BY JURISDICTION												EMISSIONS/YEAR (lb) BY JURISDICTION												GHG Emissions (lb)					
		Ship / Vessel / Boat				Range Time (hr)			Distribution (hr)			State (0-3 nm offshore)						Waters of U S (3-12 nm)						Int Waters (> 12 nm)						Total Emissions											
		Number	Ship Type	Type	Participation	Per Ship	Time at Each Power Level (%)	Total	0-3 nm from shore	3-12 nm from shore	>12 nm from shore	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	Fuel Flow (GPH)	Annual Fuel Consumption (gal)	CO_2	N_2O	CH_4	CO_{2-e}
AIR WARFARE																																									
Air Combat Maneuver	3600																																								
Air Defense Exercise	100																																								
Air Intercept Control	5300																																								
Gunnery Exercise, A-A (Medium Caliber)	36																																								
Missile Exercise, A-A	18																																								
Gunnery Exercise, S-A (Large Caliber)	9	18	FFG	Guided Mi	2.00	2.0	100%	36.0	0.0	0.0	36.0	0	0	0	0	0	0	0	0	0	0	0	0	1,186	1,698	108	1,257	83	75	1,186	1,698	108	1,257	83	75	79	2,844	59,878	2	2	60,515
Gunnery Exercise, S-A (Medium Caliber)	19	38	FFG	Guided Mi	2.00	2.0	100%	76.0	0.0	0.0	76.0	0	0	0	0	0	0	0	0	0	0	0	0	2,503	3,584	228	2,654	176	158	2,503	3,584	228	2,654	176	158	79	6,004	126,408	4	4	127,754
Missile Exercise, S-A	27	54	FFG	Guided Mi	2.00	2.0	100%	108.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	79	0	0	0	0	0
STRIKE WARFARE																																									
Bombing Exercise, A-G	7100																																								
Missile Exercise, A-G	80																																								
Gunnery Exercise, A-G	26																																								
AMPHIBIOUS WARFARE																																									
Fire Support Exercise - Land-Based target	15	15	CG	Cruiser	1	8.0	100%	120.00	120.0	0.0	0.0	7,381	9,550	518	9,316	335	301	0	0	0	0	0	0	0	0	0	0	0	0	7,381	9,550	518	9,316	335	301	184	22,080	464,872	15	13	469,823
Amphibious Rehearsal, No Landing – Marine Air Ground Task Force	12	48	LSD	Cruiser	4	24.0	100%	1152.0	1152.0	0.0	0.0	24,480	385,356	12,488	40,366	3,122	2,810	0	0	0	0	0	0	0	0	0	0	0	0	24,480	385,356	12,488	40,366	3,122	2,810	184	1,461,888	30,778,590	998	870	31,106,382
		48	LHA/LHD	Amphib. A	4	24.0	100%	1152.0	1152.0	0.0	0.0	9,308	55,100	6,647	156,096	32,924	29,632	0	0	0	0	0	0	0	0	0	0	0	0	9,308	55,100	6,647	156,096	32,924	29,632	373	1,461,888	30,778,590	998	870	31,106,382
		48	LPD	Amphibiou	4	24.0	100%	1152.0	1152.0	0.0	0.0	4,009	24,192	2,972	70,065	14,803	13,323	0	0	0	0	0	0	0	0	0	0	0	0	4,009	24,192	2,972	70,065	14,803	13,323	373	1,461,888	30,778,590	998	870	31,106,382
Amphibious Assault - Marine Air Ground Task Force	12	12	CG	Cruiser	1	8.0	100%	96.0	96.0	0.0	0.0	5,905	7,640	415	7,452	268	241	0	0	0	0	0	0	0	0	0	0	0	0	5,905	7,640	415	7,452	268	241	184	121,824	2,564,882	83	72	2,592,198
		12	LHA	Amphib. A	1	8.0	100%	96.0	96.0	0.0	0.0	708	4,179	531	12,573	2,524	2,271	0	0	0	0	0	0	0	0	0	0	0	0	708	4,179	531	12,573	2,524	2,271	373	121,824	2,564,882	83	72	2,592,198
		24	LPD	Amphibiou	2	8.0	100%	192.0	192.0	0.0	0.0	668	4,032	495	11,677	2,467	2,220	0	0	0	0	0	0	0	0	0	0	0	0	668	4,032	495	11,677	2,467	2,220	373	243,648	5,129,765	166	145	5,184,397
		24	FFG	Guided Mi	2	8.0	100%	192.0	192.0	0.0	0.0	6,324	9,055	576	6,705	444	399	0	0	0	0	0	0	0	0	0	0	0	0	6,324	9,055	576	6,705	444	399	79	243,648	5,129,765	166	145	5,184,397
Amphibious Raid - Special Purpose Marine Air Ground Task Force	6	6	LHA	Amphib. A	1	6.0	100%	36.0	36.0	0.0	0.0	266	1,567	199	4,715	946	852	0	0	0	0	0	0	0	0	0	0	0	0	266	1,567	199	4,715	946	852	373	45,684	961,831	31	27	972,074
		12	LPD	Amphibiou	2	2.5	100%	30.0	30.0	0.0	0.0	104	630	77	1,825	386	347	0	0	0	0	0	0	0	0	0	0	0	0	104	630	77	1,825	386	347	373	38,070	801,526	26	23	810,062
Non-Combatant Evacuation Operation	5	5	LHA	Amphib. A	1	80.0	100%	400.0	400.0	0.0	0.0	2,952	17,412	2,212	52,388	10,516	9,464	0	0	0	0	0	0	0	0	0	0	0	0	2,952	17,412	2,212	52,388	10,516	9,464	373	149,200	3,141,257	102	89	3,174,711
		10	LPD	Amphibiou	2	80.0	100%	800.0	800.0	0.0	0.0	2,784	16,800	2,064	48,656	10,280	9,252	0	0	0	0	0	0	0	0	0	0	0	0	2,784	16,800	2,064	48,656	10,280	9,252	373	298,400	6,282,514	204	178	6,349,422
		5	LCU	Landing C	1	80.0	100%	400.0	400.0	0.0	0.0	7,328	45,812	1,396	21,844	2,056	1,850	0	0	0	0	0	0	0	0	0	0	0	0	7,328	45,812	1,396	21,844	2,056	1,850	611	244,400	5,145,598	167	145	5,200,398
Humanitarian Assistance/ Disaster Relief Operations	5	5	LHA	Amphib. A	1	8.0	100%	40.0	40.0	0.0	0.0	295	1,741	221	5,239	1,052	946	0	0	0	0	0	0	0	0	0	0	0	0	295	1,741	221	5,239	1,052	946	373	50,760	1,068,701	35	30	1,080,083
		10	LPD	Amphibiou	2	8.0	100%	80.0	80.0	0.0	0.0	278	1,680	206	4,866	1,028	925	0	0	0	0	0	0	0	0	0	0	0	0	278	1,680	206	4,866	1,028	925	373	101,520	2,137,402	69	60	2,160,165
		5	LCAC	Landing C	1	8.0	100%	40.0	40.0	0.0	0.0	733	4,581	140	2,184	206	185	0	0	0	0	0	0	0	0	0	0	0	0	733	4,581	140	2,184	206	185	611	50,760	1,068,701	35	30	1,080,083
Unmanned Aerial Vehicle - Intelligence, Surveillance, and Reconaissance	100																																								

Table D-11: Vessel Emissions – Alternative 2 (continued)

Type Training	Training Ops (#)	OPERATIONAL INFORMATION - VESSELS										EMISSIONS/YEAR (lb) BY JURISDICTION												EMISSIONS/YEAR (lb) BY JURISDICTION												GHG Emissions (lb)					
		Ship / Vessel / Boat				Range Time (hr)			Distribution (hr)			State (0-3 nm offshore)						Waters of U S (3-12 nm)						Int Waters (> 12 nm)						Total Emissions											
		Number	Ship Type	Type	Participation	Per Ship	Time at Each Power Level (%)	Total	0-3 nm from shore	3-12 nm from shore	>12 nm from shore	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	Fuel Flow (GPH)	Annual Fuel Consumption (gal)	CO_2	N_2O	CH_4	CO_{2-e}
SURFACE WARFARE																																									
Gunnery Exercise, A-S (Small Caliber) - Ship	220																																								
Gunnery Exercise, A-S (Medium Caliber) - Ship	295																																								
Missile Exercise (A-S) - Rocket	10																																								
Missile Exercise (A-S)	20																																								
Laser Targeting	60																																								
Bombing Exercise (A-S)	37																																								
Torpedo Exercise (Submarine to Surface)	0																																								
Missile Exercise (S-S)	12	24	FFG	Guided Mi	2.00	2.0	100%	48.0	0.0	0.0	48.0	0	0	0	0	0	0	0	0	0	0	0	0	1,581	2,264	144	1,676	111	100	1,581	2,264	144	1,676	111	100	79	3,792	79,837	3	2	80,687
Gunner Exercise (Surface-to-Surface) Ship – Large-caliber	140	30.8	CG	Cruiser	0.22	2.5	100%	77.00	0.0	21.6	55.4	0	0	0	0	0	0	1,326	1,716	93	1,674	60	54	3,410	4,412	240	4,304	155	139	4,736	6,128	333	5,978	215	193	184	14,168	298,293	10	8	301,470
		63	DDG		0.45	2.5	100%	157.5	0.0	44.1	113.4	0	0	0	0	0	0	2,653	5,050	177	3,904	161	144	6,822	12,987	455	10,039	413	371	9,475	18,037	632	13,943	573	516	187	29,453	620,093	20	18	626,697
		21	FFG	Guided Mi	0.15	2.5	100%	52.5	0.0	14.7	37.8	0	0	0	0	0	0	484	693	44	513	34	31	1,245	1,783	113	1,320	87	79	1,729	2,476	158	1,833	121	109	79	4,148	87,321	3	2	88,251
		16.8	USCG	US Coast	0.12	2.5	100%	42.0	0.0	11.8	30.2	0	0	0	0	0	0	68	681	10	136	2	2	174	1,751	27	349	6	6	241	2,432	37	485	9	8	66	2,772	58,362	2	2	58,983
Gunner Exercise (Surface-to-Surface) Ship – Medium-caliber	100	22	CG	Cruiser	0.22	2.5	100%	55.00	0.0	15.4	39.6	0	0	0	0	0	0	947	1,226	67	1,196	43	39	2,436	3,151	171	3,074	110	99	3,383	4,377	238	4,270	153	138	184	10,120	213,066	7	6	215,336
		45	DDG		0.45	2.5	100%	112.5	0.0	31.5	81.0	0	0	0	0	0	0	1,895	3,607	126	2,789	115	103	4,873	9,276	325	7,171	295	265	6,768	12,884	451	9,960	410	369	187	21,038	442,924	14	13	447,641
		15	FFG	Guided Mi	0.15	2.5	100%	37.5	0.0	10.5	27.0	0	0	0	0	0	0	346	495	32	367	24	22	889	1,273	81	943	62	56	1,235	1,769	113	1,310	87	78	79	2,963	62,372	2	2	63,037
		1	LPD	Amphibiou	0.01	2.5	100%	2.5	0.0	0.7	1.8	0	0	0	0	0	0	2	15	2	43	9	8	6	38	5	109	23	21	9	53	6	152	32	29	373	933	19,633	1	1	19,842
		12	USCG	US Coast	0.12	2.5	100%	30.0	0.0	8.4	21.6	0	0	0	0	0	0	48	486	7	97	2	2	124	1,251	19	249	5	4	172	1,737	26	347	6	6	66	1,980	41,687	1	1	42,131
Sinking Exercise (SINKEX)	2	10	FFG	Guided Mi	5.00	16.0	100%	160.0	0.0	0.0	160.0	0	0	0	0	0	0	0	0	0	0	0	0	5,270	7,546	480	5,587	370	333	5,270	7,546	480	5,587	370	333	79	12,640	266,123	9	8	268,957
Gunnery Exercise (S-S) Boat – Medium-caliber	10	50	FFG	Guided Mi	5.00	3.0	100%	150.0	0.0	0.0	150.0	0	0	0	0	0	0	0	0	0	0	0	0	4,941	7,074	450	5,238	347	312	4,941	7,074	450	5,238	347	312	79	11,850	249,490	8	7	252,147
Gunnery Exercise (S-S) Small-caliber	40	80	CRRC	Combat R	2	3.0	100%	240.0	0.0	0.0	240.0	0	0	0	0	0	0	0	0	0	0	0	0	0	36	3,096	0	0	0	0	36	3,096	0	0	0	3	720	15,159	0	0	15,320
Maritime Security Operations (MSO)	8	8	FFG	Guided Mi	1	8.0	100%	64.0	0.0	0.0	64.0	0	0	0	0	0	0	0	0	0	0	0	0	2,108	3,018	192	2,235	148	133	2,108	3,018	192	2,235	148	133	79	5,056	106,449	3	3	107,583
		8	RHIB	Rigid Hulle	1	8.0	100%	64.0	0.0	0.0	64.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0	21.8	585.0	3.8	92.2	9.6	9	22	585	4	92	10	9	14	896	18,864	1	1	19,065
		8	CRRC	Combat R	1	8.0	100%	64.0	0.0	0.0	64.0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	826	0	0	0	0	10	826	0	0	0	3	192	4,042	0	0	4,085
ANTI-SUBMARINE WARFARE																																									
Tracking Exercise-Helo	65																																								
Torpedo Exercise-Helo	6																																								
Tracking Exercise-Maritime Patrol Advanced Extended Echo Ranging Sonobuoys	0																																								
Tracking Exercise -Maritime Patrol Aircraft	36																																								
Torpedo Exercise-Maritime Patrol Aircraft	6																																								
Tracking Exercise –Surface	91	91	FFG	Guided Mi	1	2.0	100%	182.0	0.0	91.0	91.0	0	0	0	0	0	0	2,998	4,292	273	3,178	210	189	2,998	4,292	273	3,178	210	189	5,995	8,583	546	6,355	420	378	79	14,378	302,714	10	9	305,938
Torpedo Exercise-Surface	6	6	FFG	Guided Mi	1	2.0	100%	12.0	0.0	6.0	6.0	0	0	0	0	0	0	198	283	18	210	14	12	198	283	18	210	14	12	395	566	36	419	28	25	79	948	19,959	1	1	20,172
Tracking Exercise– Submarine	4																																								
Torpedo Exercise – Submarine	9																																								

Table D-11: Vessel Emissions – Alternative 2 (continued)

Type Training	Training Ops (#)	OPERATIONAL INFORMATION - VESSELS										EMISSIONS/YEAR (lb) BY JURISDICTION												EMISSIONS/YEAR (lb) BY JURISDICTION												GHG Emissions (lb)					
		Ship / Vessel / Boat				Range Time (hr)			Distribution (hr)			State (0-3 nm offshore)						Waters of U S (3-12 nm)						Int Waters (> 12 nm)						Total Emissions											
		Number	Ship Type	Type	Participation	Per Ship	Time at Each Power Level (%)	Total	0-3 nm from shore	3-12 nm from shore	>12 nm from shore	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	Fuel Flow (GPH)	Annual Fuel Consumption (gal)	CO_2	N_2O	CH_4	CO_{2-e}
MAJOR TRAINING EXERCISES																																									
Joint Expeditionary Exercise	1	1.0	CVN	Nuclear C	1	80.0	100%	80.0	0.0	80.0	0.0																														
		1.0	CG		1	80.0	100%	80.0	0.0	80.0	0.0	0	0	0	0	0	0	4,921	6,366	346	6,210	223	201	0	0	0	0	0	0	4,921	6,366	346	6,210	223	201	184	14,720	309,915	10	9	313,215
		2.0	FFG		2	80.0	100%	160.0	0.0	160.0	0.0	0	0	0	0	0	0	5,270	7,546	480	5,587	370	333	0	0	0	0	0	0	5,270	7,546	480	5,587	370	333	79	12,640	266,123	9	8	268,957
		5.0	DDG		5	80.0	100%	400.0	0.0	400.0	0.0	0	0	0	0	0	0	24,064	45,808	1,604	35,412	1,456	1,310	0	0	0	0	0	0	24,064	45,808	1,604	35,412	1,456	1,310	187	74,800	1,574,839	51	45	1,591,611
		1.0	LHD/LHA		1	80.0	100%	80.0	0.0	80.0	0.0	0	0	0	0	0	0	590	3,482	442	10,478	2,103	1,893	0	0	0	0	0	0	590	3,482	442	10,478	2,103	1,893	373	29,840	628,251	20	18	634,942
		2.0	LSD		2	80.0	100%	160.0	0.0	160.0	0.0	0	0	0	0	0	0	1,293	7,653	923	21,680	4,573	4,116	0	0	0	0	0	0	1,293	7,653	923	21,680	4,573	4,116	373	59,680	1,256,503	41	36	1,269,884
		1.0	LPD		1	80.0	100%	80.0	0.0	80.0	0.0	0	0	0	0	0	0	278	1,680	206	4,866	1,028	925	0	0	0	0	0	0	278	1,680	206	4,866	1,028	925	373	29,840	628,251	20	18	634,942
		1.0	TAOE		1	80.0	100%	80.0	0.0	80.0	0.0	0	0	0	0	0	0	8,781	24,905	848	9,599	833	750	0	0	0	0	0	0	8,781	24,905	848	9,599	833	750	1,865	149,200	3,141,257	102	89	3,174,711
		1.0	SSN	Nuclear C	1	80.0	100%	80.0	0.0	80.0	0.0																														
		1.0	SSGN	Nuclear C	1	80.0	100%	80.0	0.0	80.0	0.0																														
		2.0	T-AGO(LFA)		2	80.0	100%	160.0	0.0	160.0	0.0	0	0	0	0	0	0	1,067	6,299	800	19,109	3,803	3,423	0	0	0	0	0	0	1,067	6,299	800	19,109	3,803	3,423	1,865	298,400	6,282,514	204	178	6,349,422
		1.0	CG-PARTNER		1	80.0	100%	80.0	0.0	80.0	0.0	0	0	0	0	0	0	8,623	3,768	792	1,680	208	187	0	0	0	0	0	0	8,623	3,768	792	1,680	208	187	184	14,720	309,915	10	9	313,215
		2.0	DDG-PARTNER		2	80.0	100%	160.0	0.0	160.0	0.0	0	0	0	0	0	0	16,638	7,984	1,440	2,864	400	360	0	0	0	0	0	0	16,638	7,984	1,440	2,864	400	360	187	29,920	629,936	20	18	636,644
		1.0	SS-PARTNER		1	80.0	100%	80.0	0.0	80.0	0.0	0	0	0	0	0	0	235	1,386	176	4,169	837	753	0	0	0	0	0	0	235	1,386	176	4,169	837	753	373	29,840	628,251	20	18	634,942
		5.0	LCAC		5	80.0	100%	400.0	0.0	400.0	0.0	0	0	0	0	0	0	7,328	45,812	1,396	21,844	2,056	1,850	0	0	0	0	0	0	7,328	45,812	1,396	21,844	2,056	1,850	611	507,600	10,687,010	347	302	10,800,827
		2.0	LCU		2	80.0	100%	160.0	0.0	160.0	0.0	0	0	0	0	0	0	2,931	18,325	558	8,738	822	740	0	0	0	0	0	0	2,931	18,325	558	8,738	822	740	611	97,760	2,058,239	67	58	2,080,159
		19.0	CRRC		19	80.0	100%	1520.0	0.0	1520.0	0.0	0	0	0	0	0	0	0	226	19,610	0	0	0	0	0	0	0	0	0	0	226	19,610	0	0	0	3	4,560	96,006	3	3	97,029
		2.0	RHIB		2	80.0	100%	160.0	0.0	160.0	0.0	0	0	0	0	0	0	54	1,462	10	230	24	22	0	0	0	0	0	0	54	1,462	10	230	24	22	373	59,680	1,256,503	41	36	1,269,884
		14.0	AAV		14	80.0	100%	1120.0	0.0	1120.0	0.0	0	0	0	0	0	0	851	6,966	918	1,400	291	262	0	0	0	0	0	0	851	6,966	918	1,400	291	262	3	3,360	70,741	2	2	71,495
Joint Multi-Strike Group Exercise	1	3.0	CVN		3	80.0	100%	240.0	0.0	0.0	240.0																														
		3.0	CG		3	80.0	100%	240.0	0.0	0.0	240.0	0	0	0	0	0	0	0	0	0	0	0	0	14,762	19,099	1,037	18,631	670	603	14,762	19,099	1,037	18,631	670	603	184	44,160	929,745	30	26	939,646
		3.0	FFG		3	80.0	100%	240.0	0.0	0.0	240.0	0	0	0	0	0	0	0	0	0	0	0	0	7,906	11,318	720	8,381	554	499	7,906	11,318	720	8,381	554	499	79	18,960	399,184	13	11	403,435
		12.0	DDG		12	80.0	100%	960.0	0.0	0.0	960.0	0	0	0	0	0	0	0	0	0	0	0	0	57,754	109,939	3,850	84,989	3,494	3,145	57,754	109,939	3,850	84,989	3,494	3,145	187	179,520	3,779,614	123	107	3,819,867
		3.0	TAOE		3	80.0	100%	240.0	0.0	0.0	240.0	0	0	0	0	0	0	0	0	0	0	0	0	26,342	74,714	2,544	28,798	2,498	2,249	26,342	74,714	2,544	28,798	2,498	2,249	1,865	447,600	9,423,770	306	266	9,524,134
		5.0	SSN		5	80.0	100%	400.0	0.0	0.0	400.0																														
		2.0	T-AGO(LFA)		2	80.0	100%	160.0	0.0	0.0	160.0	0	0	0	0	0	0	0	0	0	0	0	0	1,067	6,299	800	19,109	3,803	3,423	1,067	6,299	800	19,109	3,803	3,423	1,865	298,400	6,282,514	204	178	6,349,422
		1.0	SS-PARTNER		1	80.0	100%	80.0	0.0	0.0	80.0	0	0	0	0	0	0	0	0	0	0	0	0	235	1,386	176	4,169	837	753	235	1,386	176	4,169	837	753	373	29,840	628,251	20	18	634,942
ELECTRONIC WARFARE																																									
Electronic Warfare Operations	522	522	FFG	Guided Mi	1	4	100%	2088.0	0.0	0.0	2088.0	0	0	0	0	0	0	0	0	0	0	0	0	68,779	98,470	6,264	72,913	4,823	4,341	68,779	98,470	6,264	72,913	4,823	4,341	79	164,952	3,472,899	113	98	3,509,886
Flare Exercise	2200																																								
Chaff Exercise - Ship	60	60	FFG	Guided Mi	1	4	100%	240.0	0.0	0.0	240.0	0	0	0	0	0	0	0	0	0	0	0	0	7,906	11,318	720	8,381	554	499	7,906	11,318	720	8,381	554	499	79	18,960	399,184	13	11	403,435
Chaff Exercise - Aircraft	2200																																								
MINE WARFARE																																									
Civilian Port Defense	1	1	RHIB	Rigid Hulle	1	24.0	100%	24.0	24.0	0.0	0.0	8.2	219.4	1.4	34.6	3.6	3	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0	8	219	1	35	4	3	0	336	7,074	0	0	7,149
Mine Laying - Aircraft	4																																								
Mine Neutralization – Explosive Ordnance Disposal	20	60	RHIB	Rigid Hulle	3	12.0	100%	720.0	720.0	0.0	0.0	244.8	6580.8	43.2	1036.8	108.0	97	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0	245	6,581	43	1,037	108	97	66	47,520	1,000,486	32	28	1,011,141
Limpet Mine Neutralization System/Shock Wave Generator	40	40	RHIB	Rigid Hulle	1	4.0	100%	160.0	160.0	0.0	0.0	54.4	1462.4	9.6	230.4	24.0	22	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0	54	1,462	10	230	24	22	14	2,240	47,161	2	1	47,663
NAVAL SPECIAL WARFARE																																									
Personnel I&E	364	1820	RHIB	Rigid Hulle	5	8.0	100%	14560.0	14560.0	0.0	0.0	4950.4	133078.4	873.6	20966.4	2184.0	1,966	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0	4,950	133,078	874	20,966	2,184	1,966	48	698,880	14,714,220	477	416	14,870,926
		2184	CRRC	Combat R	6	8.0	100%	17472.0	17472.0	0.0	0.0	0	2,595	225,414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,595	225,414	0	0	0	3	52,416	1,103,566	36	31	1,115,319
Parachute Insertion	64																																								

Table D-11: Vessel Emissions – Alternative 2 (continued)

Type Training	Training Ops (#)	OPERATIONAL INFORMATION - VESSELS										EMISSIONS/YEAR (lb) BY JURISDICTION												EMISSIONS/YEAR (lb) BY JURISDICTION												GHG Emissions (lb)					
		Ship / Vessel / Boat				Range Time (hr)			Distribution (hr)			State (0-3 nm offshore)						Waters of U S (3-12 nm)						Int Waters (> 12 nm)						Total Emissions											
		Number	Ship Type	Type	Participation	Per Ship	Time at Each Power Level (%)	Total	0-3 nm from shore	3-12 nm from shore	>12 nm from shore	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	CO	NO_x	HC	SO_x	PM_{10}	PM2.5	Fuel Flow (GPH)	Annual Fuel Consumption (gal)	CO_2	N_2O	CH_4	CO_{2-e}
OTHER																																									
Surface Ship Sonar Maintenance	44	44	FFG	Guided Mi	1	4.0	100%	176.0	176.0	0.0	0.0	5,797	8,300	528	6,146	407	366	0	0	0	0	0	0	0	0	0	0	0	0	5,797	8,300	528	6,146	407	366	79	13,904	292,735	9	8	295,852
Submarine Sonar Maintenance	32																																								
Small Boat Attack	27	27	CRRC	Combat R	1	4.0	100%	108.0	0.0	108.0	0.0	0	0	0	0	0	0	0	16	1,393	0	0	0	0	0	0	0	0	0	0	16	1,393	0	0	0	3	324	6,821	0	0	6,894
Sub Navigation / Sub Nav Under Ice	8																																								
Precision Anchoring	18	18	FFG	Guided Mi	1	4.0	100%	72.0	72.0	0.0	0.0	2,372	3,396	216	2,514	166	150	0	0	0	0	0	0	0	0	0	0	0	0	2,372	3,396	216	2,514	166	150	79	5,688	119,755	4	3	121,031
Direct Action (TAC-P)	30																																								
Underwater Demolition Qualifications	30	30	CRRC	Combat R	1	8.0	100%	240.0	0.0	240.0	0.0	0	0	0	0	0	0	0	36	3,096	0	0	0	0	0	0	0	0	0	0	36	3,096	0	0	0	3	720	15,159	0	0	15,320
Intelligence, Surveillance, Reconnaissance	44																																								
Underwater Survey	32	96	RHIB	Rigid Hulle	3	8.0	100%	768.0	768.0	0.0	0.0	261.1	7019.5	46.1	1105.9	115.2	104	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0	261	7,020	46	1,106	115	104	48	36,864	776,135	25	22	784,400
		96	CRRC	Combat R	3	8.0	100%	768.0	768.0	0.0	0.0	0	114	9,908	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	114	9,908	0	0	0	3	2,304	48,508	2	1	49,025
Unmanned Aerial Vehicle Operation	950																																								
Unmanned Underwater Vehicle Training	64																																								
Search and Rescue At Sea	45																																								
TOTAL TRAINING (lbs per year)									38,136	5,687	6,050	94,390	792,565	273,202	603,139	110,685	99,617	86,879	198,805	35,431	170,591	21,996	19,797	206,338	367,585	22,511	281,238	21,530	19,377	362,654	915,048	306,053	828,914	109,079	98,171		6,518,690	137,244,499	4,452	6,121	218,775,098
TOTAL TRAINING (tons per year)												47	396	137	302	55	50	43	99	18	85	11	10	103	184	11	141	11	10	181	458	153	414	55	49			68,622	2	3	109,388
ANTI-SUBMARINE WARFARE TESTING																																									
Anti-submarine Warfare Tracking Test - MPA	8																																								
LIFECYCLE ACTIVITIES TESTING																																									
Littoral Combat Ship (LCS) Mission Package Testing-ASW	2	2	LCS		1	60.0	100%	120.0	0.0	120.0	0.0	0	0	0	0	0	0	3,953	5,659	360	4,190	277	249	0	0	0	0	0	0	3,953	5,659	360	4,190	277	249	79	152,280	3,206,103	104	91	3,240,248
Ship Signature Testing	40	40	FFG	Guided Mi	1	4.0	100%	160.0	52.8	52.8	54.4	1,739	2,490	158	1,844	122	110	1,739	2,490	158	1,844	122	110	1,792	2,566	163	1,900	126	113	5,270	7,546	480	5,587	370	333	79	203,040	4,274,804	139	121	4,320,331
SURFACE WARFARE / ANTI-SUBMARINE WARFARE TESTING																																									
Torpedo Testing (Explosive and Non-explosive)	6	18.0	DDG		3	4.0	100%	72.0	0.0	0.0	72.0	0	0	0	0	0	0	0	0	0	0	0	0	4,332	8,245	289	6,374	262	236	4,332	8,245	289	6,374	262	236	187	13,464	283,471	9	8	286,490
Countermeasure / Acoustic Systems Testing	3	6.0	DDG		2	2.0	100%	12.0	6.0	6.0	0.0	361	687	24	531	22	20	361	687	24	531	22	20	0	0	0	0	0	0	722	1,374	48	1,062	44	39	187	2,244	47,245	2	1	47,748
At-Sea Sonar Testing	30	120.0	SSN	Nuclear C	4	2.0	100%	240.0	0.0	0.0	240.0																														
		30.0	CG		1	2.0	100%	60.0	0.0	0.0	60.0	0	0	0	0	0	0	0	0	0	0	0	0	3,691	4,775	259	4,658	167	151	3,691	4,775	259	4,658	167	151	184	11,040	232,436	8	7	234,912
		120.0	DDG		4	2.0	100%	240.0	0.0	0.0	240.0	0	0	0	0	0	0	0	0	0	0	0	0	14,438	27,485	962	21,247	874	786	14,438	27,485	962	21,247	874	786	187	44,880	944,904	31	27	954,967
SHIPBOARD PROTECTION SYSTEMS AND SWIMMER DEFENSE TESTING																																									
Pierside Integrated Swimmer Defense	0	0	FFG	Guided Mi	1	8.0	100%	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	79	0	0	0	0	0
MINE WARFARE TESTING																																									
Mine Detection and Classification Testing	2	2	FFG	Guided Mi	1	4	100%	8.0	2.6	2.6	2.7	87	125	8	92	6	5	87	125	8	92	6	5	90	128	8	95	6	6	264	377	24	279	18	17	79	632	13,306	0	0	13,448
UNMANNED VEHICLE TESTING																																									
Unmanned Vehicle Development and Payload Testing	0																																								
OFFICE OF NAVAL RESEARCH																																									
North Pacific Acoustic Lab Philippine Sea 2018-19 Experiment (Deep Water)	1																																								
TOTAL TESTING (lbs per year)									61	181	669	2,187	3,302	190	2,467	150	135	6,140	8,961	550	6,658	427	384	24,342	43,199	1,682	34,274	1,435	1,292	32,669	55,461	2,422	43,398	2,012	1,811		427,580	9,002,269	292	254	9,098,143
TOTAL TESTING (tons per year)												1	2	0	1	0	0	3	4	0	3	0	0	12	22	1	17	1	1	16	28	1	22	1	1			4,501	0	0	4,549

Table D-12: Aircraft Emissions – Alternative 2

Type Training	Training Ops (#)	OPERATIONAL INFORMATION - AIRCRAFT: Aircraft: Distribution	Aircraft: A/C Sorties (#)	Aircraft: Type	Time: Ave Time on Range (hr)	Time: Total Time on Range (hr)	Altitude: Time < 3,000 ft (%)	Altitude: Time < 3,000 ft (hr)	Distribution (%): 0-3 nm from shore	Distribution (%): 3-12 nm from Shore	Distribution (%): >12 nm from Shore	Distribution (hr): Total Time 0-3 nm from shore	Distribution (hr): Total Time 3-12 nm from shore	Distribution (hr): Total Time >12 nm from shore	EMISSIONS/YEAR (lb) BY JURISDICTION: State (0-3 nm offshore): CO	NOx	HC	SOx	PM	PM2.5	Waters of U S (3-12 nm): CO	NOx	HC	SOx	PM	PM2.5	EMISSIONS/YEAR (lb) BY JURISDICTION: Int Waters (> 12 nm): CO	NOx	HC	SOx	PM	PM2.5	Total Emissions: CO	NOx	HC	SOx	PM	PM2.5	Training Platform Information: Engine Model	Engines (#)	Fuel Flow (lb/hr)	Annual Fuel Use (total): Pounds	Gallons	GHG Emissions (lb): CO_2	N_2O	CH_4	CO_{2-e}
AIR WARFARE																																																	
Air Combat Maneu	3600	1	3600	FA-18E/F	1.0	3600.0	0%	0.0	0%	0%	100%	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	F414-GE-4	2	10,338	37216800	5473059	115229780	3738	3256	116,456,977
		1	3600	AV-8B	1.0	3600.0	0%	0.0	0%	0%	100%	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	F402-RR-4	1	6,000	21600000	3176471	66877412	2170	1890	67,589,656
Air Defense Exerci	100	2	200	FA-18E/F	1.0	200.0	50%	100.0	0%	0%	100%	0.00	0.00	100.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	744	15249	124	414	6782	6104	744	15249	124	414	6782	6104	F414-GE-4	2	10,338	2067600	304059	6401654	208	181	6,469,832
Air Intercept Contro	5300	2	10600	FA-18E/F	1.0	10600.0	50%	5300.0	0%	0%	100%	0.00	0.00	5300.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	39450	808173	6575	21917	359432	323488	39450	808173	6575	21917	359432	323488	F414-GE-4	2	10,338	109582800	16115118	339287687	11007	9588	342,901,099
Gunnery Exercise, A-A (Medium Caliber)	36	1	36	AV-8B	1.0	36.0	0%	0.0	0%	0%	100%	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	F402-RR-4	1	6,000	216000	31765	668774	22	19	675,897
		1	36	FA-18E/F	1.0	36.0	0%	0.0	0%	0%	100%	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	F414-GE-4	2	10,338	372168	54731	1152298	37	33	1,164,570
Missile Exercise, A	18	1	18	AV-8B	1.0	18.0	0%	0.0	0%	0%	100%	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	F402-RR-4	1	6,000	108000	15882	334387	11	9	337,948
		1	18	FA-18E/F	1.0	18.0	0%	0.0	0%	0%	100%	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	F414-GE-4	2	10,338	186084	27365	576149	19	16	582,285
Gunnery Exercise, S-A (Large Caliber)	9																																																
Gunnery Exercise, S-A (Medium Caliber)	19																																																
Missile Exercise, S-A	27																																																
STRIKE WARFARE																																																	
Bombing Exercise, A-G	2300	1	2300	FA-18E/F	1.0	2300.0	10%	230.0	0%	0%	100%	0.00	0.00	230.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1712	35072	285	951	15598	14038	1712	35072	285	951	15598	14038	F414-GE-4	2	10,338	23777400	3496676	73619026	2388	2081	74,403,069
Missile Exercise, A-G	115	0.5	58	FA-18E/F	2.0	115.0	10%	11.5	0%	0%	100%	0.00	0.00	11.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	86	1754	14	48	780	702	86	1754	14	48	780	702	F414-GE-4	2	10,338	1188870	174834	3680951	119	104	3,720,153
		0.5	58	SH-60B	2.0	115.0	100%	115.0	0%	0%	100%	0.00	0.00	115.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	863	883	76	55	580	522	863	883	76	55	580	522	T700-GE-4	2	1200	138000	20294	427272	14	12	431,823
Gunnery Exercise, A-G	96	0.5	48	FA-18E/F	2.0	96.0	10%	9.6	0%	0%	100%	0.00	0.00	9.60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	71	1464	12	40	651	586	71	1464	12	40	651	586	F414-GE-4	2	10,338	992448	145948	3072794	100	87	3,105,519
		0.5	48	SH-60B	2.0	96.0	100%	96.0	0%	0%	100%	0.00	0.00	96.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	720	737	63	46	484	435	720	737	63	46	484	435	T700-GE-4	2	1200	115200	16941	356680	12	10	360,478

Table D-12: Aircraft Emissions – Alternative 2 (continued)

Type Training	Training Ops (#)	OPERATIONAL INFORMATION - AIRCRAFT: Aircraft: Distribution	Aircraft: A/C Series (#)	Aircraft: Type	Time: Ave Time on Range (hr)	Time: Total Time on Range (hr)	Altitude: Time < 3,000 ft (%)	Altitude: Time < 3,000 ft (hr)	Distribution (%): 0-3 nm from shore	Distribution (%): 3-12 nm from Shore	Distribution (%): >12 nm from Shore	Distribution (hr): Total Time 0-3 nm from shore	Distribution (hr): Total Time 3-12 nm from shore	Distribution (hr): Total Time >12 nm from shore
AMPHIBIOUS WARFARE														
Fire Support Exercise - Land-Based target	10													
Amphibious Rehearsal, No Landing – Marine Air Ground Task Force	12	4	48.0	CH-53	18.0	864.0	100%	864.0	100%	0%	0%	864.00	0.00	0.00
		10	120.0	MV-22	18.0	2160.0	100%	2160.0	100%	0%	0%	2160.00	0.00	0.00
		2	24.0	UH-1	18.0	432.0	100%	432.0	100%	0%	0%	432.00	0.00	0.00
		4	48.0	AH-1	18.0	864.0	100%	864.0	100%	0%	0%	864.00	0.00	0.00
		4	48.0	AV-8	18.0	864.0	0%	0.0	100%	0%	0%	0.00	0.00	0.00
Amphibious Assault - Marine Air Ground Task Force	12	4	48.0	CH-53	18.0	864.0	100%	864.0	100%	0%	0%	864.00	0.00	0.00
		10	120.0	MV-22	18.0	2160.0	100%	2160.0	100%	0%	0%	2160.00	0.00	0.00
		2	24.0	UH-1	18.0	432.0	100%	432.0	100%	0%	0%	432.00	0.00	0.00
		4	48.0	AH-1	18.0	864.0	100%	864.0	100%	0%	0%	864.00	0.00	0.00
		4	48.0	AV-8	18.0	864.0	0%	0.0	100%	0%	0%	0.00	0.00	0.00
Amphibious Raid - Special Purpose Marine Air Ground Task Force	6	4	24.0	H-53	12.0	288.0	100%	288.0	100%	0%	0%	288.00	0.00	0.00
		10	60.0	MV-22	12.0	720.0	100%	720.0	100%	0%	0%	720.00	0.00	0.00
		2	12.0	UH-1	12.0	144.0	100%	144.0	100%	0%	0%	144.00	0.00	0.00
		4	24.0	AH-1	12.0	288.0	100%	288.0	100%	0%	0%	288.00	0.00	0.00
		4	24.0	AV-8	12.0	288.0	0%	0.0	100%	0%	0%	0.00	0.00	0.00
Non-Combatant Evacuation Operation	5	10	50	MV-22	20.0	1000.0	100%	1000.0	100%	0%	0%	1000.00	0.00	0.00
		4	20	H-53	20.0	400.0	100%	400.0	100%	0%	0%	400.00	0.00	0.00
		2	10	UH-1	20.0	200.0	100%	200.0	100%	0%	0%	200.00	0.00	0.00
		4	20	AH-1	20.0	400.0	100%	400.0	100%	0%	0%	400.00	0.00	0.00
		4	20	AV-8	20.0	400.0	0%	0.0	100%	0%	0%	0.00	0.00	0.00
Humanitarian Assistance/ Disaster Relief Operations	5	10	50	MV-22	20.0	1000.0	100%	1000.0	100%	0%	0%	1000.00	0.00	0.00
		4	20	H-53	20.0	400.0	100%	400.0	100%	0%	0%	400.00	0.00	0.00
		2	10	UH-1	20.0	200.0	100%	200.0	100%	0%	0%	200.00	0.00	0.00
		4	20	AH-1	20.0	400.0	100%	400.0	100%	0%	0%	400.00	0.00	0.00
		4	20	AV-8	20.0	400.0	0%	0.0	100%	0%	0%	0.00	0.00	0.00
Unmanned Aerial Vehicle - Intelligence, Surveillance, and Reconaissance	100	1	100.0	MQ-4C	4.0	400.0	100%	400.0	100%	0%	0%	400.00	0.00	0.00

Type Training	EMISSIONS/YEAR (lb) BY JURISDICTION: State (0-3 nm offshore): CO	NOx	HC	SOx	PM	PM2.5	Waters of U S (3-12 nm): CO	NOx	HC	SOx	PM	PM2.5
AMPHIBIOUS WARFARE												
Fire Support Exercise - Land-Based target												
Amphibious Rehearsal, No Landing – Marine Air Ground Task Force	8215	31164	579	1543	8524	7671	0	0	0	0	0	0
	47755	9532	8298	968	4306	3876	0	0	0	0	0	0
	779	1101	40	93	980	882	0	0	0	0	0	0
	7865	3817	400	281	2947	2652	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
Amphibious Assault - Marine Air Ground Task Force	8215	31164	579	1543	8524	7671	0	0	0	0	0	0
	47755	9532	8298	968	4306	3876	0	0	0	0	0	0
	779	1101	40	93	980	882	0	0	0	0	0	0
	7865	3817	400	281	2947	2652	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
Amphibious Raid - Special Purpose Marine Air Ground Task Force	2738	10388	193	514	2841	2557	0	0	0	0	0	0
	15918	3177	2766	323	1435	1292	0	0	0	0	0	0
	260	367	13	31	327	294	0	0	0	0	0	0
	2622	1272	133	94	982	884	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
Non-Combatant Evacuation Operation	22109	4413	3842	448	1994	1794	0	0	0	0	0	0
	3803	14428	268	714	3946	3552	0	0	0	0	0	0
	361	510	18	43	454	408	0	0	0	0	0	0
	3641	1767	185	130	1364	1228	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
Humanitarian Assistance/ Disaster Relief Operations	22109	4413	3842	448	1994	1794	0	0	0	0	0	0
	3803	14428	268	714	3946	3552	0	0	0	0	0	0
	361	510	18	43	454	408	0	0	0	0	0	0
	3641	1767	185	130	1364	1228	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
Unmanned Aerial Vehicle - Intelligence, Surveillance, and Reconaissance	840	15536	264	1416	244	220	0	0	0	0	0	0

Type Training	EMISSIONS/YEAR (lb) BY JURISDICTION: Int Waters (> 12 nm): CO	NOx	HC	SOx	PM	PM2.5	Total Emissions: CO	NOx	HC	SOx	PM	PM2.5
AMPHIBIOUS WARFARE												
Fire Support Exercise - Land-Based target												
Amphibious Rehearsal, No Landing – Marine Air Ground Task Force	0	0	0	0	0	0	8215	31164	579	1543	8524	7671
	0	0	0	0	0	0	47755	9532	8298	968	4306	3876
	0	0	0	0	0	0	779	1101	40	93	980	882
	0	0	0	0	0	0	7865	3817	400	281	2947	2652
	0	0	0	0	0	0	0	0	0	0	0	0
Amphibious Assault - Marine Air Ground Task Force	0	0	0	0	0	0	8215	31164	579	1543	8524	7671
	0	0	0	0	0	0	47755	9532	8298	968	4306	3876
	0	0	0	0	0	0	779	1101	40	93	980	882
	0	0	0	0	0	0	7865	3817	400	281	2947	2652
	0	0	0	0	0	0	0	0	0	0	0	0
Amphibious Raid - Special Purpose Marine Air Ground Task Force	0	0	0	0	0	0	2738	10388	193	514	2841	2557
	0	0	0	0	0	0	15918	3177	2766	323	1435	1292
	0	0	0	0	0	0	260	367	13	31	327	294
	0	0	0	0	0	0	2622	1272	133	94	982	884
	0	0	0	0	0	0	0	0	0	0	0	0
Non-Combatant Evacuation Operation	0	0	0	0	0	0	22109	4413	3842	448	1994	1794
	0	0	0	0	0	0	3803	14428	268	714	3946	3552
	0	0	0	0	0	0	361	510	18	43	454	408
	0	0	0	0	0	0	3641	1767	185	130	1364	1228
	0	0	0	0	0	0	0	0	0	0	0	0
Humanitarian Assistance/ Disaster Relief Operations	0	0	0	0	0	0	22109	4413	3842	448	1994	1794
	0	0	0	0	0	0	3803	14428	268	714	3946	3552
	0	0	0	0	0	0	361	510	18	43	454	408
	0	0	0	0	0	0	3641	1767	185	130	1364	1228
	0	0	0	0	0	0	0	0	0	0	0	0
Unmanned Aerial Vehicle - Intelligence, Surveillance, and Reconaissance	0	0	0	0	0	0	840	15536	264	1416	244	220

Type Training	Training Platform Information: Engine Model	Engines (#)	Fuel Flow (lb/hr)	Annual Fuel Use (total): Pounds	Gallons	GHG Emissions (lb): CO_2	N_2O	CH_4	CO_{2-e}
AMPHIBIOUS WARFARE									
Fire Support Exercise - Land-Based target									
Amphibious Rehearsal, No Landing – Marine Air Ground Task Force	T64-GE-4	3	4,464	3856896	567191	11941631	387	337	12,068,809
		2	2240	4838400	711529	14980540	486	423	15,140,083
	T400-CP-4	2	540	233280	34306	722276	23	20	729,968
	T700-GE-4	2	812	701568	103172	2172178	70	61	2,195,312
	F402-RR-4	1	6,000	5184000	762353	16050579	521	454	16,221,517
Amphibious Assault - Marine Air Ground Task Force	T64-GE-4	3	4,464	3856896	567191	11941631	387	337	12,068,809
		2	2240	4838400	711529	14980540	486	423	15,140,083
	T400-CP-4	2	540	233280	34306	722276	23	20	729,968
	T700-GE-4	2	812	701568	103172	2172178	70	61	2,195,312
	F402-RR-4	1	6,000	5184000	762353	16050579	521	454	16,221,517
Amphibious Raid - Special Purpose Marine Air Ground Task Force	T64-GE-4	3	4,464	1285632	189064	3980544	129	112	4,022,936
		2	2240	1612800	237176	4993513	162	141	5,046,694
	T400-CP-4	2	540	77760	11435	240759	8	7	243,323
	T700-GE-4	2	812	233856	34391	724059	23	20	731,771
	F402-RR-4	1	6,000	1728000	254118	5350193	174	151	5,407,172
Non-Combatant Evacuation Operation		2	2240	2240000	329412	6935435	225	196	7,009,298
	T64-GE-4	3	4,464	1785600	262588	5528533	179	156	5,587,412
	T400-CP-4	2	540	108000	15882	334387	11	9	337,948
	T700-GE-4	2	812	324800	47765	1005638	33	28	1,016,348
	F402-RR-4	1	6,000	2400000	352941	7430824	241	210	7,509,962
Humanitarian Assistance/ Disaster Relief Operations		2	2240	2240000	329412	6935435	225	196	7,009,298
	T64-GE-4	3	4,464	1785600	262588	5528533	179	156	5,587,412
	T400-CP-4	2	540	108000	15882	334387	11	9	337,948
	T700-GE-4	2	812	324800	47765	1005638	33	28	1,016,348
	F402-RR-4	1	6,000	2400000	352941	7430824	241	210	7,509,962
Unmanned Aerial Vehicle - Intelligence, Surveillance, and Reconaissance	AE3007H	1	2,532	1012800	148941	3135808	102	89	3,169,204

Table D-12: Aircraft Emissions – Alternative 2 (continued)

Type Training	Training Ops (#)	OPERATIONAL INFORMATION - AIRCRAFT: Aircraft: Distribution	Aircraft: A/C Series (#)	Aircraft: Type	Time: Ave Time on Range (hr)	Time: Total Time on Range (hr)	Altitude: Time < 3,000 ft (%)	Altitude: Time < 3,000 ft (hr)	Distribution (%): 0-3 nm from shore	Distribution (%): 3-12 nm from Shore	Distribution (%): >12 nm from Shore	Distribution (hr): Total Time 0-3 nm from shore	Distribution (hr): Total Time 3-12 nm from shore	Distribution (hr): Total Time >12 nm from shore
SURFACE WARFARE														
Gunnery Exercise, A-S (Small Caliber) - Ship	321	0.25	80.25	FA-18E/F	2.0	160.5	10%	16.1	0%	0%	100%	0.00	0.00	16.05
		0.75	240.75	SH-60B	2.0	481.5	100%	481.5	0%	0%	100%	0.00	0.00	481.50
Gunnery Exercise, A-S (Medium Caliber) - Ship	120	0.25	30	FA-18E/F	2.0	60.0	10%	6.0	0%	0%	100%	0.00	0.00	6.00
		0.75	90	SH-60B	2.0	180.0	100%	180.0	0%	0%	100%	0.00	0.00	180.00
Missile Exercise (A-S) - Rocket	110	0.33	36.3	FA-18E/F	2.0	72.6	10%	7.3	0%	0%	100%	0.00	0.00	7.26
		0.66	72.6	SH-60B	2.0	145.2	100%	145.2	0%	0%	100%	0.00	0.00	145.20
Missile Exercise (A-S)	10	0.5	5	FA-18E/F	2.0	10.0	10%	1.0	0%	0%	100%	0.00	0.00	1.00
		0.5	5	SH-60B	2.0	10.0	100%	10.0	0%	0%	100%	0.00	0.00	10.00
Laser Targeting	600	0.5	300	FA-18E/F	1.0	300.0	10%	30.0	0%	0%	100%	0.00	0.00	30.00
		0.5	300	SH-60B	1.0	300.0	100%	300.0	0%	0%	100%	0.00	0.00	300.00
Bombing Exercise (A-S)	37	0.5	19	FA-18E/F	1.0	18.5	10%	1.9	0%	0%	100%	0.00	0.00	1.85
		0.5	19	P-3	1.0	18.5	10%	1.9	0%	0%	100%	0.00	0.00	1.85
Torpedo Exercise (Submarine to Surface)	0													
Missile Exercise (S-S)	28													
Sinking Exercise (SINKEX)	1	2	2	FA-18E/F	8.0	16.0	10%	1.6	0%	0%	100%	0.00	0.00	1.60
		1	1	P-3	8.0	8.0	10%	0.8	0%	0%	100%	0.00	0.00	0.80
		1	1	SH-60B	8.0	8.0	100%	8.0	0%	0%	100%	0.00	0.00	8.00
Gunnery Exercise (S-S) Boat – Medium-caliber	20													
Gunnery Exercise (S-S) Small-caliber	43													
Maritime Security Operations (MSO)	40	1	40	SH-60B	4.0	160.0	100%	160.0	100%	0%	0%	160.00	0.00	0.00

Type Training	EMISSIONS/YEAR (lb) BY JURISDICTION: State (0-3 nm offshore): CO	NOx	HC	SOx	PM	PM2.5	Waters of U S (3-12 nm): CO	NOx	HC	SOx	PM	PM2.5
SURFACE WARFARE												
Gunnery Exercise, A-S (Small Caliber) - Ship	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
Gunnery Exercise, A-S (Medium Caliber) - Ship	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
Missile Exercise (A-S) - Rocket	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
Missile Exercise (A-S)	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
Laser Targeting	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
Bombing Exercise (A-S)	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
Torpedo Exercise (Submarine to Surface)												
Missile Exercise (S-S)												
Sinking Exercise (SINKEX)	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
Gunnery Exercise (S-S) Boat – Medium-caliber												
Gunnery Exercise (S-S) Small-caliber												
Maritime Security Operations (MSO)	1200	1229	106	77	806	726	0	0	0	0	0	0

Type Training	EMISSIONS/YEAR (lb) BY JURISDICTION: Int Waters (> 12 nm): CO	NOx	HC	SOx	PM	PM2.5	Total Emissions: CO	NOx	HC	SOx	PM	PM2.5
SURFACE WARFARE												
Gunnery Exercise, A-S (Small Caliber) - Ship	119	2447	20	66	1088	980	119	2447	20	66	1088	980
	3611	3698	318	231	2427	2184	3611	3698	318	231	2427	2184
Gunnery Exercise, A-S (Medium Caliber) - Ship	45	915	7	25	407	366	45	915	7	25	407	366
	1350	1382	119	86	907	816	1350	1382	119	86	907	816
Missile Exercise (A-S) - Rocket	54	1107	9	30	492	443	54	1107	9	30	492	443
	1089	1115	96	70	732	659	1089	1115	96	70	732	659
Missile Exercise (A-S)	7	152	1	4	68	61	7	152	1	4	68	61
	75	77	7	5	50	45	75	77	7	5	50	45
Laser Targeting	223	4575	37	124	2035	1831	223	4575	37	124	2035	1831
	2250	2304	198	144	1512	1361	2250	2304	198	144	1512	1361
Bombing Exercise (A-S)	14	282	2	8	125	113	14	282	2	8	125	113
	22	69	5	4	35	32	22	69	5	4	35	32
Torpedo Exercise (Submarine to Surface)												
Missile Exercise (S-S)												
Sinking Exercise (SINKEX)	12	244	2	7	109	98	12	244	2	7	109	98
	10	30	2	2	15	14	10	30	2	2	15	14
	60	61	5	4	40	36	60	61	5	4	40	36
Gunnery Exercise (S-S) Boat – Medium-caliber												
Gunnery Exercise (S-S) Small-caliber												
Maritime Security Operations (MSO)	0	0	0	0	0	0	1200	1229	106	77	806	726

Type Training	Training Platform Information: Engine Model	Engines (#)	Fuel Flow (lb/hr)	Annual Fuel Use (total): Pounds	Gallons	GHG Emissions (lb): CO_2	N_2O	CH_4	CO_{2-e}
SURFACE WARFARE									
Gunnery Exercise, A-S (Small Caliber) - Ship	F414-GE-4	2	10,338	1659249	244007	5137328	167	145	5,192,040
	T700-GE-4	2	1200	577800	84971	1788971	58	51	1,808,023
Gunnery Exercise, A-S (Medium Caliber) - Ship	F414-GE-4	2	10,338	620280	91218	1920496	62	54	1,940,950
	T700-GE-4	2	1200	216000	31765	668774	22	19	675,897
Missile Exercise (A-S) - Rocket	F414-GE-4	2	10,338	750538.8	110373	2323801	75	66	2,348,549
	T700-GE-4	2	1200	174240	25624	539478	18	15	545,223
Missile Exercise (A-S)	F414-GE-4	2	10,338	103380	15203	320083	10	9	323,492
	T700-GE-4	2	1200	12000	1765	37154	1	1	37,550
Laser Targeting	F414-GE-4	2	10,338	3101400	456088	9602482	312	271	9,704,748
	T700-GE-4	2	1200	360000	52941	1114624	36	32	1,126,494
Bombing Exercise (A-S)	F414-GE-4	2	10,338	191253	28125	592153	19	17	598,459
	T56-A-14 (	4	4,800	88800	13059	274940	9	8	277,869
Torpedo Exercise (Submarine to Surface)									
Missile Exercise (S-S)									
Sinking Exercise (SINKEX)	F414-GE-4	2	10,338	165408	24325	512132	17	14	517,587
	T56-A-14 (	4	4,800	38400	5647	118893	4	3	120,159
	T700-GE-4	2	1200	9600	1412	29723	1	1	30,040
Gunnery Exercise (S-S) Boat – Medium-caliber									
Gunnery Exercise (S-S) Small-caliber									
Maritime Security Operations (MSO)	T700-GE-4	2	1200	192000	28235	594466	19	17	600,797

Table D-12: Aircraft Emissions – Alternative 2 (continued)

Type Training	Training Ops (#)	OPERATIONAL INFORMATION - AIRCRAFT: Aircraft: Distribution	Aircraft: A/C Series (#)	Aircraft: Type	Time: Ave Time on Range (hr)	Time: Total Time on Range (hr)	Altitude: Time < 3,000 ft (%)	Altitude: Time < 3,000 ft (hr)	Distribution (%): 0-3 nm from shore	Distribution (%): 3-12 nm from Shore	Distribution (%): >12 nm from Shore	Distribution (hr): Total Time 0-3 nm from shore	Distribution (hr): Total Time 3-12 nm from shore	Distribution (hr): Total Time >12 nm from shore
ANTI-SUBMARINE WARFARE														
Tracking Exercise-Helo	65	3	195	SH-60	4.0	780.0	100%	780.0	0%	100%	0%	0.00	780.00	0.00
Torpedo Exercise-Helo	6	3	18	SH-60	4.0	72.0	100%	72.0	0%	100%	0%	0.00	72.00	0.00
Tracking Exercise-Maritime Patrol Advanced Extended Echo Ranging Sonobuoys	0	1	0	P-3	6.0	0.0	75%	0.0	0%	100%	0%	0.00	0.00	0.00
Tracking Exercise-Maritime Patrol Aircraft	36	1	36	P-3	6.0	216.0	75%	162.0	0%	100%	0%	0.00	162.00	0.00
Torpedo Exercise-Maritime Patrol Aircraft	6	1	6	P-3	6.0	36.0	75%	27.0	0%	100%	0%	0.00	27.00	0.00
Tracking Exercise--Surface	91													
Torpedo Exercise-Surface	6													
Tracking Exercise--	4													
Torpedo Exercise -- Submarine	9													
MAJOR TRAINING EVENTS														
Joint Expeditionary	1	48	48	FA-18E	8.0	384.0	10%	38.4	0%	100%	0%	0.00	38.40	0.00
		4	4	EA-6B	8.0	32.0	10%	3.2	0%	100%	0%	0.00	3.20	0.00
		4	4	E-2	8.0	32.0	10%	3.2	0%	100%	0%	0.00	3.20	0.00
		3	3	P-3	8.0	24.0	10%	2.4	0%	100%	0%	0.00	2.40	0.00
		6	6	AV-8B	8.0	48.0	10%	4.8	0%	100%	0%	0.00	4.80	0.00
		2	2	C-130	8.0	16.0	10%	1.6	0%	100%	0%	0.00	1.60	0.00
		4	4	A-10	8.0	32.0	10%	3.2	0%	100%	0%	0.00	3.20	0.00
		1	1	E-3	8.0	8.0	10%	0.8	0%	100%	0%	0.00	0.80	0.00
		1	1	KC-135	8.0	8.0	10%	0.8	0%	100%	0%	0.00	0.80	0.00
		15	15	SH-60B	8.0	120.0	100%	120.0	0%	100%	0%	0.00	120.00	0.00
		4	4	CH-53	8.0	32.0	100%	32.0	0%	100%	0%	0.00	32.00	0.00
		12	12	CH-46	8.0	96.0	100%	96.0	0%	100%	0%	0.00	96.00	0.00
		4	4	AH-1	8.0	32.0	100%	32.0	0%	100%	0%	0.00	32.00	0.00
		2	2	UH-1	8.0	16.0	100%	16.0	0%	100%	0%	0.00	16.00	0.00
		10	10	MV-22	8.0	80.0	100%	80.0	0%	100%	0%	0.00	80.00	0.00
Joint Multi-Strike Group Exercise	1	144	144	FA-18E	8.0	1152.0	10%	115.2	0%	0%	100%	0.00	0.00	115.20
		12	12	EA-6B	8.0	96.0	10%	9.6	0%	0%	100%	0.00	0.00	9.60
		12	12	E-2	8.0	96.0	10%	9.6	0%	0%	100%	0.00	0.00	9.60
		5	5	P-3	8.0	40.0	10%	4.0	0%	0%	100%	0.00	0.00	4.00
		1	1	E-3	8.0	8.0	10%	0.8	0%	0%	100%	0.00	0.00	0.80
		2	2	KC-135	8.0	16.0	10%	1.6	0%	0%	100%	0.00	0.00	1.60
		6	6	B-1B	8.0	48.0	10%	4.8	0%	0%	100%	0.00	0.00	4.80
		24	24	F-15	8.0	192.0	10%	19.2	0%	0%	100%	0.00	0.00	19.20
		45	45	SH-60B	8.0	360.0	100%	360.0	0%	0%	100%	0.00	0.00	360.00
ELECTRONIC WARFARE														
Electronic Warfare Operations	522	1	522	FA-18E	2.0	1044.0	0%	0.0	0%	0%	100%	0.00	0.00	0.00
Flare Exercise	2200	0.9	1980	F-15	3.0	5940.0	0%	0.0	0%	0%	100%	0.00	0.00	0.00
		0.06	132	FA-18E	3.0	396.0	0%	0.0	0%	0%	100%	0.00	0.00	0.00
		0.04	88	SH-60B	3.0	264.0	100%	264.0	0%	0%	100%	0.00	0.00	264.00
Chaff Exercise - Ship	60													
Chaff Exercise - Aircraft	2200	0.9	1980	F-15	3.0	5940.0	0%	0.0	0%	0%	100%	0.00	0.00	0.00
		0.06	132	FA-18E	3.0	396.0	0%	0.0	0%	0%	100%	0.00	0.00	0.00
		0.04	88	SH-60B	3.0	264.0	100%	264.0	0%	0%	100%	0.00	0.00	264.00
MINE WARFARE														
Mine Laying - Aircraft	4	0.5	2	FA-18E	0.5	1.0	0%	0.0	0%	0%	100%	0.00	0.00	0.00
		0.5	2	P-3	1.0	2.0	0%	0.0	0%	0%	100%	0.00	0.00	0.00
Mine Neutralization – Explosive Ordnance	20													
Limpet Mine Neutralization System/Shock Wave Generator	60													

Type Training	EMISSIONS/YEAR (lb) BY JURISDICTION: State (0-3 nm offshore): CO	NOx	HC	SOx	PM	PM2.5	Waters of U S (3-12 nm): CO	NOx	HC	SOx	PM	PM2.5
ANTI-SUBMARINE WARFARE												
Tracking Exercise-Helo	0	0	0	0	0	0	5850	5990	515	374	3931	3538
Torpedo Exercise-Helo	0	0	0	0	0	0	540	553	48	35	363	327
Tracking Exercise-Maritime Patrol Advanced Extended Echo Ranging Sonobuoys	0	0	0	0	0	0	0	0	0	0	0	0
Tracking Exercise-Maritime Patrol Aircraft	0	0	0	0	0	0	1952	6011	451	311	3087	2778
Torpedo Exercise-Maritime Patrol Aircraft	0	0	0	0	0	0	325	1002	75	52	515	463
Tracking Exercise--Surface												
Torpedo Exercise-Surface												
Tracking Exercise--												
Torpedo Exercise -- Submarine												
MAJOR TRAINING EVENTS												
Joint Expeditionary	0	0	0	0	0	0	286	5855	48	159	2604	2344
	0	0	0	0	0	0	148	165	10	8	73	66
	0	0	0	0	0	0	18	71	3	3	7	6
	0	0	0	0	0	0	29	89	7	5	46	41
	0	0	0	0	0	0	222	248	16	12	109	98
	0	0	0	0	0	0	15	59	3	3	29	26
	0	0	0	0	0	0	39	86	4	4	26	23
	0	0	0	0	0	0	54	221	8	10	7	6
	0	0	0	0	0	0	25	247	1	7	2	2
	0	0	0	0	0	0	900	922	79	58	605	544
	0	0	0	0	0	0	304	1154	21	57	316	284
	0	0	0	0	0	0	2454	593	380	58	256	231
	0	0	0	0	0	0	291	141	15	10	109	98
	0	0	0	0	0	0	29	41	1	3	36	33
	0	0	0	0	0	0	1769	353	307	36	159	144
Joint Multi-Strike Group Exercise	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
ELECTRONIC WARFARE												
Electronic Warfare Operations	0	0	0	0	0	0	0	0	0	0	0	0
Flare Exercise	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
Chaff Exercise - Ship												
Chaff Exercise - Aircraft	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
MINE WARFARE												
Mine Laying - Aircraft	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
Mine Neutralization – Explosive Ordnance												
Limpet Mine Neutralization System/Shock Wave Generator												

Type Training	EMISSIONS/YEAR (lb) BY JURISDICTION: Int Waters (> 12 nm): CO	NOx	HC	SOx	PM	PM2.5	Total Emissions: CO	NOx	HC	SOx	PM	PM2.5
ANTI-SUBMARINE WARFARE												
Tracking Exercise-Helo	0	0	0	0	0	0	5850	5990	515	374	3931	3538
Torpedo Exercise-Helo	0	0	0	0	0	0	540	553	48	35	363	327
Tracking Exercise-Maritime Patrol Advanced Extended Echo Ranging Sonobuoys	0	0	0	0	0	0	0	0	0	0	0	0
Tracking Exercise-Maritime Patrol Aircraft	0	0	0	0	0	0	1952	6011	451	311	3087	2778
Torpedo Exercise-Maritime Patrol Aircraft	0	0	0	0	0	0	325	1002	75	52	515	463
Tracking Exercise--Surface												
Torpedo Exercise-Surface												
Tracking Exercise--												
Torpedo Exercise -- Submarine												
MAJOR TRAINING EVENTS												
Joint Expeditionary	0	0	0	0	0	0	286	5855	48	159	2604	2344
	0	0	0	0	0	0	148	165	10	8	73	66
	0	0	0	0	0	0	18	71	3	3	7	6
	0	0	0	0	0	0	29	89	7	5	46	41
	0	0	0	0	0	0	222	248	16	12	109	98
	0	0	0	0	0	0	15	59	3	3	29	26
	0	0	0	0	0	0	39	86	4	4	26	23
	0	0	0	0	0	0	54	221	8	10	7	6
	0	0	0	0	0	0	25	247	1	7	2	2
	0	0	0	0	0	0	900	922	79	58	605	544
	0	0	0	0	0	0	304	1154	21	57	316	284
	0	0	0	0	0	0	2454	593	380	58	256	231
	0	0	0	0	0	0	291	141	15	10	109	98
	0	0	0	0	0	0	29	41	1	3	36	33
	0	0	0	0	0	0	1769	353	307	36	159	144
Joint Multi-Strike Group Exercise	857	17566	143	476	7813	7031	857	17566	143	476	7813	7031
	444	495	31	23	219	197	444	495	31	23	219	197
	54	212	8	8	20	18	54	212	8	8	20	18
	48	148	11	8	76	69	48	148	11	8	76	69
	54	221	8	10	7	6	54	221	8	10	7	6
	49	494	1	15	5	4	49	494	1	15	5	4
	27	418	4	13	4	4	27	418	4	13	4	4
	431	5558	77	48	970	873	431	5558	77	48	970	873
	2700	2765	238	173	1814	1633	2700	2765	238	173	1814	1633
ELECTRONIC WARFARE												
Electronic Warfare Operations	0	0	0	0	0	0	0	0	0	0	0	0
Flare Exercise	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	1980	2028	174	127	1331	1198	1980	2028	174	127	1331	1198
Chaff Exercise - Ship												
Chaff Exercise - Aircraft	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	1980	2028	174	127	1331	1198	1980	2028	174	127	1331	1198
MINE WARFARE												
Mine Laying - Aircraft	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
Mine Neutralization – Explosive Ordnance												
Limpet Mine Neutralization System/Shock Wave Generator												

Type Training	Training Platform Information: Engine Model	Engines (#)	Fuel Flow (lb/hr)	Annual Fuel Use (total): Pounds	Gallons	GHG Emissions (lb): CO_2	N_2O	CH_4	CO_{2-e}
ANTI-SUBMARINE WARFARE									
Tracking Exercise-Helo	T700-GE-4	2	1200	936000	137647	2898021	94	82	2,928,885
Torpedo Exercise-Helo	T700-GE-4	2	1200	86400	12706	267510	9	8	270,359
Tracking Exercise-Maritime Patrol Advanced Extended Echo Ranging Sonobuoys	T56-A-14 (	4	4,800	0	0	0	0	0	0
Tracking Exercise-Maritime Patrol Aircraft	T56-A-14 (	4	4,800	1036800	152471	3210116	104	91	3,244,303
Torpedo Exercise-Maritime Patrol Aircraft	T56-A-14 (	4	4,800	172800	25412	535019	17	15	540,717
Tracking Exercise--Surface									
Torpedo Exercise-Surface									
Tracking Exercise--									
Torpedo Exercise -- Submarine									
MAJOR TRAINING EVENTS									
Joint Expeditionary	F414-GE-4	2	10,338	3969792	583793	12291177	399	347	12,422,078
	F402-RR-4	1	6,000	192000	28235	594466	19	17	600,797
	T56-A-425	1	1,100	35200	5176	108985	4	3	110,146
	T56-A-14 (	4	4,800	115200	16941	356680	12	10	360,478
	F402-RR-4	1	6,000	288000	42353	891699	29	25	901,195
	T56-A-425	4	4,500	72000	10588	222925	7	6	225,299
		2	6,052	193664	28480	599618	19	17	606,004
		4	130,736	1045888	153807	3238254	105	92	3,272,741
		4	91,552	732416	107708	2267689	74	64	2,291,840
	T700-GE-4	2	1200	144000	21176	445849	14	13	450,598
	T64-GE-41	3	4,464	142848	21007	442283	14	12	446,993
	T58-GE-16	2	1200	144000	21176	445849	14	13	450,598
	T700-GE-4	2	812	25984	3821	80451	3	2	81,308
	T400-CP-4	2	540	8640	1271	26751	1	1	27,036
		2	2240	179200	26353	554835	18	16	560,744
Joint Multi-Strike Group Exercise	F414-GE-4	2	10,338	11909376	1751379	36873530	1196	1042	37,266,233
	F402-RR-4	1	6,000	576000	84706	1783398	58	50	1,802,391
	T56-A-425	1	1,100	105600	15529	326956	11	9	330,438
	T56-A-14 (	4	4,800	192000	28235	594466	19	17	600,797
		4	130,736	1045888	153807	3238254	105	92	3,272,741
		4	91,552	1464832	215416	4535378	147	128	4,583,680
		4	26,560	1274880	187482	3947253	128	112	3,989,292
	F100-PW-	2	6196	1189632	174946	3683311	119	104	3,722,538
	T700-GE-4	2	1200	432000	63529	1337548	43	38	1,351,793
ELECTRONIC WARFARE									
Electronic Warfare Operations	F414-GE-4	2	10,338	10792872	1587187	33416636	1084	944	33,772,523
Flare Exercise	F100-PW-	2	6196	36804240	5412388	113952422	3697	3220	115,166,015
	F414-GE-4	2	10,338	4093848	602036	12675276	411	358	12,810,267
	T700-GE-4	2	1200	316800	46588	980869	32	28	991,315
Chaff Exercise - Ship									
Chaff Exercise - Aircraft	F100-PW-	2	6196	36804240	5412388	113952422	3697	3220	115,166,015
	F414-GE-4	2	10,338	4093848	602036	12675276	411	358	12,810,267
	T700-GE-4	2	1200	316800	46588	980869	32	28	991,315
MINE WARFARE									
Mine Laying - Aircraft	F414-GE-4	2	10,338	10338	1520	32008	1	1	32,349
	T56-A-14 (	4	4,800	9600	1412	29723	1	1	30,040
				0	0	0	0.00	0.00	0
Mine Neutralization – Explosive Ordnance									
Limpet Mine Neutralization System/Shock Wave Generator									

Table D-12: Aircraft Emissions – Alternative 2 (continued)

Type Training	Training Ops (#)	OPERATIONAL INFORMATION - AIRCRAFT: Aircraft: Distribution	Aircraft: A/C Series (#)	Aircraft: Type	Time: Ave Time on Range (hr)	Time: Total Time on Range (hr)	Altitude: Time < 3,000 ft (%)	Altitude: Time < 3,000 ft (hr)	Distribution (%): 0-3 nm from shore	Distribution (%): 3-12 nm from Shore	Distribution (%): >12 nm from Shore	Distribution (hr): Total Time 0-3 nm from shore	Distribution (hr): Total Time 3-12 nm from shore	Distribution (hr): Total Time >12 nm from shore
NAVAL SPECIAL WARFARE														
Personnel I&E	364	4	1456	H-60	8.0	11648.0	100%	11648.0	100%	0%	0%	11648.00	0.00	0.00
		2	728	MV-22	8.0	5824.0	100%	5824.0	100%	0%	0%	5824.00	0.00	0.00
Parachute Insertion	64	1	64	C-130	4.0	256.0	100%	256.0	100%	0%	0%	256.00	0.00	0.00
		1	64	CH-46	4.0	256.0	100%	256.0	100%	0%	0%	256.00	0.00	0.00
		1	64	H-60	4.0	256.0	100%	256.0	100%	0%	0%	256.00	0.00	0.00
OTHER														
Surface Ship Sonar Maintenance	42													
Submarine Sonar Maintenance	48													
Small Boat Attack	27													
Sub Navigation / Sub Nav Under Ice	8													
Precision Anchoring	18													
Unmanned Aerial Vehicle Operation	950													
Intelligence, Surveillance, and Reconnaissance	44	1	44.0	MQ-4C	4.0	176.0	100%	176.0	0%	50%	50%	0.00	88.00	0.00
Underwater Survey	32	1	32	SH-60B	2.0	64.0	100%	64.0	100%	0%	0%	64.00	0.00	0.00
Unmanned Underwater Vehicle Training	64													
TOTAL TRAINING (lbs per year)														
TOTAL TRAINING (tons per year)														
ANTI-SUBMARINE WARFARE TESTING														
Anti-submarine Warfare Tracking Test - MPA	8	1	8	P-3	6.0	48.0	75%	36.0	0%	100%	0%	0.00	36.00	0.00
LIFECYCLE ACTIVITIES TESTING														
Littoral Combat Ship (LCS) Mission Package Testing-ASW	2													
Ship Signature Testing	40													
SURFACE WARFARE / ANTI-SUBMARINE WARFARE TESTING														
Torpedo Testing (Explosive and Non-explosive)	6													
Countermeasure / Acoustic Systems Testing	3													
At-Sea Sonar Testing	30													
SHIPBOARD PROTECTION SYSTEMS AND SWIMMER DEFENSE TESTING														
Pierside Integrated Swimmer Defense	0													
MINE WARFARE TESTING														
Mine Detection and Classification Testing	2	1	2	SH-60B	2.0	4.0	100%	4.0	33%	33%	34%	1.32	1.32	1.36
UNMANNED VEHICLE TESTING														
Unmanned Vehicle Development and Payload Testing	0													
OFFICE OF NAVAL RESEARCH														
North Pacific Acoustic Lab Philippine Sea 2018-19 Experiment (Deep Water)	1													
TOTAL TESTING (lbs per year)														
TOTAL TESTING (tons per year)														

Type Training	EMISSIONS/YEAR (lb) BY JURISDICTION: State (0-3 nm offshore): CO	NOx	HC	SOx	PM	PM2.5	Waters of U S (3-12 nm): CO	NOx	HC	SOx	PM	PM2.5
NAVAL SPECIAL WARFARE												
Personnel I&E	87360	89457	7688	5591	58706	52835	0	0	0	0	0	0
	128762	25700	22373	2609	11611	10450	0	0	0	0	0	0
Parachute Insertion	2385	9400	541	461	4573	4116	0	0	0	0	0	0
	5235	0	811	123	547	492	0	0	0	0	0	0
	1920	1966	169	123	1290	1161	0	0	0	0	0	0
OTHER												
Surface Ship Sonar Maintenance												
Submarine Sonar Maintenance												
Small Boat Attack												
Sub Navigation / Sub Nav Under Ice												
Precision Anchoring												
Unmanned Aerial Vehicle Operation												
Intelligence, Surveillance, and Reconnaissance	0	0	0	0	0	0	185	3418	58	312	54	48
Underwater Survey	480	492	42	31	323	290	0	0	0	0	0	0
Unmanned Underwater Vehicle Training												
TOTAL TRAINING (lbs per year)	**438,775**	**292,444**	**62,357**	**19,831**	**132,713**	**119,442**	**15,433**	**27,219**	**2,050**	**1,515**	**12,334**	**11,100**
TOTAL TRAINING (tons per year)	**219**	**146**	**31**	**10**	**66**	**60**	**8**	**14**	**1**	**1**	**6**	**6**
ANTI-SUBMARINE WARFARE TESTING												
Anti-submarine Warfare Tracking Test - MPA	0	0	0	0	0	0	434	1336	100	69	686	617
LIFECYCLE ACTIVITIES TESTING												
Littoral Combat Ship (LCS) Mission Package Testing-ASW												
Ship Signature Testing												
SURFACE WARFARE / ANTI-SUBMARINE WARFARE TESTING												
Torpedo Testing (Explosive and Non-explosive)												
Countermeasure / Acoustic Systems Testing												
At-Sea Sonar Testing												
SHIPBOARD PROTECTION SYSTEMS AND SWIMMER DEFENSE TESTING												
Pierside Integrated Swimmer Defense												
MINE WARFARE TESTING												
Mine Detection and Classification Testing	10	10	1	1	7	6	10	10	1	1	7	6
UNMANNED VEHICLE TESTING												
Unmanned Vehicle Development and Payload Testing												
OFFICE OF NAVAL RESEARCH												
North Pacific Acoustic Lab Philippine Sea 2018-19 Experiment (Deep Water)												
TOTAL TESTING (lbs per year)	**9.9**	**10.1**	**0.9**	**0.6**	**6.7**	**6.0**	**443.6**	**1345.9**	**101.1**	**69.8**	**692.7**	**623.4**
TOTAL TESTING (tons per year)	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.2**	**0.7**	**0.1**	**0.0**	**0.3**	**0.3**

Type Training	EMISSIONS/YEAR (lb) BY JURISDICTION: Int Waters (> 12 nm): CO	NOx	HC	SOx	PM	PM2.5	Total Emissions: CO	NOx	HC	SOx	PM	PM2.5
NAVAL SPECIAL WARFARE												
Personnel I&E	0	0	0	0	0	0	87360	89457	7688	5591	58706	52835
	0	0	0	0	0	0	128762	25700	22373	2609	11611	10450
Parachute Insertion	0	0	0	0	0	0	2385	9400	541	461	4573	4116
	0	0	0	0	0	0	5235	0	811	123	547	492
	0	0	0	0	0	0	1920	1966	169	123	1290	1161
OTHER												
Surface Ship Sonar Maintenance												
Submarine Sonar Maintenance												
Small Boat Attack												
Sub Navigation / Sub Nav Under Ice												
Precision Anchoring												
Unmanned Aerial Vehicle Operation												
Intelligence, Surveillance, and Reconnaissance	0	0	0	0	0	0	185	3418	58	312	54	48
Underwater Survey	0	0	0	0	0	0	480	492	42	31	323	290
Unmanned Underwater Vehicle Training												
TOTAL TRAINING (lbs per year)	**61,211**	**913,723**	**8,847**	**25,306**	**407,937**	**367,144**	**515,419**	**1,233,386**	**73,255**	**46,652**	**552,984**	**497,686**
TOTAL TRAINING (tons per year)	**31**	**457**	**4**	**13**	**204**	**184**	**258**	**617**	**37**	**23**	**276**	**249**
ANTI-SUBMARINE WARFARE TESTING												
Anti-submarine Warfare Tracking Test - MPA	0	0	0	0	0	0	434	1336	100	69	686	617
LIFECYCLE ACTIVITIES TESTING												
Littoral Combat Ship (LCS) Mission Package Testing-ASW												
Ship Signature Testing												
SURFACE WARFARE / ANTI-SUBMARINE WARFARE TESTING												
Torpedo Testing (Explosive and Non-explosive)												
Countermeasure / Acoustic Systems Testing												
At-Sea Sonar Testing												
SHIPBOARD PROTECTION SYSTEMS AND SWIMMER DEFENSE TESTING												
Pierside Integrated Swimmer Defense												
MINE WARFARE TESTING												
Mine Detection and Classification Testing	10	10	1	1	7	6	30	31	3	2	20	18
UNMANNED VEHICLE TESTING												
Unmanned Vehicle Development and Payload Testing												
OFFICE OF NAVAL RESEARCH												
North Pacific Acoustic Lab Philippine Sea 2018-19 Experiment (Deep Water)												
TOTAL TESTING (lbs per year)	**10.2**	**10.4**	**0.9**	**0.7**	**6.9**	**6.2**	**463.7**	**1366.5**	**102.9**	**71.0**	**706.2**	**635.6**
TOTAL TESTING (tons per year)	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.2**	**0.7**	**0.1**	**0.0**	**0.4**	**0.3**

Type Training	Training Platform Information: Engine Model	Engines (#)	Fuel Flow (lb/hr)	Annual Fuel Use (total): Pounds	Gallons	GHG Emissions (lb): CO_2	N_2O	CH_4	CO_{2-e}
NAVAL SPECIAL WARFARE									
Personnel I&E	T700-GE-4	2	1200	13977600	2055529	43277116	1404	1223	43,738,017
		2	2240	13045760	1918494	40391975	1310	1142	40,822,149
Parachute Insertion	T56-A-425	4	4,500	1152000	169412	3566795	116	101	3,604,782
	T58-GE-16	2	1200	307200	45176	951145	31	27	961,275
	T700-GE-4	2	1200	307200	45176	951145	31	27	961,275
OTHER									
Surface Ship Sonar Maintenance									
Submarine Sonar Maintenance									
Small Boat Attack									
Sub Navigation / Sub Nav Under Ice									
Precision Anchoring									
Unmanned Aerial Vehicle Operation									
Intelligence, Surveillance, and Reconnaissance	AE3007H	1	2,532	445632	65534	1379755	45	39	1,394,450
Underwater Survey	T700-GE-4	2	1200	76800	11294	237786	8	7	240,319
Unmanned Underwater Vehicle Training									
TOTAL TRAINING (lbs per year)				**405,383,473**	**59,615,217**	**1,255,138,770**	**40,717**	**35,471**	**1,268,505,992**
TOTAL TRAINING (tons per year)				**202,692**	**59,615,217**	**627,569**	**20**	**18**	**634,253**
ANTI-SUBMARINE WARFARE TESTING									
Anti-submarine Warfare Tracking Test - MPA	T56-A-14 (	4	4,800	230400	33882	713359	23	20	720,956
LIFECYCLE ACTIVITIES TESTING									
Littoral Combat Ship (LCS) Mission Package Testing-ASW									
Ship Signature Testing									
SURFACE WARFARE / ANTI-SUBMARINE WARFARE TESTING									
Torpedo Testing (Explosive and Non-explosive)									
Countermeasure / Acoustic Systems Testing									
At-Sea Sonar Testing									
SHIPBOARD PROTECTION SYSTEMS AND SWIMMER DEFENSE TESTING									
Pierside Integrated Swimmer Defense									
MINE WARFARE TESTING									
Mine Detection and Classification Testing	T700-GE-4	2	1200	4800	706	14862	0	0	15,020
UNMANNED VEHICLE TESTING									
Unmanned Vehicle Development and Payload Testing									
OFFICE OF NAVAL RESEARCH									
North Pacific Acoustic Lab Philippine Sea 2018-19 Experiment (Deep Water)									
TOTAL TESTING (lbs per year)				**235200.0**	**34588.2**	**728220.7**	**23.6**	**20.6**	**735976.3**
TOTAL TESTING (tons per year)					**34588.2**	**364.1**	**0.0**	**0.0**	**368.0**

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Table D-13: Emissions from Ordnance – Alternative 2

MEM Category	Location	Training MEM	Testing MEM	Emissions (lb/year) Training						Emissions (lb/year) Testing					
		#/yr	#/yr	CO	NOx	VOC	SOx	PM10	PM2.5	CO	NOx	VOC	SOx	PM10	PM2.5
BOMBS															
Bombs (H-E)	MITT	6,454	0	394,551.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bombs (N-E)	MITT	2,820	0	719.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PROJECTILES															
Small Caliber	MITT	310,155	0	713.4	30.1	0.0	0.0	15.8	11.8	0.0	0.0	0.0	0.0	0.0	0.0
Medium Caliber (H-E)	MITT	23,020	4082	92.1	29.9	0.0	0.0	218.7	117.4	16.3	5.3	0.0	0.0	38.8	20.8
Medium Caliber (N-E)	MITT	309,275	0	804.1	30.0	0.0	0.0	43.3	37.1	0.0	0.0	0.0	0.0	0.0	0.0
Large Caliber (H-E)	MITT	6,757	240	864.9	1,081.1	0.0	0.0	64.9	50.3	30.7	38.4	0.0	0.0	2.3	1.8
Large Caliber (N-E)	MITT	24,540	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Missiles (H-E)	MITT	258	20	7,900.9	9,178.1	0.0	0.0	15,943.1	15,943.1	612.5	711.5	0.0	0.0	1,235.9	1,235.9
Missiles (N-E)	MITT	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rockets (H-E)	MITT	4,100	16	3,813.0	23.0	0.0	0.0	1,640.0	1,189.0	14.9	0.1	0.0	0.0	6.4	4.6
Rockets (N-E)	MITT	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
COUNTERMEASURES															
Chaff	MITT	18,204	0	1.1	2.8	0.0	0.0	5.1	4.7	0.0	0.0	0.0	0.0	0.0	0.0
Flares	MITT	17,600	0	1.0	2.7	0.0	0.0	5.0	4.6	0.0	0.0	0.0	0.0	0.0	0.0
TARGETS															
Airborne targets	MITT	16	0												
Surface targets	MITT	240	0												
Expendable sub-surface targets	MITT	261	0												
TOTAL EMISSIONS (lbs per year)				409,461	10,378	0	0	17,936	17,358	674	755	0	0	1,283	1,263
TOTAL EMISSIONS (tons per year)				204.7	5.2	0.0	0.0	9.0	8.7	0.3	0.4	0.0	0.0	0.6	0.6

D.5 RECORD OF NON-APPLICABILITY

RECORD OF NON-APPLICABILITY

The Proposed Action falls under the Record of Non-Applicability (RONA) category and is documented with this RONA.

PROPOSED ACTION

Action Proponent: Commander, U.S. Pacific Fleet

Location: Mariana Islands Training and Testing Study Area

Proposed Action: Mariana Islands Training and Testing (MITT) Military Readiness Activities

Proposed Action and Emissions Summary:

The Proposed Action is to conduct military readiness activities within the MITT Study Area. The Proposed Action involves operation of military aircraft, vessels, and small boats.

Federal actions may be exempt from conformity determinations if their emissions do not exceed designated *de minimis* levels for the criteria pollutants of nonattainment or maintenance in the areas of the federal action (40 CFR part 93.153[b]). A portion of the Study Area is located within the Guam Piti-Cabras area, which has been designated nonattainment for sulfur dioxide (SO_2), unclassifiable for particles with an aerodynamic diameter less than or equal to a nominal 10 micrometers, and unclassifiable/attainment for carbon monoxide, ozone, nitrogen dioxide, lead, and particles with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers. As a result, the action alternatives emissions were evaluated to assess compliance with the General Conformity Rule *de minimis* thresholds. The estimated annual emissions for SO_2 for Alternative 1 and Alternative 2 compared to the baseline are shown in Table 1. The detailed calculations for emissions are shown in Table D-1 through D-13 of Appendix D of the MITT Final Supplemental Environmental Impact Statement/Overseas Environmental Impact Statement.

Table 1: Estimated Emissions from Training and Testing Activities Between 0 and 3 Nautical Miles from Shore, Alternative 1 & 2

Criteria Pollutant	Annual SO_2 Emissions (tons per year)
Baseline Emissions	237
Alternative 1 Emissions	254
Alternative 2 Emissions	313
Net Change from Alternative 1	**17**
Net Change from Alternative 2	**76**
De minimis thresholds	100
Alternative 1 Exceeds Threshold?	No
Alternative 2 Exceeds Threshold?	No

Notes: Individual values may not add exactly to total values due to rounding. SO_2 = sulfur dioxide

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PROPOSED ACTION EXEMPTION(S)

The Proposed Action is exempt from the General Conformity Rule Requirements because the projected SO_2 emissions as shown in Table 1 are below the *de minimis* thresholds.

ATTAINMENT AREA STATUS AND EMISSIONS EVALUATION CONCLUSION

Since the Proposed Action's projected emissions as reflected in Table 1 do not exceed the *de minimis thresholds*, the Navy concludes that formal Conformity Determination procedures are not required, resulting in this RONA.

Affected Air Basin: Piti-Cabras, Guam

Date RONA Prepared: March 6, 2020

Rona Prepared by: Naval Facilities Engineering Command

RONA Approval

MCNAIR.DANIEL.ANTHONY.1166125894 Digitally signed by MCNAIR.DANIEL.ANTHONY.1166125894 Date: 2020.05.11 08:56:09 -10'00'

Date: 11 May 2020

D. A. McNAIR
Director, Environmental Readiness
By direction of the Commander
U.S. Pacific Fleet

Mariana Islands Training and Testing
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Appendix E: Estimated Marine Mammal and Sea Turtle Impacts from Exposure to Acoustic and Explosive Stressors Under Navy Training and Testing Activities

Supplemental Environmental Impact Statement/ Overseas Environmental Impact Statement Mariana Islands Training and Testing

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APPENDIX E Estimated Marine Mammal and Sea Turtle Impacts from Exposure to Acoustic and Explosive Stressors Under Navy Training and Testing Activities

Navy training and testing activities would result in the incidental takes of marine mammals and sea turtles within the Study Area. This appendix provides the estimated number of marine mammal and sea turtle impacts. Specifically, estimated impacts are derived from the quantitative analysis for activities under Alternatives 1 and 2 that involve the use of acoustic or explosive stressors. The quantitative analysis takes into account Navy activities, marine species density layers, acoustic modeling, and other environmental parameters. A detailed explanation of the quantitative analysis is provided in the technical report *Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing* (U.S. Department of the Navy, 2018). It is important to note that *impacts*, as discussed in this appendix, represent the estimated instances of take of marine mammals or sea turtles, not necessarily the number of individuals impacted (i.e., some marine mammals or sea turtles could be impacted several times, while others would not experience any impact). In addition, across training and testing activities, the seven-year total impacts in each table may be slightly more or less than seven times the maximum impact in any year.

E.1 Estimated Marine Mammal Impacts from Sonar and Other Transducers Under Navy Training and Testing Activities

Table E-1 provides a summary of the estimated number of marine mammal impacts from exposure to sonar and other transducers used during Navy training and testing activities under Alternatives 1 and 2 over the course of one year.

Table E-1: Estimated Marine Mammals Impacts per Year from Sonar Training and Testing Activities

Species	*Alternative 1 – Minimum*			*Alternative 1 – Maximum*			*Alternative 2 – Maximum*		
	Behavioral Response	*TTS*	*PTS*	*Behavioral Response*	*TTS*	*PTS*	*Behavioral Response*	*TTS*	*PTS*
Mysticetes									
Blue whale*	4	19	0	4	19	0	4	20	0
Bryde's whale	33	236	0	33	236	0	36	256	0
Fin whale*	4	18	0	4	18	0	5	20	0
Humpback whale*	46	387	0	46	387	0	51	419	0
Minke whale	8	78	0	8	78	0	9	84	0
Omura's whale	3	23	0	3	23	0	3	25	0
Sei whale*	15	125	0	15	125	0	17	135	0
Odontocetes									
Blainville's beaked whale	1,554	26	0	1,557	26	0	1,691	27	0
Cuvier's beaked whale	599	4	0	600	4	0	642	4	0
Ginkgo-toothed beaked whale	3,366	63	0	3,373	63	0	3,659	65	0
Longman's beaked whale	5,473	103	0	5,483	103	0	5,958	106	0
Bottlenose dolphin	104	21	0	104	21	0	116	21	0
Dwarf sperm whale	1,180	6,428	28	1,186	6,434	28	1,289	7,046	29
Pygmy sperm whale	463	2,593	11	465	2,595	11	508	2,840	11
False killer whale	571	117	0	573	117	0	641	121	0
Fraser's dolphin	10,123	1,896	0	10,150	1,896	0	11,322	1,947	0

Table E-1: Estimated Marine Mammals Impacts per Year from Sonar Training and Testing Activities (continued)

Species	*Alternative 1 – Minimum*			*Alternative 1 – Maximum*			*Alternative 2 – Maximum*		
	Behavioral Response	*TTS*	*PTS*	*Behavioral Response*	*TTS*	*PTS*	*Behavioral Response*	*TTS*	*PTS*
Killer whale	32	7	0	32	7	0	36	8	0
Melon-headed whale	2,058	488	0	2,064	488	0	2,305	508	0
Pantropical spotted dolphin	10,733	2,717	0	10,764	2,717	0	12,074	2,815	0
Pygmy killer whale	77	16	0	78	16	0	87	17	0
Risso's dolphin	2,359	504	0	2,365	505	0	2,649	519	0
Rough-toothed dolphin	145	35	0	146	35	0	161	36	0
Short-finned pilot whale	873	172	0	876	172	0	986	176	0
Sperm whale*	184	11	0	184	11	0	192	11	0
Spinner dolphin	1,040	223	0	1,042	223	0	1,185	228	0
Striped dolphin	2,891	723	0	2,899	723	0	3,255	750	0

* ESA-listed species within the MITT Study Area
Notes: PTS = permanent threshold shift, TTS = temporary threshold shift

E.2 Estimated Marine Mammal Impacts per Seven-Year Period from Sonar and Other Transducers Under Navy Training and Testing Activities

Table E-2 provides a summary of the estimated number of marine mammal impacts from exposure to sonar and other transducers used during Navy training and testing activities under Alternatives 1 and 2 over the course of seven years.

Table E-2: Estimated Marine Mammals Impacts per Seven-Year Period from Sonar Training and Testing Activities

Species	*Alternative 1 – 7-Year*			*Alternative 2 – 7-Year*		
	Behavioral Response	*TTS*	*PTS*	*Behavioral Response*	*TTS*	*PTS*
Mysticetes						
Blue whale*	26	103	0	29	140	0
Bryde's whale	226	1,338	0	253	1,792	0
Fin whale*	30	100	0	34	139	0
Humpback whale*	318	2,199	0	357	2,933	0
Minke whale	56	453	0	63	590	0
Omura's whale	21	130	0	23	172	0
Sei whale*	105	708	0	119	947	0
Odontocetes						
Blainville's beaked whale	10,117	118	0	11,844	189	0
Cuvier's beaked whale	3,923	19	0	4,498	31	0
Ginkgo-toothed beaked whale	21,937	282	0	25,626	454	0
Longman's beaked whale	35,630	477	0	41,731	743	0
Bottlenose dolphin	674	92	0	811	150	0
Dwarf sperm whale	8,275	37,761	127	9,029	49,298	204
Pygmy sperm whale	3,247	15,230	50	3,560	19,868	79
False killer whale	3,700	531	0	4,487	844	0
Fraser's dolphin	64,859	8,401	0	79,242	13,627	0
Killer whale	209	32	0	255	54	0
Melon-headed whale	13,364	2,179	0	16,127	3,552	0
Pantropical spotted dolphin	69,701	12,367	0	84,487	19,707	0
Pygmy killer whale	499	71	0	609	117	0
Risso's dolphin	15,223	2,288	0	18,536	3,630	0
Rough-toothed dolphin	943	162	0	1,127	252	0
Short-finned pilot whale	5,639	792	0	6,901	1,235	0
Sperm whale*	1,087	47	0	1,344	76	0
Spinner dolphin	6,747	970	0	8,292	1,598	0
Striped dolphin	18,723	3,257	0	22,776	5,250	0

* ESA-listed species within the MITT Study Area
Notes: PTS = permanent threshold shift, TTS = temporary threshold shift

E.3 Estimated Marine Mammal Impacts from Explosives Under Navy Training and Testing Activities

Table E-3 provides a summary of the estimated number of marine mammal impacts from exposure to explosives used during Navy training and testing activities under Alternatives 1 and 2 over the course of one year.

Table E-3: Estimated Marine Mammals Impacts per Year from Explosive Training and Testing Activities

Species	*Alternative 1 – Minimum*				*Alternative 1 – Maximum*				*Alternative 2 – Maximum*			
	Behavioral Response	*TTS*	*PTS*	*Injury*	*Behavioral Response*	*TTS*	*PTS*	*Injury*	*Behavioral Response*	*TTS*	*PTS*	*Injury*
Mysticetes												
Blue whale*	0	0	0	0	0	0	0	0	0	0	0	0
Bryde's whale	3	1	0	0	3	2	0	0	4	2	0	0
Fin whale*	0	0	0	0	0	0	0	0	0	0	0	0
Humpback whale*	5	3	0	0	6	3	0	0	6	3	0	0
Minke whale	1	1	0	0	1	1	0	0	1	1	0	0
Omura's whale	0	0	0	0	0	0	0	0	1	0	0	0
Sei whale*	1	1	0	0	2	1	0	0	2	1	0	0
Odontocetes												
Blainville's beaked whale	0	0	0	0	0	0	0	0	0	0	0	0
Cuvier's beaked whale	0	0	0	0	0	0	0	0	0	0	0	0
Ginkgo-toothed beaked whale	0	1	0	0	0	1	0	0	1	1	0	0
Longman's beaked whale	1	1	0	0	1	1	0	0	1	1	0	0
Bottlenose dolphin	0	0	0	0	0	0	0	0	0	0	0	0
Dwarf sperm whale	57	89	17	0	58	92	18	0	64	100	21	0
Pygmy sperm whale	23	32	7	0	23	33	8	0	25	37	8	0

Table E-3: Estimated Marine Mammals Impacts per Year from Explosive Training and Testing Activities (continued)

Species	*Alternative 1 – Minimum*				*Alternative 1 – Maximum*				*Alternative 2 – Maximum*			
	Behavioral Response	*TTS*	*PTS*	*Injury*	*Behavioral Response*	*TTS*	*PTS*	*Injury*	*Behavioral Response*	*TTS*	*PTS*	*Injury*
False killer whale	0	0	0	0	0	0	0	0	0	0	0	0
Fraser's dolphin	4	4	1	0	4	4	1	0	4	5	1	0
Killer whale	0	0	0	0	0	0	0	0	0	0	0	0
Melon-headed whale	1	1	0	0	1	1	0	0	1	1	0	0
Pantropical spotted dolphin	4	2	1	0	4	2	1	0	4	3	1	0
Pygmy killer whale	0	0	0	0	0	0	0	0	0	0	0	0
Risso's dolphin	1	1	0	0	1	1	0	0	1	1	0	0
Rough-toothed dolphin	0	0	0	0	0	0	0	0	0	0	0	0
Short-finned pilot whale	0	0	0	0	0	0	0	0	1	0	0	0
Sperm whale*	0	0	0	0	0	0	0	0	0	0	0	0
Spinner dolphin	0	1	0	0	0	1	0	0	0	1	1	0
Striped dolphin	1	1	0	0	1	1	0	0	1	1	0	0

* ESA-listed species within the MITT Study Area
Notes: PTS = permanent threshold shift, TTS = temporary threshold shift

E.4 Estimated Marine Mammal Impacts per Seven-Year Period from Explosives Under Navy Training and Testing Activities

Table E-4 provides a summary of the estimated number of marine mammal impacts from exposure to explosives used during Navy training and testing activities under Alternatives 1 and 2 over the course of seven years.

Table E-4: Estimated Marine Mammals Impacts per Seven-Year Period from Explosive Training and Testing Activities

Species	*Alternative 1 – 7-Year*				*Alternative 2 – 7-Year*			
	Behavioral Response	*TTS*	*PTS*	*Injury*	*Behavioral Response*	*TTS*	*PTS*	*Injury*
Mysticetes								
Blue whale*	0	0	0	0	0	0	0	0
Bryde's whale	21	11	0	0	22	11	0	0
Fin whale*	0	0	0	0	0	0	0	0
Humpback whale*	38	19	0	0	38	20	0	0
Minke whale	8	4	0	0	8	4	0	0
Omura's whale	0	0	0	0	4	0	0	0
Sei whale*	11	5	0	0	12	5	0	0
Odontocetes								
Blainville's beaked whale	0	0	0	0	0	0	0	0
Cuvier's beaked whale	0	0	0	0	0	0	0	0
Ginkgo-toothed beaked whale	0	4	0	0	4	4	0	0
Longman's beaked whale	5	7	0	0	5	8	0	0
Bottlenose dolphin	0	0	0	0	0	0	0	0
Dwarf sperm whale	403	635	125	0	446	686	137	0
Pygmy sperm whale	160	231	52	0	175	250	57	0
False killer whale	0	0	0	0	0	0	0	0
Fraser's dolphin	28	30	7	0	29	33	8	0

Table E-4: Estimated Marine Mammals Impacts per Seven-Year Period from Explosive Training and Testing Activities (continued)

Species	*Alternative 1 – 7-Year*				*Alternative 2 – 7-Year*			
	Behavioral Response	*TTS*	*PTS*	*Injury*	*Behavioral Response*	*TTS*	*PTS*	*Injury*
Melon-headed whale	8	4	0	0	8	4	0	0
Killer whale	0	0	0	0	0	0	0	0
Pantropical spotted dolphin	28	17	6	0	30	18	7	0
Pygmy killer whale	0	0	0	0	0	0	0	0
Risso's dolphin	7	5	0	0	7	6	0	0
Rough-toothed dolphin	0	0	0	0	0	0	0	0
Short-finned pilot whale	0	0	0	0	4	0	0	0
Sperm whale*	0	0	0	0	0	0	0	0
Spinner dolphin	0	6	0	0	0	6	4	0
Striped dolphin	5	5	0	0	6	6	0	0

* ESA-listed species within the MITT Study Area
Notes: PTS = permanent threshold shift, TTS = temporary threshold shift

E.5 Estimated Sea Turtle Impacts from Sonar and Other Transducers Under Navy Training and Testing Activities

Based on the quantitative analysis, no sea turtle impacts are anticipated from exposure to sonar and other transducers used during Navy training and testing activities under Alternatives 1 and 2 over the course of one year or seven years.

E.6 Estimated Sea Turtle Impacts from Explosives Under Navy Training and Testing Activities

Table E-5 provides a summary of the estimated number of sea turtle impacts from exposure to explosives used during Navy training and testing activities under Alternatives 1 and 2 over the course of one year.

Table E-5: Estimated Sea Turtle Impacts per Year from Explosive Training and Testing Activities

Species	*Alternative 1 – Minimum*			*Alternative 1 – Maximum*			*Alternative 2 – Maximum*		
	TTS	*PTS*	*Injury*	*TTS*	*PTS*	*Injury*	*TTS*	*PTS*	*Injury*
Explosive Training and Testing Activities									
Family Cheloniidae (hardshell turtles)									
Green turtle*	6	3	0	6	3	0	6	3	0
Hawksbill turtle*	0	0	0	0	0	0	0	0	0
Loggerhead turtle*	0	0	0	0	0	0	0	0	0
Family Dermochelyidae (scuteless turtles)									
Leatherback turtle*	0	0	0	0	0	0	0	0	0

* ESA-listed species within the MITT Study Area
Notes: PTS = permanent threshold shift, TTS = temporary threshold shift

E.7 Estimated Sea Turtle Impacts per Seven-Year Period from Explosives Under Navy Training and Testing Activities

Table E-6 provides a summary of the estimated number of sea turtle impacts from exposure to explosives used during Navy training and testing activities under Alternatives 1 and 2 per seven-year period.

Table E-6: Estimated Sea Turtle Impacts per Seven-Year Period from Explosive Training and Testing Activities

Species	*Alternative 1 – 7-Year*			*Alternative 2 – 7-Year*		
	TTS	*PTS*	*Injury*	*TTS*	*PTS*	*Injury*
Explosive Training and Testing Activities						
Family Cheloniidae (hardshell turtles)						
Green turtle*	40	20	0	40	20	0
Hawksbill turtle*	0	0	0	0	0	0
Loggerhead turtle*	0	0	0	0	0	0
Family Dermochelyidae (scuteless turtles)						
Leatherback turtle*	0	0	0	0	0	0

* ESA-listed species within the MITT Study Area
Notes: PTS = permanent threshold shift, TTS = temporary threshold shift

REFERENCES

U.S. Department of the Navy. (2018). *Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing* (Technical Report prepared by NUWC Division Newport, Space and Naval Warfare Systems Center Pacific, G2 Software Systems, and the National Marine Mammal Foundation). Newport, RI: Naval Undersea Warfare Center.

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Appendix F: Training and Testing Activities Matrices

Supplemental Environmental Impact Statement/ Overseas Environmental Impact Statement Mariana Islands Training and Testing

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APPENDIX F TRAINING AND TESTING ACTIVITIES MATRICES F-1

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Appendix F Training and Testing Activities Matrices

This appendix contains three matrices. The first two matrices (Table F-1 and Table F-2) in this appendix list the training and testing activities that occur in the Mariana Islands Training and Testing Study Area and their associated stressors. The third matrix (Table F-3) lists the resources analyzed in this Supplemental Environmental Impact Statement/Overseas Environmental Impact Statement and the stressors they are potentially affected by.

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Table F-1: Stressors by Training Activity

Mariana Islands Training Activity	Biological Resources																				Physical Resources					Human Resources[2]							
	Acoustic Stressors				Explosives		Energy Stressors			Physical Disturbance and Strike Stressors							Entanglement Stressors		Ingestion Stressors		Air Quality Stressor	Sediments and Water Quality Stressors				Cultural Resource Stressors		Socioeconomic Stressors			Public Health & Safety Stressors		
	Sonar & Other Transducers	Vessel Noise	Aircraft Noise	Weapons Noise	In-Air Explosions	In-Water Explosions	In-Air Electromagnetic Devices	In-Water Electromagnetic Devices	High Energy Lasers	Vessels & In-water Devices	Aircraft & Aerial Targets	Military Expended Material	Seafloor Devices	Personnel Disturbance	Ground Disturbance	Wildfires	Wires & Cables	Decelerators/Parachutes	Military Expended Materials – Munitions	Military Expended Materials – Other than Munitions	Criteria Air Pollutants	Explosives	Metals	Chemicals	Other Materials[1]	Explosives[3]	Physical Disturbance & Strike[4]	Accessibility[5]	Airborne Acoustics[6]	Physical Disturbance & Strike[4]	In-Water Energy[7]	In-Air Energy[8]	Physical Interactions[9]
Legend																						= Decrease in number of events from 2015 Final MITT EIS/OEIS							= Increase in number of events from 2015 Final MITT EIS/OEIS					
Major Training Exercises																																	
Joint Expeditionary Exercise	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Joint Multi-Strike Group Exercise (decrease for Alt 1 only)	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓					✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Air Warfare (AW)																																	
Air Combat Maneuver (ACM)			✓				✓				✓										✓		✓						✓	✓			
Air Defense Exercise (ADEX)		✓	✓				✓			✓	✓										✓						✓		✓	✓			✓
Air Intercept Control (AIC)			✓								✓										✓								✓	✓			
Gunnery Exercise (Air-to-Air) Medium-Caliber GUNEX A-A			✓	✓			✓				✓	✓							✓		✓		✓				✓	✓	✓	✓			✓
Gunnery Exercise (Surface-to-Air) Large-Caliber GUNEX S-A		✓	✓	✓	✓		✓			✓	✓	✓							✓		✓	✓	✓		✓		✓	✓	✓	✓		✓	✓
Gunnery Exercise (Surface-to-Air) Medium-Caliber GUNEX S-A		✓	✓	✓	✓		✓			✓	✓	✓							✓		✓		✓		✓		✓	✓	✓	✓			✓
Missile Exercise (Air-to-Air) MISSILEX A-A		✓	✓	✓	✓		✓			✓	✓	✓						✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓			✓
Missile Exercise (Surface-to-Air) MISSILEX S-A		✓	✓	✓	✓		✓			✓	✓	✓							✓	✓	✓	✓	✓	✓			✓	✓	✓	✓			✓
Amphibious Warfare (AW)																																	
Amphibious Rehearsal, No Landing		✓								✓											✓						✓	✓		✓			✓
Marine Air Ground Task Force Exercise (Amphibious) – Battalion	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓					✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Table F-1: Stressors by Training Activity (continued)

Mariana Islands Training Activity	Biological Resources																					Physical Resources					Human Resources[2]							
	Acoustic Stressors				Explosives		Energy Stressors			Physical Disturbance and Strike Stressors							Entanglement Stressors		Ingestion Stressors			Air Quality Stressor	Sediments and Water Quality Stressors				Cultural Resource Stressors		Socioeconomic Stressors			Public Health & Safety Stressors		
	Sonar & Other Transducers	Vessel Noise	Aircraft Noise	Weapons Noise	In-Air Explosions	In-Water Explosions	In-Air Electromagnetic Devices	In-Water Electromagnetic Devices	High Energy Lasers	Vessels & In-water Devices	Aircraft & Aerial Targets	Military Expended Material	Seafloor Devices	Personnel Disturbance	Ground Disturbance	Wildfires	Wires & Cables	Decelerators/Parachutes	Military Expended Materials – Munitions	Military Expended Materials – Other than Munitions		Criteria Air Pollutants	Explosives	Metals	Chemicals	Other Materials[1]	Explosives[3]	Physical Disturbance & Strike[4]	Accessibility[5]	Airborne Acoustics[6]	Physical Disturbance & Strike[4]	In-Water Energy[7]	In-Air Energy[8]	Physical Interactions[9]
Amphibious Warfare (AW) (continued)																																		
Amphibious Assault		✓	✓							✓	✓			✓								✓						✓	✓		✓			✓
Amphibious Raid		✓	✓							✓	✓			✓								✓						✓	✓		✓			✓
Humanitarian Assistance/Disaster Relief Operations		✓	✓				✓			✓	✓											✓						✓	✓		✓			✓
Naval Surface Fire Support Exercise – Land-based target (Land) (increase Alt 2 only)		✓		✓	✓			✓		✓												✓							✓	✓				✓
Noncombatant Evacuation Operation		✓	✓				✓			✓	✓											✓		✓	✓	✓			✓		✓			✓
Special Purpose Marine Air Ground Task Force Exercise		✓	✓	✓	✓	✓				✓	✓	✓							✓	✓		✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
Unmanned Aerial Vehicle – Intelligence, Surveillance, and Reconnaissance			✓								✓											✓						✓	✓	✓	✓			✓
Anti-Submarine Warfare (ASW)																																		
Torpedo Exercise (TORPEX) – Helicopter (increase Alt 2 only)	✓	✓	✓				✓			✓	✓	✓					✓	✓	✓	✓		✓		✓	✓	✓		✓	✓	✓	✓	✓		✓
Torpedo Exercise (TORPEX) – Maritime Patrol Aircraft (increase Alt 2 only)	✓		✓				✓			✓	✓	✓					✓	✓	✓	✓		✓		✓	✓	✓		✓	✓	✓	✓	✓		✓
Torpedo Exercise (TORPEX) – Submarine	✓	✓								✓		✓					✓			✓				✓				✓			✓	✓		✓
Torpedo Exercise (TORPEX) – Surface	✓	✓					✓			✓		✓					✓	✓		✓	✓			✓				✓	✓	✓	✓	✓		✓
Tracking Exercise (TRACKEX) – Helicopter	✓		✓				✓			✓	✓	✓					✓	✓		✓	✓			✓	✓	✓		✓	✓	✓	✓	✓		✓

Table F-1: Stressors by Training Activity (continued)

Mariana Islands Training Activity	Biological Resources																				Physical Resources					Human Resources[2]							
	Acoustic Stressors				Explosives		Energy Stressors			Physical Disturbance and Strike Stressors							Entanglement Stressors		Ingestion Stressors		Air Quality Stressor	Sediments and Water Quality Stressors				Cultural Resource Stressors		Socioeconomic Stressors			Public Health & Safety Stressors		
	Sonar & Other Transducers	Vessel Noise	Aircraft Noise	Weapons Noise	In-Air Explosions	In-Water Explosions	In-Air Electromagnetic Devices	In-Water Electromagnetic Devices	High Energy Lasers	Vessels & In-water Devices	Aircraft & Aerial Targets	Military Expended Material	Seafloor Devices	Personnel Disturbance	Ground Disturbance	Wildfires	Wires & Cables	Decelerators/Parachutes	Military Expended Materials – Munitions	Military Expended Materials – Other than Munitions	Criteria Air Pollutants	Explosives	Metals	Chemicals	Other Materials[1]	Explosives[3]	Physical Disturbance & Strike[4]	Accessibility[5]	Airborne Acoustics[6]	Physical Disturbance & Strike[4]	In-Water Energy[7]	In-Air Energy[8]	Physical Interactions[9]
Anti-Submarine Warfare (ASW) (continued)																																	
Tracking Exercise (TRACKEX) – Maritime Patrol Aircraft	✓		✓				✓			✓	✓	✓					✓	✓		✓	✓		✓	✓	✓		✓	✓	✓	✓	✓		✓
Tracking Exercise (TRACKEX)– Submarine	✓	✓								✓		✓					✓						✓				✓			✓	✓		✓
Tracking Exercise (TRACKEX) – Surface	✓	✓					✓	✓		✓		✓					✓				✓						✓	✓	✓	✓	✓		✓
Small Joint Coordinated ASW Exercise (Multi-Sail/GUAMEX)	✓	✓	✓				✓			✓	✓	✓					✓	✓	✓	✓	✓		✓	✓	✓		✓	✓	✓	✓	✓	✓	✓
Electronic Warfare (EW)																																	
Counter Targeting Chaff Exercise – Aircraft			✓								✓	✓								✓	✓				✓				✓				✓
Counter Targeting Chaff Exercise – Ship		✓								✓		✓								✓	✓				✓			✓					✓
Counter Targeting Flare Exercise – Aircraft			✓				✓				✓	✓								✓	✓		✓		✓				✓				✓
Electronic Warfare Operations		✓	✓				✓			✓	✓										✓							✓	✓	✓			✓
Expeditionary Warfare																																	
Parachute Insertion		✓	✓							✓	✓			✓							✓	✓			✓		✓	✓	✓	✓			✓
Personnel Insertion/Extraction		✓	✓							✓	✓			✓							✓						✓	✓		✓			✓
Mine Warfare (MIW)																																	
Civilian Port Defense	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Limpet Mine Neutralization System		✓				✓				✓											✓	✓	✓	✓			✓	✓	✓	✓	✓		✓

Table F-1: Stressors by Training Activity (continued)

Mariana Islands Training Activity	Biological Resources																				Physical Resources					Human Resources[2]							
	Acoustic Stressors				Explosives		Energy Stressors			Physical Disturbance and Strike Stressors							Entanglement Stressors		Ingestion Stressors		Air Quality Stressor	Sediments and Water Quality Stressors				Cultural Resource Stressors		Socioeconomic Stressors			Public Health & Safety Stressors		
	Sonar & Other Transducers	Vessel Noise	Aircraft Noise	Weapons Noise	In-Air Explosions	In-Water Explosions	In-Air Electromagnetic Devices	In-Water Electromagnetic Devices	High Energy Lasers	Vessels & In-water Devices	Aircraft & Aerial Targets	Military Expended Material	Seafloor Devices	Personnel Disturbance	Ground Disturbance	Wildfires	Wires & Cables	Decelerators/Parachutes	Military Expended Materials – Munitions	Military Expended Materials – Other than Munitions	Criteria Air Pollutants	Explosives	Metals	Chemicals	Other Materials[1]	Explosives[3]	Physical Disturbance & Strike[4]	Accessibility[5]	Airborne Acoustics[6]	Physical Disturbance & Strike[4]	In-Water Energy[7]	In-Air Energy[8]	Physical Interactions[9]
Mine Warfare (MIW) (continued)																																	
Mine Neutralization – Remotely Operated Vehicle Sonar (ASQ-235 [AQS-20], SLQ-48)	✓	✓	✓			✓	✓	✓		✓	✓	✓	✓				✓		✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓		✓
Mine Countermeasure Exercise – Surface Ship Sonar (SQQ-32, MCM)	✓	✓					✓			✓			✓								✓							✓			✓		✓
Mine Countermeasure – Towed Mine Neutralization		✓	✓				✓	✓		✓	✓		✓								✓						✓	✓	✓	✓	✓	✓	✓
Airborne Mine Countermeasure – Towed Mine Detection	✓	✓	✓							✓	✓		✓								✓						✓	✓	✓	✓	✓	✓	✓
Mine Countermeasure Exercise – Towed Sonar (AQS-20, LCS)	✓	✓					✓	✓		✓	✓		✓								✓	✓					✓	✓	✓	✓	✓		✓
Mine Laying		✓	✓								✓	✓	✓								✓		✓				✓	✓	✓	✓			✓
Mine Neutralization – Explosive Ordnance Disposal		✓	✓			✓				✓	✓	✓	✓						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
Submarine Mine Exercise	✓									✓		✓	✓																		✓		✓
Surface Ship Object Detection	✓	✓								✓			✓								✓						✓	✓		✓	✓	✓	✓
Underwater Demolition Qualification/Certification		✓	✓		✓	✓				✓	✓	✓	✓							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
Strike Warfare (STW)																																	
Bombing Exercise (Air-to-Ground)			✓								✓	✓									✓		✓			✓	✓		✓				
Gunnery Exercise (Air-to-Ground)			✓	✓							✓	✓							✓		✓		✓			✓	✓		✓				
Missile Exercise (MISSILEX)		✓	✓	✓						✓	✓	✓									✓		✓			✓	✓		✓				

Table F-1: Stressors by Training Activity (continued)

Mariana Islands Training Activity	Biological Resources																					Physical Resources					Human Resources[2]							
	Acoustic Stressors				Explosives		Energy Stressors			Physical Disturbance and Strike Stressors							Entanglement Stressors		Ingestion Stressors			Air Quality Stressor	Sediments and Water Quality Stressors				Cultural Resource Stressors		Socioeconomic Stressors			Public Health & Safety Stressors		
	Sonar & Other Transducers	Vessel Noise	Aircraft Noise	Weapons Noise	In-Air Explosions	In-Water Explosions	In-Air Electromagnetic Devices	In-Water Electromagnetic Devices	High Energy Lasers	Vessels & In-water Devices	Aircraft & Aerial Targets	Military Expended Material	Seafloor Devices	Personnel Disturbance	Ground Disturbance	Wildfires	Wires & Cables	Decelerators/Parachutes	Military Expended Materials – Munitions	Military Expended Materials – Other than Munitions		Criteria Air Pollutants	Explosives	Metals	Chemicals	Other Materials[1]	Explosives[3]	Physical Disturbance & Strike[4]	Accessibility[5]	Airborne Acoustics[6]	Physical Disturbance & Strike[4]	In-Water Energy[7]	In-Air Energy[8]	Physical Interactions[9]
Surface Warfare (SUW)																																		
Bombing Exercise (Air-to-Surface)		✓	✓	✓		✓				✓	✓	✓							✓	✓		✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓
Gunnery Exercise (Air-to-Surface) – Medium-Caliber		✓	✓	✓	✓	✓				✓	✓	✓							✓	✓		✓	✓	✓			✓	✓	✓	✓	✓	✓		✓
Gunnery Exercise (Air-to-Surface) – Small-Caliber		✓	✓	✓						✓	✓	✓							✓	✓		✓		✓				✓	✓	✓	✓			✓
Gunnery Exercise (Surface-to-Surface) Boat – Small- and Medium-Caliber		✓		✓	✓					✓		✓							✓	✓		✓	✓	✓			✓	✓	✓	✓	✓	✓		✓
Gunnery Exercise (Surface-to-Surface) Ship – Large-Caliber		✓		✓	✓	✓				✓		✓							✓	✓		✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓
Gunnery Exercise (Surface-to-Surface) Ship – Small- and Medium-Caliber		✓		✓	✓	✓	✓			✓		✓							✓	✓		✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓
Laser Targeting (at sea)		✓	✓						✓	✓	✓											✓							✓		✓		✓	✓
Maritime Security Operations		✓	✓	✓	✓	✓				✓	✓	✓							✓			✓	✓						✓	✓	✓	✓	✓	✓
Missile Exercise (Air-to-Surface) MISSILEX		✓	✓	✓	✓	✓	✓			✓	✓	✓							✓	✓		✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
Missile Exercise (Air-to-Surface) Rocket		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓							✓	✓		✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
Missile Exercise (Surface-to-Surface)		✓		✓	✓	✓	✓		✓	✓		✓							✓	✓		✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
Sinking Exercise		✓	✓	✓	✓	✓	✓			✓	✓	✓	✓				✓		✓	✓		✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
Other Training Activities																																		
Direct Action (Tactical Air Control Party)		✓	✓							✓	✓											✓												

Table F-1: Stressors by Training Activity (continued)

Mariana Islands Training Activity	Biological Resources																				Physical Resources					Human Resources[2]							
	Acoustic Stressors				Explosives		Energy Stressors			Physical Disturbance and Strike Stressors							Entanglement Stressors		Ingestion Stressors		Air Quality Stressor	Sediments and Water Quality Stressors				Cultural Resource Stressors		Socioeconomic Stressors			Public Health & Safety Stressors		
	Sonar & Other Transducers	Vessel Noise	Aircraft Noise	Weapons Noise	In-Air Explosions	In-Water Explosions	In-Air Electromagnetic Devices	In-Water Electromagnetic Devices	High Energy Lasers	Vessels & In-water Devices	Aircraft & Aerial Targets	Military Expended Material	Seafloor Devices	Personnel Disturbance	Ground Disturbance	Wildfires	Wires & Cables	Decelerators/Parachutes	Military Expended Materials – Munitions	Military Expended Materials – Other than Munitions	Criteria Air Pollutants	Explosives	Metals	Chemicals	Other Materials[1]	Explosives[3]	Physical Disturbance & Strike[4]	Accessibility[5]	Airborne Acoustics[6]	Physical Disturbance & Strike[4]	In-Water Energy[7]	In-Air Energy[8]	Physical Interactions[9]
Other Training Activities (continued)																																	
Intelligence, Surveillance, Reconnaissance		✓	✓							✓	✓						✓	✓		✓									✓	✓	✓		✓
Precision Anchoring		✓								✓			✓								✓			✓	✓		✓	✓		✓			✓
Search and Rescue at Sea		✓	✓							✓	✓	✓									✓							✓	✓	✓	✓		✓
Small Boat Attack (increase for Alt 2 only)		✓								✓		✓							✓	✓	✓		✓					✓	✓	✓		✓	✓
Submarine Navigation	✓									✓																		✓	✓	✓	✓		✓
Submarine Sonar Maintenance	✓									✓																			✓		✓		
Surface Ship Sonar Maintenance	✓	✓					✓			✓											✓										✓		
Underwater Survey		✓								✓											✓						✓	✓					✓
Unmanned Aerial Vehicle Training and Certification		✓								✓	✓	✓									✓								✓				
Unmanned Underwater Vehicle Training	✓	✓								✓		✓	✓								✓							✓	✓	✓	✓	✓	✓

Legend = Decrease in number of events from 2015 Final MITT EIS/OEIS; = Increase in number of events from 2015 Final MITT EIS/OEIS

[1] Other Materials include marine markers and flares, chaff, towed and stationary targets, and miscellaneous components of other expended objects
[2] Area of interest is U.S. Territorial Waters (seaward of the mean high water line to 12 nautical miles and any inshore waters)
[3] Vibration and shock waves from underwater explosions
[4] Physical disturbance and strike stressors resulting from in-water devices, military expended materials, seafloor devices, pile driving, and vibration from sonic booms in U.S. territorial waters (seaward of the mean high water line to 12 nautical miles).
[5] Availability of access on the ocean and in the air
[6] Loud noises from weapons firing, in-air explosions, and sonic booms
[7] Active sonar, underwater explosions, air guns, vessel movements, mine warfare training devices, and unmanned underwater systems
[8] Sources of electromagnetic energy and lasers
[9] Interaction of Navy or Marine Corps aircraft, vessels, and equipment with general public
Note: A check indicates training and/or testing event that trigger the stressor as it applies to the specific resource.

Table F-2: Stressors by Testing Activity

Mariana Islands Testing Activity	Biological Resources																				Physical Resources					Human Resources[2]							
	Acoustic Stressors				Explosives		Energy Stressors			Physical Disturbance and Strike Stressors							Entanglement Stressors		Ingestion Stressors		Air Quality Stressor	Sediments and Water Quality Stressors				Cultural Resource Stressors		Socioeconomic Stressors			Public Health & Safety Stressors		
	Sonar & Other Transducers	Vessel Noise	Aircraft Noise	Weapons Noise	In Air Explosions	In Water Explosions	In-Air Electromagnetic Devices	In-Water Electromagnetic Devices	High Energy Lasers	Vessels & In-water Devices	Aircraft & Aerial Targets	Military Expended Material	Seafloor Devices	Personnel Disturbance	Ground Disturbance	Wildfires	Wires & Cables	Decelerators/Parachutes	Military Expended Materials – Munitions	Military Expended Materials – Other than Munitions	Criteria Air Pollutants	Explosives	Metals	Chemicals	Other Materials[1]	Explosives[3]	Physical Disturbance & Strike[4]	Accessibility[5]	Airborne Acoustics[6]	Physical Disturbance & Strike[4]	In-Water Energy[7]	In-Air Energy[8]	Physical Interactions[9]
Legend																					= Decrease in number of events from 2015 Final MITT EIS/OEIS								= Increase in number of events from 2015 Final MITT EIS/OEIS					
NAVAL AIR SYSTEMS COMMAND																																	
Anti-Submarine Warfare (ASW)																																	
Anti-Submarine Warfare Torpedo Test	✓		✓				✓			✓	✓	✓	✓				✓	✓		✓	✓		✓	✓	✓		✓	✓	✓	✓	✓		✓
Anti-Submarine Warfare Tracking Test – Maritime Patrol Aircraft (Sonobuoys)	✓	✓	✓		✓	✓	✓			✓	✓	✓					✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
Electronic Warfare (EW)																																	
Intelligence, Surveillance, Reconnaissance ISR/EW Electronic Warfare Testing (previously named Broad Area Maritime Surveillance Testing – MQ-4C)							✓				✓										✓								✓				✓
Surface Warfare (SUW)																																	
Air-to-Surface Missile Test			✓	✓	✓	✓	✓				✓	✓							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓
NAVAL SEA SYSTEMS COMMAND																																	
Anti-Submarine Warfare (ASW)																																	
Anti-Submarine Warfare Mission Package Testing	✓	✓	✓				✓			✓	✓	✓					✓	✓		✓	✓		✓	✓	✓		✓	✓	✓	✓	✓	✓	✓
At-Sea Sonar Testing	✓						✓	✓				✓					✓				✓		✓		✓			✓	✓	✓	✓	✓	✓
Torpedo (Explosive) Testing	✓	✓	✓			✓	✓			✓	✓	✓					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Torpedo (Non-explosive) Testing	✓	✓	✓				✓			✓	✓	✓					✓	✓		✓	✓		✓	✓	✓		✓	✓	✓	✓	✓	✓	✓

Table F-2: Stressors by Testing Activity (continued)

Mariana Islands Testing Activity	Biological Resources																				Physical Resources					Human Resources[2]							
	Acoustic Stressors				Explosives		Energy Stressors			Physical Disturbance and Strike Stressors							Entanglement Stressors		Ingestion Stressors		Air Quality Stressor	Sediments and Water Quality Stressors				Cultural Resource Stressors		Socioeconomic Stressors			Public Health & Safety Stressors		
	Sonar & Other Transducers	Vessel Noise	Aircraft Noise	Weapons Noise	In Air Explosions	In Water Explosions	In-Air Electromagnetic Devices	In-Water Electromagnetic Devices	High Energy Lasers	Vessels & In-water Devices	Aircraft & Aerial Targets	Military Expended Material	Seafloor Devices	Personnel Disturbance	Ground Disturbance	Wildfires	Wires & Cables	Decelerators/Parachutes	Military Expended Materials – Munitions	Military Expended Materials – Other than Munitions	Criteria Air Pollutants	Explosives	Metals	Chemicals	Other Materials[1]	Explosives[3]	Physical Disturbance & Strike[4]	Accessibility[5]	Airborne Acoustics[6]	Physical Disturbance & Strike[4]	In-Water Energy[7]	In-Air Energy[8]	Physical Interactions[9]
Electronic Warfare (EW)																																	
Radar and Other System Testing		✓	✓				✓	✓	✓	✓	✓	✓						✓			✓				✓		✓	✓	✓	✓		✓	✓
Mine Warfare (MIW)																																	
Mine Countermeasure and Neutralization Testing	✓	✓	✓			✓	✓	✓		✓	✓	✓	✓				✓		✓		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
Surface Warfare																																	
Kinetic Energy Weapon Testing		✓		✓	✓		✓			✓	✓	✓						✓	✓	✓	✓		✓				✓	✓	✓	✓		✓	✓
Vessel Evaluation																																	
Undersea Warfare Testing	✓	✓	✓				✓			✓	✓	✓					✓	✓		✓	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓
Other Testing Activities																																	
Simulant Testing		✓	✓				✓			✓	✓										✓			✓	✓			✓	✓	✓			✓
OFFICE OF NAVAL RESEARCH																																	
Acoustic and Oceanographic Research		✓								✓			✓								✓							✓	✓	✓	✓	✓	✓

Legend = Decrease in number of events from 2015 Final MITT EIS/OEIS; = Increase in number of events from 2015 Final MITT EIS/OEIS

[1] Other Materials include marine markers and flares, chaff, towed and stationary targets, and miscellaneous components of other expended objects
[2] Area of interest is U.S. Territorial Waters (seaward of the mean high water line to 12 nautical miles and any inshore waters)
[3] Vibration and shock waves from underwater explosions.
[4] Physical disturbance and strike stressors resulting from in-water devices, military expended materials, seafloor devices, pile driving, and vibration from sonic booms in U.S. territorial waters (seaward of the mean high water line to 12 nautical miles).
[5] Availability of access on the ocean and in the air
[6] Loud noises from weapons firing, in-air explosions, and sonic booms
[7] Active sonar, underwater explosions, air guns, vessel movements, mine warfare training devices, and unmanned underwater systems
[8] Sources of electromagnetic energy and lasers
[9] Interaction of Navy or Marine Corps aircraft, vessels, and equipment with general public
Note: A check indicates training and/or testing events that trigger the stressor as it applies to the specific resource.

Table F-3: Stressors by Resource

Stressors vs. Resource		Biological Resources																				Physical Resources					Human Resources[2]							
		Acoustic Stressors				Explosives		Energy Stressors			Physical Disturbance and Strike Stressors							Entanglement Stressors		Ingestion Stressors		Air Quality Stressor	Sediments and Water Quality Stressors				Cultural Resource Stressors		Socioeconomic Stressors			Public Health & Safety Stressors		
		Sonar & Other Transducers	Vessel Noise	Aircraft Noise	Weapons Noise	In Air Explosions	In Water Explosions	In-Air Electromagnetic Devices	In-Water Electromagnetic Devices	High Energy Lasers	Vessels & In-water Devices	Aircraft & Aerial Targets	Military Expended Material	Seafloor Devices	Personnel Disturbance	Ground Disturbance	Wildfires	Wires & Cables	Decelerators/Parachutes	Military Expended Materials – Munitions	Military Expended Materials – Other than Munitions	Criteria Air Pollutants	Explosives	Metals	Chemicals	Other Materials[1]	Explosives[3]	Physical Disturbance & Strike[4]	Accessibility[5]	Airborne Acoustics[6]	Physical Disturbance & Strike[4]	In-Water Energy[7]	In-Air Energy[8]	Physical Interactions[9]
Physical Resources	Sediments and Water Quality																						✓	✓	✓	✓								
	Air Quality					✓																✓												
Biological Resources	Marine Habitats						✓				✓		✓	✓	✓																			
	Marine Mammals	✓	✓	✓	✓		✓		✓	✓	✓		✓	✓				✓	✓	✓	✓		✓	✓	✓	✓								
	Sea Turtles	✓	✓	✓	✓		✓		✓	✓	✓		✓	✓		✓		✓	✓	✓	✓		✓	✓	✓	✓								
	Marine Birds	✓		✓	✓	✓	✓	✓		✓	✓	✓	✓							✓	✓													
	Marine Vegetation						✓				✓		✓	✓									✓	✓	✓	✓								
	Marine Invertebrates	✓					✓		✓		✓		✓	✓	✓			✓	✓	✓	✓		✓	✓	✓	✓								
	Fish	✓	✓		✓		✓		✓	✓	✓		✓	✓		✓		✓	✓	✓	✓		✓	✓	✓	✓								
	Terrestrial			✓	✓	✓						✓	✓			✓	✓																	
Human Resources	Cultural Resources			✓			✓						✓	✓													✓	✓	✓	✓	✓			
	Socioeconomic Resources	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓					✓	✓				✓	✓	✓	✓			✓	✓	✓			
	Public Health and Safety	✓			✓	✓	✓	✓		✓	✓	✓	✓	✓																		✓	✓	✓

Table F-3: Stressors by Resource (continued)

Stressors vs. Resource	Biological Resources																			Physical Resources					Human Resources[2]							
	Acoustic Stressors				Explosives		Energy Stressors			Physical Disturbance and Strike Stressors							Entanglement Stressors		Ingestion Stressors		Air Quality Stressor	Sediments and Water Quality Stressors				Cultural Resource Stressors		Socioeconomic Stressors			Public Health & Safety Stressors		
	Sonar & Other Transducers	Vessel Noise	Aircraft Noise	Weapons Noise	In Air Explosions	In Water Explosions	In-Air Electromagnetic Devices	In-Water Electromagnetic Devices	High Energy Lasers	Vessels & In-water Devices	Aircraft & Aerial Targets	Military Expended Material	Seafloor Devices	Personnel Disturbance	Ground Disturbance	Wildfires	Wires & Cables	Decelerators/Parachutes	Military Expended Materials – Munitions	Military Expended Materials – Other than Munitions	Criteria Air Pollutants	Explosives	Metals	Chemicals	Other Materials[1]	Explosives[3]	Physical Disturbance & Strike[4]	Accessibility[5]	Airborne Acoustics[6]	Physical Disturbance & Strike[4]	Underwater Energy[7]	In-Air Energy[8]	Physical Interactions[9]

[1] Other Materials include marine markers and flares, chaff, towed and stationary targets, and miscellaneous components of other expended objects
[2] Area of interest is U.S. Territorial Waters (seaward of the mean high water line to 12 nautical miles and any inshore waters)
[3] Vibration and shock waves from underwater explosions.
[4] Physical disturbance and strike stressors resulting from in-water devices, military expended materials, seafloor devices, pile driving, and vibration from sonic booms in U.S. territorial waters (seaward of the mean high water line to 12 nautical miles).
[5] Availability of access on the ocean and in the air
[6] Loud noises from weapons firing, in-air explosions, and sonic booms
[7] Active sonar, underwater explosions, air guns, vessel movements, mine warfare training devices, and unmanned underwater systems
[8] Sources of electromagnetic energy and lasers
[9] Interaction of Navy or Marine Corps aircraft, vessels, and equipment with general public
Note: A check indicates training and/or testing events that trigger the stressor as it applies to the specific resource.

Appendix G: Conceptual Framework for Assessing Effects on Biological Resources

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APPENDIX G Conceptual Framework for Assessing Effects on Biological Resources

The analysis of impacts on biological resources focused on the likelihood of encountering the stressor, the primary stimulus, response, and recovery of individual organisms. Where appropriate, the potential of a biological resource to overlap with a stressor was analyzed with consideration given to the specific geographic area (large marine ecosystems, open ocean areas, range complexes, operating areas, and other training and testing areas) in which the overlap could occur. Additionally, the differential impacts of training versus testing activities that introduce stressors to the resource were considered.

For each of the non-biological resources considered in this Supplemental Environmental Impact Statement/Overseas Environmental Impact Statement, the methods are unique to each specific resource and are therefore described in each resource section. For Sediments and Water Quality, Air Quality, Cultural Resources, Socioeconomics, and for Public Health and Safety, see Section 3.0.1 (Overall Approach to Analysis).

G.1 Conceptual Framework for Assessing Effects from Acoustic and Explosive Activities

This conceptual framework describes the potential effects from exposure to acoustic and explosive activities and the accompanying short-term costs to the animal (e.g., expended energy or missed feeding opportunity). It then outlines the conditions that may lead to long-term consequences for the individual if the animal cannot fully recover from the short-term costs and how these in turn may affect the population. Within each biological resource section (e.g., marine mammals, birds, and fishes) the detailed methods to predict effects on specific taxa are derived from this conceptual framework.

An animal is considered "exposed" to a sound if the received sound level at the animal's location is above the background ambient noise level within a similar frequency band. A variety of effects may result from exposure to acoustic and explosive activities.

The categories of potential effects are listed below:

- ***Injury*** *and other non-auditory injury – Injury to organs or tissues of an animal*
- ***Hearing loss*** *– A noise-induced decrease in hearing sensitivity, which can be either temporary or permanent and may be limited to a narrow frequency range of hearing*
- ***Masking*** *– When the perception of a biologically important sound (i.e., signal) is interfered with by a second sound (i.e., noise)*
- ***Physiological stress*** *– An adaptive process that helps an animal cope with changing conditions; although, too much stress can result in physiological problems*
- ***Behavioral response*** *– A reaction ranging from very minor and brief changes in attentional focus, changes in biologically important behaviors, and avoidance of a sound source or area, to aggression or prolonged flight*

Figure G-1 is a flowchart that diagrams the process used to evaluate the potential effects to marine animals exposed to sound-producing activities. The shape and color of each box on the flowchart represents either a decision point in the analysis (green diamonds); specific processes such as responses, costs, or recovery (blue rectangles); external factors to consider (purple parallelograms); and final outcomes for the individual or population (orange ovals and rectangles). Each box is labeled for reference throughout the following sections. For simplicity, sound is used here to include not only sound

waves but also blast waves generated from explosive sources. Box A1, the Sound-Producing Activity, is the source of this stimuli and therefore the starting point in the analysis.

The first step in predicting whether an activity is capable of affecting a marine animal is to define the stimuli experienced by the animal. The stimuli include the overall level of activity, the surrounding acoustical environment, and characteristics of the sound when it reaches the animal.

Sounds emitted from a sound-producing activity (Box A1) travel through the environment to create a spatially variable sound field. The received sound at the animal (Box A2) determines the range of possible effects. The received sound can be evaluated in several ways, including number of times the sound is experienced (repetitive exposures), total received energy, or highest sound pressure level experienced.

Sounds that are higher than the ambient noise level and within an animal's hearing sensitivity range (Box A3) have the potential to cause effects. There can be any number of individual sound sources in a given activity, each with its own unique characteristics. For example, a United States Department of the Navy training exercise may involve several ships and aircraft using several types of sonar. Environmental factors such as temperature and bottom type impact how sound spreads and attenuates through the environment. Additionally, independent of the sounds, the overall level of activity and the number and movement of sound sources are important to help predict the probable reactions.

The magnitude of the responses is predicted based on the characteristics of the acoustic stimuli and the characteristics of the animal (species, susceptibility, life history stage, size, and past experiences). Very high exposure levels close to explosives have the potential to cause injury. High-level, long-duration, or repetitive exposures may potentially cause some hearing loss. All perceived sounds may lead to behavioral responses, physiological stress, and masking. Many sounds, including sounds that are not detectable by the animal, could have no effect (Box A4).

G.1.1 Injury

Injury (Box B1) refers to the direct injury of tissues and organs by shock or pressure waves impinging upon or traveling through an animal's body. Marine animals are well adapted to large, but relatively slow, hydrostatic pressures changes that occur with changing depth. However, injury may result from exposure to rapid pressure changes, such that the tissues do not have time to adequately adjust.

Therefore, injury is normally limited to relatively close ranges from explosions. Injury can be mild and fully recoverable or, in some cases, lead to mortality.

Injury includes both auditory and non-auditory injury. Auditory injury is the direct mechanical injury to hearing-related structures, including tympanic membrane rupture, disarticulation of the middle ear ossicles, and injury to the inner ear structures such as the organ of Corti and the associated hair cells. Auditory injury differs from auditory fatigue in that the latter involves the overstimulation of the auditory system at levels below those capable of causing direct mechanical damage. Auditory injury is always injurious but can be temporary. One of the most common consequences of auditory injury is hearing loss.

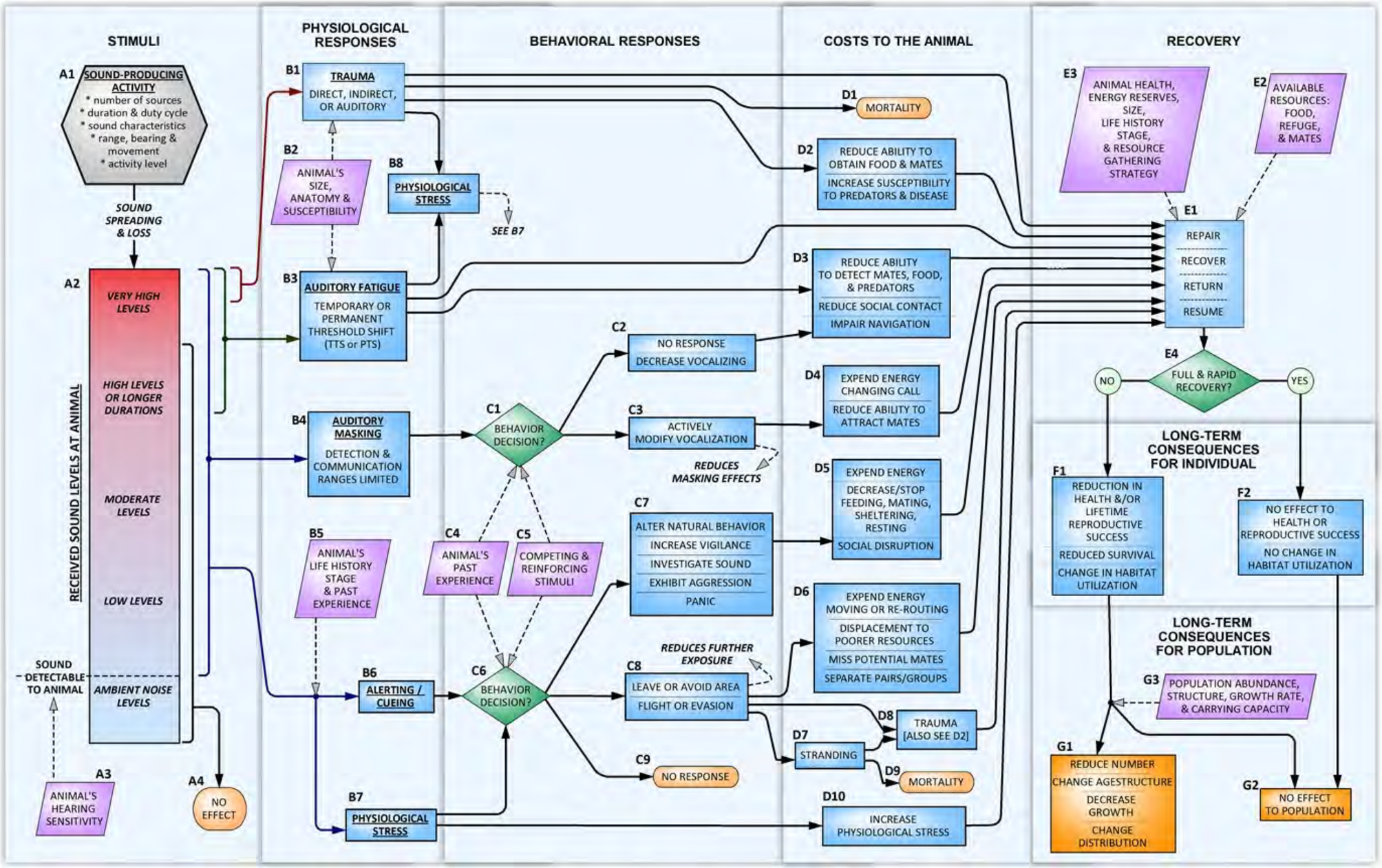

Figure G-1: Flow Chart of the Evaluation Process of Sound-Producing Activities

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Non-auditory injury can include hemorrhaging of small blood vessels and the rupture of gas-containing tissues such as the lung, swim bladder, or gastrointestinal tract. After the ear (or other sound-sensing organs), these are usually the organs and tissues most sensitive to explosive injury. An animal's size and anatomy are important in determining its susceptibility to non-auditory injury (Box B2). Larger size indicates more tissue to protect vital organs. Therefore, larger animals should be less susceptible to injury than smaller animals. In some cases, acoustic resonance of a structure may enhance the vibrations resulting from noise exposure and result in an increased susceptibility to injury. The size, geometry, and material composition of a structure determine the frequency at which the object will resonate. Because most biological tissues are heavily damped, the increase in susceptibility from resonance is limited.

Vascular and tissue bubble formation resulting from sound exposure is a hypothesized mechanism of injury to breath-holding marine animals. Bubble formation and growth due to direct sound exposure have been hypothesized (Crum & Mao, 1996; Crum et al., 2005); however, the experimental laboratory conditions under which these phenomena were observed would not be replicated in the wild. Certain dive behaviors by breath-holding animals are predicted to result in conditions of blood nitrogen super-saturation, potentially putting an animal at risk for decompression sickness (Fahlman et al., 2014), although this phenomena has not been observed (Houser et al., 2009). In addition, animals that spend long periods of time at great depths are predicted to have super-saturated tissues that may slowly release nitrogen if the animal then spends a long time at the surface (i.e., stranding) (Houser et al., 2009).

Injury could increase the animal's physiological stress (Box B8), which feeds into the stress response (Box B7) and also increases the likelihood or severity of a behavioral response. Injury may reduce an animal's ability to secure food by reducing its mobility or the efficiency of its sensory systems, making the injured individual less attractive to potential mates, increasing an individual's chances of contracting diseases or falling prey to a predator (Box D2), or increasing an animal's overall physiological stress level (Box D10). Severe injury can lead to the death of the individual (Box D1).

Damaged tissues from mild to moderate injury may heal over time. The predicted recovery of direct injury is based on the severity of the injury, availability of resources, and characteristics of the animal. The animal may also need to recover from any potential costs due to a decrease in resource gathering efficiency and any secondary effects from predators or disease. Severe injuries can lead to reduced survivorship (longevity), elevated stress levels, and prolonged alterations in behavior that can reduce an animal's lifetime reproductive success. An animal with decreased energy stores or a lingering injury may be less successful at mating for one or more breeding seasons, thereby decreasing the number of offspring produced over its lifetime.

G.1.2 Hearing Loss

Hearing loss, also called a noise-induced threshold shift, is possibly the most studied type of effect from sound exposures to animals. Hearing loss manifests itself as loss in hearing sensitivity across part of an animal's hearing range, which is dependent upon the specifics of the noise exposure. Hearing loss may be either PTS or TTS. If the threshold shift eventually returns to zero (the animal's hearing returns to pre-exposure value), the threshold shift is a TTS. If the threshold shift does not return to zero but leaves some finite amount of threshold shift, then that remaining threshold shift is a PTS. Figure G-2 shows one hypothetical threshold shift that completely recovers, a TTS, and one that does not completely recover, leaving some PTS.

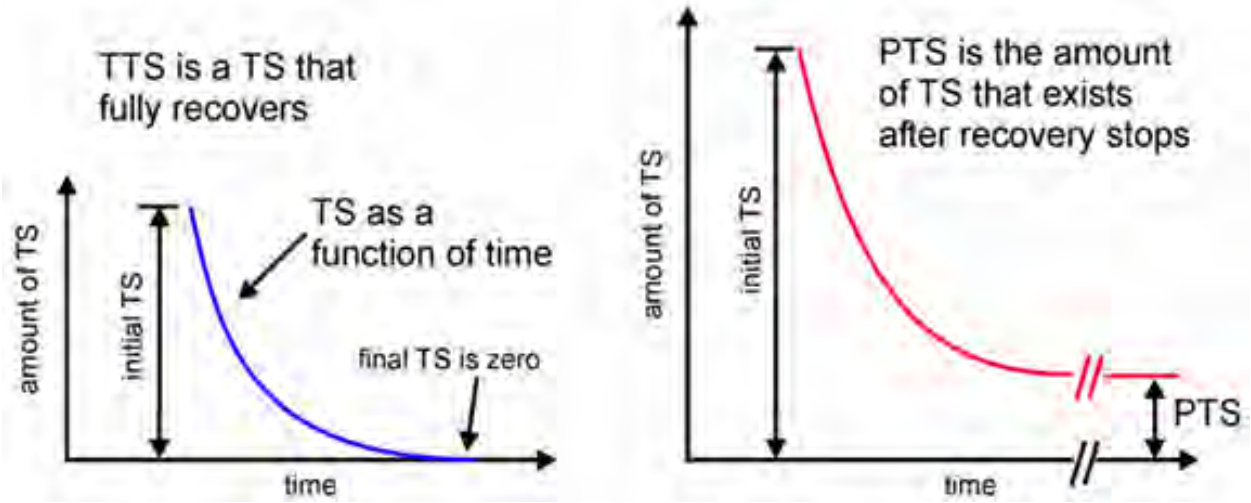

Figure G-2: Two Hypothetical Threshold Shifts

The characteristics of the received sound stimuli are used and compared to the animal's hearing sensitivity and susceptibility to noise (Box A3) to determine the potential for hearing loss. The amplitude, frequency, duration, and temporal pattern of the sound exposure are important parameters for predicting the potential for hearing loss over a specific portion of an animal's hearing range. Duration is particularly important because hearing loss can increase with prolonged exposure time. Longer exposures with lower sound levels can cause more threshold shift than a shorter exposure using the same amount of energy overall. The frequency of the sound also plays an important role. Experiments show that animals are most susceptible to hearing loss (Box B3) within their most sensitive hearing range. Sounds outside of an animal's audible frequency range do not cause hearing loss.

The mechanisms responsible for hearing loss may consist of a variety of mechanical and biochemical processes in the inner ear, including physical damage or distortion of the tympanic membrane (not including tympanic membrane rupture which is considered auditory injury), physical damage or distortion of the cochlear hair cells, hair cell death, changes in cochlear blood flow, and swelling of cochlear nerve terminals (Henderson et al., 2006; Kujawa & Liberman, 2009). Although the outer hair cells are the most prominent target for fatigue effects, severe noise exposures may also result in inner hair cell death and loss of auditory nerve fibers (Henderson et al., 2006).

The relationship between TTS and PTS is complicated and poorly understood, even in humans and terrestrial mammals, where numerous studies failed to delineate a clear relationship between the two. Relatively small amounts of TTS (e.g., less than 40–50 decibels measured two minutes after exposure) will recover with no apparent permanent effects; however, terrestrial mammal studies revealed that larger amounts of threshold shift can result in permanent neural degeneration, despite the hearing thresholds returning to normal (Kujawa & Liberman, 2009). The amounts of threshold shift induced by Kujawa and Liberman (2009) were described as being "at the limits of reversibility." It is unknown whether smaller amounts of threshold shift can result in similar neural degeneration, or if effects would translate to other species such as marine animals.

Hearing loss can increase an animal's physiological stress (Box B8), which feeds into the stress response (Box B7). Hearing loss can increase the likelihood or severity of a behavioral response and increase an animal's overall physiological stress level (Box D10). Hearing loss reduces the distance over which animals can communicate and detect other biologically important sounds (Box D3). Hearing loss could

also be inconsequential for an animal if the frequency range affected is not critical for that animal to hear within, or the hearing loss is of such short duration (e.g., a few minutes) that there are no costs to the individual.

Small to moderate amounts of hearing loss may recover over a period of minutes to days, depending on the amount of initial threshold shift. Severe noise-induced hearing loss may not fully recover, resulting in some amount of PTS. An animal whose hearing does not recover quickly and fully could suffer a reduction in lifetime reproductive success. An animal with PTS may be less successful at mating for one or more breeding seasons, thereby decreasing the number of offspring it can produce over its lifetime.

G.1.3 Masking

Masking occurs if the noise from an activity interferes with an animal's ability to detect, understand, or recognize biologically relevant sounds of interest (Box B4). In this context noise refers to unwanted or unimportant sounds that mask an animal's ability to hear sounds of interest. Sounds of interest include those from conspecifics such as offspring, mates, and competitors; echolocation clicks; sounds from predators; natural, abiotic sounds that may aid in navigation; and reverberation, which can give an animal information about its location and orientation within the ocean. The probability of masking increases as the noise and sound of interest increase in similarity and the masking noise increases in level. The frequency, received level, and duty cycle of the noise determines the potential degree of auditory masking. Masking only occurs during the sound exposure.

A behavior decision (either conscious or instinctive) is made by the animal when the animal detects increased background noise, or possibly, when the animal recognizes that biologically relevant sounds are being masked (Box C1). An animal's past experiences can be important in determining the behavioral response when dealing with masking (Box C4). For example, an animal may modify its vocalizations to reduce the effects of masking noise. Other stimuli present in the environment can influence an animal's behavior decision (Box C5) such as the presence of predators, prey, or potential mates.

An animal may exhibit a passive behavioral response when coping with masking (Box C2). It may simply not respond and keep conducting its current natural behavior. An animal may also stop calling until the background noise decreases. These passive responses do not present a direct energetic cost to the animal; however, masking will continue, depending on the acoustic stimuli.

An animal may actively compensate for masking (Box C3). An animal can vocalize more loudly to make its signal heard over the masking noise. An animal may also shift the frequency of its vocalizations away from the frequency of the masking noise. This shift can actually reduce the masking effect for the animal and other animals that are listening in the area.

If masking impairs an animal's ability to hear biologically important sounds (Box D3) it could reduce an animal's ability to communicate with conspecifics or reduce opportunities to detect or attract more distant mates, gain information about their physical environment, or navigate. An animal that modifies its vocalization in response to masking could also incur a cost (Box D4). Modifying vocalizations may cost the animal energy, interfere with the behavioral function of a call, or reduce a signaler's apparent quality as a mating partner. For example, songbirds that shift their calls up an octave to compensate for increased background noise attract fewer or less-desirable mates, and many terrestrial species advertise body size and quality with low-frequency vocalizations (Slabbekoorn & Ripmeester, 2007). Masking may also lead to no measurable costs for an animal. Masking could be of short duration or intermittent such that biologically important sounds that are continuous or repeated are received by the animal between masking noise.

Masking only occurs when the sound source is operating; therefore, direct masking effects stop immediately upon cessation of the sound-producing activity. Masking could have long-term consequences for individuals if the activity was continuous or occurred frequently enough.

G.1.4 Physiological Stress

Marine animals naturally experience physiological stress as part of their normal life histories. The physiological response to a stressor, often termed the stress response, is an adaptive process that helps an animal cope with changing external and internal environmental conditions. Sound-producing activities have the potential to cause additional stress. However, too much of a stress response can be harmful to an animal, resulting in physiological dysfunction.

If a sound is detected (i.e., heard or sensed) by an animal, a stress response can occur (Box B7). The severity of the stress response depends on the received sound level at the animal (Box A2), the details of the sound-producing activity (Box A1), and the animal's life history stage (e.g., juvenile or adult, breeding or feeding season), and past experience with the stimuli (Box B5). An animal's life history stage is an important factor to consider when predicting whether a stress response is likely (Box B5). An animal's life history stage includes its level of physical maturity (i.e., larva, infant, juvenile, sexually mature adult) and the primary activity in which it is engaged such as mating, feeding, or rearing/caring for young. Prior experience with a stressor may be of particular importance because repeated experience with a stressor may dull the stress response via acclimation (St. Aubin & Dierauf, 2001) or increase the response via sensitization. Additionally, if an animal suffers injury or hearing loss, a physiological stress response will occur (Box B8).

The generalized stress response is characterized by a release of hormones (Reeder & Kramer, 2005) and other chemicals (e.g., stress markers) such as reactive oxidative compounds associated with noise-induced hearing loss (Henderson et al., 2006). Stress hormones include norepinephrine and epinephrine (i.e., the catecholamines), which produce elevations in the heart and respiration rate, increase awareness, and increase the availability of glucose and lipid for energy. Other stress hormones are the glucocorticoid steroid hormones cortisol and aldosterone, which are classically used as an indicator of a stress response and to characterize the magnitude of the stress response (Hennessy et al., 1979).

An acute stress response is traditionally considered part of the startle response and is hormonally characterized by the release of the catecholamines. Annoyance type reactions may be characterized by the release of either or both catecholamines and glucocorticoid hormones. Regardless of the physiological changes that make up the stress response, the stress response may contribute to an animal's decision to alter its behavior.

Elevated stress levels may occur whether or not an animal exhibits a behavioral response (Box D10). Even while undergoing a stress response, competing stimuli (e.g., food or mating opportunities) may overcome any behavioral response. Regardless of whether the animal displays a behavioral response, this tolerated stress could incur a cost to the animal. Reactive oxygen compounds produced during normal physiological processes are generally counterbalanced by enzymes and antioxidants; however, excess stress can lead to damage of lipids, proteins, and nucleic acids at the cellular level (Berlett & Stadtman, 1997; Sies, 1997; Touyz, 2004).

Frequent physiological stress responses may accumulate over time increasing an animal's chronic stress level. Each component of the stress response is variable in time, and stress hormones return to baseline levels at different rates. Elevated chronic stress levels are usually a result of a prolonged or repeated

disturbance. Chronic elevations in the stress levels (e.g., cortisol levels) may produce long-term health consequences that can reduce lifetime reproductive success.

G.1.5 Behavioral Reactions

Behavioral responses fall into two major categories: alterations in natural behavior patterns and avoidance. These types of reactions are not mutually exclusive, and many overall reactions may be combinations of behaviors or a sequence of behaviors. Severity of behavioral reactions can vary drastically between minor and brief reorientations of the animal to investigate the sound, to severe reactions such as aggression or prolonged flight. The type and severity of the behavioral response will determine the cost to the animal. The total number of vehicles and platforms involved, the size of the activity area, the distance between the animal and activity, and the duration of the activity are important considerations when predicting the initial behavioral responses.

A physiological stress response (Box B7) such as an annoyance or startle reaction, or cueing or alerting (Box B6) may cause an animal to make a behavior decision (Box C6). Any exposure that produces an injury or hearing loss is also assumed to produce a stress response (Box B7) and increase the severity or likelihood of a behavioral reaction. Both an animal's experience (Box C4) and competing and reinforcing stimuli (Box C5) can affect an animal's behavior decision. The decision can result in three general types of behavioral reactions: no response (Box C9), area avoidance (Box C8), or alteration of a natural behavior (Box C7).

An animal’s past experiences can be important in determining what behavior decision it may make when dealing with a stress response (Box C4). Habituation is the process by which an animal learns to ignore or tolerate stimuli over some period and return to a normal behavior pattern, perhaps after being exposed to the stimuli with no negative consequences. Sensitization is when an animal becomes more sensitive to a set of stimuli over time, perhaps as a result of a past, negative experience that could result in a stronger behavioral response.

Other stimuli (Box C5) present in the environment can influence an animal’s behavioral response. These stimuli may be conspecifics or predators in the area or the drive to engage in a natural behavior. Other stimuli can also reinforce the behavioral response caused by acoustic stimuli. For example, the awareness of a predator in the area coupled with the sound-producing activity may elicit a stronger reaction than the activity alone would have.

An animal may reorient, become more vigilant, or investigate if it detects a sound-producing activity (Box C7). These behaviors all require the animal to divert attention and resources, therefore slowing or stopping their presumably beneficial natural behavior. This can be a very brief diversion, or an animal may not resume its natural behaviors until after the activity has concluded. An animal may choose to leave or avoid an area where a sound-producing activity is taking place (Box C8). A more severe form of this comes in the form of flight or evasion. Avoidance of an area can help the animal avoid further effects by avoiding or reducing further exposure. An animal may also choose not to respond to a sound-producing activity (Box C9).

An animal that alters its natural behavior in response to stress or an auditory cue may slow or cease its natural behavior and instead expend energy reacting to the sound-producing activity (Box D5). Natural behaviors include feeding, breeding, sheltering, and migrating. The cost of feeding disruptions depends on the energetic requirements of individuals and the potential amount of food missed during the disruption. Alteration in breeding behavior can result in delaying reproduction. The costs of a brief interruption to migrating or sheltering are less clear.

An animal that avoids a sound-producing activity may expend additional energy moving around the area, be displaced to poorer resources, miss potential mates, or have social interactions affected (Box D6). The amount of energy expended depends on the severity of the behavioral response. Missing potential mates can result in delaying reproduction. Groups could be separated during a severe behavioral response such as flight and offspring that depend on their parents may die if they are permanently separated. Splitting up an animal group can result in a reduced group size, which can have secondary effects on individual foraging success and susceptibility to predators.

Some severe behavioral reactions can lead to stranding (Box D7) or secondary injury (Box D8). Animals that take prolonged flight, a severe avoidance reaction, may injure themselves or strand in an environment for which they are not adapted. Some injury is likely to occur to an animal that strands (Box D8). Injury can reduce the animal's ability to secure food and mates, and increase the animal's susceptibility to predation and disease (Box D2). An animal that strands and does not return to a hospitable environment may die (Box D9).

G.1.6 Long-Term Consequences

The potential long-term consequences from behavioral responses are difficult to discern. Animals displaced from their normal habitat due to an avoidance reaction may return over time and resume their natural behaviors. This is likely to depend upon the severity of the reaction and how often the activity is repeated in the area. In areas of repeated and frequent acoustic disturbance, some animals may habituate to the new baseline; conversely, species that are more sensitive may not return, or return but not resume use of the habitat in the same manner. For example, an animal may return to an area to feed but no longer rest in that area. Long-term abandonment or a change in the utilization of an area by enough individuals can change the distribution of the population. Frequent disruptions to natural behavior patterns may not allow an animal to recover between exposures, which increase the probability of causing long-term consequences to individuals.

The magnitude and type of effect and the speed and completeness of recovery (i.e., return to baseline conditions) must be considered in predicting long-term consequences to the individual animal (Box E4). The predicted recovery of the animal (Box E1) is based on the cost to the animal from any reactions, behavioral or physiological. Available resources fluctuate by season, location, and year and can play a major role in an animal's rate of recovery (Box E2). Recovery can occur more quickly if plentiful food resources, many potential mates, or refuge or shelter is available. An animal's health, energy reserves, size, life history stage, and resource gathering strategy affect its speed and completeness of recovery (Box E3). Animals that are in good health and have abundant energy reserves before an effect takes place will likely recover more quickly.

Animals that recover quickly and completely are unlikely to suffer reductions in their health or reproductive success, or experience changes in habitat utilization (Box F2). No population-level effects would be expected if individual animals do not suffer reductions in their lifetime reproductive success or change their habitat utilization (Box G2). Animals that do not recover quickly and fully could suffer reductions in their health and lifetime reproductive success; they could be permanently displaced or change how they use the environment; or they could die (Box F1). These long-term consequences to the individual can lead to consequences for the population (Box G1); although, population dynamics and abundance play a role in determining how many individuals would need to suffer long-term consequences before there was an effect on the population.

Long-term consequences to individuals can translate into consequences for populations dependent upon population abundance, structure, growth rate, and carry capacity. Carrying capacity describes the theoretical maximum number of animals of a particular species that the environment can support. When a population nears its carrying capacity, its growth is naturally limited by available resources and predator pressure. If one, or a few animals, in a population are removed or gather fewer resources, then other animals in the population can take advantage of the freed resources and potentially increase their health and lifetime reproductive success. Abundant populations that are near their carrying capacity (theoretical maximum abundance) that suffer consequences on a few individuals may not be affected overall. Populations that exist well below their carrying capacity may suffer greater consequences from any lasting consequences to even a few individuals. Population-level consequences can include a change in the population dynamics, a decrease in the growth rate, or a change in geographic distribution.

G.2 Conceptual Framework for Assessing Effects from Energy-Producing Activities

G.2.1 Stimuli

G.2.1.1 Magnitude of the Energy Stressor

Regulations do not provide threshold criteria to determine the significance of the potential effects from activities that involve the use of varying electromagnetic frequencies or lasers. Many organisms, primarily marine vertebrates, have been studied to determine their thresholds for detecting electromagnetic fields, as reviewed by Normandeau et al. (2011); however, there are no data on predictable responses to exposure above or below detection thresholds. The types of electromagnetic fields discussed are those from mine neutralization activities (magnetic influence minesweeping). High-energy and low-energy lasers were considered for analysis. Low-energy lasers (e.g., targeting systems, detection systems, laser light detection and ranging) do not pose a risk to organisms (Swope, 2010) and, therefore, will not be discussed further. Radar was also considered for analysis and was determined not to pose a risk to biological resources.

G.2.1.2 Location of the Energy Stressor

Evaluation of potential energy exposure risks considered the spatial overlap of the resource occurrence and electromagnetic field and high-energy laser use. Wherever appropriate, specific geographic areas of potential impact were identified and the relative location of the resource with respect to the source was considered. For example, the greatest potential electromagnetic energy exposure is at the source, where intensity is greatest and the greatest potential for high energy laser exposure is at the ocean's surface, where high-energy laser intensity is greatest. All light energy, including laser light, entering the ocean becomes absorbed and scattered at a rate that is dependent on the frequency of the light. For most laser applications, the energy is rapidly reduced as the light penetrates the ocean.

G.2.1.3 Behavior of the Organism

Evaluation of potential energy exposure risk considered the behavior of the organism, especially where the organism lives and feeds (e.g., surface, water column, seafloor). The analysis for electromagnetic devices considered those species with the ability to perceive or detect electromagnetic signals. The analysis for high-energy lasers and radar particularly considered those species known to occur at or above the surface of the ocean.

G.2.2 Immediate Response and Costs to the Individual

Many different types of organisms (e.g., some invertebrates, fishes, turtles, birds, mammals) are sensitive to electromagnetic fields (Normandeau et al., 2011). An organism that encounters a

disturbance in an electromagnetic field could respond by moving toward the source, moving away from it, or not responding at all. The types of electromagnetic devices used in the Proposed Action simulate the electromagnetic signature of a vessel passing through the water column, so the expected response would be similar to that of vessel movement. However, since there would be no actual strike potential, a physiological response would be unlikely in most cases. Recovery of an individual from encountering electromagnetic fields would be variable, but since the physiological response would likely be minimal, as reviewed by Normandeau et al. (2011), any recovery time would also be minimal.

Very little data are available to analyze potential impacts on organisms from exposure to high energy lasers. For all but the highest-energy lasers, the greatest laser-related concern for marine species is damage to an organism's ability to see.

G.2.3 Long-Term Consequences to the Individual and Population

Long-term consequences are considered in terms of a resource's existing population level, growth and mortality rates, other stressors on the resource from the Proposed Action, cumulative impacts on the resource, and the ability of the population to recover from or adapt to impacts. Impacts of multiple or repeated stressors on individuals are cumulative.

G.3 Conceptual Framework for Assessing Effects from Physical Disturbance or Strike

G.3.1 Stimuli

G.3.1.1 Size and Weight of the Objects

To determine the likelihood of a strike and the potential impacts on an organism or habitat that would result from a physical strike, the size and weight of the striking object relative to the organism or habitat must be considered. For example, most small organisms and early life stages would simply be displaced by the movement generated by a large object moving through, or falling into, the water, whereas a larger organism could potentially be struck by an object since it may not be displaced by the movement of the water. The weight of the object is also a factor that would determine the severity of a strike. A strike by a heavy object would be more severe than a strike by a low-weight object (e.g., a decelerator/parachute, flare end cap, or chaff canister).

G.3.1.2 Location and Speed of the Objects

Evaluation of potential physical disturbance or strike risk considered the spatial overlap of the resource occurrence and potential striking objects. Analysis of impacts from physical disturbance or strike stressors focuses on proposed activities that may cause an organism or habitat to be struck by an object moving through the air (e.g., aircraft), water (e.g., vessels, in-water devices, towed devices), or dropped into the water (e.g., non-explosive practice munitions and seafloor devices). The area of operation, vertical distribution, and density of these items also play central roles in the likelihood of impact. Wherever appropriate, specific geographic areas of potential impact are identified. Analysis of potential physical disturbance or strike risk also considered the speed of vessels as a measure of intensity. Some vessels move slowly, while others are capable of high speeds.

G.3.1.3 Buoyancy of the Objects

Evaluation of potential physical disturbance or strike risk in the ocean considered the buoyancy of targets or expended materials during operation, which will determine whether the object will be encountered at the surface, within the water column, or on the seafloor.

G.3.1.4 Behavior of the Organism

Evaluation of potential physical disturbance or strike risk considered where organisms occur and if they occur in the same geographic area and vertical distribution as those objects that pose strike risks.

G.3.2 Immediate Response and Costs to the Individual

Before being struck, some organisms would sense a pressure wave through the water and respond by remaining in place, moving away from the object, or moving toward it. An organism displaced a small distance by movements from an object falling into the water nearby would likely continue on with no response. However, others could be disturbed and may exhibit a generalized stress response. If the object actually hits the organism, direct injury in addition to stress may result. The function of the stress response in vertebrates is to rapidly raise the blood sugar level to prepare the organism to flee or fight. This generally adaptive physiological response can become a liability if the stressor persists and the organism cannot return to its baseline physiological state.

Most organisms would respond to sudden physical approach or contact by darting quickly away from the stimulus. Other species may respond by freezing in place or seeking refuge. In any case, the individual must stop whatever it was doing and divert its physiological and cognitive attention to responding to the stressor. The energy costs of reacting to a stressor depend on the specific situation, but in all cases the caloric requirements of stress reactions reduce the amount of energy available to the individual for other functions such as predator avoidance, reproduction, growth, and metabolism.

The ability of an organism to return to what it was doing following a physical strike (or near miss resulting in a stress response) is a function of fitness, genetic, and environmental factors. Some organisms are more tolerant of environmental or human-caused stressors than others and become acclimated more easily. Within a species, the rate at which an individual recovers from a physical disturbance or strike may be influenced by its age, sex, reproductive state, and general condition. An organism that has reacted to a sudden disturbance by swimming at burst speed would tire after some time; its blood hormone and sugar levels may not return to normal for 24 hours. During the recovery period, the organism may not be able to attain burst speeds and could be more vulnerable to predators. If the individual were not able to regain a steady state following exposure to a physical stressor, it may suffer depressed immune function and even death.

G.3.3 Long-Term Consequences to the Population

Long-term consequences are considered in terms of a resource's existing population level, growth and mortality rates, other stressors on the resource from the Proposed Action, cumulative impacts on the resource, and the ability of the population to recover from or adapt to impacts. Impacts of multiple or repeated stressors on individuals are cumulative.

G.4 Conceptual Framework for Assessing Effects from Entanglement

G.4.1 Stimuli

G.4.1.1 Physical Properties of the Objects

For an organism to become entangled in military expended materials, the materials must have certain properties, such as the ability to form loops and a high breaking strength. Some items could have a relatively low breaking strength on their own, but that breaking strength could be increased if multiple loops were wrapped around an entangled organism.

G.4.1.2 Physical Features of the Resource

The physical makeup of the organism itself is also considered when evaluating the risk of entanglement. Some species, by their size or physical features, are more susceptible to entanglement than others. For example, more rigid bodies with protruding snouts (e.g., hammerhead shark) or large, rigid fins (e.g., humpback whale) would have an increased risk of entanglement when compared to species with smoother, streamlined bodies such as lamprey or eels.

G.4.1.3 Location of the Objects

Evaluation of potential entanglement risk considered the spatial overlap of the resource occurrence and military expended materials. Distribution and density of expended items play a central role in the likelihood of impact. Wherever appropriate, specific geographic areas of potential impact are identified.

G.4.1.4 Buoyancy of Objects

Evaluation of potential entanglement risk considered the buoyancy of military expended materials to determine whether the object will be encountered within the water column (including the surface) or on the seafloor. Less buoyant materials, such as torpedo guidance wires, sink rapidly to the seafloor. More buoyant materials include less dense items (e.g., decelerators/parachutes) that are weighted and would sink slowly to the seafloor and could be entrained in currents.

G.4.1.5 Behavior of the Organism

Evaluation of potential entanglement risk considered the general behavior of the organism, including where the organism typically occurs (e.g., surface, water column, seafloor). A defense response by some large whales (when encountering rope) is to spin, thereby entangling themselves further in the “object.” This makes selecting for non-looping and lower breaking strength in objects such as ropes very important. The analysis particularly considered those species known to become entangled in nonmilitary expended materials (e.g., “marine debris”) such as fishing lines, nets, rope, and other derelict fishing gear that often entangle marine organisms.

G.4.2 Immediate Response and Costs to the Individual

The potential impacts of entanglement on a given organism depend on the species and size of the organism. Species that have protruding snouts, fins, or appendages are more likely to become entangled than smooth-bodied organisms. Also, items could get entangled by an organism's mouth, if caught on teeth or baleen, with the rest of the item trailing alongside the organism. Materials similar to fishing gear, which is designed to entangle an organism, would be expected to have a greater entanglement potential than other materials. An entangled organism would likely try to free itself of the entangling object and in the process may become even more entangled, possibly leading to a stress response. The net result of being entangled by an object could be disruption of the normal behavior, injury due to lacerations, and other sublethal or lethal impacts.

G.4.3 Long-Term Consequences to the Individual and Population

Consequences of entanglement could range from an organism successfully freeing itself from the object or remaining entangled indefinitely, possibly resulting in lacerations and other sublethal or lethal impacts. Stress responses or infection from lacerations could lead to latent mortality. The analysis will focus on reasonably foreseeable long-term consequences of the direct impact, particularly those that could impact the fitness of an individual. Changes in an individual’s growth, survival, annual

reproductive success, or lifetime reproductive success could have population-level impacts if enough individuals are impacted. This population-level impact would vary among species and taxonomic groups.

G.5 Conceptual Framework for Assessing Effects from Ingestion

G.5.1 Stimuli

G.5.1.1 Size of the Objects

To assess the ingestion risk from military expended materials, this analysis considered the size of the object relative to the animal's ability to swallow it. Some items are too large to be ingested (e.g., non-explosive practice bombs and most targets) and impacts from these items are not discussed further. However, these items may potentially break down into smaller ingestible pieces over time. Items that are of ingestible size when they are introduced into the environment are carried forward for analysis within each resource section where applicable.

G.5.1.2 Location of the Objects

Evaluation of potential ingestion risk considered the spatial overlap of the resource occurrence and military expended materials. The distribution and density of expended items play a central role in the likelihood of impact. Wherever appropriate, specific geographic areas of potential impact were identified.

G.5.1.3 Buoyancy of the Objects

Evaluation of potential ingestion risk considered the buoyancy of military expended materials to determine whether the object will be encountered within the water column (including the surface) or on the seafloor. Less buoyant materials, such as solid metal materials (e.g., projectiles or munitions fragments), sink rapidly to the seafloor. More buoyant materials include less dense items (e.g., target fragments and decelerators/parachutes) that may be caught in currents and gyres or entangled in floating kelp. These materials can remain in the water column for an indefinite period of time before sinking. However, decelerators/parachutes are weighted and would generally sink, unless that sinking is suspended, in the scenario described here.

G.5.1.4 Feeding Behavior

Evaluation of potential ingestion risk considered the feeding behavior of the organism, including where (e.g., surface, water column, seafloor) and how (e.g., filter feeding) the organism feeds and what it feeds on. The analysis particularly considered those species known to ingest nonfood items (e.g., plastic or metal items).

G.5.2 Immediate Response and Costs to the Individual

Potential impacts of ingesting foreign objects on a given organism depend on the species and size of the organism. Species that normally eat spiny hard-bodied invertebrates would be expected to have tougher mouths and guts than those that normally feed on softer prey. Materials similar in size and shape to the normal diet of an organism may be more likely to be ingested without causing harm to the animal; however, some general assumptions were made. Relatively small objects with smooth edges, such as shells or small-caliber projectiles, might pass through the digestive tract without causing harm. A small sharp-edged item may cause the individual immediate physical distress by tearing or cutting the mouth, throat, or stomach. If the object is rigid and large (relative to the individual's mouth and throat), it may block the throat or obstruct digestive processes. An object may even be enclosed by a cyst in the gut

lining. The net result of ingesting large foreign objects is disruption of the normal feeding behavior, which could be sublethal or lethal.

G.5.3 Long-Term Consequences to the Individual and Population

The consequences of ingesting nonfood items could be nutrient deficiency, bioaccumulation, uptake of toxic chemicals, compaction, and mortality. The analysis focused on reasonably foreseeable long-term consequences of the direct impact, particularly those that could impact the fitness of an individual. Changes in an individual's growth, survival, annual reproductive success, or lifetime reproductive success could have population-level impacts if enough individuals were impacted. This population-level impact would vary among species and taxonomic groups.

G.6 Conceptual Framework for Assessing Effects from Secondary Stressors

This conceptual framework describes the potential effects to marine species exposed to stressors indirectly through impacts on habitat and prey availability (e.g., sediment or water quality, and physical disturbance). Stressors from United States Department of the Navy training and testing activities could pose indirect impacts on marine biological resources via indirect effects to habitat or to prey. These include indirect impacts from (1) explosives, explosives byproducts, and unexploded munitions; (2) metals; (3) chemicals; and (4) transmission of disease and parasites. The methods used to determine secondary stressors on marine resources are presented below. Once a category of primary stressor has been analyzed to determine how a marine biological resource is impacted, an analysis follows of how a secondary stressor is potentially impacting a marine resource. After the secondary stressors are identified, a determination on the significance of the secondary impact is made. The same criteria to determine the level of significance for primary impacts are used for secondary stressors. In addition, it is possible for a significant primary impact to produce a beneficial indirect impact. For example, sinking exercises could generate a significant impact on the seafloor and surrounding habitats, while causing a potential beneficial secondary impact by creating hard-bottom habitat for invertebrates, producing a food source for fishes, and creating structural refuges for other biological resources.

G.6.1 Secondary Stressors

G.6.1.1 Impacts on Habitat

Primary impacts defined in each marine resource section were used to develop a conceptual model to predict the potential secondary stressors on each habitat or resource. This conceptual model incorporated factors such as the co-occurrence of stressors in space and time, the impacts or assessment endpoints of individual stressors (e.g., habitat alteration, changes in animal behavior or physiology, injury, mortality, or changes in human use), and the duration and intensity of the impacts of individual stressors. For example, a secondary stressor from a munitions strike could be habitat degradation. The primary impact or stressor is the actual strike on the habitat such as the seafloor, with the introduction of military expended materials, munitions, and fragments inducing further habitat degradation.

Secondary stressors can also induce additive impacts on habitats. These types of impacts are also determined by summing the individual stressors with identical and quantifiable assessment endpoints. For example, if one stressor disturbed 0.25 square nautical miles (NM^2) of benthic habitat, a second stressor disturbed 0.5 NM^2, and all other stressors did not disturb benthic habitat, then the total benthic habitat disturbed would be 0.75 NM^2. For stressors with identical but not quantifiable assessment endpoints, potential additive impacts were qualitatively evaluated using available scientific knowledge

and best professional judgment. Other habitat impacts such as underwater detonations were assessed by size of charge (net explosive weight), charge radius, height above the seafloor, substrate types in the area, and equations linking all these factors. The analysis also considered that impacts of underwater explosions vary with the bottom substrate type and that the secondary impacts would also be variable among substrate types.

G.6.1.2 Impacts on Prey Availability

Assessing the impacts of secondary stressors on prey availability falls into two main areas over different temporal scales: the cost to an individual over a relatively short amount of time (short-term) and the cost to an individual or population over a longer period of time (long-term).

G.6.2 Immediate Response and Costs to the Individual

After a primary impact was identified, an analysis of secondary stressors on that resource was initiated. This analysis examined whether indirect impacts would occur after the initial (primary) impact and at what temporal scale that secondary stressor would affect the resource (short-term or long-term). An assessment was then made as to whether the secondary stressor would impact an individual or a population. For example, an underwater explosion could impact a single resource such as a fish or multiple other species in the food web (e.g., prey species such as plankton). The analysis also took into consideration whether the primary impact affected more than an individual or single species. For example, a prey species that would be directly injured or killed by an explosive blast could draw in predators or scavengers from the surrounding waters that would feed on those organisms, and in turn could be more directly susceptible to being injured or killed by subsequent explosions. For purposes of this analysis, indirect impacts on a resource did not require trophic transfer (e.g., bioaccumulation) in order to be observed. It is important to note that the terms “indirect” and “secondary” describe how the impact may occur in an organism or its ecosystem and does not imply reduced severity of environmental consequences.

G.6.3 Long-Term Consequences to the Individual and Population

Long-term consequences of secondary stressors on an individual or population are often difficult to determine. Once a primary impact is identified, the severity of that impact helps to determine the temporal scale at which the secondary stressor can be measured. For most marine resources, the abundance of prey species near a detonation point would be diminished for a short period (weeks to months) before being repopulated by animals from adjacent waters. In some extreme cases, recovery of the habitat or prey resources could occur over a relatively long time frame (months to years). It is important to note that indirect impacts often differ among resources, spatial, and temporal scales.

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Appendix H: Acoustic and Explosive Concepts

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Appendix H Acoustic and Explosive Concepts

This section introduces basic principles and terminology for acoustics and explosives to help the reader understand the analyses presented in this Supplemental Environmental Impact Statement (SEIS)/Overseas EIS (OEIS). This section briefly explains the transmission of sound and explosive energy; introduces some of the basic mathematical formulas used to describe propagation; and defines acoustical terms, abbreviations, and units of measurement. The difference between transmission of sound in water and in air is also discussed. Finally, it discusses methods used to analyze what animals may hear.

A number of other sources provide a more extensive background on acoustics and explosives than presented in this overview and are recommended for further inquiry. These include, but are not limited to

- *Marine Mammals and Noise* (Richardson et al., 1995) for a general overview
- *Principles of Underwater Sound* (Urick, 1983), *Fundamentals of Acoustical Oceanography* (Medwin & Clay, 1998), and *Principles of Marine Bioacoustics* (Au & Hastings, 2008) for comprehensive explanations of underwater acoustics

H.1 Terminology

The following terms are used in this document when discussing sound and the attributes of a sound source.

H.1.1 Sound

Sound is produced when an elastic medium (such as air or water) is set into motion, typically by a vibrating object within the medium. As the object vibrates, its motion is transmitted to adjacent "particles" of the medium. The motion of these particles is transmitted to adjacent particles, and so on. The result is a mechanical disturbance (the "sound wave") that moves away from the source and propagates at a medium-dependent speed (the "sound speed"). As the sound wave travels through the medium, the individual particles of the medium oscillate about their original positions but do not actually move with the sound wave. As the particles of the medium move back and forth, they create small changes about the original values of the medium density, pressure, and temperature.

Sound may be described by both physical and subjective attributes. Physical attributes, such as sound amplitude and frequency, may be directly measured. Subjective (or sensory) attributes like loudness depend on an animal's perception of sound. Physical attributes of a sound at a particular point are usually obtained by measuring pressure changes as sound waves pass.

H.1.2 Signal versus Noise

When sound is purposely created to convey information, communicate, or obtain information about the environment, it is often referred to as a signal. Examples of sounds that could be considered signals are sonar pings, marine mammal vocalizations and echolocation clicks, tones used in hearing experiments, and small sonobuoy explosions used for submarine detection.

Noise is undesired sound (American National Standards Institute, 1994). Sounds produced by naval aircraft and vessel propulsion are considered noise because they represent possible inefficiencies and increased detectability. Whether a sound is perceived as noise often depends on the receiver (i.e., the animal or system that detects the sound). For example, small explosives and sonar used to generate

sounds that can locate an enemy submarine produce signals that are useful to Sailors engaged in anti-submarine warfare, but are assumed to be noise when detected by marine mammals.

The combination of all sounds at a particular location, whether these sources are located near or far, is ambient noise (American National Standards Institute, 1994). Ambient noise includes natural sources, such as sound from crashing waves, rain, and animals (e.g., snapping shrimp), and anthropogenic sources, such as seismic surveys and vessel noise.

H.1.3 Frequency and Wavelength

Frequency is the physical attribute most closely associated with the subjective attribute "pitch"; the higher the frequency, the higher the pitch. Frequency is defined by the number of oscillations in the sound pressure or particle motion per second. One hertz (Hz) is equal to one oscillation per second, and one kilohertz (kHz) is equal to 1,000 oscillations per second. Human hearing generally spans the frequency range from 20 Hz to 20 kHz. The frequency range of a sound is called its bandwidth.

Pure tones have energy at a constant, single frequency. Complex tones contain energy at multiple, discrete frequencies, rather than a single frequency. A harmonic of a sound at a particular frequency is a multiple of that frequency (e.g., harmonic frequencies of a 2 kHz tone are 4 kHz, 6 kHz, 8 kHz, etc.). A source operating at a nominal frequency may emit several harmonic frequencies, but at lower amplitudes. Some sources may also emit subharmonics; however, these are typically many orders of magnitude less powerful than at the center frequency. Sounds with large bandwidth ("broadband" sounds) have energy spread across many frequencies.

In this document, sounds are generally described as either low- (less than 1 kHz), mid- (1 kHz–10 kHz), high- (10 kHz–100 kHz), or very high- (greater than 100 kHz) frequency. Hearing ranges of marine animals (e.g., fish, birds, sea turtles, and marine mammals) are quite varied and are species-dependent. For example, some fish can hear sounds below 100 Hz and some species of marine mammals have hearing capabilities that extend above 100 kHz. Acoustic impact analyses must therefore focus not only on the sound amplitude (i.e., pressure or particle motion, see Section H.1.4, Sound Amplitude), but on the sound frequency and the hearing capabilities of the species being considered.

The wavelength of a sound is the distance between wave peaks. Wavelength decreases as frequency increases. The frequency multiplied by the wavelength equals the speed of sound in a medium, as shown in this equation:

$$\text{Frequency } (s^{-1}) \times \text{wavelength (m)} = \text{sound speed (m/s)}$$

The approximate speed of sound in sea water is 1500 m/s and in air is 340 m/s, although speed varies depending on environmental conditions (e.g., pressure, temperature, and, in the case of sea water, salinity; see Section H.3.1 (Speed of Sound).

H.1.4 Sound Amplitude

Sound amplitude is the physical attribute most closely associated with the subjective attribute loudness. Amplitude is related to the amount that the medium particles oscillate about their original positions and can be thought of as the "strength" of a sound (as the amplitude increases, the loudness also increases). As the sound wave travels, the particles of the medium oscillate but do not actually travel with the wave. The result is a mechanical disturbance (i.e., the sound wave) that propagates away from the sound source.

Sound amplitude is typically characterized by measuring the acoustic pressure or particle motion (see Section H.2, Sound Metrics).

H.1.5 Impulsive versus Non-Impulsive Sounds

Although no standard definitions exist, sounds may be broadly categorized as impulsive or non-impulsive. Impulsive sounds have short durations, rapid rise-times, broad frequency content, and high peak sound pressures. Impulsive sounds are often produced by processes involving a rapid release of energy or mechanical impacts (Hamernik & Hsueh, 1991). Explosions, air guns, weapon firing, and impact pile driving are examples of impulsive sound sources analyzed in this document. In contrast, sonars, vessel operation, vibratory pile driving, and underwater transducers lack the characteristics of impulsive sources and are thus examples of non-impulsive sound sources. Non-impulsive sounds can be essentially continuous, such as machinery noise, or intermittent, such as sonar pings.

H.1.6 Acoustic Impedance

Acoustic impedance is a property of the propagation medium (air, water, or tissue) that can be simply described as the opposition to flow of a pressure wave. Acoustic impedance is a function of the density and speed of sound in a medium. Sound transmits more readily through materials of similar acoustic impedance, such as water and animal tissue. When sound waves encounter a medium with different acoustic impedance (for example, an air-water interface), they reflect and refract (see Sections H.3.3.3, Refraction; and H.3.3.4, Reflection and Multipath Propagation), creating more complex propagation conditions. For example, sound traveling in air (low impedance) encountering the water surface (high impedance) will be largely reflected, preventing most sound energy in the air from being transmitted into the water. The impedance difference at the tissue-air interface in animals with gas-containing organs also makes these areas susceptible to damage when exposed to the shock wave near an explosion, since the transmission from high-impedance to low-impedance can result in large motion at the boundary.

H.1.7 Duty Cycle

Duty cycle describes the portion of time that a sound source actually generates sound. It is defined as the percentage of time during which a sound is generated over a total operational time period. For example, if a sonar source produces a one-second ping once every 10 seconds, the duty cycle is 10 percent. Duty cycles vary among different acoustic sources; in general, a low duty cycle could be considered 20 percent or less and a high duty cycle 80 percent or higher.

H.1.8 Resonance

Resonance occurs when an object is vibrated at a frequency near its “natural frequency” or resonant frequency. The resonant frequency can be considered the preferred frequency at which an object will oscillate at a greater magnitude than when exposed to other frequencies. In this document, resonance is considered in relation to the size of an air bubble or air cavity in an animal that is exposed to high pressure waves and the potential for injury. The natural frequencies of dolphin and beluga lungs near the surface are about 36 Hz and 30 Hz, respectively (Finneran, 2003), the natural frequency of lungs of a large whale would be lower, while the natural frequency of small air bubbles would be much higher. Resonant frequencies would tend to increase as an animal dives, since the increased water pressure would compress an air-filled structure and reduce its size.

H.2 Sound Metrics

The sound metrics described here are used in this document to quantify exposure to a sound or explosion.

H.2.1 Pressure

Sound pressure is the incremental variation in a medium's static pressure as a sound wave travels through it. Sound pressure is typically expressed in units of pascals (Pa) (1 Pa = N/m^2 = 10 µbar = 1.45×10^{-4} psi), although explosive overpressure may also be described in pounds per square inch (psi).

Various sound pressure metrics are illustrated in Figure H-1 for (a) a non-impulsive sound (a pure tone in this illustration) and (b) an impulsive sound. As shown in Figure H-1, the non-impulsive sound has a relatively gradual rise in pressure from static pressure (the ambient pressure without the added sound), while the impulsive sound has a near-instantaneous rise to a high peak pressure. The peak pressure shown on both illustrations is the maximum absolute value of the instantaneous sound pressure during a specified time interval ("zero-to-peak" or "peak"), which accounts for the values of peak pressures below the static (ambient) pressure (American National Standards Institute, 2013). "Peak-to-peak" pressure is the difference between the maximum and minimum sound pressures. The root-mean-square (rms) value is often used to describe the average sound pressure level of sounds, and sound pressure levels provided in this EIS/OEIS are root-mean-square values unless otherwise specified. As the name suggests, this method takes the square root of the average squared sound pressure values over a time interval. The duration of this time interval can have a strong effect on the measured rms sound pressure for a given sound, especially where pressure levels vary significantly, as during an impulsive sound exposure. If the analysis duration includes a significant portion of the waveform after the sound pressure has returned to zero, the rms pressure would be relatively low. If the analysis duration includes only the highest pressures of the impulsive exposure, the rms value would be comparatively high. For this reason, it is important to specify the duration used to calculate the rms pressure for impulsive sounds.

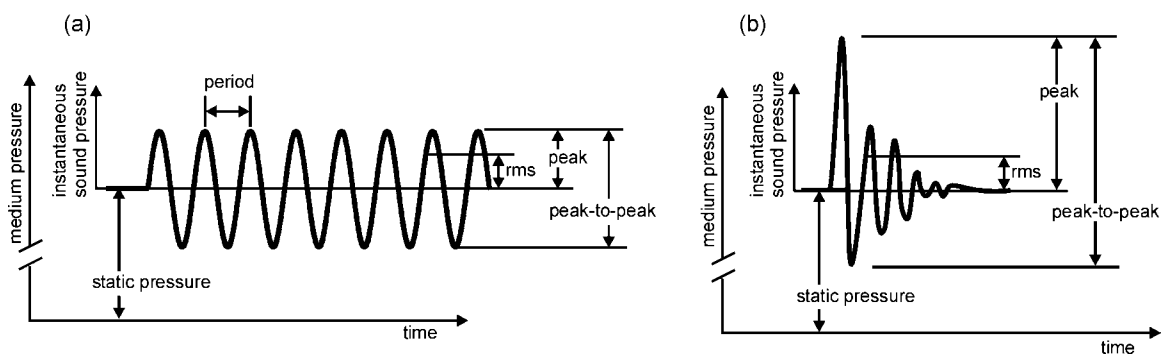


Figure H-1: Various Sound Pressure Metrics for a Hypothetical (a) Pure Tone (Non-Impulsive) and (b) Impulsive Sound

H.2.2 Sound Pressure Level

The most common sound level metric is sound pressure level (SPL). Because many animals can detect very large pressure ranges and judge the relative loudness of sounds by the ratio of the sound pressures (a logarithmic behavior), SPL is described by taking the logarithm of the ratio of the sound pressure to a

reference pressure. Use of a logarithmic scale compresses the wide range of measured pressure values into a more useful scale.

Sound pressure levels are normally expressed in decibels. A decibel is 1/10 of a bel, a unit of level when the logarithm is to the base ten and the quantities concerned are proportional to power (American National Standards Institute, 2013). Sound pressure level in decibels is calculated as follows:

$$SPL = 20\log_{10}\left(\frac{P}{P_{ref}}\right)$$

where P is the sound pressure and P_{ref} is the reference pressure. Unless stated otherwise, the pressure P is the rms value of the pressure (American National Standards Institute, 2013). In some situations, SPL is calculated for the peak pressure rather than the rms pressure. On the occasions when rms pressure is not used, the pressure metric will be stated (e.g., peak SPL means an SPL calculated using the peak pressure rather than the rms pressure).

When a value is presented in decibels, it is important to also specify the value and units of the reference quantity. Normally the numeric value is given, followed by the text "re," meaning "with reference to," and the numeric value and unit of the reference quantity. For example, a pressure of 1 Pa, expressed in decibels with a reference of 1 micropascal (µPa), is written 120 dB re 1 µPa. The standard reference pressures are 1 µPa for water and 20 µPa for air. The reference pressure for air, 20 µPa, is the approximate lowest threshold of human hearing. It is important to note that because of the differences in reference units, the same sound pressures would result in different SPL values for each medium (the same sound pressure measured in water and in air would result in a higher SPL in water than in air, since the in-air reference is larger). Therefore, sound pressure levels in air and in water should never be directly compared.

H.2.3 Sound Exposure Level

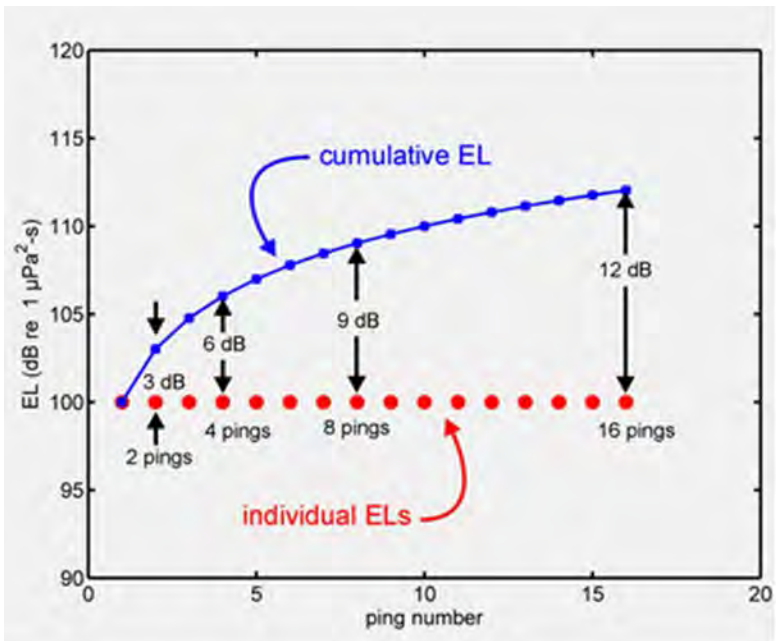
Sound exposure level (SEL) can be thought of as a composite metric that represents both the SPL of a sound and its duration. Individual time-varying noise events (e.g., a series of sonar pings or an impulsive sound) have two main characteristics: (1) a sound pressure that changes throughout the event and (2) a period of time during which the source is exposed to the sound. SEL can be provided for a single exposure (i.e., a single sonar ping or single explosive detonation) or for an entire acoustic event (i.e., multiple sonar pings or multiple explosive detonations). Cumulative SEL provides a measure of the net exposure of the entire acoustic event, but it does not directly represent the sound level heard at any given time. SEL is determined by calculating the decibel level of the cumulative sum-of-squared pressures over the duration of a sound, with units of dB re 1 micropascal squared seconds (re 1 μPa^2-s) for sounds in water and dB re (20 micropascal) squared seconds [dB re $(20\ \mu Pa)^2$-s] for sounds in air.

Some rules of thumb for SEL are as follows:

- The numeric value of SEL is equal to the SPL of a 1-second sound that has the same total energy as the exposure event. If the sound duration is 1 second, SPL and SEL have the same numeric value (but not the same reference quantities). For example, a 1 second sound with an SPL of 100 dB re 1 µPa has a SEL of 100 dB re 1 μPa^2-s.
- If the sound duration is constant but the SPL changes, SEL will change by the same number of decibels as the SPL.

- If the SPL is held constant and the duration (T) changes, SEL will change as a function of $10\log_{10}(T)$:
  - $10 \log_{10}(10) = 10$, so increasing duration by a factor of 10 raises SEL by 10 dB.
  - $10 \log_{10}(0.1) = -10$, so decreasing duration by a factor of 10 lowers SEL by 10 dB.
  - Since $10 \log_{10}(2) \approx 3$, so doubling the duration increases SEL by 3 dB.
  - $10 \log_{10}(1/2) \approx -3$, so halving the duration lowers SEL by 3 dB.

Figure H-2 illustrates the summation of energy for a succession of sonar pings. In this hypothetical case, each ping has the same duration and SPL. The SEL at a particular location from each individual ping is 100 dB re 1 µPa^2-s (red circles). The upper, blue curve shows the running total or cumulative SEL.



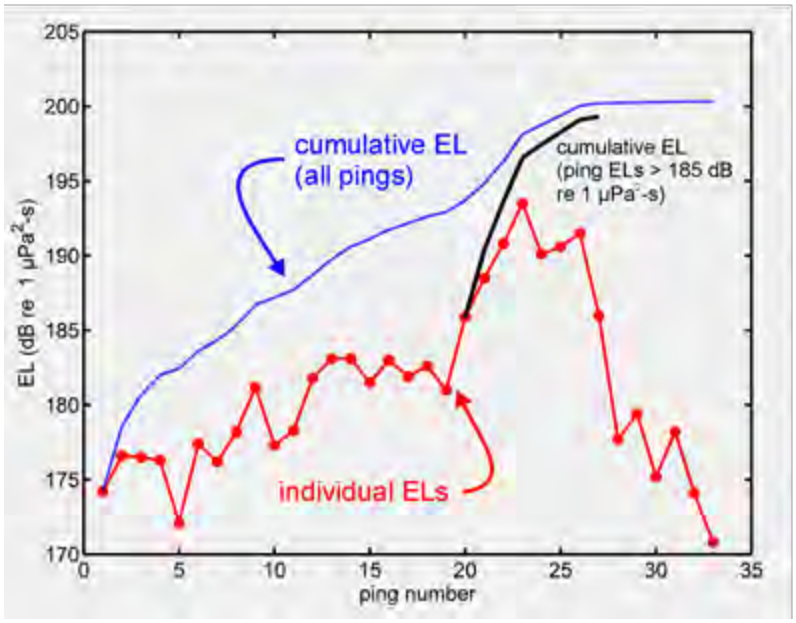
Note: EL = Exposure Level (i.e., Sound Exposure Level)

Figure H-2: Summation of Acoustic Energy from a Hypothetical, Intermittently Pinging, Stationary Sound Source

After the first ping, the cumulative SEL is 100 dB re 1 µPa^2-s. Since each ping has the same duration and SPL, receiving two pings is the same as receiving a single ping with twice the duration. The cumulative SEL from two pings is therefore 103 dB re 1 µPa^2-s. The cumulative SEL from four pings is 3 dB higher than the cumulative SEL from two pings, or 106 dB re 1 µPa^2-s. Each doubling of the number of pings increases the cumulative SEL by 3 dB.

Figure H-3 shows a more realistic example where the individual pings do not have the same SPL or SEL. These data were recorded from a stationary hydrophone as a sound source approached, passed, and moved away from the hydrophone. As the source approached the hydrophone, the received SPL from each ping increased, causing the SEL of each ping to increase. After the source passed the hydrophone, the received SPL and SEL from each ping decreased as the source moved farther away (downward trend of red line), although the cumulative SEL increased with each additional ping received (slight upward trend of blue line). The main contributions are from those pings with the highest individual SELs. Individual pings with SELs 10 dB or more below the ping with the highest level contribute little (less than 0.5 dB) to the total cumulative SEL. This is shown in Figure H-3, where only a small error is introduced by

summing the energy from the eight individual pings with SEL greater than 185 dB re 1 µPa^2-s (black line), as opposed to including all pings (blue line).



Note: EL = Exposure Level (i.e., Sound Exposure Level)

Figure H-3: Cumulative Sound Exposure Level under Realistic Conditions with a Moving, Intermittently Pinging Sound Source

H.2.4 Particle motion

The particles of a medium (e.g., water or air) oscillate around their original position as a sound wave passes. This motion is quantified using average displacement (m or dB re 1pm), velocity (m/s or dB re 1 nm/s^2), and acceleration (m/s^2 or dB re 1 µm/s^2) of the particles (Nedelec et al., 2016). Note that particle velocity is not the same as sound speed, which is how fast a sound wave moves through a medium. Particle motion is directional, whereas pressure measurement is not (Nedelec et al., 2016).

Far from a sound source and without any boundaries that could cause wave interference, particle velocity is directly proportional to sound pressure. Closer to a sound source, particle velocity begins to increase relative to sound pressure. Because this phenomenon is related to wavelength, it may be relevant only when very close to sound sources with extremely low frequencies.

H.2.5 Impulse

Impulse is a metric used to describe the pressure and time component of a pressure wave. Impulse is typically only considered for high energy exposures to impulsive sources, such as exposures close to explosives. Specifically, positive impulse is the time integral of the initial peak positive pressure with units of Pascal-seconds (Pa-s). Impulse is a measured quantity that is distinct from the term “impulsive,” which is not a measurement term, but rather describes a type of sound (see Section H.1.5, Impulsive versus Non-Impulsive Sounds).

H.3 Predicting How Sound Travels

While the concept of a sound wave traveling from its source to a receptor is relatively simple, sound propagation is quite complex because of the simultaneous presence of numerous sound waves of

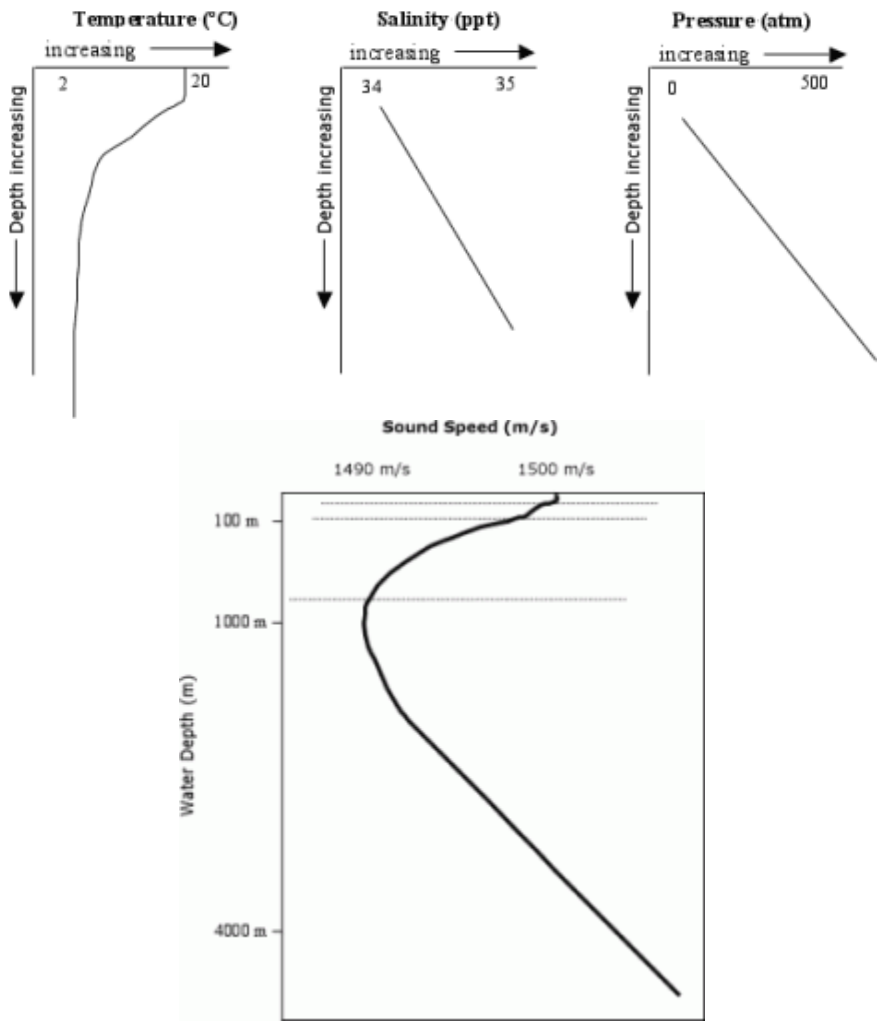
different frequencies and source levels, and other phenomena such as reflections of sound waves and subsequent constructive (additive) or destructive (cancelling) interferences between reflected and incident waves. Other factors such as refraction, diffraction, bottom types, and surface conditions also affect sound propagation. While simple examples are provided here for illustration, the Navy Acoustic Effects Model used to quantify acoustic exposures to marine mammals and sea turtles takes into account the influence of multiple factors to predict acoustic propagation (see technical report *Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing* (U.S. Department of the Navy, 2017a)).

H.3.1 Speed of Sound

The speed of sound is not affected by the SPL or frequency of the sound, but rather depends wholly on characteristics of the medium through which it is passing (e.g., the density and the compressibility). Sound travels faster through a medium that is harder to compress. For example, water is more difficult to compress than air, and sound travels approximately 340 m/s in air and 1,500 m/s in seawater.

The speed of sound in air is primarily influenced by temperature, relative humidity, and pressure, because these factors affect the density and compressibility of air. Generally, the speed of sound in air increases as air temperature increases.

The speed of sound in seawater also increases with increasing temperature and, to a lesser degree, with increasing hydrostatic pressure and salinity. Figure H-4 shows an example of how these attributes can change with depth. In seawater, temperature has the most important effect on sound speed for depths less than about 300 m. Below 1,500 m, the increasing hydrostatic pressure is the dominant factor because the water temperature is relatively constant. The variation of sound speed with depth in the ocean is called a sound velocity profile.



Source: Diogou (2014)

Figure H-4: Sound Velocity Profile (Sound Speed) Is Related to Temperature, Salinity, and Hydrostatic Pressure of Seawater

H.3.2 Source Directivity

Most sonar and other active acoustic sources do not radiate sound in all directions. Rather, they emit sounds over a limited range of angles, in order to focus sound energy on a specific area or object of interest. The specific angles are sometimes given as horizontal or vertical beam width. Some sources can be described qualitatively as “forward-looking,” when sound energy is radiated in a limited direction in front of the source, or “downward-looking,” when sound energy is directed toward the bottom.

H.3.3 Transmission Loss

As a sound wave passes through a medium, the sound level decreases with distance from the sound source. This phenomenon is known as transmission loss (TL). The transmission loss is used to relate the source SPL (SL), defined as the SPL produced by a sound source at a distance of one meter, and the received SPL (RL) at a particular location, as follows:

$$RL = SL – TL$$

The main contributors to transmission loss are as follows (Urick, 1983):

- Geometric spreading of the sound wave as it propagates away from the source
- Sound absorption (conversion of sound energy into heat)
- Scattering, diffraction, multipath interference, and boundary effects

H.3.3.1 Geometrical Spreading Loss

Spreading loss is a geometric effect representing regular weakening of a sound wave as it spreads out from a source. Spreading describes the reduction in sound pressure caused by the increase in surface area as the distance from a sound source increases. Spherical and cylindrical spreading are common types of spreading loss.

In the simple case of sound propagating from a point source without obstruction or reflection, the sound waves take on the shape of an expanding sphere. An example of spherical spreading loss is shown in Figure H-5. As spherical propagation continues, the sound energy is distributed over an ever-larger area following the inverse square law: the pressure of a sound wave decreases inversely with the square of the distance between the source and the receptor. For example, doubling the distance between the receptor and a sound source results in a reduction in the pressure of the sound to one-fourth of its initial value; tripling the distance results in one-ninth of the original pressure, and so on. Since the surface area of a sphere is $4\pi r^2$, where r is the sphere radius, the change in SPL with distance r from the source is proportional to the radius squared. This relationship is known as the spherical spreading law. The transmission loss for spherical spreading between two locations is:

$$TL = 20 \log_{10} (r_2/r_1)$$

where r_1 and r_2 are distances from the source. Spherical spreading results in a 6 dB reduction in SPL for each doubling of distance from the sound source. For example, calculated transmission loss for spherical spreading is 40 dB at 100 m and 46 dB at 200 m.

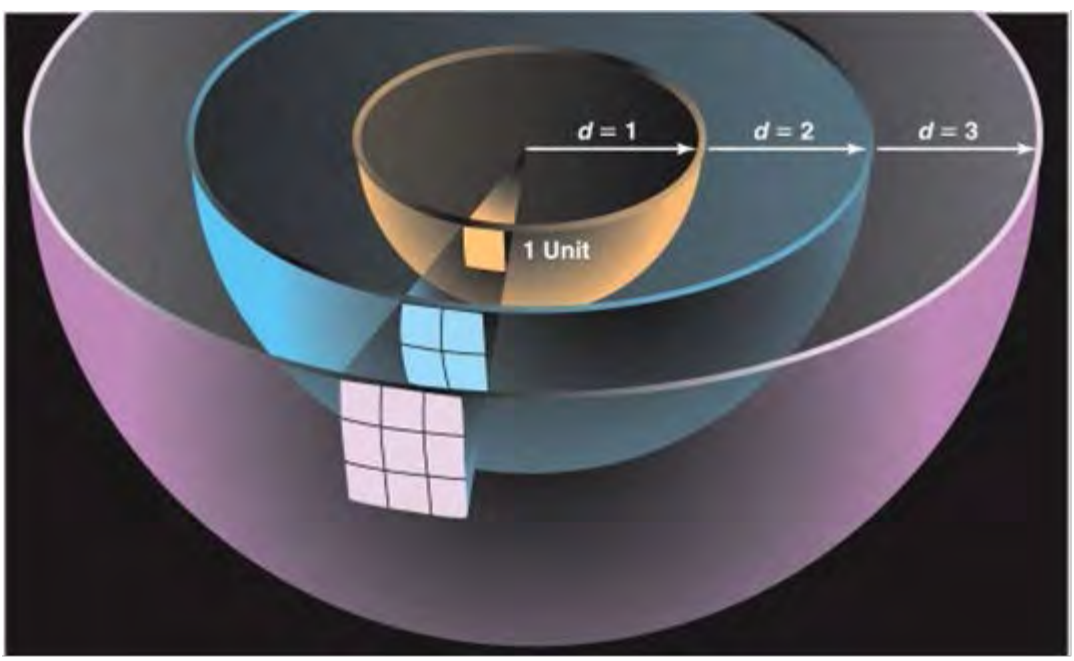


Figure H-5: Graphical Representation of the Inverse Square Relationship in Spherical Spreading

In cylindrical spreading, spherical waves expanding from the source are constrained by the water surface and the seafloor and take on a cylindrical shape. In this case the sound wave expands in the shape of a cylinder rather than a sphere, and the transmission loss is:

$$TL = 10\log_{10}(r_2/r_1)$$

Cylindrical spreading is an approximation of sound propagation in a water-filled channel with horizontal dimensions much larger than the depth. Cylindrical spreading predicts a 3 dB reduction in SPL for each doubling of distance from the source. For example, calculated transmission loss for cylindrical spreading is 30 dB at 1,000 m and 33 dB at 2,000 m.

The cylindrical and spherical spreading equations above represent two simple hypothetical cases. In reality, geometric spreading loss is more spherical near a source and more cylindrical with distance, and is better predicted using more complex models that account for environmental variables, such as the Navy Acoustic Effects Model [see technical report *Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing* (U.S. Department of the Navy, 2017a)].

However, when conducting simple spreading loss calculations in near shore environments, "practical spreading loss" can be applied, where:

$$TL = 15\log_{10}(r_2/r_1)$$

Practical spreading loss accounts for other realistic losses in the environment, such as absorption and scattering, which are not accounted for in geometrical spreading.

H.3.3.2 Absorption

Absorption is the conversion of acoustic energy to kinetic energy in the particles of the propagation medium (Urick, 1983). Absorption is directly related to sound frequency, with higher frequencies having higher rates of absorption. Absorption rates range from 0.07 dB/km for a 1 kHz sound to about 30 dB/km for a 100 kHz sound. Therefore, absorption is the cause of a significant amount of attenuation for high and very high frequency sound sources, reducing the distance over which these sources may be perceived compared to mid- and low-frequency sound sources with the same source level.

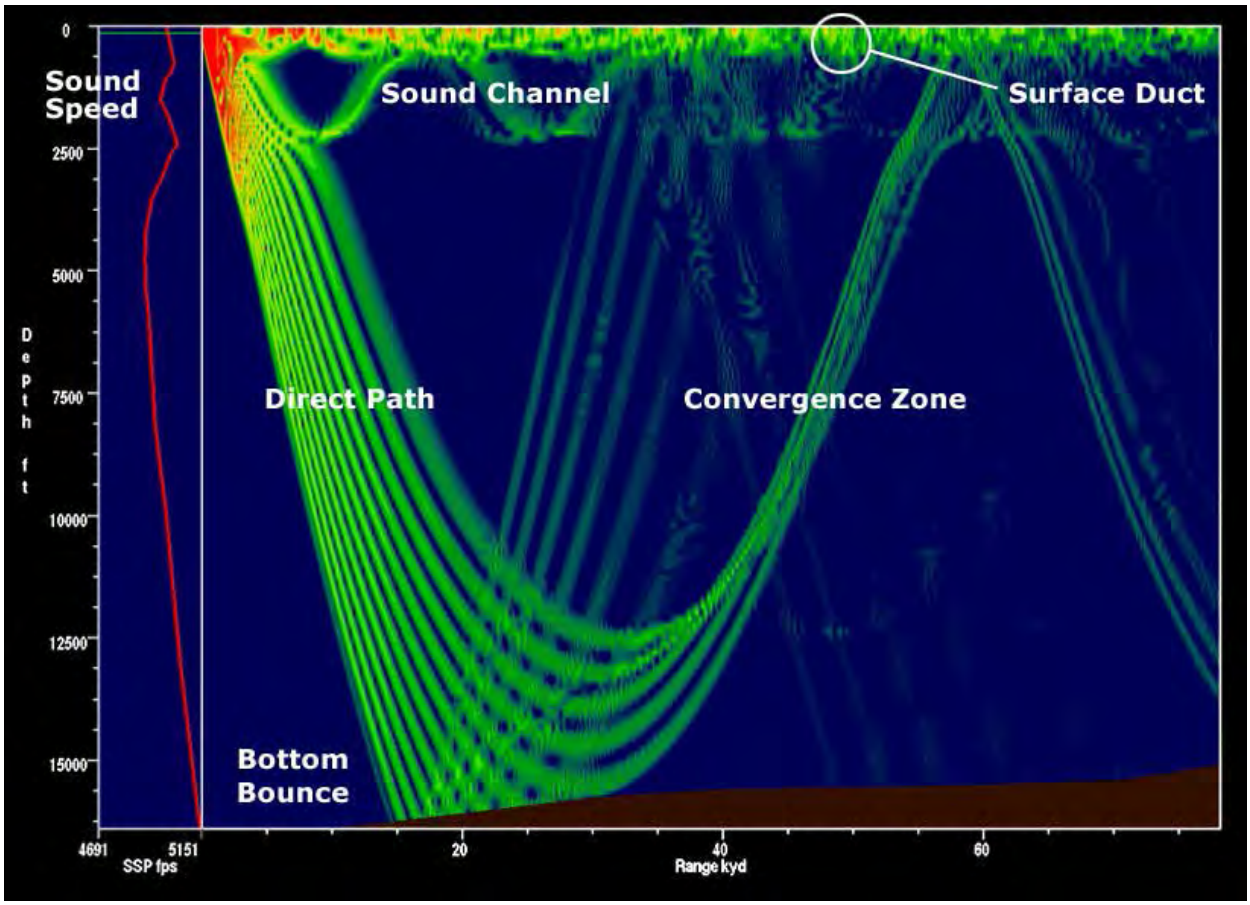
H.3.3.3 Refraction

When a sound wave propagating in a medium encounters a second medium with a different density (e.g., the air-water boundary), part of the incident sound will be reflected back into the first medium and part will be transmitted into the second medium (Kinsler et al., 1982). The propagation direction will change as the sound wave enters the second medium; this phenomenon is called refraction. Refraction may also occur within a single medium if the properties of the medium change enough to cause a variation in the sound speed. Refraction of sound resulting from spatial variations in the sound speed is one of the most important phenomena that affect sound propagation in water (Urick, 1983).

As discussed in Section H.3.1 (Speed of Sound), the sound speed in the ocean primarily depends on hydrostatic pressure (i.e., depth) and temperature. Although the actual variations in sound speed are small, the existence of sound speed gradients in the ocean has an enormous effect on the propagation of sound in the ocean. If one pictures sound as rays emanating from an underwater source, the propagation of these rays changes as a function of the sound speed profile in the water column. Specifically, the directions of the rays bend toward regions of slower sound speed. This phenomenon creates ducts in which sound becomes "trapped," allowing it to propagate with high efficiency for large

distances within certain depth boundaries. During winter months, the reduced sound speed at the surface due to cooling can create a surface duct that efficiently propagates sound such as commercial shipping noise (Figure H-6). Sources located within this surface duct can have their sounds trapped, but sources located below this layer would have their sounds refracted downward. The deep sound channel, or sound frequency and ranging (SOFAR) channel, is another duct that exists where sound speeds are slowest deeper in the water column (600–1,200 m depth at the mid-latitudes).

Similarly, the path of sound will bend toward regions of lower sound speed in air. Air temperature typically decreases with altitude, meaning sounds produced in air tend to bend skyward. When an atmospheric temperature inversion is present, air is cooler near the earth's surface. In inversion conditions, sound waves near the earth's surface will tend to refract downward.



Note: 1 kiloyard (kyd) = 0.9 km

Figure H-6: Sound Propagation Showing Multipath Propagation and Conditions for Surface Duct

H.3.3.4 Reflection and Multipath Propagation

In multipath propagation, sound may not only travel a direct path (with no reflection) from a source to a receiver, but also be reflected from the surface or bottom multiple times before reaching the receiver (Urick, 1983). Reflection is shown in Figure H-6 at the seafloor (bottom bounce) and at the water surface. At some distances, the reflected wave will be in phase with the direct wave (their waveforms add together) and at other distances the two waves will be out of phase (their waveforms cancel). The

existence of multiple sound paths, or rays, arriving at a single point can result in multipath interference, a condition that permits the addition and cancellation between sound waves, resulting in the fluctuation of sound levels over short distances.

Reflection plays an important role in the pressures observed at different locations in the water column. Near the bottom, the direct path pressure wave may sum with the bottom-reflected pressure wave, increasing the exposure. Near the surface, however, the surface-reflected pressure wave may destructively interfere with the direct path pressure wave, "cutting off" the wave and reducing exposure (called the Lloyd mirror effect). This can cause the sound level to decrease dramatically within the top few meters of the water column.

H.3.3.5 Diffraction, Scattering, and Reverberation

Diffraction, scattering, and reverberation are examples of what happens when sound waves interact with obstacles in the propagation path.

Diffraction may be thought of as the change of direction of a sound wave as it passes around an obstacle. Diffraction depends on the size of the obstacle and the sound frequency. The wavelength of the sound must be larger than the obstacle for notable diffraction to occur. If the obstacle is larger than the wavelength of sound, an acoustic shadow zone will exist behind the obstacle where the sound is unlikely to be detected. Common examples of diffraction include sound heard from a source around the corner of a building and sound propagating through a small gap in an otherwise closed door or window.

An obstacle or inhomogeneity (e.g., smoke, suspended particles, gas bubbles due to waves, and marine life) in the path of a sound wave causes scattering as these inhomogeneities reradiate incident sound in a variety of directions (Urick, 1983). Reverberation refers to the prolongation of a sound, after the source has stopped emitting, caused by multiple reflections at water boundaries (surface and bottom) and scattering.

H.3.3.6 Surface and Bottom Effects

Because the sea surface reflects and scatters sound, it has a major effect on the propagation of underwater sound in applications where either the source or receiver is at a shallow depth (Urick, 1983). If the sea surface is smooth, the reflected sound pressure is nearly equal to the incident sound pressure; however, if the sea surface is rough, the amplitude of the reflected sound wave will be reduced. Sound waves reflected from the sea surface experience a phase reversal. When the surface-reflected waves interact with the direct path waves near the surface, a destructive interference pattern is created in which the received pressure approaches zero.

The sea bottom is also a reflecting and scattering surface, similar to the sea surface. Sound interaction with the sea bottom is more complex, however, primarily because the acoustic properties of the sea bottom are more variable and the bottom is often layered into regions of differing density. As sound travels into the seafloor it reflects off of these different density layers in complex ways. For sources in contact with the bottom, such as during pile driving or bottom-placed explosives, a ground wave is produced that travels through the bottom sediment and may refract back into the water column.

For a hard bottom such as rock, the reflected wave will be approximately in phase with the incident wave. Thus, near the ocean bottom, the incident and reflected sound pressures may add together (constructive interference), resulting in an increased sound pressure near the sea bottom. Soft bottoms such as mud or sediment absorb sound waves and reduce the level in the water column overall.

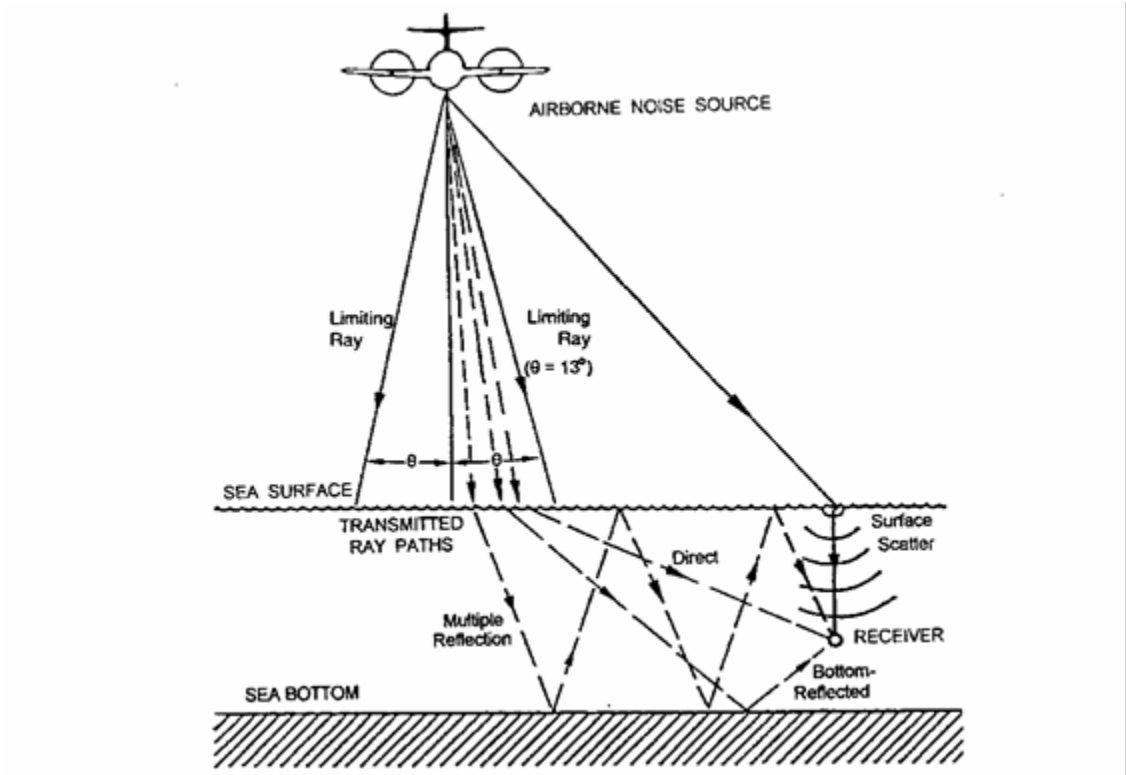
H.3.3.7 Air-Water Interface

Sound from aerial sources such as aircraft and weapons firing may be transmitted into the water under certain conditions. The most studied of these sources are fixed-wing aircraft and helicopters, which create noise with most energy below 500 Hz. Noise levels in water are highest at the surface and are highly dependent on the altitude of the aircraft and the angle at which the aerial sound encounters the ocean surface. Transmission of the sound once it is in the water is identical to any other sound as described in the sections above.

Transmission of sound from a moving airborne source to a receptor underwater is influenced by numerous factors and has been addressed by Young (1973), Urick (1983), Richardson et al. (1995), Eller and Cavanagh (2000), Laney and Cavanagh (2000), and others. Sound is transmitted from an airborne source to a receptor underwater by four principal means: (1) a direct path, refracted upon passing through the air-water interface; (2) direct-refracted paths reflected from the bottom in shallow water; (3) evanescent transmission in which sound travels laterally close to the water surface; and (4) scattering from interface roughness due to wave motion.

When sound waves in air meet the water surface, the sound can either be transmitted across the air-water boundary or reflected off the water surface. When sound waves meet the water at a perpendicular angle (e.g., straight down from an in-air source to a flat water surface), the sound waves are both transmitted directly across the water surface in the same direction of travel and reflected 180° back toward the original direction of travel. This can create a localized condition at the water surface where the incident and reflected waves sum, doubling the in-air overpressure (+ 6 dB). As the incident angle of the in-air sound wave changes from perpendicular, this phenomenon is reduced, ultimately reaching the angle where sound waves are parallel to the water surface and there is no surface reflection.

The sound that enters the water is refracted due to the difference in sound velocity between air and water, as shown in Figure H-7. As the angle of the in-air incident wave moves away from perpendicular, the direction of travel of the underwater refracted waves becomes closer to parallel to the water surface. When the incident angle is reached where the underwater refracted sound wave is parallel to the water surface, all of the sound is reflected back into the air and no sound enters the water. This occurs at an angle of about 13–14°. As a result, most of the acoustic energy transmitted into the water through a relatively narrow cone extending vertically downward from the in-air source. The width of the footprint would be a function of the source altitude. Lesser amounts of sound may enter the water outside of this cone due to surface scattering (e.g., from water surface waves that can vary the angle of incidence over an area) and as evanescent waves that are only present very near the surface.



Source: Richardson et al. 1995

Figure H-7: Characteristics of Sound Transmission through the Air-Water Interface

If a sound wave is ideally transmitted into water (that is, with no surface transmission loss, such as due to foamy, wave conditions that could decrease sound entering the water), the sound pressure level underwater is calculated by changing the pressure reference unit from 20 µPa in air to 1 µPa in water. For a sound with the same pressure in air and water, this calculation results in a +26 dB sound pressure level in water compared to air. For this reason, sound pressure levels in water and sound pressure levels in air should never be directly compared.

H.4 Auditory Perception

Animals with an eardrum or similar structure, including mammals, birds, and reptiles, directly detect the pressure component of sound. Some marine fish also have specializations to detect pressure changes, although most invertebrates and many marine fish do not have anatomical structures that enable them to detect the pressure component of sound and are only sensitive to the particle motion component of sound. This difference in acoustic energy sensing mechanisms limits the range at which these animals can detect most sound sources analyzed in this document. This is because far from a sound source (i.e., in the far field), particle velocity and sound pressure are directly proportional. But close to a source (i.e., in the near field), particle velocity increases relative to sound pressure and may become more detectable to certain animals. As sound frequency increases, the wavelength becomes shorter, resulting in a smaller near field.

Because mammalian ears can detect large pressure ranges and humans judge the relative loudness of sounds by the ratio of the sound pressures (a logarithmic behavior), sound amplitude is described by the SPL, calculated by taking the logarithm of the ratio of the sound pressure to a reference pressure (see

Section H.2.2, Sound Pressure Level). Use of a logarithmic scale compresses the wide range of pressure values into a more usable numerical scale. On the decibel scale, the smallest audible sound in air (near total silence) to a human is 0 dB re 20 µPa. If the sound intensity increases by a factor of 10, the SPL would increase to 10 dB re 20 µPa. If the sound intensity increases by a factor of 100, the SPL would increase to 20 dB re 20 µPa, and if the sound intensity increases by a factor of 1000, the SPL would be 30 dB re 20 µPa. A quiet conversation has an SPL of about 50 dB re 20 µPa, while the threshold of pain is around 120–140 dB re 20 µPa.

As described in Section H.2.2 (Sound Pressure Level), SPLs under water differ from those in air because they rely on different reference pressures in their calculation; therefore, the two should never be directly compared.

While sound pressure and frequency are physical measure of the sound, loudness is a subjective attribute that varies with not only sound pressure but also other attributes of the sound, such as frequency. For example, a human listener would perceive a 60 dB re 20 µPa sound at 2 kHz to be louder than a 60 dB re 20 µPa sound at 50 Hz, even though the SPLs are identical. This effect is most noticeable at lower sound pressure levels; however, at very high sound pressure levels, the difference in perceived loudness at different frequencies becomes smaller.

To account for differences in hearing sensitivity at various frequencies, acoustic risk analyses commonly use auditory weighting functions—mathematical functions that adjust (or "weight") received sound levels across sound frequency based on how the listener's sensitivity or susceptibility to sound changes at different frequencies. For humans, the most common weighting function is called "A-weighting" (see Figure H-8). A-weighted sound levels are specified in units of "dBA" (A-weighted decibels). For example, if the unweighted received level of a 500 Hz tone at a human receiver was 90 dB re 20 µPa, the A-weighted sound level would be 90 dB – 3 dB = 87 dBA because the A-weighting function amplitude at 500 Hz is -3 dB. Many measurements of sound in air appear as A-weighted decibels in the literature because the intent of the authors is to assess noise impacts on humans.

The auditory weighting concept can be applied to other species. When used in analyzing the impacts of sound on an animal, auditory weighting functions adjust received sound levels to emphasize ranges of best hearing and de-emphasize ranges of less or no sensitivity. Auditory weighting functions were developed for marine mammals and sea turtles and are used to assess acoustic impacts. For more information on weighting functions and their derivation for this analysis see technical report *Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III)* (U.S. Department of the Navy, 2017b).

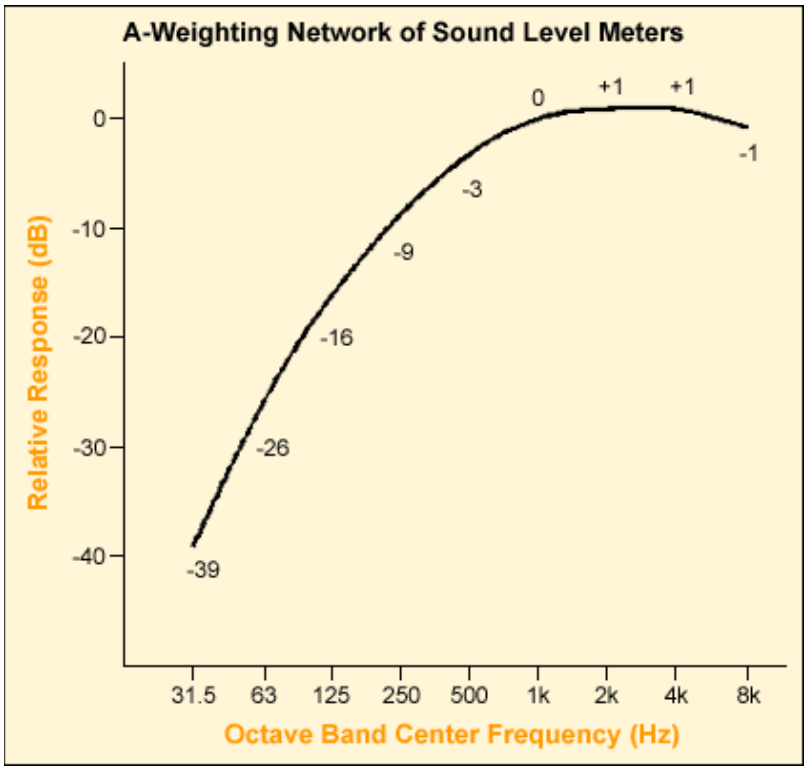


Figure H-8: A-weighting for Human Hearing of Sounds in Air (OSHA). The Numbers along the Curve Indicate How a Received Sound Level Would Be Adjusted at that Frequency.

H.5 Explosives

Explosive materials used in Navy testing and training activities are either (1) "high explosives," sometimes referred to as HE, which means that the explosive material has a very fast rate of detonation (exceeding the speed of sound), or (2) low explosives, which exhibit a relatively slow burn, or deflagration, such as black powder. Because low explosives are typically used in small quantities and have less destructive power, the below discussion focuses on high explosives.

This rate of detonation of a high explosive is highly supersonic, producing a high pressure, steep instantaneous shock wave front travelling through the explosive material. This shock front is produced by the supersonic expansion of the explosive products, but as the shock front travels away from the immediate area of the detonation, it begins to behave as an acoustic wave front travelling at the speed of sound.

The near-instantaneous rise from ambient to an extremely high peak pressure is what makes the explosive shock wave potentially damaging. The area under this positive pressure duration is calculated as the positive impulse.

The positive pressure produced by an explosion is also referred to as the overpressure. As the shock front passes a location, the positive pressure exponentially decays, as shown in Figure H-9. As the shock front travels away from the detonation, the waveform is stretched – the peak pressure decreases while the positive duration increases. The reduction in peak pressure reduces the rate at which the positive impulse is received. Both the reduction in peak pressure and stretching of the positive impulse reduce

the potential for injury. In addition, absorption losses of higher frequencies over distance results in a softening of the shock front, such that the rise to peak pressure is no longer near-instantaneous.

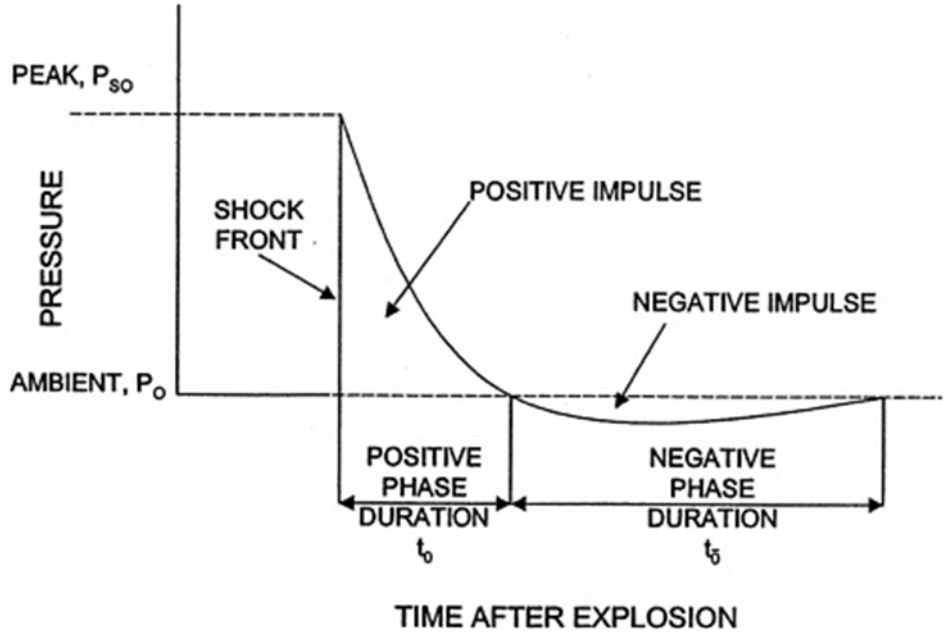


Figure H-9: Impulse Shown as a Function of Pressure over Duration at a Specific Location

The peak pressure experienced by a receptor (i.e., an animal) is a function of the explosive material, the net explosive weight, and the distance from the charge. Net explosive weight is a way to classify and compare quantities of different explosive compounds. The net explosive weight for a charge is the energetic equivalent weight of trinitrotoluene (TNT). In general, shock wave effects near an explosive charge increase in proportion to the cube root of the explosive weight (Young, 1991). For example, shock wave impacts will double when the explosive charge weight is increased by a factor of eight (i.e., cube root of eight equals two). This relationship is known as the similarity principle, and the corresponding similitude equations allow for prediction of various explosive metrics for a given charge weight and material.

The similitude equations allow for a simple prediction of peak pressure in a uniform free field environment, and sources are provided below for using these equations for estimating explosive effects in air and in water. However, at longer distances or in more complex environments with boundaries and variations in the propagation medium, explosive propagation modeling is preferred.

H.5.1 Explosions in Air

Explosions in air produce an initial blast front that propagates away from the detonation. When pressure waves from an explosion in air meet the water surface, the pressure wave can be transmitted across the air-water boundary and reflected off the water surface. When pressure waves in air meet the water at a perpendicular angle (e.g., straight down from an in-air source to a flat water surface), the sound waves are both transmitted directly across the water surface in the same direction of travel and reflected 180° back toward the original direction of travel. For acoustic waves, this can create a localized condition at the water surface where the incident and reflected waves sum, doubling the in-air overpressure (+ 6 dB). For shock waves with high incident pressures travelling at supersonic speeds, the reflection from the water surface depends on the angle of incidence and the speed of the shock wave,

and the reflected shock wave pressure can be greater than the incident shock wave pressure (Kinney & Graham, 1985; U.S. Department of the Navy, 1975).

In certain explosive geometries, depending on the size of the explosive and its height of detonation, a combined shock wave, called a Mach stem, can be created by the summing of the direct and reflected shock waves at larger angles of incidence (Kinney & Graham, 1985). In instances where this specific geometry does not occur, only the direct path wave is experienced because there is no surface reflection (waves are parallel to or angled away from the water surface, such as would occur when an explosive is detonated at the water surface), or separate direct and reflected pressure waves may be experienced.

H.5.1.1 Fragmentation

Missiles, rockets, projectiles, and other cased weapons will produce casing fragments upon detonation. These fragments may be of variable size and are ejected at supersonic speed from the detonation. The casing fragments will be ejected at velocities much greater than debris from any target due to the proximity of the casing to the explosive material. Unlike detonations on land targets, detonations during Navy training and testing would not result in other propelled materials such as crater debris.

Fragment density can be simply assumed to follow an inverse-square law with distance, in which the possibility of fragment strike is reduced by the square of the distance from the original detonation point. The forces of gravity and drag will further reduce the likelihood of strike with increasing distance than is accounted for in the inverse-square relationship (Zaker, 1975). The possible area of strike risk at any given distance from the detonation point is limited to the surface area of produced fragments, with drag and gravity reducing the number of produced fragments that travel to greater distances.

H.5.2 Explosions in Water

At the instant of explosion underwater, gas byproducts are generated at high pressure and temperature, creating a bubble. The heat causes a certain amount of water to vaporize, adding to the volume of the bubble. This action immediately begins to force the water in contact with the blast front in an outward direction, creating an intense, supersonic pressure shock wave. As the high-pressure wave travels away from the source, it slows to the speed of sound and acts like an acoustic wave similar to other impulsive sources that lack a strong shock wave (e.g., air guns). Explosions have the greatest amount of energy in lower frequencies below 500 Hz, although energy is present in frequencies exceeding 10 kHz (Urick, 1983). The higher frequency components exhibit more attenuation with distance due to absorption (see Section H.3.3.2, Absorption).

The shock wave caused by an explosion in deeper water may be followed by several bubble pulses in which the explosive byproduct gases expand and contract, with correlated high and low pressure oscillations. These bubble pulses lack the steep pressure front of the initial explosive pulse, but the first bubble pulse may still contribute to the total energy released at frequencies below 100 Hz (Urick, 1983). Subsequent bubble pulses contribute little to the total energy released during the explosion (Urick, 1983). If the detonation occurs at or just below the surface, a portion of the explosive power is released into the air and a pulsating gas bubble is not formed.

The pressure waves from an explosive can constructively add or destructively cancel each other in ocean environments with multi-path propagation, as described for acoustic waves in Section H.3.3.3 (Refraction) and Section H.3.3.4 (Reflection and Multipath Propagation). The received impulse is affected by the depth of the charge and the depth of the receiving animal. Pressure waves from the

detonation may travel directly to the receiver or be reflected off the water surface before arriving at the receiver. If a charge is detonated closer to the surface or if an animal is closer to the surface, the time between the initial direct path arrival and the following surface-reflected tension wave arrival is reduced, resulting in a steep negative pressure cut-off of the initial direct path positive impulse exposure. Two animals at similar distances from a charge, therefore, may experience the same peak pressure but different levels of impulse at different depths.

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Appendix I: Geographic Mitigation Assessment

Supplemental Environmental Impact Statement/ Overseas Environmental Impact Statement Mariana Islands Training and Testing

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Appendix I Geographic Mitigation Assessment

I.1 Introduction

As described in Chapter 5 (Mitigation), the United States (U.S.) Department of the Navy (Navy) will implement at-sea procedural mitigation, at-sea geographic mitigation, and terrestrial mitigation to avoid or reduce potential impacts on environmental and cultural resources from training and testing activities proposed in the Mariana Islands Training and Testing (MITT) Supplemental Environmental Impact Statement (SEIS)/Overseas Environmental Impact Statement (OEIS) Proposed Action. The purpose of this appendix is to present an assessment of the potential geographic mitigation (i.e., mitigation implemented seasonally or year round within defined at-sea mitigation areas) that the Navy considered to reduce or avoid impacts on marine mammals and sea turtles in the Study Area. The goals of developing geographic mitigation in this appendix are (1) in combination with procedural mitigation, to effect the least practicable adverse impact on marine mammal species or stocks and their habitat, and (2) to ensure that the Proposed Action does not jeopardize the continued existence of endangered or threatened species.

This appendix includes background information on the areas that the Navy is proposing as geographic mitigation areas, information on the marine mammals and sea turtles known to occur in each area, and an assessment of the effectiveness and practicality of implementing mitigation. A summary of the mitigation areas that the Navy proposes to implement under Alternative 1 or Alternative 2 (Preferred Alternative) of the Proposed Action as a result of the assessments presented in this appendix is also included in Section 5.4 (At-Sea Mitigation Areas to be Implemented). The Navy will work collaboratively with the appropriate regulatory agencies to finalize its mitigation areas through the consultation and permitting processes and will coordinate with the National Marine Fisheries Service (NMFS) to finalize the geographic mitigation analyzed in this appendix. Final mitigation measures will be documented in the Navy Record of Decision, NMFS Marine Mammal Protection Act (MMPA) Final Rule and Letter of Authorization, and the Endangered Species Act (ESA) Biological Opinions as applicable.

I.2 Geographic Mitigation Development Process

See Chapter 5 (Mitigation) for general information on the Navy's mitigation development process, including definitions of mitigation terminology, background information pertinent to the overall process, and information about the mitigation effectiveness and practicality criteria. This section presents information specific to assessing and developing geographic mitigation for marine mammals and sea turtles in the Study Area.

The Navy considered areas suggested by the public, governmental agencies, and non-governmental organizations during the public involvement process. The Navy also considered additional areas that were informed by Navy-funded studies.

NMFS has not identified Biologically Important Areas for marine mammals in the MITT Study Area (Ferguson et al., 2015b; Van Parijs et al., 2015). Data informing geographic mitigation area development and assessment included the operational information described in Section 5.2.4 (Practicality of Implementation), the best available science discussed in Chapter 3 (Affected Environment and Environmental Consequences), published literature, and marine species monitoring and density data. The Navy operational community (i.e., the aviation, surface, subsurface, and special warfare communities; the research and acquisition community; and training and testing experts), environmental planners, and scientific experts provided input on the effectiveness and practicality of mitigation.

The Navy used a comprehensive qualitative method to analyze potential geographic mitigation that considered a biological assessment of how a potential time and area limitation on Navy activities would benefit the species or stock and its habitat (e.g., Does a certain area support important biological functions? Would mitigation in that area result in an avoidance or reduction of impacts?) in the context of the stressors of concern in the specific area, and an operational assessment of the practicality of implementation (e.g., including an assessment of the specific importance of that area for training and testing).

I.2.1 Identification by the Navy of Areas to Consider for Potential Geographic Mitigation

Navy scientists derived the geographic boundaries and applicable timeframes (i.e., seasonal or year round) for potential areas based on a review of the best available science. The Navy evaluated marine mammal and sea turtle sighting and satellite tag data to identify locations where species appeared to concentrate, the timeframes of apparent concentrations, and documented behaviors from available reports and publications (Ampela et al., 2014; Fulling et al., 2011; Hill et al., 2015a; Hill et al., 2014; Hill et al., 2015b; Hill et al., 2016a; Hill et al., 2016b; Hill et al., 2017a; Hill et al., 2017b; Hill et al., 2018a; Hill et al., 2018b; Hill et al., 2018c; Hill et al., 2019; Hill et al., 2020; Jones & Van Houtan, 2014a; Jones & Van Houtan, 2014b; Jones et al., 2015; Jones & Martin, 2016; Klinck et al., 2015; Klinck et al., 2016; Ligon et al., 2011; Martien et al., 2014; Martin & Jones, 2016; Martin et al., 2018, 2019; Munger et al., 2014; Munger et al., 2015; National Marine Fisheries Service, 2018, 2019; Nieukirk et al., 2016; Norris et al., 2015; Norris et al., 2014; Norris et al., 2017; Oleson et al., 2015; Summers et al., 2017; Summers et al., 2018; Tetra Tech Inc., 2014; U.S. Department of the Navy, 2013, 2018a; Uyeyama, 2014; Yack et al., 2016). Initially, area boundaries were drawn generally with straight lines and simple shapes, with the goal that these areas would be relatively easy for operators to plot if they were carried forward for implementation. Based on additional sighting data received after publication of the Draft SEIS/OEIS and comments received on the Draft SEIS/OEIS, water depth was incorporated to redefine or partially redefine area boundaries, as discussed in detail below (National Marine Fisheries Service, 2019).

The Navy named each area considered according to a nearby geographic feature. A list of the areas identified by the Navy as potential mitigation areas and their applicable resource protection focus and timeframe is provided in Table I-1. A map showing the location of each area identified as a potential mitigation area is shown in Figure I-1.

Table I-1: Navy-Identified Potential Geographic Mitigation Areas

Habitat Considered	*Protection Focus*	*Applicable Timeframe*
Marpi Reef Area	Humpback whales	Seasonal (December–April)
	Marine mammals	Year round
Chalan Kanoa Reef Area	Humpback whales	Seasonal (December–April)
	Marine mammals and sea turtles	Year round
Agat Bay Nearshore Area	Spinner dolphins and sea turtles	Year round
North Guam Offshore Area[1]	Marine mammals	Year round
Ritidian Point Offshore Area[1]	Marine mammals	Year round
Tumon Bay Offshore Area[1]	Marine mammals	Year round

[1]The Navy reviewed the area and determined that it did not meet the Navy's criteria as a key area of biological importance for marine mammals or sea turtles. While sightings and transits of the area by some species were noted in review of available scientific research, there is currently no information on specific uses for biologically important life processes beyond normal species broad area occurrence (e.g., the area is not an exclusive feeding area, migration route, or breeding location).

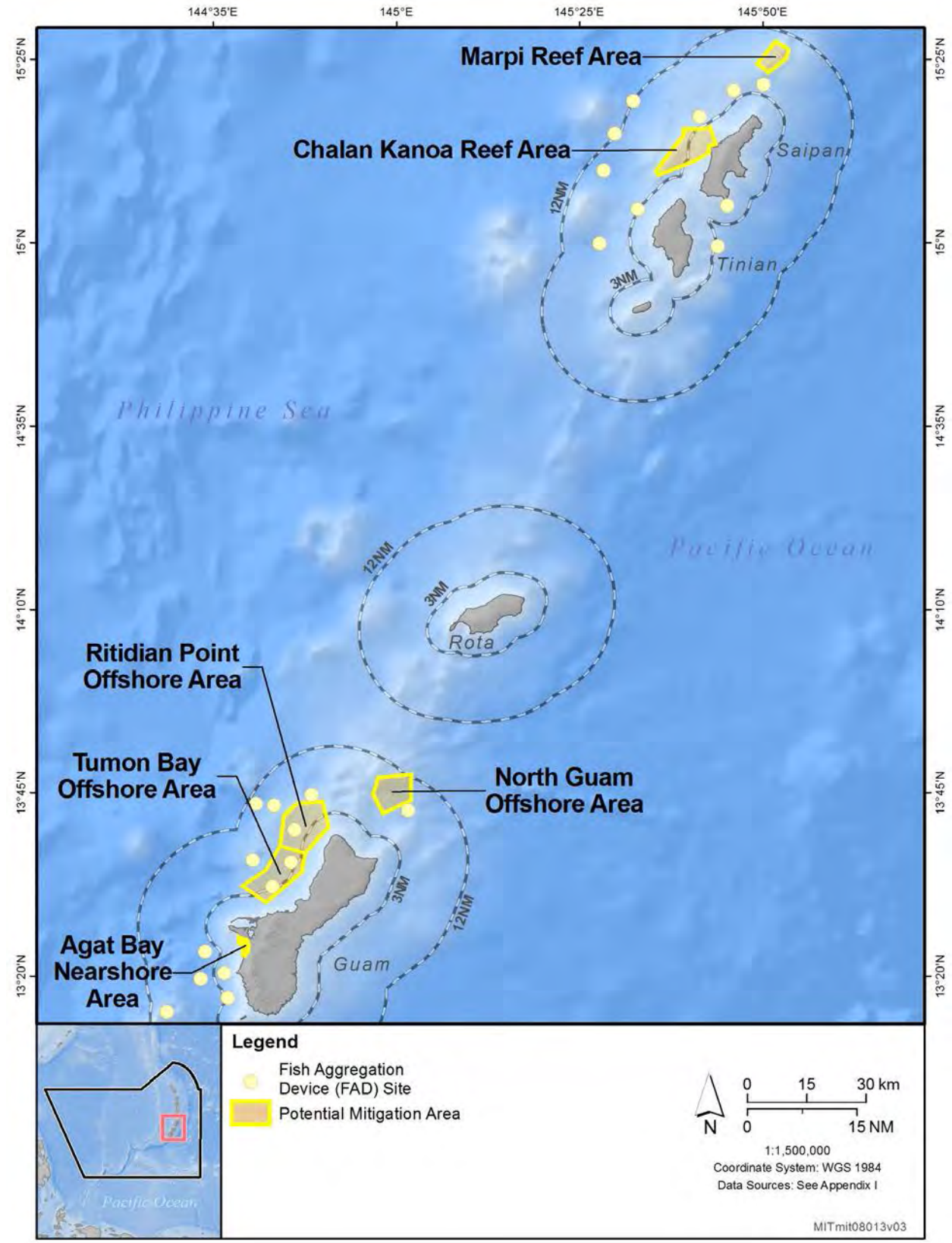

Figure I-1: Navy-Identified Potential Geographic Mitigation Areas

I.2.2 Assessing Mitigation Effectiveness

The first step in assessing the potential geographic mitigation areas was to use the best available science to determine if implementing geographic mitigation would effectively help the Navy avoid or reduce potential impacts associated with the Proposed Action on marine mammals or sea turtles. This appendix focuses on avoiding or reducing potential impacts from the stressors that have the highest potential for injurious impacts on marine mammals and sea turtles. Therefore, the Navy focused its assessment on hull-mounted mid-frequency active sonar and in-water explosives. The Navy considered a geographic mitigation area to be biologically effective if it met the following criteria:

- **The mitigation area is a key area of biological importance:** The best available science suggests that the mitigation area is particularly important to one or more species of marine mammals or sea turtles for a biologically important life process (e.g., foraging, migration, reproduction); and
- **The mitigation will result in an avoidance or reduction of impacts:** Implementing the mitigation will likely avoid or reduce potential impacts on species, stocks, or populations of marine mammals or sea turtles based on data describing their seasonal occurrence and distribution, spatial density, and behaviors in the Study Area. Furthermore, implementing the mitigation would not shift or transfer adverse impacts from one species to another (e.g., to a more vulnerable or sensitive species).

While this appendix focuses on marine mammals and sea turtles, geographic mitigation may provide potential benefits to other marine resources known to occur in each area, such as marine invertebrates and fishes. Additional information on the Navy's mitigation effectiveness criteria is presented in Section 5.2.2 (At-Sea Mitigation Area Development).

I.2.3 Assessing Practicality of Implementation

In the next step of the mitigation assessment process, the Navy operational community conducted an extensive and comprehensive analysis to determine how and to what degree the implementation of geographic mitigation areas would impact planning, scheduling, and conducting safe training and testing activities as described under the Proposed Action. Conducting the proposed training and testing activities is necessary for the Navy to fulfill its Title 10 requirements, ensuring naval forces are ready to execute the range of military operations required by operational Commanders. The Navy considered a mitigation measure to be practical to implement if it met all criteria discussed in Section 5.2.4 (Practicality of Implementation) for safety, sustainability, and mission requirements.

I.3 Geographic Mitigation Assessment – Areas Proposed for Implementation

The Navy determined that three of the six potential geographic mitigation areas met the criteria presented in Section I.2.2 (Assessing Mitigation Effectiveness) and Section I.2.3 (Assessing Practicality of Implementation). These three areas (Marpi Reef Geographic Mitigation Area, Chalan Kanoa Reef Geographic Mitigation Area, and Agat Bay Nearshore Geographic Mitigation Area) are the three mitigation areas proposed for implementation and described in detail in this appendix. The three other potential mitigation areas (Ritidian Point Offshore Area, Tumon Bay Offshore Area, and North Guam Offshore Area) considered in this appendix did not meet the Navy's criteria because, based on the available data, the areas are not key areas of biological importance for any marine mammal or sea turtle species (i.e., there is no documented evidence of exclusive use for calving, feeding, breeding, or migration).

The following discussion of each of the three geographic mitigation areas includes a physical description of the area, details on how and why the area was identified, information on Navy training and testing activities potentially occurring in the area, and a mitigation assessment. The mitigation assessment uses information presented in Sections 3.4 (Marine Mammals) and 3.5 (Sea Turtles) to assess the effectiveness of geographic mitigation in reducing or avoiding impacts on these resources, and uses information presented in Chapter 2 (Description of Proposed Action and Alternatives) and Appendix A (Training and Testing Activities Descriptions) to assess practicality of implementation and impacts on the effectiveness of military readiness activities. The Navy considered both the potential benefit to resources and the practicality of implementing the mitigation when determining which areas to propose as geographic mitigation areas. Additional information on the three mitigation areas and the three potential mitigation areas is contained in the administrative record for this SEIS/OEIS.

I.3.1 Marpi Reef Geographic Mitigation Area

The Marpi Reef Geographic Mitigation Area is located approximately 11 kilometers (km) north of Saipan at its closest point and covers approximately 33 square kilometers (km^2). As shown in Figure I-2, this is an observed area of concentration and reproductive behavior for humpback whales based on sightings documented during a broad area line transect survey in 2007 (Fulling et al., 2011) and during non-systematic small boat surveys occurring from 2010 through spring of 2019 (HDR, 2011; HDR EOC, 2012; Hill et al., 2014; Hill et al., 2016b; Hill et al., 2017a; Hill et al., 2018b; Hill et al., 2018c; Hill et al., 2020; Ligon et al., 2011; National Marine Fisheries Service, 2019). Navy scientists reviewed these sighting data using a Geographic Information System, and a straight-line boundary was drawn to encompass the area of known concentration at Marpi Reef.

Based on additional data and comments received after publication of the Draft SEIS/OEIS, the straight-line boundary of the Marpi Reef Geographic Mitigation Area that had been presented in the Draft SEIS/OEIS was redefined as the 400 m isobath encompassing Marpi Reef (National Marine Fisheries Service, 2019). This updated Marpi Reef Geographic Mitigation Area encompasses sightings of humpback whale mother-calf pairs and whales exhibiting competitive behaviors associated with reproduction (Figure I-2). The depth range, extending to 400 m, is consistent with observations of mother-calf pairs and competitive behaviors at known humpback whale reproductive areas in Hawaii (Pack et al., 2017).

I.3.1.1 Resources within the Marpi Reef Geographic Mitigation Area

The Marpi Reef Geographic Mitigation Area was developed based on the seasonal presence of humpback whales; however, other biological resources have been observed or are expected to be present at Marpi Reef, including other marine mammals, sea turtles, invertebrates including corals, and fishes. Those resources are discussed in detail in the following sections of this SEIS/OEIS: Section 3.4 (Marine Mammals), Section 3.5 (Sea Turtles), Section 3.8 (Marine Invertebrates), and Section 3.9 (Fishes).

As shown in Table I-2, five marine mammal species have been documented in the Marpi Reef Geographic Mitigation Area either through sightings or satellite tag detections (Fulling et al., 2011; HDR, 2011; HDR EOC, 2012; Hill et al., 2014; Hill et al., 2016b; Hill et al., 2017a; Hill et al., 2018b; Hill et al., 2018c; Hill et al., 2020; Ligon et al., 2011). Species documented in the Marpi Reef Geographic Mitigation Area include humpback whale, spinner dolphin, bottlenose dolphin, short-finned pilot whale, and false killer whale. Sea turtles have not been reported in the Marpi Reef Geographic Mitigation Area.

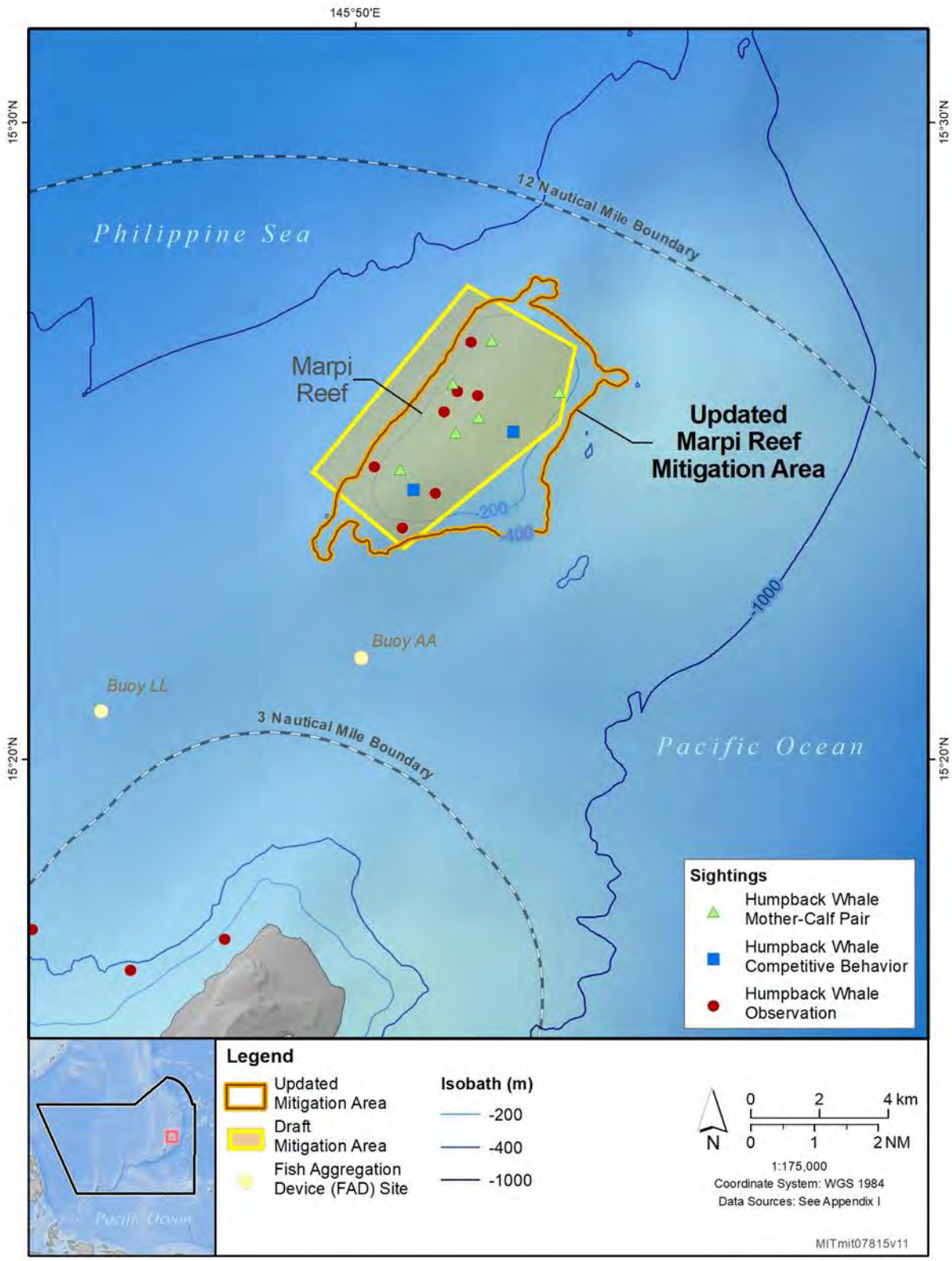

Figure I-2: Updated Marpi Reef Geographic Mitigation Area

Table I-2: Marine Mammals Documented Within the Marpi Reef Geographic Mitigation Area

Common Name	2007	2010	2011	2012	2013	2014	2016	2017	2018
Humpback whale	S						S	S	S
Spinner dolphin	S	S	S	S	S	S	S	S	S
Bottlenose dolphin					S+T			S	S
Short-finned pilot whale					S+T	S+T	S+T	S	
False killer whale					T				

Notes: S = One or more sightings during a survey in the area; T = one or more satellite tag detections; S+T = one or more sightings and satellite tag detections in a given year; empty cells indicate no documented occurrence of the species in the given year; years not shown indicate that no surveys were conducted in the area in that year.

I.3.1.1.1 Marine Mammals

I.3.1.1.1.1 Humpback Whales

While all species of marine mammals described in this SEIS/OEIS could occur at Marpi Reef, the Marpi Reef Geographic Mitigation Area was specifically developed to avoid or reduce potential impacts on seasonally present humpback whales engaged in reproductive behaviors (e.g., breeding, birthing, and nursing).

Humpback whales have been observed during four surveys in the vicinity of Saipan, in relatively small numbers, with multiple sightings documented within the Marpi Reef Geographic Mitigation Area (Fulling et al., 2011; Hill et al., 2015a; Hill et al., 2014; Hill et al., 2015b; Hill et al., 2016b; Hill et al., 2017a; Hill et al., 2018b; Oleson & Hill, 2010a).

Humpback whales have occasionally been observed seasonally during winter and spring (December-April) throughout the Mariana Islands by local fisherman, dive-tour operators, and during marine mammal surveys (Hill et al., 2015a; Hill et al., 2016a; U.S. Department of the Navy, 2005; Uyeyama, 2014). Humpback whales have been sighted during surveys in the vicinity of Saipan in the months of February and March (Fulling et al., 2011; Hill et al., 2015a; Hill et al., 2016b; Hill et al., 2017a; Hill et al., 2018b). It remains unclear if humpback whales are simply transiting through the Study Area or use portions of the Study Area as a wintering location (Hill et al., 2016a). Given the species' absence in the waters off Saipan, Tinian, and Guam during any of the surveys that occurred between February 2010 and April 2014 (Hill et al., 2015a), their seasonal presence may be variable in the Mariana Islands even in the vicinity of Marpi Reef.

In the 2007 survey of the region, there were eight humpback whales observed in the Marpi Reef Geographic Mitigation Area, but no calves were observed (Fulling et al., 2011). The next surveys to encounter humpback whales in the Mariana Islands occurred from February 26, 2015 to March 8, 2015, when four mother-calf pairs and four other individual humpback whales were observed at Chalan Kanoa Reef (Hill et al., 2015a; Hill et al., 2016b). During the subsequent NMFS Mariana Archipelago Cetacean Survey two months later (May 8 to June 6, 2015), survey transects sampling all the Mariana Islands out to 50 NM from shore detected no humpback whales visually or acoustically in the Mariana Islands (Hill et al., 2018c; Oleson, 2017). Humpback whales were observed at Marpi Reef again the following year.

Eight humpback whales were sighted on March 2, 2016, including two mother-calf pairs, and on March 10, 2016, six humpback whales were sighted, also including two mother-calf pairs (Hill et al., 2017a). At Marpi Reef in 2017, a total of 21 humpback whales were sighted over two days of effort, but no calves were observed (Hill et al., 2018b). For the broader area around Saipan, humpback whales were encountered in the 2017 surveys off Marpi Reef, Chalan Kanoa Reef, or off the northwest side of Saipan between the two reefs. Sightings included mother-calf pairs, one accompanied by an escort, and other humpbacks in competitive groups (Hill et al., 2018b). Humpback whales engaged in reproductive activities or in the company of calves are generally found at or near the surface and therefore more readily observable from survey vessels, so it is unlikely that humpbacks were present and were unobserved.

In 2007 and in all subsequent surveys, all age classes of humpbacks have been observed in the Mariana Islands, including calves (Fulling et al., 2011; Hill et al., 2015a; Hill et al., 2016a; Hill et al., 2018b; Hill et al., 2018c). These surveys have documented behaviors (e.g., escorting, competitive groups) consistent with known humpback whale reproductive activities in other locations (Gabriele et al., 2017; Pack et al., 2017; U.S. Department of Commerce et al., 2015), and in 2018 NMFS confirmed that the waters around Saipan are a newly identified “breeding location” for humpback whales (National Oceanic and Atmospheric Administration, 2018).

Based on a compendium of all observations, humpback whales have been sighted in the Study Area from January through March (Hill et al., 2018d; Hill et al., 2020; U.S. Department of the Navy, 2005; Uyeyama, 2014), and male humpback songs have been recorded from December through April (Hill et al., 2017a; Klinck et al., 2016; Munger et al., 2014; Norris et al., 2014; Oleson et al., 2015). Except for the potential presence of a few individual humpback whales at any time during the year or when migrating to or from summer feeding areas in the North Pacific, humpback whales will most likely occur in the vicinity of the Mariana Islands in relatively shallow waters during the December to April timeframe. For the purposes of establishing geographic mitigation and based on a conservative approach extending beyond the time periods for sightings in the Mariana Islands (Fulling et al., 2011; Hill et al., 2016a; Hill et al., 2017a; Hill et al., 2017b; Hill et al., 2018b; Hill et al., 2018c), humpback whales are assumed to be seasonally present from December through April in the Marpi Reef Geographic Mitigation Area.

I.3.1.1.1.2 Spinner Dolphins

In 2017, spinner dolphins were sighted at Marpi Reef in group sizes that ranged between 25 and 110 individuals (Hill et al., 2018b). Spinner dolphins have been the most commonly encountered marine mammal species in small boat surveys since 2010 (Hill et al., 2018b; Hill et al., 2018c). As shown in Table I-2, spinner dolphins have been sighted in every year that a survey of the Marpi Reef area has occurred, present in the months of at least February through September (Fulling et al., 2011; HDR, 2011; HDR EOC, 2012; Hill et al., 2014; Hill et al., 2016b; Hill et al., 2017a; Hill et al., 2018b; Ligon et al., 2011). Spinner dolphin behaviors observed most often at this location include milling or approaches to the survey boat to bow-ride (Hill et al., 2018b). The behaviors of these animals and their common occurrence throughout the Mariana Islands suggest that the Marpi Reef Geographic Mitigation Area is of no particular biological importance for this species.

I.3.1.1.1.3 Bottlenose Dolphins

Bottlenose dolphins were sighted in the Marpi Reef Geographic Mitigation Area in 2013, 2017, and 2018, in groups of two to eight individuals. A satellite tag was deployed on a bottlenose dolphin off

Aguijan in 2013, and that individual moved through the Marpi Reef Geographic Mitigation Area and continued north to waters south of Sarigan (Hill et al., 2014), which is a distance of approximately 200 km. This is consistent with findings from other bottlenose dolphin tagging efforts in the Mariana Islands (Hill et al., 2013b; Hill et al., 2014; Hill et al., 2015b; Hill et al., 2016b; Hill et al., 2017a; Hill et al., 2018b) indicating that bottlenose dolphins are wide-ranging across the Mariana Islands. During the 2017 encounter, it was noted the bottlenose dolphins were interacting with the humpback whales and short finned pilot whales that were also present at Marpi Reef (Hill et al., 2018b). The wide-ranging movements of these animals suggest that no specific islands or areas in the Mariana Islands are of any particular biological importance for this species.

I.3.1.1.1.4 Short-Finned Pilot Whales

Short-finned pilot whales were sighted and detected via satellite tag in the Marpi Reef Geographic Mitigation Area from 2013 through 2017 (Hill et al., 2013b; Hill et al., 2014; Hill et al., 2015b; Hill et al., 2016b; Hill et al., 2017a; Hill et al., 2018b). During the 2017 survey, a pod of approximately 35 short-finned pilot whales was observed interacting with bottlenose dolphins and humpback whales (Hill et al., 2018b). Satellite tag location data for short-finned pilot whales indicate that these animals also range widely across the Mariana Islands and that no specific islands or areas in the Mariana Islands are of any particular biological importance for this species.

I.3.1.1.1.5 False Killer Whales

False killer whales have not been sighted within the Marpi Reef Geographic Mitigation Area during any surveys. In 2013, satellite tags were deployed on four false killer whales off Rota in pods with a group size ranging from 15 to 17 individuals (Hill et al., 2013b). Only one of these four tagged individuals moved north and through the Marpi Reef Geographic Mitigation Area, but all four individuals traveled in excess of 200 NM from their initial tag detection locations off Rota (Hill et al., 2013b). The wide-ranging movements provided by these tag data indicate no particular islands or areas of importance for the species in the Mariana Islands.

I.3.1.1.2 Sea Turtles

Sea turtles could be present in the vicinity of the Marpi Reef area (Martin & Jones, 2016; Martin et al., 2016; Martin et al., 2018, 2019; U.S. Department of the Navy, 2018a). Sea turtles have not been sighted within the boundaries of the Marpi Reef Geographic Mitigation Area during any of the surveys conducted to date (HDR, 2011, 2012; HDR EOC, 2012; Hill et al., 2011; Hill et al., 2013a; Hill et al., 2014; Hill et al., 2015b; Hill et al., 2016b; Hill et al., 2017a; Hill et al., 2018b; Ligon et al., 2011; Martin et al., 2019; Oleson & Hill, 2010a) and have not transited through the area based on the satellite tag detections recorded since 2013 (Jones & Van Houtan, 2014b; Jones et al., 2015; Jones & Martin, 2016; Martin & Jones, 2016; Martin et al., 2016; Martin et al., 2018, 2019).

The available data indicate that the Marpi Reef Geographic Mitigation Area does not meet the Navy's criteria as a key area of biological importance for sea turtles.

I.3.1.2 Navy Training and Testing Activities – Marpi Reef Geographic Mitigation Area

The Marpi Reef Geographic Mitigation Area has historically been a low-use area for Navy training and testing activities. Explosive munitions have not been used in this area, nor has sonar use been reported in this area. However, transiting vessels could engage in training or testing activities within this area

using sonar or explosives while implementing procedural mitigation measures and following Standard Operating Procedures to ensure public safety.

I.3.1.3 Mitigation Assessment – Marpi Reef Geographic Mitigation Area

I.3.1.3.1 Biological Assessment – Marpi Reef

NMFS has concluded that the waters around Saipan are a newly identified "breeding location" for humpback whales (National Marine Fisheries Service, 2019; National Oceanic and Atmospheric Administration, 2018). Based on the non-systematic survey data described above indicating that humpback whales, including mother-calf pairs, are seasonally present on a non-annual basis in the Marpi Reef Geographic Mitigation Area, the area may be of biological importance to humpback whales for biologically important life processes associated with reproduction (e.g., breeding, birthing, and nursing) for part of the year. Marpi Reef is one of only two locations in the Study Area where reproductive activities have been repeatedly, although not always annually, observed. Additional data would help refine frequency of occurrence in terms of oceanographic variability, validate re-sightings of the same individuals as a percent of a humpback whale distinct population segment, and determine if actual residency time for mother-calf pairs at Marpi Reef is significant or not. This is different from others areas in the Pacific, such as Hawaii or the U.S. West Coast, where datasets of 30–40 years are available and where far larger numbers of animals engaged in biologically important life processes have been observed. However, in consideration of the scientific data that are available at this time for the Study Area the Navy considers that this area does meet its criteria as an area of biological importance for humpback whale reproductive behaviors. The data do not indicate that the Marpi Reef Geographic Mitigation Area is of any particular importance for other marine mammal species that may occur there.

As detailed in Section 3.4.2 (Environmental Consequences) of this SEIS/OEIS and based on the discussion above, the proposed Navy training and testing activities described in Chapter 2 (Description of Proposed Action and Alternatives) and Appendix A (Training and Testing Activities Descriptions) are not expected to result in long-term consequences to any marine species present in the Marpi Reef Geographic Mitigation Area. Geographic mitigation limiting training and testing activities would likely reduce or avoid potential impacts on marine mammals present in the Marpi Reef Geographic Mitigation Area in the event that naval forces conduct training or testing activities using hull-mounted mid-frequency active sonar or in-water explosives.

I.3.1.3.2 Practicality of Geographic Mitigation – Marpi Reef Geographic Mitigation Area

Access to a variety of bathymetric features, including shallow areas, is critical to support realistic Anti-Submarine Warfare training and testing activities using sonar. Areas with shallow depths are limited in the Mariana Archipelago; therefore, the Navy has determined that it would be imprudent to limit the use of sonar at the Marpi Reef Geographic Mitigation Area.

The Navy has access to established, nearshore training and testing areas for the use of explosive munitions; therefore, the Navy has determined that it would be practical to avoid using explosives in the Marpi Reef Geographic Mitigation Area.

I.3.1.3.3 Summary – Marpi Reef Geographic Mitigation Area

As a result of the assessment of the Marpi Reef Geographic Mitigation Area, the Navy is proposing to implement geographic mitigation, limit surface ship hull-mounted MF1 mid-frequency active sonar hours, and to report sonar use as described in Table I-3. Geographic mitigation would reduce or avoid impacts on any marine mammals or sea turtles present in the event mission requirements necessitate

using active sonar while conducting a training or testing activity. Given that Marpi Reef is an area for humpback whale reproductive behaviors, the Navy has limited MF1 sonar hours from 1 December to 30 April and developed special reporting requirements, similar to those employed in the Hawaiian Humpback Whale Sanctuary, specifically for the use of MF1 sonar, which will aid the Navy and NMFS in continuing to analyze potential impacts of training and testing in this area. The Navy must retain its ability to conduct active sonar in the limited shallow, nearshore waters of the MITT Study Area, including Marpi Reef, to ensure vessels can meet training and testing requirements for MF1 surface ship hull-mounted mid-frequency active sonar. The Navy must have the capability to train and test in a shallow water environment to accommodate future advances in sonar technology and anti-submarine warfare tactics.

Based on current operational projections and the availability of other similar, suitable training and testing locations in the Study Area, the Navy has determined that it would be practical to avoid using explosives in the Marpi Reef Geographic Mitigation Area year round under the Proposed Action. Such geographic mitigation would ensure that marine mammals are not exposed to explosives in this area, which is thought to be particularly important for humpback whale reproductive behaviors.

Table I-3: Mitigation Within the Marpi Reef Geographic Mitigation Area

Mitigation Area Description
Stressor or Activity • Surface ship hull-mounted mid-frequency active sonar (bin MF1) • In-water explosives
Identified Resource Protection Focus • Humpback whales; seasonally present (December – April) • Marine mammals; potentially present year round
Mitigation Area Requirements[1] • The Navy will conduct a maximum combined total of 20 hours of surface ship hull-mounted MF1 mid-frequency active sonar during training and testing from 1 December to 30 April within the Marpi Reef Mitigation Area and Chalan Kanoa Reef Mitigation Area. The Navy will report the total hours of active sonar (all bins, by bin) used in the Marpi Reef Mitigation Area and Chalan Kanoa Reef Mitigation Area from 1 December to 30 April in its annual training and testing activity reports submitted to NMFS. Should national security present a requirement to use surface ships hull-mounted MF-1 mid-frequency active sonar between 1 December to 30 April, the Navy will provide NMFS with advance notification of the activity. • The Navy will not use in-water explosives in the Marpi Reef Mitigation Area year-round. • The Navy will issue an annual seasonal awareness notification message to alert ships and aircraft operating in the Marpi Reef Mitigation Area to the possible presence of increased concentrations of humpback whales from 1 December through 30 April. To maintain safety of navigation and to avoid interactions with large whales during transits, the Navy will instruct vessels to remain vigilant to the presence of humpback whales, that when concentrated seasonally, may become vulnerable to vessel strikes. Platforms will use the information from the awareness notification messages to assist their visual observation of applicable mitigation zones during training and testing activities and to aid in the implementation of procedural mitigation.

[1] *Should* national security present a requirement to conduct training or testing prohibited by the mitigation requirements specified in this table, naval units will obtain permission from the appropriate designated Command authority prior to commencement of the activity. The Navy will provide NMFS with advance notification and include relevant information (e.g., sonar hours, explosives use) in its annual activity reports submitted to NMFS.

I.3.2 Chalan Kanoa Reef Geographic Mitigation Area

The Chalan Kanoa Reef[1] includes exposed fringing reef, reef flats exposed at low tide, nearshore shallow waters (less than 20 meters in depth), and a portion of Saipan Harbor. The area extends about 0.4 to approximately 12 km off the west coast of Saipan and covers approximately 102 km^2, as shown in Figure I-3. This area was developed to encompass the relative concentration of total marine mammal sightings and tag detections as observed and documented between 2007 and 2018, which included seasonal (in February and March) humpback whale sightings documented during non-systematic small boat surveys occurring in 2015 through March 2018 (Fulling et al., 2011; Hill et al., 2014; Hill et al., 2015b; Hill et al., 2016b; Hill et al., 2017a; Hill et al., 2018b; Hill et al., 2018c; Hill et al., 2020; Oleson & Hill, 2010a). Navy scientists reviewed the locations of sightings and tag detections using a Geographic Information System, and delineated a straight-line boundary to encompass the area of highest concentration at Chalan Kanoa Reef with a particular emphasis on including humpback whale sightings. As with the Marpi Reef Geographic Mitigation Area, based on additional data and comments received after publication of the Draft SEIS/OEIS, the boundary of the Chalan Kanoa Reef Geographic Mitigation Area was partially redefined using water depth; the offshore boundary of the mitigation area follows the 400 m isobath (National Marine Fisheries Service, 2019). The 400 m isobath was chosen as the boundary because all mother-calf pairs and all males exhibiting reproductive behaviors sighted during surveys occurred within it. The depth range, extending to 400 m, is consistent with observations of mother-calf pairs and competitive behaviors at known humpback whale reproductive areas in Hawaii (Pack et al., 2017).

I.3.2.1 Resources within the Chalan Kanoa Reef Geographic Mitigation Area

The Chalan Kanoa Reef Geographic Mitigation Area was developed based on the seasonal presence of humpback whales, observed behaviors associated with reproduction, and sightings and tag detections of other marine mammals and sea turtles. Other biological resources have been observed or are expected to be present at Chalan Kanoa Reef, including corals, other invertebrates, and fishes. These resources are discussed in detail in the following sections of this SEIS/OEIS: Section 3.4 (Marine Mammals), Section 3.5 (Sea Turtles), Section 3.8 (Marine Invertebrates), and Section 3.9 (Fishes). Seven marine mammal species have been sighted or detected via satellite tag in the area: humpback whale, spinner dolphin, bottlenose dolphin, short-finned pilot whale, false killer whale, rough-toothed dolphin, and pygmy killer whale (Table I-4). Sea turtles have also been sighted in the Chalan Kanoa Reef Geographic Mitigation Area, but not all observations identified the specific species. Based on sea turtle surveys conducted throughout the Mariana Islands, the most likely species observed were green sea turtles and hawksbill sea turtles (Hill et al., 2018b; Hill et al., 2019; Martin et al., 2016; Martin et al., 2019; U.S. Department of the Navy, 2014b).

[1] Chalan Kanoa Reef is also known as “CK Reef,” “Double Reef,” or “6-Mile Reef” (Hill et al., 2015a).

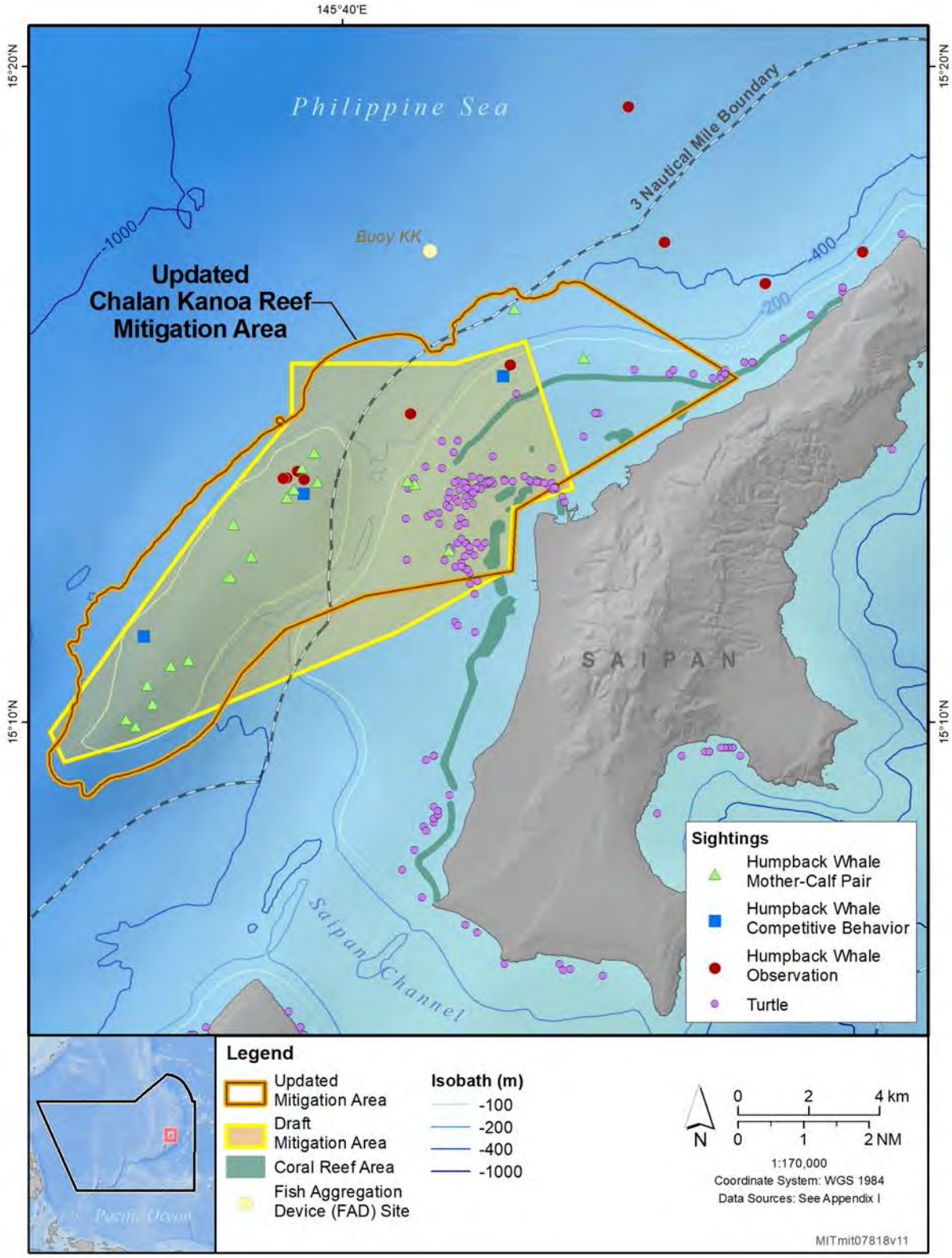

Figure I-3: Updated Chalan Kanoa Reef Geographic Mitigation Area

Table I-4: Marine Mammals and Sea Turtles Documented Within the Chalan Kanoa Reef Geographic Mitigation Area

Common Name	2010	2011	2012	2013	2014	2015	2016	2017	2018
Humpback whale						S	S	S	S
Spinner dolphin	S		S	S	S		S	S	S
Bottlenose dolphin				S+T	S+T	S		S	
Short-finned pilot whale				T	T		T		
False killer whale				T					
Rough-toothed dolphin				S+T					S
Pygmy killer whale						S			
Sea Turtle			S	S				S	S

Notes: S = One or more sightings during a survey in the area; T = one or more satellite tag detections; S+T = one or more sightings and satellite tag detections in a given year; empty cells indicate no documented occurrence of the species in the given year; years not shown indicate that no surveys were conducted in the area in that year.

I.3.2.1.1 Marine Mammals

Surveys and satellite tag data have documented the presence of seven marine mammal species in the Chalan Kanoa Reef Geographic Mitigation Area (Fulling et al., 2011; Hill et al., 2015a; Hill et al., 2014; Hill et al., 2015b; Hill et al., 2016b; Hill et al., 2017a; Hill et al., 2018b; Hill et al., 2019; Oleson & Hill, 2010a). However, the Navy assumes all species of marine mammals known to occur in the Mariana Islands could potentially be present, if only briefly, in the offshore portion of the Chalan Kanoa Reef Geographic Mitigation Area, because sighting and tagging data show multiple species have transited through or near the area (Hill et al., 2013b; Hill et al., 2015b; Hill et al., 2018b; Hill et al., 2019). It is unlikely marine mammals other than spinner dolphins would be present in the shallow waters landward of the fringing reef, in Saipan Harbor, or the channel leading to the harbor. Spinner dolphins have been sighted within these inshore areas, likely using them as resting areas, consistent with behavior documented in similar habitats (Hill et al., 2015b; Hill et al., 2017a; Hill et al., 2018b).

I.3.2.1.1.1 Humpback Whales

Humpback whales have been observed during four surveys in the vicinity of Saipan in relatively small numbers, and multiple sightings have been documented within the Chalan Kanoa Reef Geographic Mitigation Area in 2015 and 2017 (Fulling et al., 2011; Hill et al., 2015a; Hill et al., 2014; Hill et al., 2015b; Hill et al., 2016b; Hill et al., 2017a; Hill et al., 2018b; Oleson & Hill, 2010a). Four encounters with humpback whales during surveys in the vicinity of Saipan occurred in February and March (Fulling et al., 2011; Hill et al., 2015a; Hill et al., 2016b; Hill et al., 2017a; Hill et al., 2018b). Hill et al. (2016b; 2017b) proposed that humpback whales use the Mariana Islands as a wintering location, but given the species'

absence during surveys in the waters off Saipan, Tinian, and Guam in February 2010 and in April 2014 (Hill et al., 2015a), their seasonal presence may be variable in the Mariana Islands.

In 2015, during small boat surveys conducted over a nine-day period, a total of 12 humpback whales were encountered in the Chalan Kanoa Reef Geographic Mitigation Area, including four mother-calf pairs (Hill et al., 2015a). In 2016, two humpbacks, a single mother-calf pair, were sighted in the area. The mother that was detected and photographed in 2007 at Marpi Reef (Fulling et al., 2011) was identified in the Chalan Kanoa Reef Geographic Mitigation Area in 2016 by matching patterns observed on her flukes with those in the photographs (Hill et al., 2016b). In a 2017 survey, nine humpback whales, including two mother-calf pairs, were documented during three encounters in the Chalan Kanoa Reef Geographic Mitigation Area (Hill et al., 2018b). Three of the nine whales had been identified during previous surveys in the vicinity of the Chalan Kanoa Reef (Hill et al., 2018b). As detailed in the discussion of the Marpi Reef Geographic Mitigation Area (Section I.3.1.1.1.1, Humpback Whales), NMFS has confirmed that the waters around Saipan are a newly identified breeding location for humpback whales (National Oceanic and Atmospheric Administration, 2018). For purposes of geographic mitigation and based on a conservative approach exceeding the time periods for sightings in the Mariana Islands (Fulling et al., 2011; Hill et al., 2015a; Hill et al., 2014; Hill et al., 2015b; Hill et al., 2016b; Hill et al., 2017a; Hill et al., 2018b; Oleson & Hill, 2010a), humpback whales are assumed to be seasonally present from December through April in the Chalan Kanoa Reef Geographic Mitigation Area.

I.3.2.1.1.2 Spinner Dolphins

Spinner dolphins are the most commonly encountered species in small boat surveys and have been sighted in the Chalan Kanoa Reef Geographic Mitigation Area during every survey that has been conducted in the area, except during the winters of 2011 and 2015 (HDR EOC, 2012; Hill et al., 2011; Hill et al., 2013a; Hill et al., 2014; Hill et al., 2015b; Hill et al., 2016b; Hill et al., 2017a; Hill et al., 2018b; Hill et al., 2019). During small boat surveys, group sizes in the Chalan Kanoa Reef Geographic Mitigation Area have ranged from as few as four individuals in a pod to as many as 124 in the largest group observed. Milling behavior and slow travel were the most commonly observed behaviors and indicate spinner dolphin resting behavior, as documented in other locations (Tyne et al., 2015).

I.3.2.1.1.3 Bottlenose Dolphins

Small groups of bottlenose dolphins were routinely sighted in the years 2013, 2015, and 2017 in the Chalan Kanoa Reef Geographic Mitigation Area. In 2013, there were two sightings of bottlenose dolphins on the same day, a pod of three and a pod of six (Hill et al., 2013b). In 2015, a single individual was sighted in the area (Hill et al., 2016b). In February 2017, a pod of four bottlenose dolphins was sighted, and in May a pod of six was observed in the Chalan Kanoa Reef Geographic Mitigation Area (Hill et al., 2018b). Satellite tags on two bottlenose dolphins deployed in the Marpi Reef area during 2017 documented the extensive travel by these animals (and likely their accompanying pods). The animals traveled from within the Chalan Kanoa Reef Geographic Mitigation Area, south to waters off Tinian, north past Saipan to Marpi Reef, and then farther north with a final tag detection approximately 85 km west of Farallon de Medinilla (FDM) (Hill et al., 2018b). Although these satellite tracking data are limited, they indicate that the Chalan Kanoa Reef Geographic Mitigation Area is only a small portion of the range these tagged individuals (and their accompanying pods) use in the Study Area.

I.3.2.1.1.4 Short-Finned Pilot Whales

Short-finned pilot whales have not been visually sighted in the Chalan Kanoa Reef Geographic Mitigation Area. However, individuals initially tagged off Guam, Rota, and Tinian with satellite tags were detected within the Chalan Kanoa Reef Geographic Mitigation Area in 2013, 2014, and 2016. The animals ranged widely in the Mariana Islands from waters south of Guam and north to at least as far as FDM (a straight-line distance of at least 350 km) (Hill et al., 2013b; Hill et al., 2014; Hill et al., 2017a). Through 2017, there have been 17 satellite tags deployed on short-finned pilot whales in the Mariana Islands; these individuals were in groups ranging in size from 15 to 48 animals (Hill et al., 2013b; Hill et al., 2014; Hill et al., 2017a). Although tagged animals tended to remain closer to Guam than to any other islands in the Marianas, several were tracked transiting north to Rota. Similarly, several animals tagged off of Rota were previously sighted off Guam. The median distance from shore for the eight animals tagged and tracked in 2014 was 17.1 km, and the median depth was 1,184 m (Hill et al., 2015b; Hill et al., 2017a). The wide-ranging movements of these animals suggest that no specific islands or areas in the Mariana Islands are of any particular biological importance for this species.

I.3.2.1.1.5 False Killer Whales

False killer whales have not been sighted within the Chalan Kanoa Reef Geographic Mitigation Area during any surveys. In 2013, satellite tags were deployed on four false killer whales off Rota in groups ranging in size from 15 to 17 individuals (Hill et al., 2013b). Two of the four tagged animals moved north and through the Chalan Kanoa Reef Geographic Mitigation Area, and all four individuals traveled in excess of 200 NM from their initial tag detection locations off Rota (Hill et al., 2013b). The wide-ranging movements of these animals suggest that no specific islands or areas in the Mariana Islands are of any particular biological importance for this species.

I.3.2.1.1.6 Rough-Toothed Dolphins

In 2013, a pod of four rough-toothed dolphins was sighted in the Chalan Kanoa Reef Geographic Mitigation Area (Hill et al., 2013b). Five days prior to the sighting, a satellite tag was deployed on a rough-toothed dolphin in a group of six individuals off Aguijan (Hill et al., 2013b). The tagged animal moved north from the deployment location over an 11-day period and transited through the Chalan Kanoa Reef Geographic Mitigation Area to waters north of Saipan, at which point the transmissions ended. In total, the animal covered a distance of approximately 65 km. It is not known whether the tagged animal remained with the five other dolphins. The distance traveled by this individual, and possibly the group, coupled with the lack of other occurrence data, suggests that the Chalan Kanoa Reef Geographic Mitigation Area is not of any particular importance for rough-toothed dolphins in the Mariana Islands.

I.3.2.1.1.7 Pygmy Killer Whales

In March 2015, a pod of six pygmy killer whales was sighted in the Chalan Kanoa Reef Geographic Mitigation Area interacting with two adult humpback whales (Hill et al., 2016b). The only other sighting of pygmy killer whales in the vicinity of Saipan was a 2011 encounter with a pod of 11 approximately 2 NM from the Marpi Reef Geographic Mitigation Area (Hill et al., 2011). The limited sighting data from the surveys at the Chalan Kanoa Reef indicate that the Chalan Kanoa Reef Geographic Mitigation Area is not of any particular importance for pygmy killer whales in the Mariana Islands.

I.3.2.1.2 Sea Turtles

All species of sea turtles could be present in the Chalan Kanoa Reef Geographic Mitigation Area; although as discussed in Section 3.5 (Sea Turtles), the species most likely to be present are green sea turtles and hawksbill sea turtles, based on documented sightings the Mariana Islands (Martin & Jones, 2016; Martin et al., 2016; Martin et al., 2018, 2019; Summers et al., 2017; U.S. Department of the Navy, 2018b). Loggerhead and leatherback sea turtles are known to pass through the Study Area during migration, and olive ridley sea turtles are expected to be rare throughout the year in all waters in the Study Area (U.S. Department of the Navy, 2018).

Sea turtle sightings shown in Figure I-3 were recorded during surveys conducted in the vicinity of the Chalan Kanoa Reef (not necessarily within the boundaries of the Chalan Kanoa Reef Geographic Mitigation Area) from 2009 through the spring of 2018 (HDR, 2011, 2012; HDR EOC, 2012; Hill et al., 2011; Hill et al., 2013a; Hill et al., 2014; Hill et al., 2015b; Hill et al., 2016b; Hill et al., 2017a; Hill et al., 2018b; Hill et al., 2019; Jones & Martin, 2016; Ligon et al., 2011; Martin & Jones, 2016; Martin et al., 2016; Martin et al., 2018; Oleson & Hill, 2010a; Summers et al., 2017; U.S. Department of the Navy, 2018a). The concentration of sightings of sea turtles (almost certainly all green and hawksbill sea turtles) in nearshore waters of the Chalan Kanoa Reef (Figure I-3) demonstrates that the area, including portions of the Chalan Kanoa Reef Geographic Mitigation Area, is used by sea turtles; however, the reef is not the only location where sea turtles are known to concentrate off Saipan. Summers et al. (2017) assessed population demographics and habitat-use for green and hawksbill sea turtles off Tinian, Saipan, and Rota using a mark-recapture study. They captured 493 green and 36 hawksbill turtles between August 2006 and February 2014 and noted long-term residency and high site fidelity among both species at the locations surveyed. Refer to Section 3.5 (Sea Turtles) and the Navy Marine Species Density Database Technical Report for the MITT Study Area (U.S. Department of the Navy, 2018a) for additional information regarding the general distribution of sea turtles in the Study Area, including in the vicinity of the Chalan Kanoa Reef Geographic Mitigation Area.

I.3.2.2 Navy Training and Testing Activities – Chalan Kanoa Reef

The Chalan Kanoa Reef has historically been a low-use area for Navy training and testing activities. Explosive munitions have not been used in this area, nor has sonar use been reported in this area. However, transiting vessels could engage in training or testing activities within this area using sonar or explosives while implementing procedural mitigation measures and following Standard Operating Procedures to ensure public safety.

I.3.2.3 Mitigation Assessment – Chalan Kanoa Reef Geographic Mitigation Area

I.3.2.3.1 Biological Assessment – Chalan Kanoa Reef

Based on sea turtle sightings in the area, the Navy assumes that sea turtles may use the Chalan Kanoa Reef Geographic Mitigation Area for foraging; however, the available data (Martin & Jones, 2016; Martin et al., 2016; Martin et al., 2018, 2019; Summers et al., 2017; U.S. Department of the Navy, 2018b) do not indicate that the Chalan Kanoa Reef Geographic Mitigation Area is a key area of biological importance for sea turtles. There is currently no information on specific uses of the area for a biologically important life process beyond species normal occurrence (e.g., the area is not an exclusive feeding area, migration route, or breeding location).

NMFS has concluded that the waters around Saipan are a newly identified “breeding location” for humpback whales (National Oceanic and Atmospheric Administration, 2018). Based on the

non-systematic survey data described above indicating that humpback whales, including mother-calf pairs, are seasonally present in the Chalan Kanoa Reef area, the reef may be important to humpback whales for biologically important life processes associated with reproduction (e.g., birthing, nursing, and breeding) for part of the year. Chalan Kanoa Reef is one of only two locations in the study area where reproductive activities have been repeatedly, although not always annually, observed. Additional data would help refine frequency of occurrence in terms of oceanographic variability, validate re-sightings of the same individuals as a percent of a humpback whale distinct population segment, and determine if actual residency time for mother-calf pairs at Chalan Kanoa Reef is significant or not. This is different from others areas in the Pacific such as Hawaii or the U.S. West Coast, where datasets of 30–40 years are available and where far larger number of animals engaged in biologically important life process have been observed. However, in consideration of the scientific data that is available at this time for the MITT study area and in order to be conservative to the resource (i.e., over-protective), the Navy considers this area does meet its criteria as an area of biological importance for humpback whale reproductive behaviors. The data do not indicate that the Chalan Kanoa Reef Geographic Mitigation Area is of any particular importance for other marine mammal species that may occur there.

As detailed in Section 3.4.2 (Environmental Consequences) of this SEIS/OEIS and based on the discussion above, the proposed Navy training and testing activities as described in Chapter 2 (Description of Proposed Action and Alternatives) and Appendix A (Training and Testing Activities Descriptions) are not expected to result in long-term consequences to any marine resources present in the Chalan Kanoa Reef. Geographic mitigation would reduce or avoid impacts on any marine mammals present in the Chalan Kanoa Reef Geographic Mitigation Area in the event that naval forces conduct training or testing activities using hull-mounted mid-frequency active sonar or in-water explosives. While it was determined that the mitigation area did not meet the Navy's criteria as a key area of biological importance for sea turtles, this mitigation would also reduce or avoid impacts on any sea turtles present.

I.3.2.3.2 Practicality of Geographic Mitigation – Chalan Kanoa Reef

Access to a variety of bathymetric features, including shallow areas, is critical to support realistic Anti-Submarine Warfare training and testing activities using sonar. Areas with shallow depths are limited in the Mariana Archipelago; therefore, the Navy has determined that it would be imprudent to limit the use of sonar at the Chalan Kanoa Reef Geographic Mitigation Area.

The Navy has access to established, nearshore training and testing areas for the use of explosive munitions; therefore, the Navy has determined that it would be practical to avoid using explosives in the Chalan Kanoa Reef Geographic Mitigation Area.

I.3.2.3.3 Summary – Chalan Kanoa Reef

As a result of the assessment for the Chalan Kanoa Reef Geographic Mitigation Area, the Navy is proposing to implement the mitigation, limit surface ship hull-mounted MF1 mid-frequency active sonar hours, and reporting requirements described in Table I-5. Geographic mitigation would reduce or avoid impacts on any marine mammals or sea turtles present in the event mission requirements necessitate using active sonar while conducting a training or testing activity. Given that Chalan Kanoa Reef is an area for humpback whale reproductive behaviors, the Navy has limited MF1 sonar hours from 1 December to 30 April and developed special reporting requirements, similar to those employed in the Hawaiian Humpback Whale Sanctuary, specifically for the use of MF1 sonar, which will aid the Navy and NMFS in continuing to analyze potential impacts of training and testing in this area. The Navy must retain its

ability to conduct active sonar in the limited shallow, nearshore waters of the MITT Study Area, including Chalan Kanoa Reef, to ensure vessels can meet training and testing requirements for MF1 surface ship hull-mounted mid-frequency active sonar. The Navy must have the capability to train and test in a shallow water environment to accommodate future advances in sonar technology and anti-submarine warfare tactics.

Based on current operational projections and the availability of other similar, suitable training and testing locations in the Study Area, the Navy has determined that it would be practical to avoid using in-water explosives in the Chalan Kanoa Reef Geographic Mitigation Area year round under the Proposed Action. Such geographic mitigation would ensure that marine mammals are not exposed to explosives in this area, which is thought to be particularly important for humpback whale reproductive behaviors.

Table I-5: Mitigation Within the Chalan Kanoa Reef Geographic Mitigation Area

Mitigation Area Description
Stressor or Activity • Surface ship hull-mounted mid-frequency active sonar (bin MF1) • In-water explosives
Identified Resource Protection Focus • Humpback whales; seasonally present (December–April) • Marine mammals; potentially present year round • Sea turtles; present year round
Mitigation Area Requirements[1] • The Navy will conduct a maximum combined total of 20 hours of surface ship hull-mounted MF1 mid-frequency active sonar during training and testing from 1 December to 30 April within the Marpi Reef Mitigation Area and Chalan Kanoa Reef Mitigation Area. The Navy will report the total hours of active sonar (all bins, by bin) used in the Marpi Reef Mitigation Area and Chalan Kanoa Reef Mitigation Area from 1 December to 30 April in its annual training and testing activity reports submitted to NMFS. Should national security present a requirement to use MF1 surface ships hull-mounted mid-frequency active sonar between 1 December to 30 April, the Navy will provide NMFS with advance notification of the activity. • The Navy will not use in-water explosives in the Chalan Kanoa Reef Mitigation Area year-round. • The Navy will issue an annual seasonal awareness notification message to alert ships and aircraft operating in the Chalan Kanoa Reef Mitigation Area to the possible presence of increased concentrations of humpback whales from 1 December through 30 April. To maintain safety of navigation and to avoid interactions with large whales during transits, the Navy will instruct vessels to remain vigilant to the presence of humpback whales, that when concentrated seasonally, may become vulnerable to vessel strikes. Platforms will use the information from the awareness notification messages to assist their visual observation of applicable mitigation zones during training and testing activities and to aid in the implementation of procedural mitigation.

[1] *Should* national security present a requirement to conduct training or testing prohibited by the mitigation requirements specified in this table, naval units will obtain permission from the appropriate designated Command authority prior to commencement of the activity. The Navy will provide NMFS with advance notification and include relevant information (e.g., sonar hours, explosives use) in its annual activity reports submitted to NMFS.

I.3.3 Agat Bay Nearshore Geographic Mitigation Area

The Agat Bay Nearshore Geographic Mitigation Area (Figure I-4) encompasses the shoreline between Tipalao, Dadi Beach, and Agat on the west coast of Guam, with a boundary across the bay enclosing an area of approximately 5 km^2 in relatively shallow waters (less than 100 m) and extending out to 1.27 km from shore. The boundaries of the Agat Bay Nearshore Geographic Mitigation were defined by Navy scientists based on spinner dolphin sightings documented during small boat surveys from 2010 through 2018 (excluding 2016). Sea turtle sightings documented during surveys from 2007 through 2018 were also used to define the mitigation area (Fulling et al., 2011; HDR, 2011; HDR EOC, 2012; Hill et al., 2013a; Hill et al., 2014; Hill et al., 2015b; Hill et al., 2016b; Hill et al., 2017a; Hill et al., 2018b; Jones & Van Houtan, 2014b; Jones et al., 2015; Jones & Martin, 2016; Ligon et al., 2011; Martin & Jones, 2016; Martin et al., 2016; Martin et al., 2018, 2019; Oleson & Hill, 2010a).

I.3.3.1 Resources within Agat Bay Nearshore Geographic Mitigation Area

Biological resources within the Agat Bay Nearshore Geographic Mitigation Area include spinner dolphins, sea turtles, invertebrates including corals, and fishes. These resources and their occurrence in the Study Area are discussed in detail in this SEIS/OEIS in the following sections: Section 3.4 (Marine Mammals), Section 3.5 (Sea Turtles), Section 3.8 (Marine Invertebrates), and Section 3.9 (Fishes).

As shown in Table I-6, species documented as sighted or having a satellite tag detection[2] within the boundaries of the Agat Bay Nearshore Geographic Mitigation Area include spinner dolphin and sea turtles (as noted in the sections above, most likely green and hawksbill sea turtles).

Table I-6: Marine Mammals and Sea Turtles Documented Within the Agat Bay Nearshore Geographic Mitigation Area

Common Name	2010	2011	2012	2013	2014	2015	2017	2018
Spinner dolphin	S	S	S	S				S
Sea Turtle	S	S	S	S+T	S+T	S+T	S	S

Notes: S = One or more sightings during a survey in the area; T = one or more satellite tag detections; S+T = one or more sightings and satellite tag detections in a given year; empty cells indicate no documented occurrence of the species in the given year; years not shown indicate that no surveys were conducted in the area in that year.

[2] There was one instance during an 11.4 day period in 2016 where a satellite-tracked pantropical spotted dolphin had one reported position just within the outer boundary of the Agat Bay Nearshore Geographic Mitigation Area (Hill et al., 2017a). However, given the uncertainty in the reported position due to the limited precision (error range) of even high-quality Argos satellite fixes, and in particular the reduced longitudinal precision, associated with the polar orbits used by the Argos satellites (Boyd & Brightsmith, 2013; Vincent et al., 2002), the reported position does not sufficiently demonstrate that the animal was in the Agat Bay Nearshore Geographic Mitigation Area. Given the wide-ranging use of offshore waters by the same animal as demonstrated by the remainder of the detections over the 11-day tracking period, the track of the animal between subsequent positions, and the lack of precision for the locations, pantropical spotted dolphins are not expected to be present in the Agat Bay Nearshore Geographic Mitigation Area.

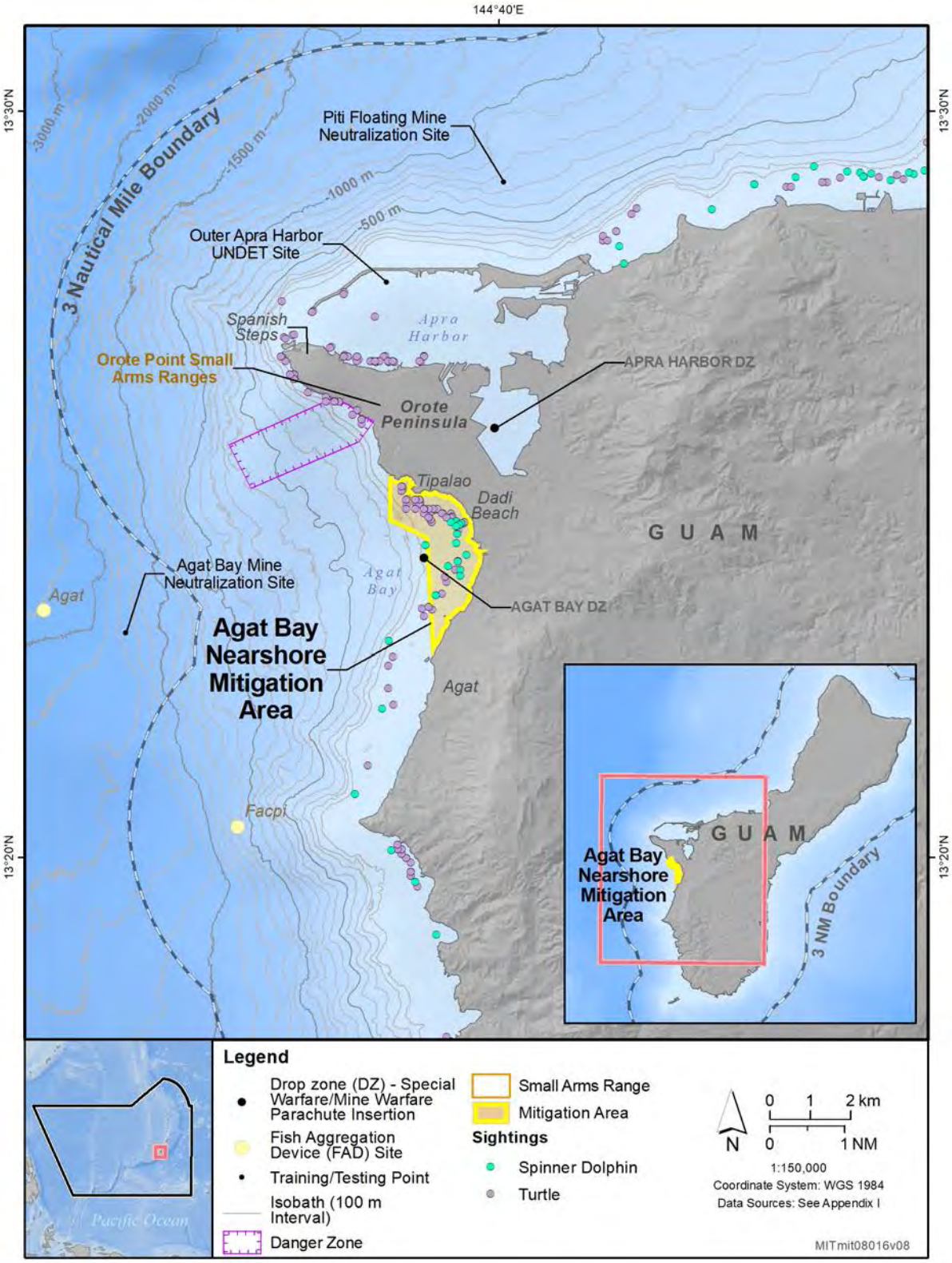

Figure I-4: Updated Agat Bay Nearshore Geographic Mitigation Area

I.3.3.1.1 Marine Mammals

I.3.3.1.1.1 Spinner Dolphins

Spinner dolphins have been the most frequently encountered species during small boat reconnaissance surveys conducted in the Mariana Islands since 2010. Consistent with more intensive studies completed for the species in the Hawaiian Islands, island-associated spinner dolphins are expected to occur in shallow water resting areas (about 50 meters [m] deep or less) in the morning and throughout the middle of the day, moving into deep waters offshore during the night to feed (Heenehan et al., 2016b; Heenehan et al., 2017a; Hill et al., 2010; Norris & Dohl, 1980). As reported by Ligon et al. (2011), this behavior is consistent with reports from Guam residents and tour boat captains describing spinner dolphin nearshore resting areas at Agat Bay; the Merizo channel, tucked into the several small remote bays between Merizo and Facpi Point; Piti Bay; Hagatna; Tumon Bay; and Pugua Point.

Consistent with documented resting behavior, a large pod of resting spinner dolphins (average group size between 22 and 85 individuals) was encountered in Agat Bay in the morning on six consecutive survey days in 2010 (February 9–14) (Ligon et al., 2011; Oleson & Hill, 2010b). Groups larger than 25 have not been observed again in Agat Bay during the small boat surveys since these sightings in 2010 (HDR, 2011, 2012; HDR EOC, 2012; Hill et al., 2011; Hill et al., 2013a; Hill et al., 2013b; Hill et al., 2014; Hill et al., 2015b; Hill et al., 2016b; Hill et al., 2017a; Hill et al., 2018b; Jones & Van Houtan, 2014b; Jones et al., 2015; Jones & Martin, 2016; Ligon et al., 2011; Martin & Jones, 2016; Martin et al., 2016; Martin et al., 2018, 2019; Oleson & Hill, 2010a).

In February 2011, during two survey passes, a group of four spinner dolphins were observed resting in Agat Bay, but none were present in the area on subsequent survey days (HDR, 2011). No spinner dolphins were observed in two survey passes of Agat Bay in August–September 2011, although there were multiple sightings involving large pods of spinner dolphins present nearshore off Guam north of Apra Harbor, off Anderson, and south of Pati Point on the east side of Guam, as well as elsewhere in the Mariana Islands (Hill et al., 2011). In March 2012, a group of 20 spinner dolphins was present during one of two passes through Agat Bay (HDR EOC, 2012), and in June 2013 a group of 25 was present in the bay (Hill et al., 2013a). From 2014 through 2017, no spinner dolphins were observed in Agat Bay during seven surveys of the area (four passes in May 2014, one pass in 2015, and two passes in 2017) (Hill et al., 2018b). The Agat Bay area was not surveyed in 2016 (Hill et al., 2016b). A group of approximately 32 spinner dolphins was observed less than 1 km outside of Agat Bay in water less than 100 m deep in September 2018 (Martin et al., 2019).

In 2010, Agat Bay was described as the “bread and butter” of the Guam dolphin-watching industry given its proximity to various small boat harbors and the expected presence of spinner dolphins (Ligon et al., 2011). Concerns have been raised in Hawaii where daytime resting by spinner dolphins has been chronically disturbed by watching boats, kayaks, and swimmer traffic, resulting in spinner dolphins spending less time in essential resting habitats (Heenehan et al., 2016a; Heenehan et al., 2016b; Heenehan et al., 2017a; Heenehan et al., 2017b; Tyne et al., 2014; Tyne, 2015; Tyne et al., 2015; Tyne et al., 2017; Tyne et al., 2018). Ligon et al. (2011) reported being uncertain of the number of boats that interacted with the spinner dolphins in Agat Bay on a daily basis, but that some of the dolphin watch boats were known to make multiple viewing trips per day, and that during the survey they occasionally observed two to three boats grouped together in the area where the dolphins were regularly observed. Given the concern over similar tourism-related disturbance elsewhere, this impact may be why there

have not been reported routine sightings of spinner dolphins or pods larger than 25 during subsequent small boat surveys of Agat Bay since 2010.

I.3.3.1.2 Sea Turtles

Sea turtle sightings around Guam have increased steadily since 2000 (Jones et al., 2015; Martin et al., 2016; Martin et al., 2018). A summary of 32 years of in-water aerial surveys around Guam was compiled by Martin et al. (2016). Aerial surveys conducted by the Guam Division of Aquatic and Wildlife Resources indicated the year-round presence of a resident population in Guam's nearshore waters (Kolinski et al., 2001; Martin et al., 2016; National Marine Fisheries Service & U.S. Fish and Wildlife Service, 1998; Pultz et al., 1999). As presented in Section 3.5 (Sea Turtles), it is most likely that the species present would be green or hawksbill turtles (Jones & Van Houtan, 2014b; Jones et al., 2015; Martin et al., 2016; Martin et al., 2018). The summarized results of five decades of marine surveys around Guam indicate the entire west coast of Guam, including the Agat Bay Nearshore Geographic Mitigation Area, should be expected to have a relatively uniform density of sea turtles (Zone 6 in Martin et al. (2016)).

As described in Sections 3.5.1.2 (Habitat Use) and 3.5.1.3 (Dive Behavior), it is assumed that the shallow water area within Agat Bay Nearshore Geographic Mitigation Area would be used for foraging by sea turtles. There has been no known nesting at Dadi Beach, but there have been a relatively high number of documented sea turtle sightings in the water off Tipalao. There have been 47 sea turtles sighted in the Agat Bay Nearshore Geographic Mitigation Area between 2010 and 2017 (HDR, 2011, 2012; HDR EOC, 2012; Hill et al., 2011; Hill et al., 2013a; Hill et al., 2013b; Hill et al., 2014; Hill et al., 2015b; Hill et al., 2016b; Hill et al., 2017a; Hill et al., 2018b; Jones & Van Houtan, 2014b; Jones et al., 2015; Jones & Martin, 2016; Ligon et al., 2011; Martin & Jones, 2016; Martin et al., 2016; Martin et al., 2018; Oleson & Hill, 2010a). The distribution of sea turtle sightings is a result of the survey coverage, and Agat Bay should not be interpreted as the only area where sea turtles would be expected to be found in waters off Guam. The Agat Bay Nearshore Geographic Mitigation Area overlaps a portion of what was identified as a "core area" of based on the movements of tagged green sea turtles (Martin et al., 2018). Two tags that remained active after 189 days tracked the turtles' movements to the north from Agat, with one going to as far as Apra Harbor and the other to Pati Point on the north coast of Guam (Martin et al., 2016), indicating that green sea turtles move and forage widely around Guam.

I.3.3.2 Navy Training and Testing Activities – Agat Bay Nearshore

The Agat Bay Nearshore Area has historically been a low-use area for most types of Navy training and testing activities. Explosive munitions have not been used in this area nor has sonar use been reported in this area. However, transiting vessels could conduct training or testing activities within this area using sonar or explosives while implementing procedural mitigation measures and following Standard Operating Procedures to ensure public safety. Navy training and testing activities have been shut down or canceled in the vicinity of the mitigation area in the past due to the presence of marine mammals and civilian boat traffic.

I.3.3.3 Mitigation Assessment – Agat Bay Nearshore Geographic Mitigation Area

I.3.3.3.1 Biological Assessment – Agat Bay Nearshore

Spinner dolphins are known to use Agat Bay, including the Agat Bay Nearshore Geographic Mitigation Area, for resting behavior, and a relatively high number of sea turtles have been documented in the area off Tipalao. The available data on spinner dolphin occurrence and behaviors and the data on sea turtles indicate that the Agat Bay Nearshore Geographic Mitigation Area does meet the Navy's criteria as an

area of biological importance for spinner dolphins and sea turtles. As discussed in detail in Section 3.4.2.1.2 (Impacts from Sonar and Other Transducer Stressors) and Section 3.4.2.2.2 (Impacts from Explosive Stressors), marine mammals engaged in important behaviors, such as resting, may be more likely to ignore or tolerate a source of disturbance and continue their natural behavior patterns. Behavioral reactions, if occurring at all, are likely to be short term and low-to-moderate severity and unlikely to produce long-term consequences. The Navy has determined that impacts on spinner dolphins and sea turtles are likely to be avoided or reduced by prohibiting the use of MF1 surface ship hull-mounted mid-frequency active sonar and in-water explosives in the Agat Bay Nearshore Geographic Mitigation Area.

I.3.3.3.2 Practicality of Geographic Mitigation – Agat Bay Nearshore

Access to a variety of bathymetric features, including shallow areas, is critical to support realistic Anti-Submarine Warfare training and testing activities using sonar. However, due to multiple factors impacting its value for some training and testing activities, such as the very shallow depth of this area, and the proximity to shore and civilian boating activity, the Navy has determined that it would be appropriate and practical to restrict the use of MF1 surface ship hull-mounted mid-frequency active sonar.

As the Navy has access to established, nearshore training and testing areas for explosive munitions, the Navy has determined that it would be practical to avoid using in-water explosives in the Agat Bay Nearshore Geographic Mitigation Area year round.

I.3.3.3.3 Summary – Agat Bay Nearshore

As a result of the assessment for the Agat Bay Nearshore Geographic Mitigation Area, the Navy is proposing implementation of geographic mitigation as described in Table I-7. Based on current operational projections and the availability of other similar, suitable training and testing locations in the Study Area, the Navy has determined that it would be practical to avoid using surface ship hull-mounted mid-frequency active sonar and in-water explosives in the Agat Bay Nearshore Geographic Mitigation Area year round under the Proposed Action. Such geographic mitigation would ensure that spinner dolphins and sea turtles are not exposed to MF1 sonar and explosives in this area, which has the potential to disturb spinner dolphin resting behavior and sea turtle foraging behavior.

Table I-7: Mitigation Within the Agat Bay Nearshore Geographic Mitigation Area

Mitigation Area Description
Stressor or Activity • Surface ship hull-mounted mid-frequency active sonar (bin MF1) • In-water explosives
Identified Resource Protection Focus • Spinner dolphins; potentially present year round • Sea turtles; present year round
Mitigation Area Requirements[1,2] • The Navy will not use surface ship hull-mounted MF1 mid-frequency active sonar in the Agat Bay Nearshore Mitigation Area year-round. • The Navy will not use in-water explosives in the Agat Bay Nearshore Mitigation Area year-round.

[1] *Should* national security present a requirement to conduct training or testing prohibited by the mitigation requirements specified in this table, naval units will obtain permission from the appropriate designated Command authority prior to commencement of the activity. The Navy will provide NMFS with advance notification and include relevant information (e.g., sonar hours, explosives use) in its annual activity reports submitted to NMFS. The designated Command authority will base such authorization on the unique characteristics of the area from a military readiness perspective, taking into account the importance of the area for spinner dolphins and sea turtles and the need to avoid adverse impacts to the maximum extent practicable. Furthermore, the Command authority conducting the activity will provide specific direction to operational units on required mitigation prior to conducting training or testing using in-water explosives in this area.
[2] The designated Command authority will base authorization on the unique characteristics of the area from a military readiness perspective, taking into account the importance of the area for spinner dolphins and sea turtles and the need to avoid adverse impacts to the maximum extent practicable. Furthermore, the Command authority conducting the activity will provide specific direction to operational units on required mitigation prior to conducting training or testing using in-water explosives in this area.

I.4 Geographic Mitigation Assessment – Areas Not Carried Forward for Implementation

The Navy received scoping comments and comments on the Draft SEIS/OEIS suggesting areas for potential mitigation within the MITT Study Area. The comments and a brief description and assessment of the areas are presented in the following subsections.

I.4.1 West Mariana Ridge

The West Mariana Ridge was identified by the Governor of the Commonwealth of the Northern Mariana Islands (CNMI) (Ralph D.L.G. Torres) as an area of potential geographic mitigation in a scoping comment on the 2017 Draft SEIS/OEIS Notice of Intent. The area was originally identified by the previous governor, Governor Eloy S. Inos, in a comment on the 2013 MITT Draft EIS/OEIS. The comment recommended that the Navy avoid conducting activities with sonar and explosives along the bathymetric feature known as the West Mariana Ridge.

The West Mariana Ridge (Figure I-5) consists of a seafloor ridge formed by a chain of conical seamounts extending northward to Japan, approximately parallel to the island chain that forms Guam and the CNMI. Coordinates or a map for the entire West Marina Ridge area were not provided in the scoping comment so, for the purposes of this assessment, the potential mitigation area was defined as an area centered approximately over the ridge that extends out to the 3,500 m isobath between approximately 13° north and 18° north latitude and would include (according to the comment letter) “some seamounts (including the Pathfinder, Arakane, and Suruga seamounts between 142° and 143° E) [that] rise to summits less than 50 m below sea level.” As shown in Figure I-5, the area spans approximately 1,000 km north to south and covers an area of 69,800 km^2 within the Study Area, although the bathymetric feature defining this area continues to extend north of the Study Area, terminating in waters off Japan.

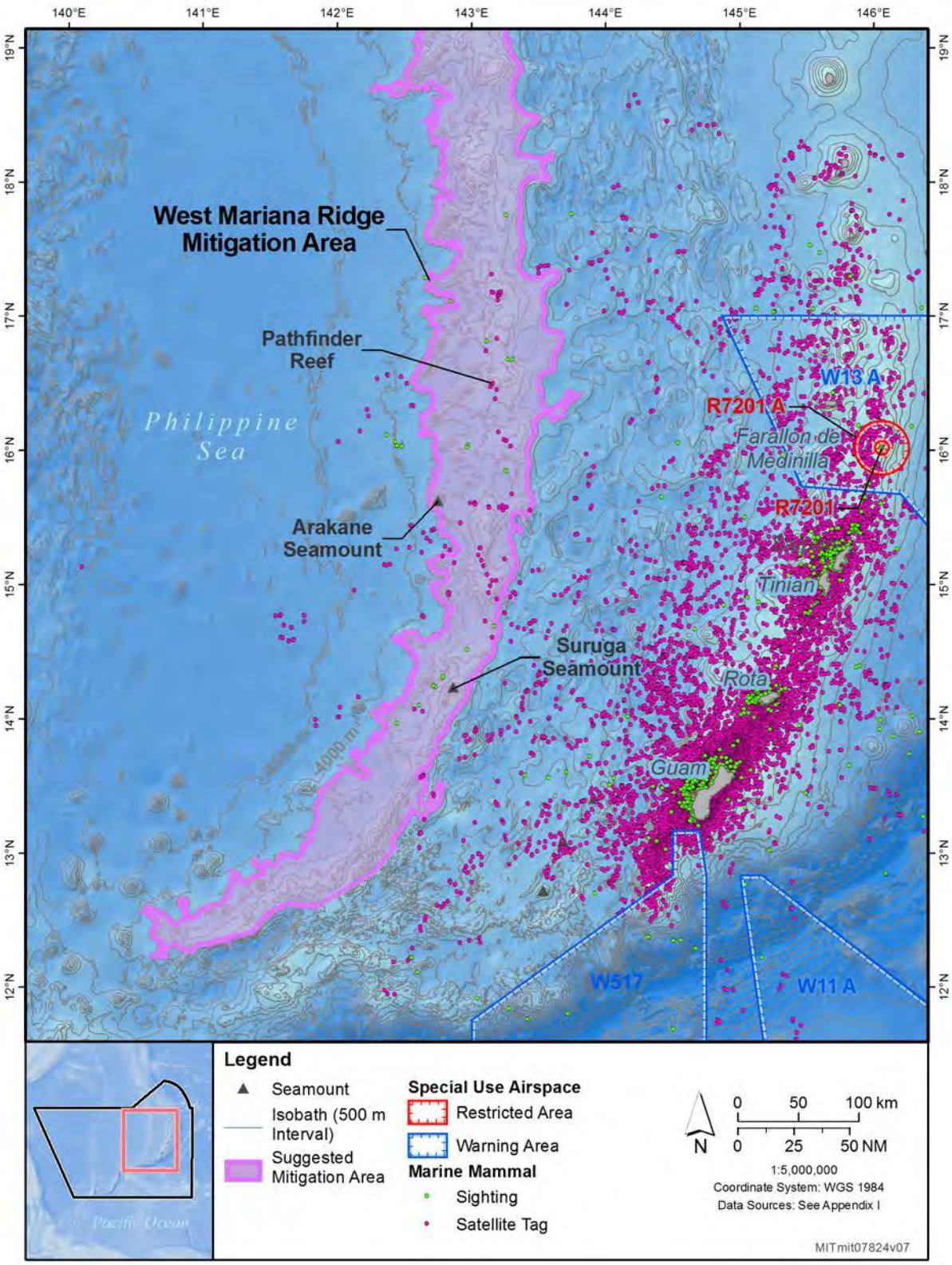

Figure I-5: West Mariana Ridge Area Suggested as a Potential Mitigation Area

The ridge is approximately 250 km west of Guam and, as stated in the comment by Governor Inos in 2013, "support[s] a rich diversity of coral reef and continental slope species," and "dense concentrations of biological productivity: high planktonic production, and large schools of small and predatory fishes including skipjack and other species of tuna." Also specifically mentioned in the comment were two beaked whale sightings, detections of short-finned pilot whales, and satellite tag detections of a false killer whale in the vicinity of the ridge. The comment letter indicated that "… multiple sightings of several cetacean species…supported the delineation of a geographic mitigation area and were evidence indicative of… a biologically important feature that should be protected."

The Navy recognizes that biological productivity is often associated with bathymetric features like ocean ridges and seamounts; however, productivity in such areas is often highly dependent on changeable conditions, including weather patterns, wind intensity and direction, localized currents and eddies, and the presence of nutrients in the water column.

Based on the distribution of marine mammals as known from visual surveys and satellite tag detections within the Study Area (Figure I-5), limiting Navy training and testing activities at the West Mariana Ridge and surrounding region to the 3,500 m isobath would not result in avoiding "high concentrations" of marine mammals (Fulling et al., 2011; Hill et al., 2014; Hill et al., 2015b; Hill et al., 2016b; Hill et al., 2017a; Hill et al., 2018b; Klinck et al., 2015; Klinck et al., 2016; Ligon et al., 2011; Munger et al., 2014; Munger et al., 2015; National Oceanic and Atmospheric Administration, 2015; Nieukirk et al., 2016; Norris et al., 2017; Oleson et al., 2015; Tetra Tech Inc., 2014; U.S. Department of the Navy, 2007, 2012, 2013, 2014a, 2018a; Yack et al., 2016). While marine mammals have been observed in the area of the West Mariana Ridge, the vast majority of marine mammal sightings and satellite tag detections have been recorded far to the east of the ridge (Figure I-5) (Fulling et al., 2011; Hill et al., 2018b). The available data do not indicate that the West Mariana Ridge or surrounding area is an area of key biological importance for marine mammals or other marine species, nor is it clear that limiting the use of sonar and explosives in the area would result in an avoidance or reduction of impacts. Therefore, the West Mariana Ridge area does not meet the Navy's criteria for effective geographic mitigation.

I.4.2 Commonwealth of the Northern Mariana Islands Landward of the 3,500 Meter Isobath

This area was identified by the Governor of the CNMI (Ralph D.L.G. Torres) in a scoping comment on the 2017 Draft SEIS/OEIS Notice of Intent. The comment recommended that the Navy avoid conducting activities with sonar and explosives around the Islands of the CNMI landward of the 3,500 m isobath (Figure I-6). The comment was originally submitted by the previous governor, Governor Eloy S. Inos, as a comment on the 2013 MITT Draft EIS/OEIS.

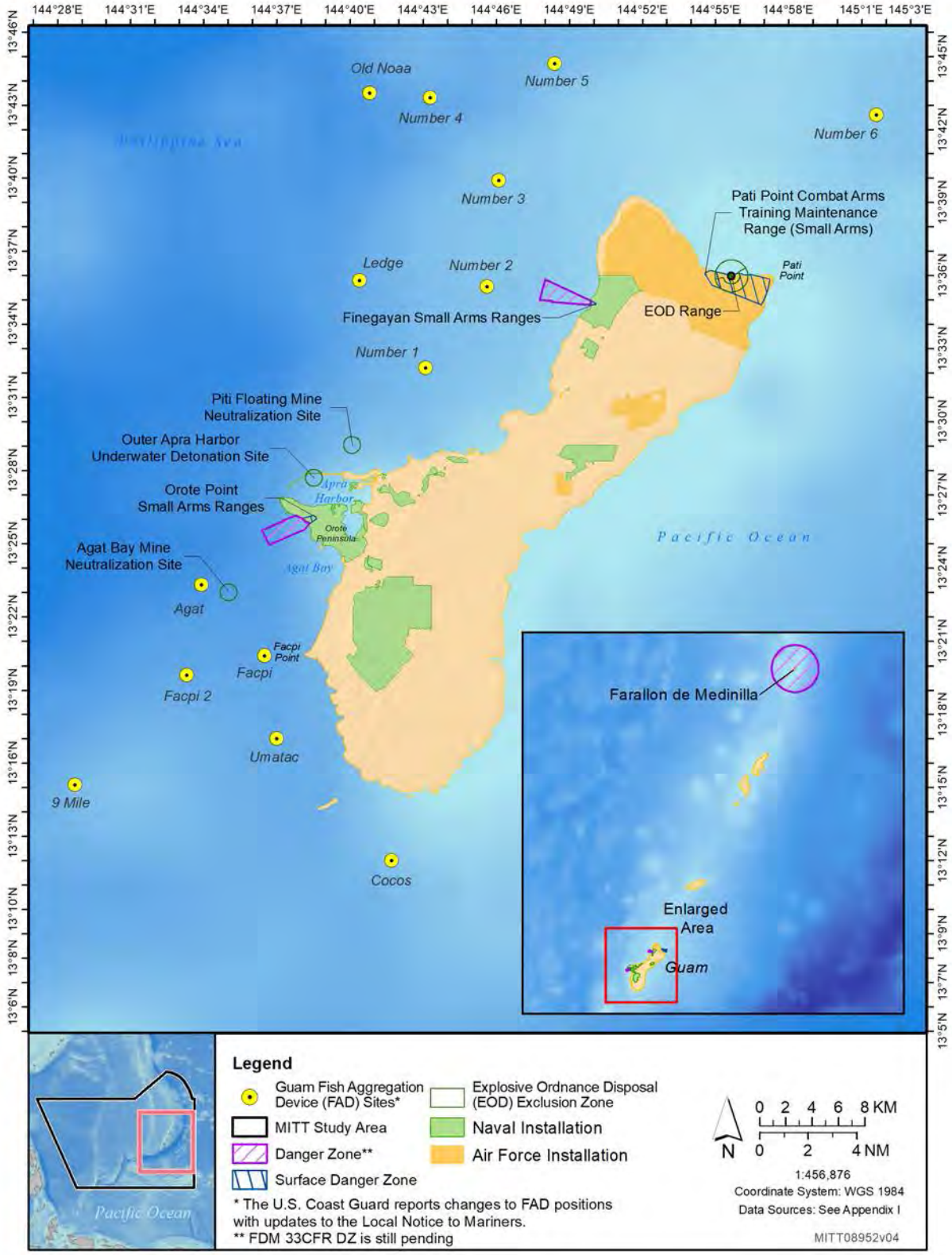

Figure I-6: Commonwealth of the Northern Mariana Islands Landward of the 3,500 Meter Isobath Suggested as a Potential Mitigation Area

The comment indicates there are island-associated populations of marine mammals present in the Study Area. The comment assumes there are island-associated populations in the Mariana Islands, because there have been a number of small and resident populations documented in the Hawaiian Islands (Baird et al., 2015). The comment offers that because "…insular populations of odontocetes are generally concentrated within the 3,500 m isobath…" around the Hawaiian Islands, then that same isobath should be used to define the boundary for a mitigation area in the Mariana Islands to mitigate "…the distinct risks posed to resident marine mammal populations, near island habitat…." The comment goes on to suggest that the results from small boat, nearshore surveys in the Mariana Islands are indicative of site fidelity (meaning the animals remain at or regularly return to those sites) for several species, including spinner dolphins, bottlenose dolphins, rough-toothed dolphins, and short-finned pilot whales in waters shallower than 3,500 m, as cited in Hill et al. (2011); Hill et al. (2014); Hill et al. (2018b) and similar to the findings from Hawaii (Baird et al., 2015). However, data from surveys conducted in the Study Area and cited in the comment, as well as other surveys (Fulling et al., 2011; Hill et al., 2013a; Hill et al., 2014; Hill et al., 2018b; Klinck et al., 2015; Norris et al., 2017; Oleson & Hill, 2010b) and data from satellite tags recording the movement of individual animals, indicate many of those same species utilize ocean areas beyond the 3,500 m isobath. Many of these species, including bottlenose dolphins, rough-toothed dolphins, pantropical spotted dolphins, false killer whales, and beaked whales have wide-ranging distributions in the Study Area.

Additionally, research from areas, including Hawaii, where training and testing activities occur more often and involve more concentrated use of sonar and explosives, such as at the Pacific Missile Range Facility, has documented the presence of numerous small and resident populations of marine mammals and long-term residency of individuals (Baird et al., 2015). These marine mammals have co-existed for decades alongside areas of concentrated Navy training and testing activity.

Furthermore, there are no indications from satellite tag data or photographic identification of marine mammals that there are any island-associated small or resident populations of marine mammals in the Mariana Islands (Ampela et al., 2014; HDR, 2011, 2012; HDR EOC, 2012; Hill et al., 2011; Hill et al., 2013a; Hill et al., 2015a; Hill et al., 2013b; Hill et al., 2014; Hill et al., 2015b; Hill et al., 2016b; Hill et al., 2017a; Hill et al., 2018b; Ligon et al., 2011). For additional information on the results from research and monitoring where the Navy has been training and testing for decades in the Mariana Islands, refer to Section 3.4.3.4 (Summary of Monitoring and Observations During Navy Activities Since 2015) of this SEIS/OEIS.

With regard to the practicality of geographic mitigation, the suggested mitigation area overlaps with all nearshore training and testing areas and completely encompasses FDM and R-7201. The suggested area overlaps with the northern part of W-517, most of W-13A, and a small part of W-13B. Essentially every training and testing activity in the Proposed Action may occur in the suggested mitigation area, and many of the Navy's activities would only occur in the suggested mitigation area.

W-517 is special use airspace and is important because it overlays a large, contiguous deep-ocean area that is relatively free of surface vessel traffic. W-517 altitude limits are from the surface to infinity and it supports GUNEX, CHAFFEX, MISSILEX, MINEX, SINKEX, BOMBEX, TORPEX, and Carrier training activities. W-517 is a laser certified open-ocean range. It is also used for surface vessel unit-level training.

FDM consists of the island land mass and the restricted airspace around it, R-7201. It contains a live-fire and inert bombing range and supports live-fire and inert engagements such as surface-to-ground and air-to-ground GUNEX, BOMBEX, MISSILEX, and Naval Surface Fire Support. FDM is an uncontrolled and

un-instrumented, laser-certified range with fixed targets, including boxes and truck frames in various configurations within the lightweight, inert-only zone.

The suggested geographic mitigation area encompasses all mine neutralization sites, all shorelines, all anchorages, and all drop zones. All proposed amphibious warfare training and expeditionary warfare activities can only occur in the suggested mitigation area.

In addition to the training and testing areas where sonar may be used (e.g., required in-port sonar testing in Apra Harbor, Operating Areas), the suggested mitigation area encompasses open-ocean areas and several transit corridors between operating areas where sonar may be used for unit-level training or testing. Requiring units to take circuitous transit routes between Operating Areas in order to complete their required unit-level training and testing outside the 3,500 m isobath would add a substantial burden in terms of lost time for productive events, time away from home, unnecessary wear on equipment, and excessive fuel usage.

The MIRC provides training and testing venues that support the operational readiness of the Navy, U.S. Marine Corps, U.S. Air Force, Guam Army National Guard, Guam Air National Guard, Army Reserves Marianas, U.S. Coast Guard, and other users based and deployed in the Western Pacific. The MIRC is characterized by a unique combination of attributes that make it a strategically important range complex for the Services. These attributes include

- location within U.S. territory;
- live-fire ranges on Guam and FDM;
- expansive airspace, surface sea space, and underwater sea space;
- authorized use of multiple types of live and inert ordnance on FDM;
- support for all Navy warfare areas and numerous other Service roles, missions, and tactical tasks;
- support to homeported Navy, Army, U.S. Coast Guard, and U.S. Air Force units based at military installations on Guam and CNMI;
- training support for deployed forces;
- Western Pacific Theater training venue for Special Warfare forces;
- ability to conduct Joint and combined force exercises; and
- rehearsal area for Western Pacific contingencies.

Geographic mitigation for explosives and sonar landward of the 3,500 m isobath would have a substantial impact on training and testing activities and largely negate the existence of the MIRC; it is unlikely that Naval forces would be able to meet required conditions of readiness, and it could impact readiness for the other services. Therefore, it would not be operationally practical to implement.

I.4.3 Earthjustice and on Behalf of Tinian Women Association, Guardians of Gani', PaganWatch, and Center for Biological Diversity

Scoping comments on five topics regarding marine species were submitted by Earthjustice and on behalf of the Tinian Women Association, Guardians of Gani', PaganWatch, and Center for Biological Diversity in response to the Notice of Intent for this SEIS/OEIS. The basis for the mitigation as stated by the Earthjustice letter was that the MITT activities "…threaten serious harm to marine mammals," citing to the current authorization of MMPA takes of marine mammals in the Study Area. There have been two previous sets of analyses of impacts on marine mammals by NMFS and the Navy, including two previous Letters of Authorization pursuant to the MMPA, and two Biological Opinions pursuant to the ESA for Navy activities in the Study Area. To date, there has been no empirical evidence suggesting, and NMFS

has made no findings of, "serious harm" as suggested in the comment. The Navy models "take" as defined under the MMPA[3]; the Navy does not model instances of "serious harm," and the vast majority of the takes modeled for this Proposed Action are temporary behavioral reactions. Species-specific comments provided in the Earthjustice letter are provided in the following subsections.

I.4.3.1 Minke Whale Habitat

The commenter suggested geographic mitigation for minke whale habitat. Minke whales have been detected acoustically in the Mariana Islands (Fulling et al., 2011; Klinck et al., 2015; Klinck et al., 2016; Norris et al., 2012; Norris et al., 2017; Oleson & Hill, 2010b), and this body of research has been considered and integrated into this SEIS/OEIS (see Section 3.4.1.12, Minke Whale [*Balaenoptera acutorostrata*] and supporting documents) (U.S. Department of the Navy, 2018a). As the cited research indicates, minke whales are one of the most abundant species of baleen whales worldwide (Norris et al., 2017). The purpose of the research was to reliably estimate minke whale abundance in the survey area based on passive acoustic detections of "calling" minke whales (Norris et al., 2017). The acoustic detections of minke whales in the area do not indicate the Mariana Islands are in any way unique or represent key areas of biological importance. While the authors state "There are also advantages to using passive acoustic methods for identifying important habitat for species of marine mammals with low densities," that statement is in the context of survey detection, not with regard to determination of specific areas of importance. Methods for estimating density from acoustic detections are currently being developed and numerous assumptions are associated with the calculations. Norris et al. (2017) mention "several caveats, biases, uncertainties and potential violations of the assumptions," which make clear the "preliminary" nature of "some obvious and interesting patterns" in the distribution of acoustic detections (Norris et al., 2017). Basically, those patterns were that all 30 individual minke whales detected acoustically during the 2007 survey (Fulling et al., 2011) were located to the south and east of the Mariana Islands within an area of approximately 156,600 km^2. Such a large area lacks precision to identify particularly key important areas and is much too large to be practical for geographic mitigation. In addition to Norris et al. (2017) noting the requirement for more detailed analyses of the current data, these results were collected from only a single season (January to April 2007), so it remains unknown if the minke whale detections were associated with static features such as water depth and bathymetry slope or were associated with dynamic ocean conditions present during that particular survey. Given the temporally dynamic redistributions of marine mammals in response to both seasonal variation and longer-term climate change affecting ocean conditions (Becker et al., 2017; Forney et al., 2015; Ramp et al., 2015; Risch et al., 2014; Silber et al., 2017), and that species such as minke whales migrate from low-productivity tropical waters in the summer (Jefferson et al., 2015; Perrin & Brownell, 2009), it is possible that minke whales may not have a fixed distribution within the MITT Study Area. Therefore, establishing a mitigation area based on the results from a single survey would not be scientifically valid and does not meet the Navy's criteria for a geographic mitigation area (see Section I.2.2, Assessing Mitigation Effectiveness). There is no evidence delineating a specific area that is particularly important for any biologically important life process (e.g., foraging, migration, reproduction), and there is no empirical evidence of significant impacts on the minke whale population

[3] Take, as defined under the MMPA, means "to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal" (16 United States Code 1362)

in the Study Area resulting from military readiness activities. Therefore, mitigation would not result in an avoidance or reduction of impacts on the minke whale population and their habitat.

I.4.3.2 Humpback Whale Calving Grounds

Earthjustice commented: "The SEIS must examine the impacts of MITT activities on humpback whale calving grounds, particularly given the potential the affected whales come from the endangered Western North Pacific humpback population. See Hill et al. (2017)." As noted in this SEIS/OEIS in Section 3.4.1.11 (Humpback Whale [*Megaptera novaeangliae]*), the Navy-funded surveys and research have resulted in the documentation of recorded mother-calf pairs, competitive groups, and 35 additional photo-identified non-calf whales (Fulling et al., 2011; Hill et al., 2015a; Hill et al., 2015b; Hill et al., 2016a; Hill et al., 2016b; Hill et al., 2017a; Hill et al., 2018b; Hill et al., 2018c), so it is possible that humpback whale calving is occurring somewhere (as yet unknown) in the Mariana Islands (National Marine Fisheries Service, 2018), but the literature and the commenter provide no details on where a hypothetical calving ground mitigation area would be specifically located. The Navy has proposed two areas off Saipan (Section I.3.1, Marpi Reef Geographic Mitigation Area; and Section I.3.2, Chalan Kanoa Reef Geographic Mitigation Area) as geographic mitigation areas that were based largely on the aggregated sightings of humpback whales engaged in reproductive behaviors, though calving itself has not been observed.

I.4.3.3 Marine Mammal Biologically Sensitive Areas

Earthjustice requested that consideration should be given to "…severely limit training and testing activities in biologically sensitive areas" specific to marine mammals. The Navy interpreted this to mean Biologically Important Areas (BIAs) as have been identified for marine mammals in other geographic areas of the Pacific (Ferguson et al., 2015a; Van Parijs et al., 2015). In the Mariana Islands, no BIAs have been identified. No critical habitat has been designated for ESA-listed marine mammals within the Study Area. However, in lieu of BIAs or critical habitat, the Navy has compiled and assessed existing data from the Study Area and proposed three mitigation areas in this appendix based upon that data. As detailed in Chapter 5 (Mitigation) of this SEIS/OEIS, the Navy, in consultation with NMFS, has implemented mitigation measures to reduce or avoid impacting marine species and their habitat in general. If in the future there is a location identified as a BIA, then the Navy, in consultation with NMFS, will undertake analysis of that location as described in Section 5.2 (Mitigation Development Process) to consider implementation of geographic mitigation measures as part of the adaptive management process.

I.4.3.4 Sea Turtle Biologically Sensitive Areas

Earthjustice requested that consideration should be given to "…severely limit training and testing activities in biologically sensitive areas" and restrictions on MITT activities "…in areas identified as containing high densities of imperiled sea turtles." The Navy has funded much of the research providing information on sea turtles in the Mariana Islands (Hill et al., 2014; Hill et al., 2018b; Jones & Van Houtan, 2014b; Jones et al., 2015; Jones & Martin, 2016; Martin et al., 2016; Martin et al., 2018; Summers et al., 2017; Summers et al., 2018) and has considered those references and others in the analysis presented in this SEIS/OEIS. Sea turtle sightings around Guam have increased steadily since 2000 (Martin & Jones, 2016; Martin et al., 2016; Martin et al., 2018), which does not suggest ongoing Navy training and testing activities are resulting in negative effects on sea turtle populations in the area Martin et al. (2018). While sea turtle nesting areas on land can be considered sensitive areas in need of protection from certain activities, the Navy already actively manages nesting areas at onshore locations like Spanish Steps and Haupto on Guam, and currently implements mitigation measures associated with training and

testing activities in other locations where sea turtle nesting may occur (U.S. Department of the Navy, 2015). The Navy has also proposed two geographic mitigation areas (see Section 1.3.2, Chalan Kanoa Reef Geographic Mitigation Area; and Section I.3.3, Agat Bay Nearshore Geographic Mitigation Area) that are locations where sea turtles have been routinely sighted during surveys. As detailed in Section 3.5.2 (Environmental Consequences) and in consideration of the mitigation measures that would be implemented as described in Chapter 5 (Mitigation), long-term consequences to individual sea turtle or sea turtle populations are not expected as a result of the proposed training and testing activities.

I.4.4 Seafloor Habitat Less than 700 Meters Deep

The NMFS Habitat Conservation Division recommended that the Navy avoid all areas where the seafloor is less than 700 m deep, including offshore banks, shoals, and seamounts, because the use of expended materials in depths shallower than 700 m would impact seafloor Essential Fish Habitat. This area would include approximately 7,500 km^2 of the sea space around the Mariana Islands.

As detailed in Section 3.1 (Sediments and Water Quality) and Section 3.9 (Fishes), the evidence indicates that effects to seafloor habitat would be minimal and localized where expended materials are in direct contact with the seafloor. This is expected to result in small proximate changes or otherwise minimal impact on the environment and insignificant changes in ecological functions (67 Federal Register 2354). The Navy considers an impact minimal if:

- the intensity of the impact at the specific site being affected is low,
- the spatial extent of the impact relative to the availability of the habitat type affected is small,
- the sensitivity/vulnerability of the habitat to the impact is low,
- the habitat functions that may be altered by the impact (e.g., shelter from predators) are negligible, and
- the timing of the impact relative to when the species or life stage needs the habitat is not critical

Adverse effects to Essential Fish Habitat under the Magnuson-Stevens Act are evaluated by the lost value to the management unit species, and appropriate mitigation or offsets produce outcomes that result in no more than minimal adverse effects to Essential Fish Habitat. The Navy completed an Essential Fish Habitat consultation with NMFS in 2014 for these ongoing training and testing activities. NMFS provided conservation recommendations to avoid, minimize, or offset adverse impacts. The Navy responded to NMFS' concerns, agreed to implement all practicable recommendations, and provided explanations for any disagreements as required by the Magnuson-Stevens Act. The Navy cannot practicably avoid discharging expended materials in all waters less than 700 m in depth, which encompass many training and testing areas that are specifically designed for these types of activities and are required to be near shore for accessibility (e.g., small arms ranges). In addition, the Navy currently implements mitigation for seafloor resources as described in Section 5.4.1 (Mitigation Areas for Seafloor Resources), which should also avoid or reduce impacts on sensitive seafloor habitat.

I.4.5 Various Areas Recommended by the Natural Resources Defense Council

The Natural Resources Defense Council recommended in a comment on the Draft SEIS/OEIS that the Navy consider several additional habitat areas that were not discussed as potential geographic mitigation areas in Appendix I of the Draft SEIS/OEIS.

- Sperm whale calving and nursery habitat offshore of Agat Bay, Guam; and breeding and calving habitat offshore of Apra Harbor, Guam

- Spinner dolphin resting habitat at Bile Bay, Tumon Bay, Double Reef, and Cocos Island and Lagoon, Guam; and Tanapaq Lagoon, Saipan
- Breeding habitat for a possibly resident pygmy killer whale population at Cocos Island and Lagoon, Guam
- Short-finned pilot whale core use areas, west of Guam and Rota

I.4.5.1 Sperm Whale Calving and Nursery Habitat Offshore of Agat Bay, Guam; and Breeding and Calving Habitat Offshore Apra Harbor, Guam

The recommendation that the Navy consider an area off Agat Bay as a breeding and nursery area seems to be largely based on two Associated Press File photographs, taken opportunistically by a local photographer, showing a group of three adult sperm whales and a calf during an encounter from a commercial dive boat on June 15, 2001, "… about four miles off the coast of the Agat Marina in Guam" (Bangs, 2001). The Navy is not aware of any subsequent sperm whale calf sighting reported since 2001. During the Navy-funded 2010–2018 small boat surveys in the Mariana Islands, a total of seven sperm whales were detected over four encounters (in 2010, 2013, 2016, and 2018) in a median depth of approximately 1,200 m and median distance from shore of approximately 12 km (Hill et al., 2017a; Hill et al., 2018c; Hill et al., 2018d; Hill et al., 2019). Sightings and acoustic monitoring detections recorded since 2007 indicate that sperm whales range widely in the Study Area with no known areas of concentration in the Mariana Islands. Sperm whales are highly nomadic, mobile predators, and the available data do not support areas offshore of Agat Bay or Apra Harbor as important reproductive areas for sperm whales in the Study Area. See Section 3.4.1.31.2 (Geographic Range and Distribution) for more information.

I.4.5.2 Spinner Dolphin Resting Habitat at Bile Bay, Tumon Bay, Double Reef, and Cocos Island and Lagoon, Guam; and Tanapaq Lagoon, Saipan

Previously reported spinner dolphin high-use areas nearshore at Guam include Bile Bay, Tumon Bay, Double Reef, north Agat Bay, and off Merizo (Cocos Lagoon area), where these animals congregate during the day to rest (Amesbury et al., 2001; Eldredge, 1991). More recently, high-use areas have included Agat Bay; the Merizo channel, tucked into the several small remote bays between Merizo and Facpi Point; Piti Bay; Hagatna; Tumon Bay; and Pugua Point (Ligon et al., 2011). During the Navy-funded 2010–2018 small boat surveys in the Mariana Islands, there have been 157 encounters with pods of spinner dolphins (Hill et al., 2019). The approximate distance from shore for these encounters was 1 km, indicative of their preference for nearshore habitat and prevalence in the Study Area (Hill et al., 2017a; Hill et al., 2018b; Hill et al., 2019). As described in Section I.3.3 (Agat Bay Nearshore Geographic Mitigation Area), the nearshore area of Agat Bay meets the Navy's criteria as an area of biological importance and practicality for implementation, and has been proposed as a geographic mitigation area for spinner dolphin resting behavior. The numerous other locations around Guam and other islands where resting behavior has been observed or has the potential to occur (i.e., the habitat is suitable) suggests that no single area is of particular biological importance. See Section 3.4.1.32.2 (Geographic Range and Distribution) for more information.

I.4.5.3 Breeding Habitat for Pygmy Killer Whale Population at Cocos Island and Lagoon, Guam

Like similar deep-water and deep-diving species, pygmy sperm whales are likely highly mobile in the marine environment with no known concentration areas in the Marianas Islands. There was only one pygmy killer whale sighting of a group of six animals during the 2007 systematic survey of the Study Area (Fulling et al., 2011). The sighting occurred near the Mariana Trench, south of Guam, where the bottom

depth was over 4,413 m. This is consistent with the known habitat preference of this species for deep, oceanic waters. However, in the Mariana Islands, pygmy killer whale sightings close to shore are not unexpected due to deep bathymetry surrounding most islands. There is no information on population range of pygmy killer whales off Guam (Hill et al., 2019). See Section 3.4.1.26.1 (Geographic Range and Distribution) for more information.

I.4.5.4 Short-finned Pilot Whale Core Use Areas, West of Guam and Rota

During the Navy-funded 2010–2018 small boat surveys in the Mariana Islands, short-finned pilot whale groups were encountered on 23 occasions in a median depth of approximately 720 m and median distance from shore of approximately 5 km, including one pod of 35 individuals off Marpi Reef north of Saipan (Hill et al., 2014; Hill et al., 2017a; Hill et al., 2018b; Hill et al., 2018d; Hill et al., 2019). Satellite tags deployed on 17 individuals between 2013 and 2018 suggest multiple areas are used frequently by short-finned pilot whales in the Marianas, including but not limited to areas west of Guam and Rota (Hill et al., 2018d; Hill et al., 2019). Satellite tags on short-finned pilot whales lasting from approximately 9–128 days, showed that individuals ranged from south at Tumon Bay off Guam to as far north as the waters west of Anatahan (Hill et al., 2019). These tag locations suggest multiple areas of frequent use by pilot whales in the Mariana Islands and that the areas west of Guam and Rota are not key areas of biological importance for pilot whales. See Section 3.4.1.30.2 (Geographic Range and Distribution) for more information.

I.4.6 Prohibit Use of Air-Deployed Mid-Frequency Active Sonar Year Round – Proposed for All Three Mitigation Areas

Behavioral response from air-deployed mid-frequency active sonar has only been documented for beaked whales and not for other marine mammal species. Furthermore, research on beaked whale behavioral responses to dipping sonar is ongoing with results that require further validation (e.g., variability in response with distance from the source, animal behavioral state at the time of exposure to sonar). Finally, the bathymetry of all three mitigation areas is much too shallow for beaked whale habitat. There is no evidence to suggest that prohibiting the use of mid-frequency dipping sonar in any of the mitigation areas would have any particular benefit to beaked whales. The Navy already implements mitigation measures for dipping sonar to reduce or avoid impacts on marine mammals (see Section 5.3.2.1, Active Sonar), and implementing a prohibition on dipping sonar does not meet the Navy criteria as a practical mitigation (see Section I.2.3, Assessing Practicality of Implementation).

I.4.7 Prohibit Use of Low-Frequency Active Sonar from December through April – Proposed for All Three Mitigation Areas

The Navy received a comment on prohibiting all low-frequency sonar in the Marpi Reef Geographic Mitigation Area and the Chalan Kanoa Reef Geographic Mitigation Area from December through April, the approximate timeframe when humpback whales, including mother-calf pairs, have been observed in the area. Humpback whales engaged in reproductive behaviors have not been observed in Agat Bay. At issue, as implied in the comment, is that humpback whales engaging in reproductive behaviors would be disturbed by low-frequency active sonar used during activities conducted in the vicinity of the mitigation areas. As discussed in Section 3.4.2.1.1.5 (Behavioral Reactions), studies found only short-term responses to low-frequency sound by some fin and humpback whales, including changes in vocal activity and avoidance of the source vessel, while other fin, humpback, and blue whales did not respond at all. When the source was in the path of migrating gray whales they changed course up to 2 km to avoid the sound, but when the source was outside their path, little response was observed (Clark & Fristrup, 2001; Croll et al., 2001; Fristrup et al., 2003; Miller et al., 2000; Nowacek et al., 2007).

The Navy has been conducting training and testing activities using sonar in the Study Area at similar levels of activity for decades and does not anticipate population-level impacts on humpback whales from the Proposed Action. Restrictions on the use of low-frequency active sonar would have a significant impact on the training and testing of current systems and the development of new systems. This would deny program managers the flexibility to rapidly field or develop necessary systems requiring training or testing in the area. Therefore, implementing additional mitigation areas beyond what is described in this section would not be practical (see Section I.2.3, Assessing Practicality of Implementation).

I.4.8 Implement Vessel Speed Restrictions in the Three Mitigation Areas

The Navy received multiple comments requesting that vessel speed restrictions be implemented in the three proposed geographic mitigation areas, specifically from December through April. Although not explicitly stated, the Navy assumes the requests are associated with the occurrence of humpback whales, including mother-calf pairs, in the Marpi Reef and Chalan Kanoa Reef areas. Humpback whale engaged in reproductive behaviors have not been observed in the Agat Bay Geographic Mitigation Area. As described in Section 5.3.4.1 (Vessel Movement), implementing mitigation to limit vessel speed restrictions in the Study Area would be incompatible with the practicality assessment criteria for safety, sustainability, and mission requirements.

I.4.9 Various and Anonymous Commenters – Generalized Geographic Avoidance

The Navy received comments suggesting that in the future the Navy should stop conducting training and testing activities in various generalized or notional locations in the Mariana Islands. The Navy considered all public comments received during the National Environmental Policy Act scoping process and comments subsequently received on the Draft SEIS/OEIS (see Section 3.4.6, Public Comments; Appendix K, Public Comment Responses). There were comments related to the general theme of geographic mitigation that are not addressed individually here. These comments fell into one of three categories: (1) they involved notional suggestions and provided no specific location where a mitigation might be implemented; (2) they lacked scientific basis in support of the recommendation; or (3) science did not support the recommendation by the commenter.

The Navy currently implements integrated at-sea procedural mitigation (see Section 5.3, At-Sea Procedural Mitigation to be Implemented) and at-sea mitigation areas for seafloor resources (see Section 5.4, At-Sea Mitigation Areas to be Implemented) wherever and whenever applicable activities occur, as detailed in Chapter 5 (Mitigation) of this SEIS/OEIS.

Scoping comments specific to a particular marine resource were summarized at the end of the applicable resource section in this SEIS/OEIS (see Section 3.4.6, Public Comments). The concerns raised were generally based on assumptions that significant harm or damage would occur to marine resources in the future if ongoing training and testing activities were to continue into the future, despite decades of ongoing activities with no evidence of the harm or damage. In addition, a more generalized presentation of the rationale for eliminating many non-specific geographic locations from consideration was also provided in the 2015 MITT Final EIS/OEIS in Section 5.3.4.1.6 (Limiting Access to Training and Testing Locations) and Section 5.3.4.1.7 (Avoiding Locations Based on Bathymetry and Environmental Conditions). The reasoning presented in those sections, which remains valid and applicable to this SEIS/OEIS, explained why the Navy cannot generally impose geographic limitations on ongoing training and testing activities. Reasons include (1) an increased safety risk to personnel, (2) an unacceptable impact on the effectiveness of training and testing activities that would affect military readiness, and

(3) impractical burden with regard to implementation. For more information on how mitigation measures were developed in general, see Section 5.2 (Mitigation Development Process) in this SEIS/OEIS.

With regard to assumptions that significant harm or damage would occur to marine resources if Navy training and testing were to continue, potential effects on marine mammals and sea turtles from sonar and other active acoustic sources and explosives were quantitatively analyzed using the Navy's acoustic effects model. The Navy's modeled takes, the majority of which are temporary behavioral reactions, are not modeled instances of "significant harm." As detailed in Section 3.4.3.4 (Summary of Monitoring and Observations During Navy Activities Since 2015), the Navy's analysis, the previous analyses by NMFS, and the monitoring that has occurred have not indicated any significant harm or damage to marine resources as a result of Navy training and testing activities. The analysis from the 2015 MITT Final EIS/OEIS predicted no mortality or serious injury to marine mammals or sea turtles, and to date none have been reported. Consistent with those results, no mortality or serious injury are predicted for training and testing activities proposed in this SEIS/OEIS. Additionally, as detailed in Chapter 3 (Affected Environment and Environmental Consequences), long-term consequences to other marine resources in the Mariana Islands are not expected.

I.5 Summary of Geographic Mitigation Areas

Based on the extensive review and analysis presented in this appendix, the Navy proposes to implement the mitigation areas summarized in Table I-8 and depicted in Figure I-7. The Navy has taken into account public comments received as well as reviewed available scientific information in making these determinations. The mitigation areas were developed because they met the biological effectiveness criteria when balanced against the operational practicality criteria. The Navy finds that implementing these geographic mitigations would, in combination with procedural mitigation, effect the least practicable adverse impact on marine mammal species or stocks and their habitat.

Table I-8: Summary of Geographic Mitigation

Area Name	Stressors Limited	Timeframe for Measures
Marpi Reef Geographic Mitigation Area	MF1 Sonar	Seasonal: December–April Cap of 20 hours for Marpi Reef and Chalan Kanoa Reef geographic mitigation areas; special reporting
	Explosives	Year-round prohibition
Chalan Kanoa Reef Geographic Mitigation Area	MF1 Sonar	Seasonal: December–April Cap of 20 hours for Marpi Reef and Chalan Kanoa Reef geographic mitigation areas; special reporting
	Explosives	Year-round prohibition
Agat Bay Nearshore Geographic Mitigation Area	MF1 Sonar and Explosives	Year-round prohibition

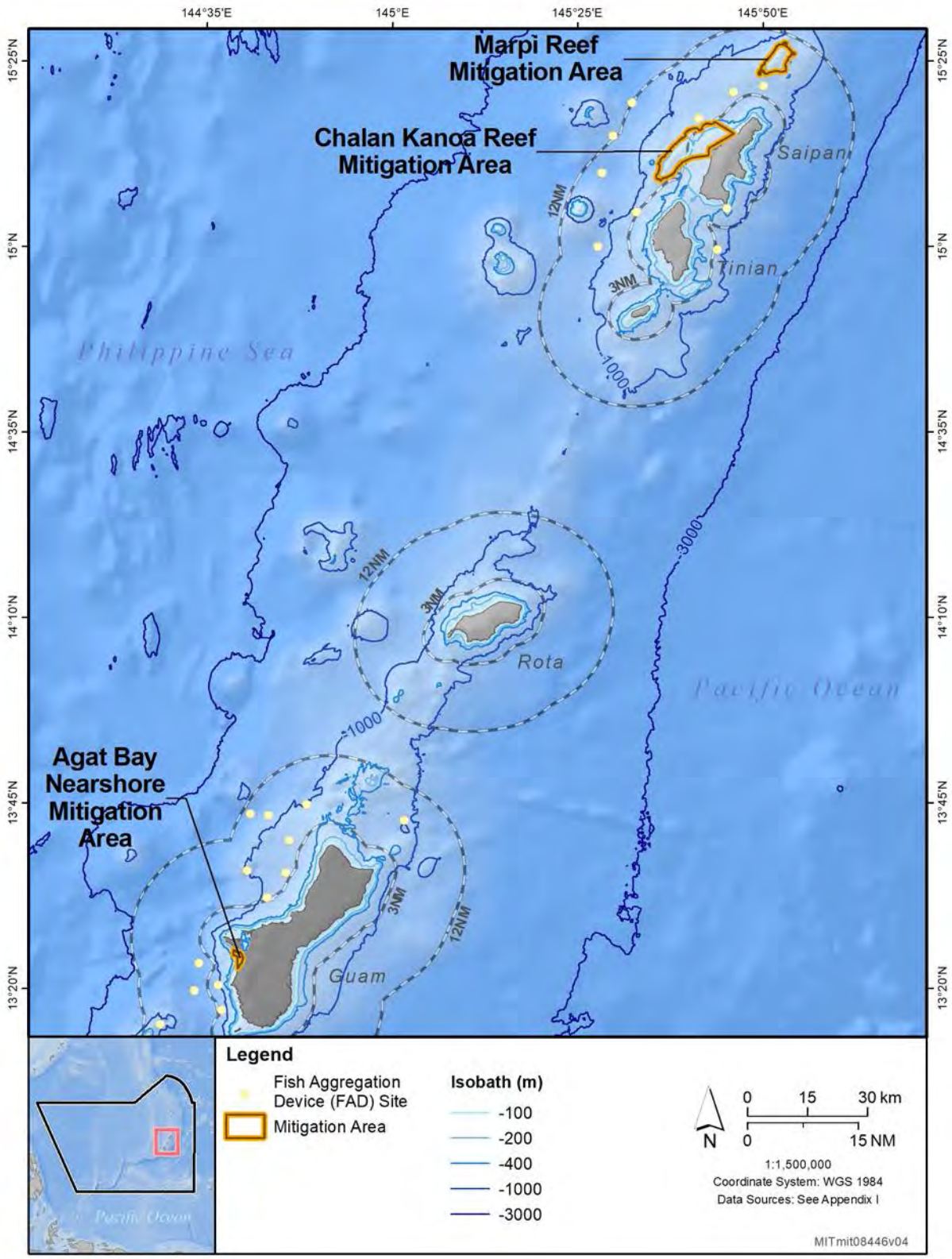

Figure I-7: Navy Geographic Mitigation Areas

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Supplemental Environmental Impact Statement/

Overseas Environmental Impact Statement

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APPENDIX J Statistical Probability Analysis for Estimating Direct Strike Impact and Number of Potential Exposures from Military Expended Materials

This Appendix discusses the methods and results for calculating the probability of the direct strike of an animal by any military items from the proposed training and testing activities falling toward (or directed at) the sea surface. For the purposes of this section, military items include non-explosive practice munitions, sonobuoys, acoustic countermeasures, some targets, torpedoes, anchors, and high-energy lasers. Only marine mammals and sea turtles will be analyzed using these methods because animal densities are necessary to complete the calculations, and density estimates are currently only available for marine mammals and sea turtles within the Study Area. The analysis conducted here does not account for explosive munitions because impacts from explosives are analyzed within the Navy Acoustic Effects Model as described in *Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing* (U.S. Department of the Navy, 2017).

J.1 Direct Impact Analysis

These calculations estimate the impact probability (P) and number of exposures (T) associated with direct impact of military items on marine animals on the sea surface within the training or testing area in which the activities are occurring (R = area of the Mariana Islands Range Complex). The statistical probability analysis is based on probability theory and modified Venn diagrams with rectangular "footprint" areas for the individual animal (A) and total impact (I) inscribed inside the training or testing area (R). The analysis is over-predictive and conservative, in that it assumes: (1) that all animals would be at or near the surface 100 percent of the time, when in fact, marine mammals spend the majority of their time underwater, and (2) that the animals are stationary, which does not account for any movement or potential avoidance of the training or testing activity.

1. A = length*width, where the individual animal's width (breadth) is assumed to be 20 percent of its length for marine mammals and 112 percent of its length for sea turtles. A is multiplied by the number of animals N_a in the training or testing area (i.e., product of the highest average seasonal animal density [D] and training or testing area [R]: $N_a = D*R$) to obtain the total animal footprint area ($A*N_a = A*D*R$) in the training or testing area. As a conservative scenario, the total animal footprint area is calculated for the species with the highest average seasonal density (pantropical spotted dolphins).
2. $I = N_{mun}$*length*diameter, where N_{mun} = total annual number of military items for each type, and "length" and "diameter" refer to the individual military equipment dimensions. For each type, the individual impact footprint area is multiplied by the total annual number of military items to obtain the type-specific impact footprint area ($I = N_{mun}$*length*diameter). Each training or testing activity uses one or more different types of military items, each with a specific number and dimensions, and several training and testing events occur in a given year. When integrating over the number of military items types for the given activity (and then over the number of events in a year), these calculations are repeated (accounting for differences in dimensions and numbers) for all military items types used, to obtain the type-specific impact footprint area (I). These impact footprint areas are summed over all military items types for the given activity, and then summed (integrated) over all events to obtain the total impact footprint area resulting from all events occurring in the training or testing area in a given year.

Though marine mammals and sea turtles are not randomly distributed in the environment, a random point calculation was chosen given the available information on an animal's or military item's spatial occurrence. Military items may be expended generally throughout the Study Area, depending on the activity and item type.

The analysis is expected to provide an overestimation of the probability of a strike for the following reasons: (1) it calculates the probability of a single military item (of all the items expended over the course of the year) hitting a single animal at its species' highest seasonal density, (2) it does not take into account the possibility that an animal may avoid military activities, (3) it does not take into account the possibility that an animal may not be at the water surface, (4) it does not take into account that most projectiles fired during training and testing activities are fired at targets, and so only a very small portion of those projectiles that miss the target would hit the water with their maximum velocity and force, and (5) it does not quantitatively take into account the Navy avoiding animals that are sighted through the implementation of mitigation measures (for consideration of mitigation during analysis see Sections 3.4, Marine Mammals; and 3.5, Sea Turtles).

The likelihood of an impact is calculated as the probability (P) that the animal footprint (A) and the impact footprint (I) will intersect within the training or testing area (R). This is calculated as the area ratio A/R or I/R, respectively. Note that A (referring to an **individual** animal footprint) and I (referring to the impact footprint resulting from the **total** number of military items N_{mun}) are the relevant quantities used in the following calculations of single-animal impact probability [P], which is then multiplied by the number of animals to obtain the number of exposures (T). The probability that the random point in the training or testing area is within both types of footprints (i.e., A and I) depends on the degree of overlap of A and I. The probability that I overlaps A is calculated by adding a buffer distance around A based on one-half of the impact area (i.e., 0.5*I), such that an impact (center) occurring anywhere within the combined (overlapping) area would impact the animal. Thus, if L_i and W_i are the length and width of the impact footprint such that $L_i*W_i = 0.5*I$ and $W_i/L_i = L_a/W_a$ (i.e., similar geometry between the animal footprint and impact footprint), and if L_a and W_a are the length and width (breadth) of the individual animal such that $L_a*W_a = A$ (= individual animal footprint area), then, assuming a purely static, rectangular scenario (Scenario 1), the total area $A_{tot} = (L_a + 2*L_i)*(W_a + 2*W_i)$, and the buffer area $A_{buffer} = A_{tot} – L_a*W_a$.

Four scenarios were examined with respect to defining and setting up the overlapping combined areas of A and I:

1. **Scenario 1**: Purely static, rectangular scenario. Impact is assumed to be static (i.e., direct impact effects only; non-dynamic; no explosions or scattering of military items after the initial impact). Hence the impact footprint area (I) is assumed to be rectangular and given by the product of military items length and width (multiplied by the number of military items).
   $A_{tot} = (L_a + 2*L_i)*(W_a + 2*W_i)$ and $A_{buffer} = A_{tot} – L_a*W_a$.
2. **Scenario 2**: Dynamic scenario with end-on collision, in which the length of the impact footprint (Li) is enhanced by Rn = 5 military items lengths to reflect forward momentum.
   $A_{tot} = (L_a + (1 + R_n)*L_i)*(W_a + 2*W_i)$ and $A_{buffer} = A_{tot} – L_a*W_a$.
3. **Scenario 3**: Dynamic scenario with broadside collision, in which the width of the impact footprint (W_i) is enhanced by R_n = 5 military items lengths to reflect forward momentum.
   $A_{tot} = (L_a + 2*W_i)*(W_a + (1 + R_n)*L_i)$ and $A_{buffer} = A_{tot} – L_a*W_a$.
4. **Scenario 4**: Purely static, radial scenario, in which the rectangular animal and impact footprints are replaced with circular footprints while conserving area. Define the radius (R_a) of the circular

individual animal footprint such that $\pi*R_a^2 = L_a*W_a$, and define the radius (R_i) of the circular impact footprint such that $\pi *R_i^2 = 0.5*L_i*W_i = 0.5*I$. Then $A_{tot} = \pi *(R_a + R_i)^2$ and $A_{buffer} = A_{tot} – \pi *R_a^2$ (where $\pi = 3.1415927$).

Static impacts (Scenarios 1 and 4) assume no additional aerial coverage effects of scattered military items beyond the initial impact. For dynamic impacts (Scenarios 2 and 3), the distance of any scattered military items must be considered by increasing the length (Scenario 2) or width (Scenario 3), depending on orientation (broadside versus end-on collision), of the impact footprint to account for the forward horizontal momentum of the falling object. Forward momentum typically accounts for five object lengths, resulting in a corresponding increase in impact area. Significantly different values may result from the static and dynamic orientation. Both of these types of collision conditions can be calculated each with 50 percent likelihood (i.e., equal weighting between Scenarios 2 and 3, to average these potentially different values).

Impact probability P is the probability of impacting one animal with the given number, type, and dimensions of all military items used in training or testing activities occurring in the area per year, and is given by the ratio of total area (A_{tot}) to training or testing area (R): $P = A_{tot}/R$. Number of exposures is $T = N*P = N*A_{tot}/R$, where N = number of animals in the training or testing area per year (given as the product of the animal density [D] and range size [R]). Thus, $N = D*R$ and hence $T = N*P = N*A_{tot}/R = D*A_{tot}$. Using this procedure, P and T were calculated for each of the four scenarios, for Endangered Species Act (ESA)-listed marine mammals and the marine mammal and sea turtle species with the highest average seasonal density (used as the annual density value) and for each military item type. The scenario-specific P and T values were averaged over the four scenarios (using equal weighting) to obtain a single scenario-averaged annual estimate of P and T. The potential number of exposures (t) are reported in Table J-1 through Table J-4.

J.1.1 Parameters for Analysis

Impact probabilities (P) and number of exposures (T) were estimated for the following parameters:

1. **Two action alternatives**: Alternative 1 and Alternative 2. Animal densities, animal dimensions, and military item dimensions are the same for the two action alternatives.
2. **The following types of non-explosive munitions or other items:**
    - **Small-caliber projectiles:** up to and including .50 caliber rounds
    - **Medium-caliber projectiles:** larger than .50 caliber rounds but smaller than 57 millimeters (mm) projectiles
    - **Large-caliber projectiles:** includes projectiles greater than or equal to a 57 mm projectile
    - **Missiles:** includes rockets and jet-propelled munitions
    - **Bombs:** Non-explosive practice bombs and mine shapes, ranging from 10 to 2,000 pounds
    - **Torpedoes:** includes all lightweight torpedoes
    - **Sonobuoys:** includes all sonobuoys
    - **Targets:** includes expended, airborne and surface, targets, as well as mine shapes
    - **Lightweight torpedo accessories:** includes all accessories that are dropped along with the torpedo (nose cap, air stabilizer, etc.)
    - **Anchors:** includes blocks used to anchor mine shapes to the seafloor
    - **Acoustic countermeasures:** includes aircraft and ship-deployed acoustic countermeasures

- **High-Energy Lasers:** includes high-energy laser weapons that are directed at a surface target
- **Expended Bathythermographs:** small sensor deployed from ships or aircraft

3. **Animal species of interest:** The five species of ESA-listed marine mammals and the non-ESA listed marine mammal species with the highest average month density (pantropical spotted dolphin). The sea turtle species with the highest average month density in the training and testing areas of interest (green sea turtles).

J.1.2 Input Data

Input data for the direct strike analysis include animal species likely to be in the area and military items proposed for use under each of the two action alternatives. Animal species data include (1) species identification and status (i.e., threatened, endangered, or neither), (2) highest average seasonal density estimate for the species of interest, and (3) adult animal dimensions (length and width) for the species with the highest density. The animal's dimensions are used to calculate individual animal footprint areas (A = length*width), and animal densities are used to calculate the number of exposures (T) from the impact probability (P): T = N*P. Military items data include (1) military items category (e.g., projectile, bomb, rocket, target), (2) military items dimensions (length and width), and (3) total number of military items used annually.

Military items input data, specifically the quantity (e.g., numbers of bombs and rockets), are different in magnitude between the two action alternatives. All animal species input data, the military items' identification and category, and the military items' dimensions are the same for the two alternatives; only the quantities (i.e., total number of military items) are different.

J.1.3 Output Data

Estimates of impact probability (P) and number of exposures (T) for a given species of interest were made with the maximum annual number of military items used for each of the two action alternatives. The calculations derived P and T from the highest annual number of military items used in the Study Area for the given alternative. Differences in P and T between the alternatives arise from different numbers of events (and therefore military items) for the two alternatives.

Results for marine mammals and sea turtles are presented in Tables J-1 through J-4.

Table J-1: Estimated Representative Marine Mammal Exposures from Direct Strike of a High-Energy Laser by Area and Alternative in a Single Year

Mariana Islands Range Complex		
	Alternative 1	Alternative 2
Humpback	0.000000	0.000000
Sei whale	0.000000	0.000000
Fin whale	0.000000	0.000000
Blue whale	0.000000	0.000000
Sperm whale	0.000001	0.000001
Pantropical Spotted Dolphin	0.000001	0.000001

Table J-2: Estimated Representative Sea Turtle Exposures from Direct Strike of a High-Energy Laser by Area and Alternative in a Single Year

Mariana Islands Range Complex		
	Alternative 1	Alternative 2
Green Sea Turtle	0.000025	0.000027

Table J-3: Estimated Representative Marine Mammal Exposures from Direct Strike of Military Expended Materials by Area and Alternative in a Single Year

Mariana Islands Range Complex		
	Alternative 1	Alternative 2
Humpback	0.000024	0.000028
Sei whale	0.000008	0.000009
Fin whale	0.000002	0.000002
Blue whale	0.000001	0.000002
Sperm whale	0.000030	0.000035
Pantropical spotted Dolphin	0.000560	0.000660

Table J-4: Estimated Representative Sea Turtle Exposures from Direct Strike of Military Expended Materials by Area and Alternative in a Single Year

Mariana Islands Range Complex		
	Alternative 1	Alternative 2
Green Sea Turtle	0.002620	0.003087

REFERENCES

U.S. Department of the Navy. (2017). *Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing* (Technical Report prepared by Space and Naval Warfare Systems Center Pacific). San Diego, CA: Naval Undersea Warfare Center.

Appendix K: Public Comment Responses

Supplemental Environmental Impact Statement/

Overseas Environmental Impact Statement

Mariana Islands Training and Testing

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APPENDIX K PUBLIC COMMENT RESPONSES

This appendix includes public comments on the Mariana Islands Training and Testing (MITT) Draft Supplemental Environmental Impact Statement/Overseas Environmental Impact Statement (SEIS/OEIS) and the Navy's responses to those comments.

K.1 INTRODUCTION

The Navy would like to thank the elected officials, federal regulatory and local resource agencies, business and community leaders, organizations, and individuals for reviewing the MITT Draft SEIS/OEIS, attending the public meetings, and submitting comments. Public involvement is an essential aspect of the environmental impact review process.

K.2 PUBLIC COMMENT PERIOD FOR THE DRAFT SUPPLEMENTAL ENVIRONMENTAL/OVERSEAS ENVIRONMENTAL IMPACT STATEMENT

The Draft SEIS/OEIS public review and comment period began with issuance of the Notice of Public Meetings (84 Federal Register [FR] 677) on January 31, 2019, and the Notice of Availability (84 FR 1119) on February 1, 2019, in the *Federal Register*. A Notice of Rescheduled Public Meetings and Extension of Public Comment Period was published in the *Federal Register* (84 FR 8515) on March 8, 2019. A Notice of Extension of Public Comment Period was published in the *Federal Register* (84 FR 12239) on April 1, 2019. The public comment period began on February 1, 2019, and concluded on April 17, 2019. The Navy made significant efforts to notify the public by distributing letters, postcards, press releases, and newspaper display advertisements to maximize public participation (see Chapter 8, Public Involvement and Distribution).

The Notice of Public Meetings included a project description, dates and locations of the four public meetings, and commenting information. The public was able to learn more about the project, review the Draft SEIS/OEIS, and submit comments during the public comment period (Appendix B, Federal Register Notices). The Draft SEIS/OEIS was available on the project website for review. Printed copies of the Draft SEIS/OEIS were provided to five libraries in Guam and the Commonwealth of the Northern Mariana Islands. Navy representatives were available during the open house public meetings to provide information and answer questions. Comment sheets and a voice recorder were available to attendees. Commenters provided their input on the Draft SEIS/OEIS in letters submitted through mail, written comments received at the public meetings, and via the project website.

K.2.1 COMMENTERS, COMMENTS AND RESPONSES

This section contains four tables containing the Navy responses associated with the comments from local agencies and elected officials (Table K-1), federal agencies (Table K-2), nongovernmental organizations (Table K-3), and individuals (Table K-4).

K.2.1.1 Comment Response Process

The Navy considered and responded to all comments received on the Draft SEIS/OEIS, as detailed in this Final SEIS/OEIS. The Navy's responses to comments received during the public comment period are included in this Appendix. In accordance with 40 Code of Federal Regulations 1503.4, comments were assessed and responded to as follows:

- The Navy project team carefully reviewed all comments received. Each comment was assigned to a resource-specific specialist from the Navy's interdisciplinary team.

- Within each comment submittal, substantive comments were identified for consideration of possible updates to the SEIS/OEIS analysis. Generally, substantive comments included questions or comments related to the alternatives analysis and components of the Proposed Action; resource-specific methodology, analysis, or impact conclusions; or the use, adequacy, or accuracy of data used to support the analysis.
- The SEIS/OEIS analysis was updated as warranted.
- Responses to comments were developed based on the above-described comment review and SEIS/OEIS update process. Responses identify, as appropriate, sections of the SEIS/OEIS where revisions were made or details on where additional information is provided within the SEIS/OEIS.

K.2.1.2 Agency, Organization and Private Individual Comment Organization

Throughout the Draft SEIS/OEIS public comment period, a total of 317 unique comments were received. Comments were grouped into four categories (1) local agencies and elected officials, (2) federal agencies, (3) nongovernmental organizations, and (4) individuals. Comments are presented by category, followed by the name of the commenter and organization (if applicable), and the full text of each unique comment.

K.3 Comment Responses

Responses to all comments received on the Draft SEIS/OEIS are included in this Appendix. Each table within this Appendix presents the Navy's response to each comment received. All comments received on the Draft SEIS/OEIS are part of the official project record. When applicable, the Navy's analyses were updated based on comments received.

Table K-1: Response to Comments from Local Agencies – Elected Officials

	Comment	Navy Response
Senator Sabina Perez, Office of Senator Perez (OSP), Guam Legislature		
OSP-01	Department of Health and Human Services manuscript was supplied (8 pages long) "Temporary and Permanent Noise-Induced Threshold Shifts: A Review of Basic and Clinical Observations"	Thank you for providing this reference. The Navy has reviewed and incorporated the best available science on the hearing sensitivity of marine species, which is more relevant to the analysis presented in this Supplemental EIS/OEIS than the submitted manuscript that reviewed basic and clinical observations on threshold shifts in humans.
Senator Therese Terlaje, Office of Senator Therese Terlaje (OST), Guam Legislature		
OST-01	**Introduction & Background** The following comments are submitted by Senator Therese Terlaje, Chairperson of the Committee on Health, Tourism, Historic Preservation, Land and Justice for the 35th Guam Legislature regarding the 2019 draft Supplemental Environmental Impact Statement (SEIS) to the 2015 Mariana Islands Training and Testing (MITT) Final EIS. Many fundamental concerns raised previously on the 2015 MITT and in the Scoping Period for the 2019 SEIS remain in the current Draft SEIS proposed here. Rather than a point-by-point analysis of the many sections of the SEIS, highlighted here again are the larger context issues that continue to remain significant to our people, environment and everyday livelihood in our region. While the 2019 MITT Draft Supplemental EIS/OEIS provides key updates to the 2015 MITT FEIS/OEIS, the Navy states "proposed training and testing activities are similar to activities conducted in the Mariana Islands for decades" [https://www.mitt-eis.com; emphasis added]. The justification that these activities have been ongoing for decades does not legitimize these continued actions. While the Navy defines the MITT range as its "Study Area," I object to this way of being imagined, recognized and treated in the area of global geopolitics. As stated in previous comments submitted by this government, the Marianas is our regional living grounds, our	Public involvement is a fundamental aspect of the environmental analysis process, and the Navy welcomes and appreciates the public's participation. The Navy reviewed all comments received during the 45-day scoping period and considered all substantive comments in the preparation of the Draft Supplemental EIS/OEIS. Each resource section within this Supplemental EIS/OEIS presents a summary of the scoping comments and responses to the issues raised. In addition, the actual public comments received on the Draft Supplemental EIS/OEIS and the Navy's responses to those comments are provided in Appendix K (Public Comment Responses). To support the environmental impact analysis, the Navy needed to determine a geographic area within which impacts on resources from the Proposed Action and alternatives were analyzed. Under NEPA, the term "Study Area" is used to define the boundary of the area of analysis included in this Supplemental EIS/OEIS. The Navy's analysis is focused on the Mariana Islands Training and Testing (MITT) EIS/OEIS Study Area (Study Area), which is defined as: (1) the Mariana Islands Range Complex, (2) additional areas on the high seas, and (3) a transit corridor between the Mariana Islands Range Complex and the Hawaii Range Complex. The supplement to the 2015 MITT Final EIS/OEIS supports ongoing and future training and testing activities conducted at sea and on Farallon de Medinilla (FDM) within the Study Area beyond 2020. The activities

	Comment	Navy Response
	ancestral habitat for centuries before it ever became a study area for military testing and training, and it is our intent to maintain it as such for our generation now and in the future.	analyzed are largely a continuation of the activities previously analyzed. This Supplemental EIS/OEIS: (1) includes the analysis of activities at sea and on FDM necessary to meet readiness requirements beyond 2020 and into the reasonably foreseeable future; (2) includes any changes to those activities previously analyzed, and (3) reflects the most up-to-date compilation of training and testing activities deemed necessary to accomplish military readiness requirements.
OST-02	The hallmark of self-determination must be the safeguarding of a non-self-governing people's right to its own natural resources and the right to participate freely in any decision-making concerning those limited resources. It is also critically important in this time of climate change that Guam, a small island, be allowed to protect its existing resources that will increase the absorption of carbon dioxide, increase the protection of shores against rising tides, and maintain its biodiversity as a hope for the future wellness and economic independence of its community. Studies have found over 100 contaminated sites on Guam. Almost all of these are from U.S. military activity and dumping, and result in the people of Guam's continued exposure to many cancer-causing agents, including radiation from nuclear testing, Agent Orange, and polychlorinated biphenyls (PCBs). One third of Guam that the U.S. military controls and uses for its continued activity, expansion, and nuclear storage, includes areas above the aquifer, adjacent to the fresh water lake, and along the coast, while designated cleanup sites are ignored. Guam has sought but been denied in U.S. compensation programs for radiation exposure despite high levels of cancer rates and findings by the Board on Radiation Effects Research (BRER) Committee that the people of Guam were exposed as downwinders of the U.S. nuclear testing in the Marshall Islands from 1945 to	The Navy recognizes the concern regarding past actions and takes environmental stewardship and our responsibility to the community very seriously. Many of the actions mentioned in the comment are not associated with the ongoing and proposed training and testing activities for this Supplemental EIS/OEIS, which occur at sea and on FDM. The analysis presented in Section 3.13 (Public Health and Safety) indicates that proposed training and testing activities would not impact public health and safety. The proposed Live-Fire Training Range Complex is not part of this Proposed Action. For more information about the proposed Live-Fire Training Range Complex, please visit www.guambuildupeis.us. Protecting marine life and marine habitats is important to the Navy. Using the latest science and technology, the Navy completed extensive analyses and computer-based modeling to determine impacts and develop science-based protective measures to reduce or avoid potential impacts on marine life. All potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practicable, procedural and geographic mitigation measures during its training and testing activities to reduce potential impacts on marine life. This Supplemental EIS/OEIS is the third Navy analysis and the third time NMFS has promulgated incidental take regulations pursuant to the MMPA relating to military readiness activities in the MITT Study Area (see 85 FR

	Comment	Navy Response
	1962. Similarly, the U.S. denies Agent Orange use on Guam during the war despite the accounts of military personnel admitting to staging, transporting, and spraying the herbicide on Guam. In addition to the establishment of the Mariana Islands Range Complex (MIRC) and the MITT ranges, the U.S. military is underway in its establishment of a Live-Fire Training Range Complex (LFTRC) on Guam near Ritidian/Litekyan, the site of a 3500-year-old ancient village. The Live-Fire Training Range requires the removal of approximately 187 acres of some of the last remaining primary limestone forests, and the habitat for several endangered species found only in Guam and within the CNMI. Pursuant to the 2015 MITT, the National Marine Fisheries Service permitted 12,580 detonations of various magnitudes per year for 5 years, 81,962 takings of 26 different marine mammal species (including whales and dolphins) per year for 5 years, damage or kill of over 6 square miles of endangered coral reefs plus an additional 20 square miles of coral reef around FDM through the use of highly explosive bombs, and that live fire or sonar activity be conducted 365 days a year for 5 years. This excessive authorization to take, or harm, mammals is unjustified and negatively impacts Guam's ability to preserve its environment, and to benefit from the diversity of species and the potential of these natural resources. The LFTRC expands the military footprint over a current wildlife refuge and cuts off public access to the people of Guam for 273 days out of the 365 days of the year. The building of U.S. military bases and infrastructure has placed a high demand for cliffside property best suitable for quarrying and mining of limestone. The history, the values, and prosperity of indigenous CHamorus are uniquely tied to the land, landscape and ecosystems of Guam.	5872). As indicated by this science-based analysis and monitoring results, and as the previous findings from NMFS have confirmed, with implementation of the Navy's protective mitigation measures, Navy training and testing activities would not have a significant impact on populations of marine mammals inhabiting the MITT Study Area. For details in this regard, see Section 3.4.2 (Environmental Consequences) and Section 3.4.3.4 (Summary of Monitoring and Observations During Navy Activities Since 2015). The U.S. Department of Defense takes concerns of the use of Agent Orange very seriously and keeps extensive records of all testing, storage and transport of the substance. The U.S. Department of Defense has searched the records, and there is no indication that Agent Orange was used, stored, or shipped through Guam. While the compound 2, 4-D is one of the components of Agent Orange, it was also part of the formula of commonly used herbicides that were widely applied throughout the United States until 1985. Joint Region Marianas is cooperating with the U.S. Environmental Protection Agency and the Government of Guam on sampling and testing efforts.

	Comment	Navy Response
	Undoubtedly, our land and water resources allow us to build a sustainable economy, health, cultural practices, and overall quality of life and provide our greatest insurance to withstand climate change, However, as outlined here, our lands and waters are increasingly blocked from access, and under threat of contamination and destruction of habitat. It should be made clear, the indigenous people of Guam have never freely agreed nor requested, voted, or negotiated that our land and waters be subjected to radiation, nuclear waste, PCBs, Agent Orange, Agent Purple, and other contamination; or that our fishing grounds and farmlands and ocean resources be taken away or restricted; or that homes be relocated; or that firing ranges be built over or adjacent to ancient villages and sacred burial grounds, all in support of U.S. military testing or military training.	
OST-03	**Concerns & Key points** 1. Cumulative Impacts - Per NEPA and CEQ regulations, "The range of actions that must be considered includes not only the project proposal but all connected and similar actions that could contribute to cumulative effects. Specifically, NEPA requires that all related actions be addressed in the same analysis (CEQ Publications, Cumulative Effects, https://ceq.doe.gov/publications/cumulative_effects.html; CEQ Considering Cumulative Effects Under the NEPA (Council on Environmental Quality, 1997). Comment: Given this, cumulative impacts/effects of the Proposed Action must also take into account past and current actions that include the cumulative effects of radiation, nuclear waste, PCBs, Agent Orange, Agent Purple, and other contamination; or that our fishing grounds and farmlands and ocean resources be taken away or restricted; or that homes be relocated; or that firing ranges be built over or adjacent to ancient villages and sacred burial grounds	The Navy used the best available science and conducted a comprehensive review of past, present, and reasonably foreseeable actions to develop a robust analysis of cumulative impacts (Chapter 4, Cumulative Impacts). As required under NEPA, the level and scope of the analysis are commensurate with the potential impacts of the action as reflected in the resource-specific discussions in Chapter 3 (Affected Environment and Environmental Consequences). The Navy considered proposed and ongoing activities alongside other activities in the region whose impacts are truly meaningful to the analysis, as noted in the Council on Environmental Quality (CEQ) publication *Considering Cumulative Effects Under the National Environmental Policy Act*. Furthermore, the entire Supplemental EIS/OEIS provides the cumulative impacts analysis, not just Chapter 4. Chapter 3 provides the current effects of past and present impacts and environmental conditions that represent baseline environmental conditions; Chapter 3 also discusses the consequences or potential future impacts from Navy activities. Chapter 4 discusses other reasonably foreseeable activities to the extent they are known and the

	Comment	Navy Response
	– all of these in addition to the impact of global climate change in our region.	incremental impact of the Navy's proposal when added to past, present, and future impacts. Past actions involving contamination such as radiation and nuclear waste are beyond the geographic and temporal scope of the cumulative effects analysis. As noted above, Chapter 3 represents the baseline of the environment and considers the actions that have affected the resources in the past.
OST-04	2. Global climate change is outlined in Table 4.2-1: Past, Present, and Reasonably Foreseeable Actions: Predictions of long-term negative environmental impacts, some of which have begun to occur at present, due to climate change include sea level rise; changes in ocean surface temperature, acidity/alkalinity, and salinity; changing weather patterns with increases in the severity of storms and droughts; changes to local and regional ecosystems (including the potential loss of species); shrinking glaciers and sea ice; thawing permafrost; a longer growing season; and shifts in plant and animal ranges, fecundity, and productivity. A special report by the Intergovernmental Panel on Climate Change discussed the long-term warming trend observed since pre-industrial times (Intergovernmental Panel on Climate Change, 2018), and how higher than the global annual average temperatures are being experienced in many land regions and seasons, (4.0 Cumulative Impacts, page 4-20). Comment/question: Both Alternative 1 and Alternative 2 indicate “new at-sea activities,” currently ongoing activities, an “increase in tempo of some training and testing activities, including additional Fleet exercises and associated unit-level activities.” How do these actions contribute to long-term negative environmental impacts on our region, including rise in sea levels, changes in ocean surface temperature, acidity/alkalinity, and salinity, changing weather patterns with increases in the severity of storms and droughts;	The Navy’s analysis shows greenhouse gas emissions would increase from the baseline by approximately 20 percent under Alternatives 1 and 2. Since greenhouse gases are relevant in a global scope, they are analyzed based on the extent to which they would contribute to climate change. Implementation of Alternative 2 would generate approximately 0.0133 percent of the U.S. annual greenhouse gas emissions, which is less than a 0.0025 percent increase from baseline contributions. This minor increase is not expected to significantly affect the global climate. Therefore, the analysis indicates the Proposed Action would not significantly contribute to long-term negative environmental impacts in the region. For more information about the analysis, please see Section 3.2 (Air Quality), Chapter 4 (Cumulative Impacts), and Chapter 6 (Additional Regulatory Considerations).

	Comment	Navy Response
	changes to local and regional ecosystems (including potential loss of species); and shifts in plant and animal ranges, fecundity, and productivity?	
OST-05	3. Seismic surveys/Use of sonar: Waters near the Study Area in the Territory of Guam and the Commonwealth of the Northern Mariana Islands. Seismic surveys are typically accomplished by towing a sound source, such as an airgun array that emits acoustic energy in timed intervals behind a research vessel. The transmitted acoustic energy is reflected and received by an array of hydrophones. This acoustic information is processed to provide information about geological structure below the seafloor. The oil and gas industry uses seismic surveys to search for new hydrocarbon deposits. Also, academic geologists use them to study plate tectonics and other topics. The underwater sound produced by these surveys could affect marine life, including marine mammals. For example, the potential exists to expose some animals to sound levels exceeding 180 decibels referenced to 1 micropascal root mean square, which would in turn potentially result in temporary or permanent loss of hearing (Bureau of Ocean Energy Management, 2011). <u>Comment/question:</u> What is the purpose of the Navy's proposed use of seismic surveys in the waters surrounding the Marianas? Does this relate to the military's plans for mining in our region? While the Navy may have authorizations and processes in place to cause temporary or permanent harm to the ocean environment and marine life, our people for generations historically and culturally, continue to value all aspects of oceanic marine life and ecosystems. This interconnectedness of land, ocean and air is what we depend on for our livelihood and way of being.	The Navy is not proposing to conduct seismic surveys in the waters surrounding the Mariana Islands in this Supplemental EIS/OEIS. Seismic surveys are included in Table 4.2-1 because the activity is considered in the cumulative effects analysis.

	Comment	Navy Response
OST-06	Additionally, I support the 14 concerns raised by the Guam Department of Agriculture in their submitted comments and in their testimony during an April 15th public hearing at the Guam Legislature on the impacts of the 2019 MITT on endangered species' and marine mammals' habitat, marine preserves, accessibility to fishermen and other recreational users, and a lack of updated and accessible data regarding marine mammal standings and takes (deaths) in the proposed study area. A biologist of the Fisheries Section of the Guam Department of Agriculture further stated, "sonar, vessel interactions, explosive detonation in the water, all of these have the potential to impact marine mammals. One of the concerns from the EIS is that for all of the marine mammals that are mentioned, I don't think there's a single one that has the most current information available listed with it. We have information on strandings, on sightings, on whales sighted giving birth that were not mentioned in the EIS anywhere. And I'm not certain where that information was gotten from, but all of this information that was provided to our federal partners as well as that we have available, was not mentioned in the EIS." He also stated, "We do have additional stranding records. We have additional records of marine mammals identified giving birth in the region. One of particular concern is the mention of the Agat offshore mine detonation site. That's almost precisely where we have photographic evidence of sperm whales giving birth which are both marine mammal and endangered species listed organisms. Though it's not listed anywhere in the EIS that incidents like that. Another area of concern is vessel strikes. Vessel strikes with marine mammals are addressed in the EIS but we have a greater incidence of vessel strikes with sea turtles on Guam. We've had at least five sea turtles killed by vessel strike in the last seven years on Guam that we've been able to identify. It's difficult to identify the vessel	The Navy reviewed the best available scientific data and information on marine mammals available at the time the Draft Supplemental EIS/OEIS was completed and incorporated relevant information into the analysis of impacts on marine mammals in this Supplemental EIS/OEIS. Peer-reviewed scientific publications are considered to be the most reliable and accurate sources of data and information and were used throughout this Supplemental EIS/OEIS to support the analysis and conclusions. Well-respected and historically vetted government reports (e.g., marine mammals stock assessment reports) were also used to support the analysis. Any newly published data and information relevant to the analysis of potential impacts on marine mammals that has become available since the Draft Supplemental EIS/OEIS was completed was incorporated into the Final Supplemental EIS/OEIS. In addition, Section 3.4.2.1.1.6 (Stranding) has been expanded to include additional information about strandings of beaked whales in the Mariana Islands and the Navy's support of efforts to better understand the causes of marine mammal strandings. The Center for Naval Analysis (CNA) recently conducted a statistical study of correlation of beaked whale strandings around the Mariana Islands with the use of U.S. Navy sonar, finding that insufficient evidence of a correlation exists. The CNA study used the complete record of all U.S. Navy sonar use between 2007 and 2019, including major training events, joint exercises, and unit level training/testing. The analysis also included the complete beaked whale stranding record for the Mariana Islands through 2019. Following the methods in Simonis et al. (2020), the CNA analysis found insufficient evidence of a correlation between sonar use and beaked whale strandings when considering the complete sonar use record. The CNA finding is in contrast to the finding in Simonis et al. (2020), which depicted a significant correlation between beaked whale strandings and Navy sonar use. However, the Simonis et al. (2020) result relied on substantially incomplete or inaccurate assumptions about U.S. Navy sonar use around the Mariana Islands. CNA also conducted statistical analyses specific to each island where beaked whale strandings have been observed in the

	Comment	Navy Response
	that did strike the turtle. Nearly all of these occurred in inner Apra Harbor which is pretty much closed to all activity except military vessel activities. So the implication is that it could be military vessel strikes that are causing the sea turtle mortality.	Mariana Islands, similarly finding insufficient evidence of a correlation to sonar use. Additional information on the findings of the CNA analysis are presented in Section 3.4.2.1.1.6 (Stranding) in Chapter 3.4 (Marine Mammals). As described in Section 5.1.2.2.1 (Marine Species Research and Monitoring Programs), for this Final Supplemental EIS/OEIS, the Navy agreed to several additional research and monitoring initiatives designed to help advance the understanding of beaked whales and strandings in the MITT Study Area. The Navy will co-fund the Pacific Marine Assessment Program for Protected Species (PACMAPPS) Mariana Islands survey in spring-summer 2021 and future studies starting in 2022 to help document beaked whale occurrence, abundance, and distribution in the Mariana Islands. The Navy will also fund additional stranding response and necropsy analyses for the Pacific Islands region, and research on a framework to improve statistical stranding analysis. Collaboratively with NMFS, the Navy will fund and organize an expert panel to provide recommendations on scientific data gaps and uncertainties for further protective measure consideration to minimize potential impacts of Navy training and testing activities on beaked whales in the Mariana Islands. Recently published information by NMFS indicates that the Mariana Islands is a calving area for humpback whales. In consideration of this, the Navy has proposed in this Supplemental EIS/OEIS geographic mitigation areas at Marpi Reef and Chalan Kanoa Reef off Saipan (see Appendix I, Geographic Mitigation Assessment). The Navy has included mention of the two Associated Press File photographs of a sperm whale calf seen off Agat Marina on June 15, 2001, in the Final MITT EIS/OEIS. This one occurrence, 19 years ago, is the only known occurrence of a sperm whale calf in the Mariana Islands and therefore does not indicate that the waters off Guam or the Mariana Islands are a sperm whale calving location. While it is possible that several species of marine mammals could occur at the Agat

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		Bay Mine Neutralization Site, the Navy's procedural mitigation measures involving observing for marine mammals and sea turtles prior to conducting activities using explosives at the site reduces the likelihood of potential impacts on marine species. Please refer to Chapter 5 (Mitigation) for additional information on the Navy's procedural mitigation measures. This Supplemental EIS/OEIS includes an analysis of potential impacts on sea turtles from physical disturbance and strike stressors (Section 3.5.2.4.1, Impacts from Physical Disturbance and Strike Stressors Under Alternative 1; and Section 3.5.2.4.2, Impacts from Physical Disturbance and Strike Stressors Under Alternative 2 [Preferred Alternative]). The Navy is also consulting with NMFS under the ESA regarding the use of vessels and in-water devices, military expended materials, and seafloor devices. During the Navy's consultation process with NMFS, the Navy analyzed the potential for ship strikes to occur, with special emphasis on Apra Harbor (where most ship movements occur). Although considered extremely rare, a ship strike of a sea turtle cannot be wholly discounted and would result in take, as defined under the ESA. Accordingly, the Navy has requested authorization pursuant with the ESA and has updated the Final Supplemental EIS/OEIS with measures to reduce the takes resulting from ship strikes. The Navy's analysis of other physical disturbances and strike stressors determined these activities would not adversely affect sea turtles.
OST-07	Another area in the EIS is mentioned… a large area to southeast of Guam Whiskey 517 is an area it was mentioned. It was very closely related to some offshore fishing banks where we documented a fair amount of fishing activity. In the last two years those banks have been off-limits about 120 days, an average for the last two years which is about a third of the year for activity and primarily for fishing activity. Now they do fall just outside the range that is delineated but we've had fishermen report that when they get down to the banks there are military vessels that are telling them to	As stated in the comment, it is correct that, with the exception of a portion of White Tuna Banks, these important fishing banks are outside W-517. The Navy does not restrict access to Galvez Bank or Santa Rosa Reef. Mariners near Galvez Bank or Santa Rosa Reef may be warned of their proximity to W-517 or asked not to enter W-517 as a precautionary measure. When certain activities are planned, the Navy publishes notices to mariners for public safety and to help water users plan accordingly to avoid temporarily restricted areas. As specified in Title 33 CFR Subpart 72.01, Notices to Mariners, the U.S. Coast Guard issues information to the public concerning maritime navigation. When notices to mariners are

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	not enter while activities are going on even though they're outside the area." [https://www.youtube.com/watch?v=qDmKc1hr8w4]	issued, the restriction is not necessarily for a full 24-hour period because many training activities last less than a full day. Additionally, nautical charts issued by the National Oceanic and Atmospheric Administration include these federally designated zones and areas. Operators of recreational and commercial vessels have a duty to abide by maritime regulations administered by the U.S. Coast Guard. The Navy will continue to communicate closures to the public and fishing community, including using Facebook. The Navy will continue to work with the fishing community to improve communication.
OST-08	4. Per Resource-Specific Cumulative Impacts: By CEQ guidance (Council on Environmental Quality, 1997), the following cumulative impacts analysis focuses on impacts that are "truly meaningful." The level of analysis for each resource is commensurate with the intensity of the impacts identified in Chapter 3 (Affected Environment and Environmental Consequences) and the level to which impacts from the Proposed Action are expected to mingle with impacts from existing activities. A full analysis of potential cumulative impacts is provided for marine mammals, sea turtles, and marine invertebrates. The rationale is also provided for an abbreviated analysis of the following resources: sediments and water quality, air quality, marine habitats, marine birds, marine vegetation, fishes, cultural resources, terrestrial species and habitats, socioeconomic resources, and public health and safety. Comment: Let the record show that the focus on "impacts that are truly meaningful" by the CEQ privileges the missions of the DoD and is not truly meaningful and commensurate with the historical and cultural experience of war in the region of the indigenous Chamoru people.	See above response (OST-03) regarding the cumulative impact analysis. Each biological resource section includes an analysis of secondary stressors and their potential impacts on a biological resource. Within these secondary stressor analyses in the Final Supplemental EIS/OEIS, discussions of the fate and transport of specific chemicals with references to chemical properties of munitions and munitions constituents are included. Marine debris is also addressed in the cumulative chapter and as part of the affected environment discussions within each biological resource section. In addition, munitions, munitions constituents, and other substances and materials are discussed in more detail in Section 3.1 (Sediments and Water Quality). This Supplemental EIS/OEIS, as well as the 2015 MITT Final EIS/OEIS, include discussion of the fate and transport of specific chemicals with references to chemical properties of munitions and munitions constituents.
OST-09	Additionally, I support the concerns of the Guam Coastal Management Program of the Bureau of Statistics and Plans in their submitted comments and in their testimony during an April 15th	The Navy submitted a Consistency Determination (CD) to the Bureau of Statistics and Plans (BSP) in December 2019 addressing proposed military training and testing activities that may affect Guam's coastal zone and coastal uses. The consistency determination was prepared in accordance

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	public hearing at the Guam Legislature on the impacts of detonations of the 2019 MITT on the coastal zones of Guam. The administrator for the Guam Coastal Management Program stated, "we want to ensure that military expended material will not pose contamination threats as material breaks down. This is not only a direct impact as the detonation occurs but any particles that may be consumed by organisms that can affect the food chain. We're not looking at just the moment but what could happen after the activity takes place. We are concerned about any kind of seafloor detonations within our coastal zone and this doesn't matter if there's no corals on hard bottom or substrates. With or without the presence of coral we know that the hard bottom substrate is an important area where coral polyps can settle and we want to be sure that that habitat is protected." [https://www.youtube.com/watch?v=qDmKc1hr8w4	with Guam's Procedures Guide for Achieving Federal Consistency with the Guam Coastal Management Program (Bureau of Statistics and Plans May 2011). BSP's response to the Navy's CD (dated March 6, 2020) can be found in Appendix C (Agency Correspondence). The Navy is in discussions with BSP in order resolve any differences and reach an agreement regarding the Navy's compliance with Guam's Coastal Management Program to the maximum extent practicable. The outcome of these discussions will be included in the ROD. The Navy has engaged with the Guam Coastal Management Program throughout the development of this Supplemental EIS/OEIS, including meeting with staff during the scoping phase and notifying the program director when the Draft Supplemental EIS/OEIS was made available for public review and comment. The Navy has engaged with the Guam Coastal Management Program throughout the development of this Supplemental EIS/OEIS, including meeting with staff during the scoping phase and notifying the program director when the Draft Supplemental EIS/OEIS was made available for public review and comment. This Supplemental EIS/OEIS describes actions that disturb benthic habitats occurring in designated/discrete areas (e.g., designated Apra Harbor underwater detonation sites). Overall as described in Section 3.3 (Marine Habitats) and Section 3.7 (Marine Vegetation) of this Supplemental EIS/OEIS, the Proposed Action would affect marine habitat structure in the Study Area, but underwater detonation activities would occur in areas that have been previously disturbed, and most impacts would be localized. The Proposed Action is not expected to result in detectable changes to seagrass growth, survival, or propagation; and is not expected to result in population-level impacts. The Navy's standard operating procedures will benefit seagrass in the Study Area by minimizing potential disturbances in areas with seagrass.

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OST-10	5. Per sections on Sediments and Water Quality, Air Quality, the 2015 MITT Final EIS/OEIS, indicated that training and testing activities under each alternative could result in local, short- and long-term changes in sediment and water quality. However, chemical, physical, or biological changes remained within standards, regulations, and guidelines. The short-term impacts arose from explosions and the byproducts of explosions and combusted propellants. The analysis in the 2015 MITT Final EIS/OEIS determined that it was unlikely that these short-term impacts would overlap in time and space with other future actions that produce similar constituents. Therefore, the short- term impacts did not contribute to cumulative impacts [emphasis added]. The long-term impacts arose from unexploded ordnance, non-combusted propellant, metals, and other materials. Long-term impacts of each alternative are cumulative with other actions that cause increases in similar constituents. However, the contribution of Alternative 1 or Alternative 2 in the 2015 MITT Final EIS/OEIS to long-term cumulative impacts was determined to be negligible [emphasis added] because of the following: - Most training and testing activities are widely dispersed in space and time. - Where activities are concentrated (i.e., Farallon de Medinilla [FDM]), marine habitat conditions observed over multiple years through dive studies indicate that ecological services that maintain water quality have not been inhibited at FDM. - Most components of expended materials are inert or corrode slowly. - Numerically, most of the metals expended are small- and medium-caliber projectiles, metals of concern comprise a small portion of the alloys used in expended materials, and metal corrosion is a slow process that allows for dilution.	Both this Supplemental EIS/OEIS and the 2015 MITT Final EIS/OEIS include an analysis of potential impacts from metals and contaminants as a result of military training and testing activities on marine resources. This analysis is presented in Section 3.1.2.2 (Metals), Section 3.4.2.7 (Secondary Stressors), Section 3.5.2.7 (Secondary Stressors), Section 3.7.2.3 (Secondary Stressors), Section 3.8.2.7 (Secondary Stressors), and Section 3.9.2.7 (Secondary Stressors). Based on the analysis presented in this Supplemental EIS/OEIS and the 2015 MITT Final EIS/OEIS, the Navy concluded that all levels of metals, chemicals, and other byproducts would be either below detectable levels or at levels below existing standards, regulations, and guidelines. This Supplemental EIS/OEIS, as well as the 2015 MITT Final EIS/OEIS, include discussion of the fate and transport of specific chemicals with references to chemical properties of munitions and munitions constituents. In summary, the Navy's analysis concludes that no federal or local guidelines would be exceeded because of the following reasons: (1) rapid and natural degradation of substances (e.g., munitions constituents and other chemicals), and (2) localized concentrations where impact would occur. These conclusions are based on evidence gathered on other military ranges in similar environments (e.g., Vieques), as well as legacy dump site studies conducted off the coast of Oahu. These studies are summarized in Section 3.1 (Sediments and Water Quality). Although binding to sediments is one possible outcome (e.g., for PCBs), other chemical pollutants behave differently. For example, when metals are exposed to seawater, they begin to slowly corrode, a process that creates a layer of corroded material between the seawater and uncorroded metal. This layer of corrosion removes the metal from direct exposure to the corrosiveness of seawater, a process that further slows movement of the metals into the adjacent sediments and water column. This is particularly true for aluminum. Elevated levels of metals in

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	- Most of the components are subject to a variety of physical, chemical, and biological processes that render them benign. - Potential areas of impacts would be limited to small zones immediately adjacent to the explosive, metals, or chemicals other than explosives. Under this SEIS/OEIS, the contribution of proposed changes in training and testing activities under Alternative 1 or Alternative 2 would still be negligible based on the reasons presented above. While all of the additional projects since 2015 may be measurable and result in long-term and widespread changes in environmental conditions (e.g., nutrient loading, turbidity, salinity, or pH), any changes in sediment and water quality would be subject to applicable standards and guidelines. Given that impacts on water quality as a result of the proposed training and testing activities would be *considered negligible*, the incremental contribution to cumulative impacts on water quality would also be *negligible* [emphasis added]. Regarding Air Quality, the 2015 MITT Final EIS/OEIS indicated that training and testing activities conducted under each alternative resulted in increased criteria pollutant emissions and hazardous air pollutant emissions throughout the Study Area. Sources of the emissions included vessels and aircraft and, to a lesser extent, munitions. Potential impacts included localized and temporarily elevated pollutant concentrations; *however, recovery occurs quickly as emissions disperse* [emphasis added]. The analysis in the 2015 MITT Final EIS/OEIS concluded that the impacts of Alternatives 1 or 2 were cumulative with other actions that involve criteria air pollutant and hazardous air pollutant emissions. However, the incremental contributions, from implementing activities in accordance with the 2015 MITT Final EIS/OEIS Record of Decision (ROD), to cumulative impacts were low for the following reasons:	sediments would be restricted to a small zone around the metal, and any release to the overlying water column would be diluted and influenced by mixing and diffusion. There are studies regarding bioaccumulation in the Mariana Archipelago that were used in the 2015 MITT Final EIS/OEIS and this Supplemental EIS (see Section 3.1.2.2, Metals). There are also several studies in other jurisdictions cited in the 2015 MITT Final EIS/OEIS concerning metals deposition in the marine environment in waters off of military training ranges (see Section 3.1.3.2.3, Impacts from Metals). The Navy reviewed these quantitative analyses of military munitions over a period of decades. This Supplemental EIS/OEIS discusses multiple studies off of Vieques Island in Puerto Rico, Pamlico Sound in North Carolina, and a Canadian military site (Canadian Forces Maritime Experimental and Test Ranges near Nanoose Bay, British Columbia) for lead and lithium (see Section 3.1.1.1.4, Farallon de Medinilla). Information on impacts on sediments and water quality from munitions at two additional sites, one in Hawaii and one in the Potomac River in Maryland, where military munitions have resided for decades, have been added to the section. This Supplemental EIS/OEIS also includes information that suggests that the majority of concerns regarding bioaccumulation are associated with urban coastal environments with specific point source and non-point source contributors of pollutants. The studies concerning military sites suggest that metals exposed to seawater are of less concern because of decreased bioavailability. The Navy applies federal and state water quality standards where applicable. Residual concentrations of contaminants resulting from Navy training and testing activities are provided in this Supplemental EIS/OEIS. In the 2010 Mariana Island Range Complex (MIRC) EIS/OEIS, it was noted that, “The CNMI Senate requested the Agency for Toxic Substances and Disease Registry (ATSDR) on February 19, 2008 to conduct a public health assessment on FDM of toxic substances released by bombs and the

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	- Most training and testing activities-related emissions are projected to occur at distances greater than 3 nautical miles (NM) from shore. - Few stationary offshore air pollutant emission sources exist within the Study Area, and few are expected in the foreseeable future. - International regulations by the International Maritime Organization required commercial shipping vessels to switch to lower-sulfur fuel near U.S. and international coasts beginning in 2012 (National Oceanic and Atmospheric Administration 2011). - The Department of Defense released the Operational Energy Strategy: Implementation Plan, which reduced demand, diversified energy sources, and integrated energy consideration into planning (Department of Defense 2012). Since then, the Navy has released the 2016 Operational Energy Strategy, which builds on the successes of the 2012 Operational Energy Strategy (U.S. Department of Defense, 2016). Under this 2019 draft SEIS/OEIS, the contribution of proposed increases in training and testing activities under Alternative 1 or Alternative 2 would still result in negligible additional impacts [emphasis added] based on the reasons presented above. In addition, the International Maritime Organization is set to impose a new 0.5 percent sulfur cap on marine fuel emissions (International Maritime Organization, 2017). Construction-related activities associated with the additional other projects in the area could generate increased air emissions; however, air quality in the region would remain below *de minimis* levels due to the quick dispersive nature of emissions. Based on the analysis presented in Section 3.2 (Air Quality) of this SEIS/OEIS and the reasons summarized above, the incremental contribution of Alternatives 1 or 2 to cumulative impacts on air quality would be *negligible* [emphasis added].	bioaccumulation of these toxins in consumable pelagic fish." The Agency, in its letter to the CNMI Senate on September 24, 2008, concluded that, "pelagic fish caught in the open water are not likely to contain high levels of explosive residues from the neighboring FDM bombing range and will not pose a public hazard to people who eat them." The conclusion is supported by the Agency's "Preliminary Assessment of Pelagic Fish Caught in the Open Pacific" (ATSDR 2008). Please refer to Section 3.8.2.7 (Secondary Stressors) of the Invertebrates Section of this Supplemental EIS/OEIS (Section 3.8) for the analysis of potential indirect impacts on marine invertebrates, including the topic of bioaccumulation. As stated in the 2015 MITT Final EIS/OEIS, indirect impacts of explosives and unexploded ordnance on marine invertebrates via water are likely to be negligible and not detectable because most explosives and explosive degradation products have very low solubility in sea water, have low concentration of byproducts, are slowly delivered into the water column, and are readily diluted to non-harmful concentrations. The Navy analyzed the potential impacts on air quality; the results of the analysis are presented in Section 3.2 (Air Quality) of this Supplemental EIS/OEIS. Military training and testing activities would result in minor, local emissions of air pollutants. However, these emissions would not impact public health. Changes to air quality from air pollutants are not expected to be detectable. This conclusion is consistent with the analysis and findings presented in the 2015 MITT Final EIS/OEIS. The analysis shows greenhouse gas emissions would increase from the baseline by approximately 20 percent under Alternatives 1 and 2. Since greenhouse gases are relevant in a global scope, they are analyzed based on the extent to which they would contribute to climate change. Implementation of Alternative 2 would generate approximately 0.0133 percent of the U.S. annual greenhouse gas emissions, which is less than a 0.0025 percent increase from baseline contributions. This minor increase

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	In addition to the cumulative effects of criteria and hazardous air pollutants, greenhouse gas emissions would increase under the Proposed Action. Greenhouse gases contribute to climate change, which are felt on a global scale, rather than having localized affects. Although the Proposed Action would result in an increase in greenhouse gas emissions, the Secretary of the Navy has released energy goals that aim to reduce the overall impact that the department has on climate change. Some of those goals involve using alternative energy sources for 50 percent of total consumption needs by 2020, having 50 percent of Navy and Marine Corps installations be net-zero emissions by 2020, and reducing petroleum use in the commercial fleet by 50 percent. These activities would more than offset the small increase in greenhouse gas emissions that would result from the implementation of Alternative 1 or 2. Comment: The negligible short-term and long-term cumulative impacts outlined are dismissive of many of the unresolved issues that our islands continue face, especially with regard to high rates of rare cancers, skin disorders, respiratory issues and heart disease. There is a kind of injustice in having to read through actions and impacts deemed negligible and minimal given that we have seen and continue to see the cumulative ill-impacts of military actions on our environment, in effect, on the livelihood of our people.	is not expected to significantly affect the global climate. Therefore, the analysis indicates the Proposed Action would not significantly contribute to long-term negative environmental impacts in the region. For more information about the analysis, please see Section 3.2 (Air Quality), Chapter 4 (Cumulative Impacts), and Chapter 6 (Additional Regulatory Considerations). The Navy is committed to protecting marine life by employing mitigation measures when training or testing using active sonar or explosives; working with regulatory agencies; and furthering our understanding of marine mammals through research and monitoring. As part of their compliance with the MMPA and ESA the Navy conducts extensive monitoring and data collection. Within the Study Area, the Navy has sponsored several monitoring projects to better understand marine mammal and sea turtle distribution and habitat use, and to assess the presence of corals and ESA-listed species at FDM. The Navy's Marine Species Monitoring Program website provides access to reports, documentation, data, and updates on current monitoring projects. Information on current monitoring projects, technical reports, conference presentations, and data are available at www.navymarinespeciesmonitoring.us. Additional information is also available in Section 5.1.2.2 (Monitoring, Research, and Reporting Initiatives) of this Supplemental EIS/OEIS. The diseases mentioned by the comment, such as rare cancers, skin disorders, respiratory issues, and heart disease, have not been linked to military training and testing activities.
OST-11	Additionally, I support the 12 concerns raised by the Guam Environmental Protection Agency in their submitted comments and in their testimony during an April 15th public hearing at the Guam Legislature regarding the lack of data on cumulative impacts of the 2015 MITT on the environment on Guam, the lack of details in how the 2019 MITT intends to meet all of the requirements of Guam	As discussed in Section 5.1.2.2 (Monitoring, Research, and Reporting Initiatives), the Navy developed its reporting requirements in conjunction with NMFS to be consistent with mission requirements and balance the usefulness of the information to be collected with the practicality of collecting it. The Navy's training and testing activity reports and incident

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	Environmental Protection Agency rules and regulations during the permitting process, and the lack of discussion regarding the environmental impact of previously used ammunition and/or degradation products on the marine ecosystem in the proposed study area. The administrator of the Guam EPA's Environmental Monitoring and Analytical Services stated, "At minimum, a yearly report should be produced summarizing all activities identified in the MITT. There is no current mechanism to evaluate if the activities and quantities identified in the MITT are met or exceeded. Report should also address any impacts to stressor types." Additionally, he states, "Neither the 2015 MITT nor the 2019 Supplemental MITT have a discussion on the rational for an increase from a 10 lbs. underwater mine charge to the new standard of a 20 lbs. charge for the listed mine detonation activities. What is the justification for the increase? This needs to be further explained and justified." [https://www.youtube.com/watch?v=qDmKc1hr8w4]	reports are designed to verify implementation of mitigation; comply with current permits, authorizations, and consultation requirements; and improve future environmental analyses. The Navy reports to NMFS if mitigation was implemented during sinking exercises (e.g., number of times explosive detonations were delayed due to marine mammal sightings). For major training exercises, the Navy's annual training and testing activity reports include information on each individual marine mammal sighting related to mitigation implementation. In the unlikely event that a vessel strike of a marine mammal should occur, the Navy would provide NMFS with relevant information pertaining to the incident, including but not limited to vessel speed. Additional reporting would be ineffective for the reasons detailed in Section 5.6.7 (Reporting Requirements). The Navy is obligated under the ESA and MMPA to provide information on any incidents involving ESA-listed species. Therefore, the Navy will continue to submit the appropriate reports to NMFS immediately, or as soon as operational security considerations allow, if it observes an incident that is or may be attributable to Navy activities, including (1) a vessel strike of a marine mammal or sea turtle during training or testing; (2) a stranded, injured, or dead marine mammal or sea turtle during training or testing; or (3) an injured or dead marine mammal, sea turtle, or ESA-listed fish species during post-explosive activity monitoring. The proposed training and testing activities in this Supplemental EIS/OEIS are needed to achieve and maintain military readiness within the Study Area. This includes the use of underwater mine charges up to 20 pounds (lb.) at the Agat underwater detonation site. Certain mine neutralization measures require the use of larger charges to ensure the efficacy of the technique and procedures trained to. While occurrence of this event will be infrequent, the capability to conduct this type of event was included in the 2015 MITT Final EIS/OEIS and is reanalyzed in this supplement. Underwater detonation activities at Apra Harbor and Piti would remain a

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		charge of 10 lb. The increase to 20 lb. at the Agat underwater detonation site was included in the 2015 MITT Final EIS/OEIS and had not changed in the 2019 Supplemental Draft EIS/OEIS. This Supplemental EIS/OEIS furthers the Navy and other military services' execution of their roles and responsibilities under 10 U.S.C. section 5062.
OST-12	6. Per Marine Habitats, the 2019 MITT Supplemental and 2015 MITT Final EIS cite continued detonations at existing underwater detonation areas such as Piti, Agat and Outer Apra Harbor. Comment/question: How long have these areas been deemed underwater detonation areas? What permits continue to authorize the use of these areas as such? When do these permits expire? What are the plans for clean-up of these sites? When can we anticipate full restoration such that marine habitat and ecosystems will be able to flourish once again? What is needed for full restoration to be possible?	The Navy has been conducting training and testing activities in the Study Area for decades, and this supplement to the 2015 MITT Final EIS/OEIS supports the continuation of that training and testing. Proposed training and testing activities are needed to achieve and maintain military readiness within the Study Area. In this regard, this Supplemental EIS/OEIS furthers the Navy and other military services' execution of their roles and responsibilities under 10 U.S.C. section 5062. Underwater detonation areas are permanently designated safety zones, danger zones, and restricted areas. These areas were designated in accordance with 33 CFR part 165 or 33 CFR part 334. The designation does not expire, and the Navy intends to continue use of the detonation areas to support its mission. The Navy is permitted to conduct underwater detonation activities in accordance with their MMPA and ESA compliance. As discussed above, public notice is provided prior to certain training activities occurring, such as underwater detonations. Restoration of underwater detonation areas is not required as these areas are repeatedly disturbed for this use. Most impacts would be localized, limiting the total area impacted. Soft-bottom substrates of disturbed areas would be expected to recover their previous structure, with the fastest recovery occurring in areas with high waves and tidal energies. Recovery at the Outer Apra Harbor Underwater Detonation site would be expected to be prolonged due to lower tidal and wave energy in the area. Additional information is available in Section 3.3 (Marine Habitats) of the 2015 MITT Final EIS/OEIS and this Supplemental EIS/OEIS.
OST-13	7. Regarding cumulative effects of all Department of Defense actions in the Mariana Islands, including CNMI Joint Military Training EIS – The CNMI Joint Military Training EIS would establish a	For clarification, the Navy prepared a Supplemental EIS/OEIS, which is not the same as a revised EIS/OEIS. The Mariana Islands Training and Testing

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	series of live-fire and maneuver ranges and training areas within the CNMI and include amphibious operations on Tinian. The proposed action for the CNMI Joint Military Training EIS is to expand existing ranges and training areas and construct new ranges and training areas within the CNMI. The resources evaluated that could contribute to cumulative impacts include geology and soils, water resources, air quality, noise, airspace, land and submerged land use, recreation, terrestrial biology, marine biology, cultural resources, visual resources, transportation, utilities, socioeconomics and environmental justice, hazardous materials and waste, and public health and safety. The Navy is drafting a revised EIS that would reduce impacts on resources as a result of the proposed action. The analysis of cumulative impacts contained in this chapter addresses cumulative effects of all Department of Defense actions on the Mariana Islands, including the CNMI Joint Military Training EIS. Comment/question: Cumulative impacts for the proposed action, as well as all DoD actions in the Mariana Islands should already be configured in the impact analysis on and for these resources. This is how cumulative impact must be analyzed given that our islands are constantly subjected to DoD proposed actions. Will the revised EIS that would reduce impacts on resources as a result of the proposed action be published in the Final EIS, and will the people of Guam be able to comment on this?	Supplemental EIS/OEIS is a separate action from the CNMI Joint Military Training (CJMT) EIS/OEIS. Chapter 4 (Cumulative Impacts) of this Supplemental EIS/OEIS includes the analysis of cumulative impacts for each resource addressed in Chapter 3 (Affected Environment and Environmental Consequences). Other proposed Department of Defense actions in Guam and the CNMI, including the CJMT EIS/OEIS, are included in the cumulative impacts analysis. See above response (OST-03) regarding the cumulative impact analysis. As part of the NEPA process, the Navy considered and responded to all public comments received on the Draft Supplemental EIS/OEIS in Appendix K (Public Comment Responses) of the Final Supplemental EIS/OEIS. Any substantive public comments the Navy receives on the Final Supplemental EIS/OEIS would be reviewed and addressed in the Record of Decision.
OST-14	8. Regarding cumulative impact on reduced fishing access, recreational fishing, commercial fishing and transport between the Mariana Islands from the restricted areas – Access to certain areas of the Study Area around islands and in the open ocean is temporarily restricted during potentially hazardous training and testing activities to ensure the safety of the public and military personnel. Danger zones may result from other Department of	The health and safety of the public is of utmost importance to the Navy. The Navy trains and conducts tests in a manner that is compatible with civilian activities. The Navy is not proposing a change to the ocean areas currently used by both the Navy and the public in this Supplemental EIS/OEIS. Restrictions on accessing areas of co-use would continue to be relatively infrequent and short-term, while other fishing and tourism sites in the Study Area would continue to be available to the public.

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	Defense actions in Guam and the Mariana Islands such as the Guam and Commonwealth of the Northern Mariana Islands Military Relocation and CNMI Joint Military Training. These other actions would occur mainly on land and around Tinian. As a result of the training and testing activities associated with this SEIS/OEIS, areas within 3 NM of FDM are permanently restricted to maintain public safety. Even when hazardous activities are not occurring at FDM, the potential occurrence of unexploded ordnance in waters surrounding the island is a constant threat to public safety. Transiting between Guam, Saipan, Tinian, or other islands located to the south of FDM and the Islands Unit (Northern Mariana Islands) would potentially be impacted by limiting access to the 12 NM danger zone around FDM. Considering that an average of 3.8 trips per year has occurred over the past 30 years (as stated in Section 3.12.3, Public Scoping Comments), the probability of military activities interfering with trips to the Islands Unit is low. Furthermore, the military will announce when FDM is not in use in addition to notifying mariners of planned activities at FDM, which will enable mariners to better plan trips to the Islands Unit. Further analysis can be found for recreational and commercial fishing and transport in Section 4.4.12 (Socioeconomic Resources). Comment/question: We have grave concerns of any language that indicates potential threat, temporary restriction, impacts of possible results from danger caused by DoD actions. That approximately 120 military actions (3.8 trips per year has occurred over the past 30 years) have occurred without true consent of the people of the Mariana Islands for the past 30 years is more than enough interference, especially to the people of the NMI. That permanent restriction in the 3 NM area surrounding FDM is considered a cumulative impact is incorrect and misleading. It should be stated upfront that this is a DIRECT IMPACT: “Even when hazardous activities are not occurring at FDM, the potential	Section 3.13 (Public Health and Safety) of this Supplemental EIS/OEIS includes a discussion of the direct impact of waters around FDM within 3 nautical miles (NM) from shore being permanently closed for safety reasons due to the potential presence of unexploded ordnance. FDM and the nearshore waters are leased to the United States for military purposes specifically for use as a live-fire naval gunfire and air warfare air strike training range. As such, FDM and its nearshore areas have been an off-limits area to all personnel both civilian and military due to unexploded ordnance concerns. The agreement between the CNMI and the United States states in Article 12 of the lease: “c. Farallon de Medinilla: Public access to Farallon de Medinilla Island and the waters of the Commonwealth immediately adjacent thereto shall be permanently restricted for safety reasons.” FDM and nearshore areas, including the fringing reef, will remain a restricted area, which prohibits the entry of all personnel, civilian, and military from the island without specific permission from Commander, Joint Region Marianas. The military understands that fishing is an important socioeconomic and cultural resource for the people of the CNMI and will continue to work with the fishing community as appropriate to enable safe access to fishing areas around FDM. However, access within 3 NM of FDM would remain restricted at all times to ensure public safety. The military recognizes the importance of fishing sites such as White Tuna Banks and other nearby fishing sites near W-517 and will continue to work with local fishers to minimize restrictions on access to fishing sites around the Mariana Islands.

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	occurrence of unexploded ordnance in waters surrounding the island is a constant threat to public safety." Finally, any actions resulting in reduced access to fishing, recreational fishing, commercial fishing and/or permanent access to areas of transport between and around the Mariana Islands adds to our already limited access resources; thus we are not able to approve of this inaccessibility or permanent restrictions. For more explanation, refer to Introduction & Background section of this Comment and to comments from the Guam Department of Agriculture in the Seismic survey/Use of Sonar section of this Comment.	
OST-15	9. Regarding cumulative impact on historic sites on Guam, the 2019 MITT draft SEIS indicates that "no additional submerged cultural resources have been identified around Guam. As such, the information presented in the 2015 MITT Final EIS/OEIS is still valid and the most current." Over 540 cultural resources associated with Guam are considered eligible for or listed in the National Register of Historic Places including 8 individual resources listed in the National Historic of Historic Places, 6 listed in the Guam Register of Historic Places only, and 348 pre-contact sites, 3 multicomponent sites, 117 historic archaeological sites, 18 buildings, and 66 structures. The training constraints map identifies 13 No Training areas (eight on Guam and five on Tinian) and 35 Limited Training areas (20 on Guam and 15 on Tinian), refined from the previous Military Operations Area constraints map boundaries (U.S. Department of Defense 2009). Limited Training areas are defined as pedestrian traffic areas with vehicular access limited to designated roadways and/or the use of rubber-tired vehicles. No pyrotechnics,	The Navy has reviewed and incorporated the best available data for cultural resources, including underwater cultural heritage and maritime archeology that are listed or eligible for listing under the National Historic Preservation Act (NHPA). The Navy has included a new figure in Section 3.11 (Cultural Resources) that includes general locations of known submerged resources (wrecks, obstructions, or occurrences) in the waters around Guam, Tinian, Saipan, and Rota. The Navy conducted data collection efforts with CNMI to retrieve additional information regarding known submerged resources which has been incorporated into this Supplemental EIS/OEIS. The Navy is required to complete independent statutory obligations under both NEPA and NHPA. The Navy has prepared this Supplemental EIS/OEIS for compliance with NEPA and continues to actively consult and develop a new long-term PA for the MITT undertaking. The Parties have executed interim bridge PAs which incorporate all of the terms and mitigations of the 2009 PA. The bridge PAs took effect after the expiration of the 2009 MITT PA and serve as a continuation of the Department of Defense's compliance under Section 106 of the NHPA for MITT activities. The Bridge PA with the CNMI HPO expires September 10, 2020, while the Bridge PA

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	demolition, or digging is allowed without prior consultation with the appropriate Historic Preservation Office. Comment/questions: I share the concerns of the Guam State Historic Preservation Officer, Guam Preservation Trust, and Guam Historic Preservation Review Board in their submitted comments and in their testimony during an April 15th public hearing at the Guam Legislature that the list of cultural resources referenced in the SEIS does not fully incorporate all the cultural resources that may be impacted. The Guam SHPO in her submitted comments mentioned that there are 119 submerged resources rather than the 84 stated in the 2015 MITT EIS. She further stated that a systematic submerged resource survey around Guam must be conducted prior to any authorization of proposed activity. Guam SHPO also noted that in the 4 years since the 2015 EIS was implemented, more cultural resources have been located, excavated, and recorded that are eligible and/or listed in the National Register of Historic Places. A systematic literature review and resurvey of areas surveyed 20 or more years ago will result in many more than the 540 cultural resources listed in the 2015 MITT. Additionally, the 2009 MIRC Programmatic Agreement expires in December 2019. What document will be used in the interim before a new agreement is negotiated, and will any of the activities be held in abeyance until an agreement is executed?Action in the Final EIS/OEIS and the ROD should outline the revisions towards this effort.	with Guam, expires June 30, 2020. The programmatic agreements will include stipulations to avoid, minimize, and mitigate adverse effects on historic properties. The Navy avoids submerged resources and limits training and testing activities in areas where submerged resources or other obstructions are detected. Consistent with Section 106 of the NHPA, the Navy made a “reasonable and good faith effort” to identify historic properties.
OST-16	10. Should there be no other opportunity following the Draft SEIS/OEIS for public comment, let the record show that I am requesting Avoidance and No Adverse Impacts and that the Proposed Action in the Final EIS/OEIS and the ROD should outline the revisions towards this effort	Thank you for your comments. Chapter 4 (Cumulative Impacts) of this Supplemental EIS/OEIS includes the analysis of cumulative impacts for each resource addressed in Chapter 3 (Affected Environment and Environmental Consequences). See above response (OST-03) regarding the cumulative impact analysis.

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	Conclusion We are faced with these processes said to protect our environment and livelihood, and yet are based on references and resources over 20 years old, and data and research that does not show the whole picture. Let the science and these processes show the true cumulative impacts of past military activities, including PCB's, depleted uranium, Agent Orange, radiation exposure in addition to the harmful and threatening impacts of the proposed actions on our community. Guam's regulatory agencies – Department of Agriculture, Coastal Management Program of Bureau of Statistics and Plans, Guam Environmental Protection Agency, and the State Historic Preservation Officer have all expressed and outlined significant concerns with the proposed actions in the 2019 MITT draft SEIS and their potential impacts on Guam's natural and cultural resources. Until the cumulative impacts can accurately represent the experience of injustice and irreversible harm on the people, lands, air and oceans, I urge that the issuance of federal regulatory permits and authorizations under the Marine Mammal Protection Act and Endangered Species Act to support military readiness requirements within the MITT Study Area beyond 2020 be permanently ceased and that the No Action Alternative be chosen. Thank you for the opportunity to submit comments for the 2019 MITT Draft Supplemental EIS/OEIS. Si Yu'os Ma'åse'	
Senator Kelly Marsh (Taitano), Office of Senator Kelly Marsh (OSM) (Taitano), Guam Legislature		
OSM-01	We strongly oppose the proposed bifurcation of the Programmatic Agreement for the Marianas Testing and Training (MITT).	The MIRC Programmatic Agreement expired in December 2019. In anticipation of this, the Navy initiated a NHPA Section 106 consultation in January 2019 with an eye toward developing new updated Programmatic Agreements. The Navy has held five consultation meetings open to

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	Regarding the MITT, the Department of Defense addressed Guam and the Northern Mariana Islands together in its SEIS-OEIS as it is clear that our environmental, cultural, and historical resources are tightly intertwined. It is imperative this remains the case in the current proposal, as a separation of MITT undertakings and actions in the Marianas would be both inappropriate and offer a fractured view of significant impacts of military testing and training exercises in Guam and the NMI. Leaders and tasked experts have a responsibility to ensure that undertakings and actions such as those proposed in the MITT SEIS-OEIS are taking our communities' health, well-being, and environment into due consideration. In order to best protect our community and our islands, leaders, tasked experts, and the community at large need to understand all military and other undertakings and actions in their entirety. Ample evidence already informs us of adverse consequences due to short-sightedness when this is not the case. Anything that interrupts the understanding and assessing undertakings and actions in their entirety has the potential to allow for consequences that can irreparably harm our communities and island environments which is exactly what bifurcating our Programmatic Agreement has the potential to do by limiting the degree to which each community is aware of, or is called to meet or respond to, particular undertakings and actions. Our archipelago has a lengthy cultural, historical, and familial history of connections spanning generations and millennia. Our environments are likewise connected. What impacts the Northern Mariana Islands, impacts Guåhan. What impacts Guåhan, impacts the Northern Mariana Islands.	consulting and interested parties on Guam and eight throughout the CNMI. Additionally, site visits, and working group sessions with the SHPOs and the National Park Service have taken place. The Navy is required to comply with NHPA Section 106 to support its undertaking. A Programmatic Agreement is one of several methods of ensuring compliance under Section 106 but is most appropriate for undertakings that involve routine and redundant activities where a federal agency plans to resolve potential adverse effects to historic properties through avoidance, minimization, and/or mitigation. An interim Programmatic Agreement for Guam that follows the exact terms of the 2009 MIRC Programmatic Agreement has been executed and is intended to "bridge" the expiration of the current Programmatic Agreement with the execution of the new Programmatic Agreement being developed. With regard to the CNMI, Cultural Resources staff at JRM have already taken action to conduct NHPA Section 106 consultation on individual training events following the expiration of the 2009 MIRC Programmatic Agreement to ensure compliance as the Navy continues the consultation process. The Navy is required to complete independent statutory obligations under both NEPA and NHPA. Thus, the Navy has prepared this Supplemental EIS/OEIS and is looking forward to the continued Section 106 process under the NHPA with the Guam Historic Preservation Officer. The Navy fully recognizes the ancestral ties and cultural overlap between Guam and the CNMI. For that reason, the NHPA Section 106 consultation has been a fluid process incorporating comments and input across both the Guam and CNMI jurisdictions. There are several reasons separate Programmatic Agreements are being developed. For example, the Mariana Islands Range Complex crosses jurisdictional boundaries, Guam and the CNMI have different historic properties of concern, and there are varying opinions on mitigation measures.

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	While bifurcation of the Programmatic Agreement is being promoted to us as simplifying matters, it could be argued that, in particular ways, separating the Programmatic Agreement into two distinct agreements complicates issues and the handling of them. Certainly, to do so allows for the potential for our communities to be at a disadvantage by not being allowed to view and assess in our own minds and according to our own cultural, historical, and other perspectives, the cumulative and connected effects of undertakings and actions. Some have called this a strategy, akin to divide and conquer. We do not support such tactics.	
John Paul Manuel, Office of Senator Amanda Shelton (OSS), Guam Legislator		
OSS-01	The use of sonar, according to the EIS itself, affects the behavior of marine mammals including beaked cetaceans who are particularly vulnerable. There has been an increase in beached whales in the Marianas and when I questioned the Marine mammal biologists at your Q&A at UOG, she did say while most of the beachings could not be attributed to sonar, that examinations of most of the beachings had inconclusive results. So, in essence, there is not enough data to conclusively assertain the cause of this increase in beachings. This should be a topic that merits further study.	Section 3.4.2.1.1.6 (Stranding) further discusses the best available information about strandings of beaked whales in the Mariana Islands and the Navy's support of efforts to better understand the causes of marine mammal strandings. The Center for Naval Analysis (CNA) recently conducted a statistical study of correlation of beaked whale strandings around the Mariana Islands with the use of U.S. Navy sonar, finding that insufficient evidence of a correlation exists. The CNA study used the complete record of all U.S. Navy sonar use between 2007 and 2019, including major training events, joint exercises, and unit level training/testing. The analysis also included the complete beaked whale stranding record for the Mariana Islands through 2019. Following the methods in Simonis et al. (2020), the CNA analysis found insufficient evidence of a correlation between sonar use and beaked whale strandings when considering the complete sonar use record. The CNA finding is in contrast to the finding in Simonis et al. (2020), which depicted a significant correlation between beaked whale strandings and Navy sonar use. However, the Simonis et al. (2020) result relied on substantially incomplete or inaccurate assumptions about U.S. Navy sonar use around

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		the Mariana Islands. CNA also conducted statistical analyses specific to each island where beaked whale strandings have been observed in the Mariana Islands, similarly finding insufficient evidence of a correlation to sonar use. Additional information on the findings of the CNA analysis are presented in Section 3.4.2.1.1.6 (Stranding) in Chapter 3.4 (Marine Mammals). As described in Section 5.1.2.2.1 (Marine Species Research and Monitoring Programs), for this Final Supplemental EIS/OEIS, the Navy agreed to several additional research and monitoring initiatives designed to help advance the understanding of beaked whales and strandings in the MITT Study Area. The Navy will co-fund the Pacific Marine Assessment Program for Protected Species (PACMAPPS) Mariana Islands survey in spring-summer 2021 and future studies starting in 2022 to help document beaked whale occurrence, abundance, and distribution in the Mariana Islands. The Navy will also fund additional stranding response and necropsy analyses for the Pacific Islands region, and research on a framework to improve statistical stranding analysis. Collaboratively with NMFS, the Navy will fund and organize an expert panel to provide recommendations on scientific data gaps and uncertainties for further protective measure consideration to minimize potential impacts of Navy training and testing activities on beaked whales in the Mariana Islands. Section 3.0.1.1.1 (Marine Species Monitoring and Research Programs) provides an overview of U.S. Navy-supported research on marine species. These programs support coordinated science, technology, research, and development focused on understanding the effects of sound on marine mammals, including physiological, behavioral, ecological, and population-level impacts. Additional information on these programs and other ocean resources-oriented initiatives can be found at the Department of the Navy's Energy, Environment, and Climate Change website (https://navysustainability.dodlive.mil).
Representative Sheila Babauta (RB), 21st CNMI Legislature		

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RB-01	I am writing as a Representative for Precinct 4 in the 21st Commonwealth Northern Mariana Islands Legislature, and as a concerned citizen of the Commonwealth of the Northern Mariana Islands. The comments and questions below are in response to the Mariana Islands Training & Testing (MITT) Draft Supplemental Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS). The proposed expansion of the military's training and testing area in the Mariana Islands is massive and one can only be concerned about the negative consequences of the activities to occur. While I understand the importance of military readiness to protect the security of the United States, I must also express my worry of the negative impact such activities will have on our people's health, environment, culture, infrastructure, safety, historic sites, and natural resources. Which brings me to ask the following questions: 1. Has the Navy considered alternative locations to conduct such military readiness training? If so, what was the outcome? If not, why? 2. Has the Navy been offered alternative locations with similar environments for proposed training activities?	The Navy is not proposing any geographic expansion of the training and testing area in this Supplemental EIS/OEIS, and the Study Area has not changed since the 2015 MITT Final EIS/OEIS. Proposed activities are similar to those conducted in the Study Area for decades. Proposed training and testing activities are needed to achieve and maintain military readiness within the Study Area. The Navy conducts training and testing throughout the world, with similar training and testing activities occurring in Hawaii, Southern California, the Pacific Northwest, and the Gulf of Alaska. The Study Area supports the Navy's 7th Fleet, the largest of the Navy's forward deployed fleets. Training and testing activities in the Mariana Islands are vital to the continued readiness of military personnel. Without access to the training areas within the Study Area, forward-deployed military units on Guam and Japan would be unable to train and maintain the skills needed to respond to crises. Alternatives carried forward were developed to meet the Navy's purpose and need and to ensure it can fulfill its obligation under Title 10 of the U.S. Code. See Section 2.4 (Action Alternatives Development) for more detailed information on the development of alternatives and rationale on why alternative training and testing locations are not feasible.
RB-02	3. Has the Navy considered the negative impact the proposed activities will have on our culture? If so, what professionals did they consult with and what was the outcome?	The Navy used the best available data in the analysis of impacts on socioeconomics, presented in Section 3.12 (Socioeconomic Resources and Environmental Justice). This Supplemental EIS/OEIS has been revised to include a section discussing cultural/traditional practices and beliefs (Section 3.11.1.3, Cultural/Traditional Practices and Beliefs). The analysis includes the importance of fishing as a socioeconomic and cultural resource for the people of the CNMI. The Navy does not propose a change to the ocean areas currently used by both the Navy and the public. Restrictions on accessing areas of co-use would continue to be infrequent and short-term, while other fishing sites in the Study Area would continue

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		to be available to the public. The military understands that fishing and tourism is an important socioeconomic and cultural resource for the people of the CNMI and will continue to work with the fishing and boating community to enable safe access in areas of co-use. The military is committed to continuing to work with the local community on issues that potentially affect the public, including access to fishing sites that are important to the culture. The Navy continues to actively consult and develop a new long-term PA for the MITT undertaking, the Parties have executed interim bridge PAs which incorporate all of the terms and mitigations of the 2009 PA. The bridge PAs took effect after the expiration of the 2009 MITT PA and serve as a continuation of the Department of Defense's compliance under Section 106 of the NHPA for MITT activities. The Bridge PA with the CNMI HPO expires September 10, 2020, while the Bridge PA with Guam, expires June 30, 2020.
RB-03	4. What chemical components will the population be exposed to from each and every type of ordnance? 5. How will each chemical component affect the population's health now and in the future?	Section 3.1 (Sediments and Water Quality) provides details on munitions and munitions constituents, chemicals, and metals that would be introduced into the marine environment resulting from training and testing activities analyzed in this Supplemental EIS/OEIS. In summary, the Navy's analysis concludes that no federal or local guidelines would be exceeded and any releases would be *de minimis* because of (1) rapid and natural degradation of substances (e.g., munitions constituents and other chemicals), and (2) localized concentrations where impact would occur. These conclusions are based on evidence gathered on other military ranges in similar environments (e.g., Vieques), as well as legacy dump site studies conducted off the coast of Oahu. These studies are summarized in Section 3.1 (Sediments and Water Quality). Both this Supplemental EIS/OEIS and the 2015 MITT Final EIS/OEIS include an analysis of potential impacts from metals and contaminants as a result of military training and testing activities on marine resources. This analysis is presented in Section 3.1.2.2 (Metals), Section 3.4.2.7 (Secondary Stressors), Section 3.5.2.7 (Secondary Stressors), Section 3.7.2.3 (Secondary Stressors), Section 3.8.2.7 (Secondary Stressors), and Section

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		3.9.2.7 (Secondary Stressors). Based on the analysis presented in this Supplemental EIS/OEIS and the 2015 MITT Final EIS/OEIS, the Navy concluded that all levels of metals, chemicals, and other byproducts would be either below detectable levels or at levels below existing standards, regulations, and guidelines.
RB-04	6. How long will all proposed training activity take place in the Mariana Islands?	The Navy has been conducting training and testing activities in the Study Area for decades and this supplement to the 2015 MITT Final EIS/OEIS supports the continuation of training and testing conducted at sea and on FDM beyond 2020. The MMPA authorization for this Supplemental EIS/OEIS would be valid for seven years.
RB-05	7. How will the Navy ensure misfires and errant ordnance do not harm the local population, tourists, and other civilians? 8. Will the military compensate families if accidental deaths were to occur?	The health and safety of the public is of utmost importance to the Navy. The Navy trains and conducts tests in a manner that is compatible with civilian activities. Various means are used to communicate information to the public about areas restricted to public or commercial activities and are described in Section 3.13 (Public Health and Safety). As specified in Title 33 CFR Subpart 72.01, Notices to Mariners, the U.S. Coast Guard issues information to the public concerning maritime navigation. Additionally, nautical charts issued by the National Oceanic and Atmospheric Administration include these federally designated zones and areas. Operators of recreational and commercial vessels have a duty to abide by maritime regulations administered by the U.S. Coast Guard. Waters around FDM within 3 NM from shore are permanently closed for safety reasons due to the potential presence of unexploded ordnance. In the unlikely event accidental death or injury were to occur, individuals may bring a claim for compensation under the Federal Tort Claims Act (28 U.S.C. section 1346).
RB-06	9. Will the military compensate the CNMI for economic losses due to damages?	In the event an individual feels they have suffered an economic loss, individuals may bring a claim for compensation under the Federal Tort Claims Act (28 U.S.C. section 1346). Damages to the CNMI-leased land are addressed through the lease document between the United States and the CNMI.

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RB-07	10. How will the military ensure no damages are done to the existing historic sites? What sites are considered historic? And what data was used to identify these sites?	As described in Section 2.3.3 (Standard Operating Procedures) and Chapter 5 (Mitigation), the Navy implements measures to avoid cultural resources and mitigate impacts during its training and testing activities to the maximum extent possible. As defined by the National Historic Preservation Act, historic property or historic resource means any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion on the National Register, including artifacts, records, and material remains related to such a property or resource. To be eligible for inclusion on the National Register, a property or majority of properties in a district must be 50 years old or older and meet other criteria for evaluation. The cultural resources analysis is presented in Section 3.11 (Cultural Resources) of this Supplemental EIS/OEIS; the section includes references to the best available data used to describe historic sites identified since the publication of the 2015 MITT Final EIS/OEIS.
RB-08	Although research and data collection is not frequent in the Mariana Islands, the Navy "continues to use the most current and best available science and analytical methods." So, I ask: 1. Where has the Navy collected and stored data regarding the Mariana Islands and the 13 environmental resource areas: air quality, sediments and water quality, marine vegetation, marine invertebrates, marine habitats, fishes, marine mammals, sea turtles, marine birds, terrestrial species on FDM, cultural resources, socioeconomics, public health and safety, and cumulative impacts? And is this data readily available for the CNMI?	All potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. The Navy analyzed potential impacts on sediments and water quality, air quality, marine habitats, marine mammals, sea turtles, marine birds, marine vegetation, marine invertebrates, fish, terrestrial species and habitats, cultural resources, socioeconomic resources and environmental justice, public health and safety, and cumulative impacts (Chapter 4). Each resource section includes a list of references which are included as part of the Administrative Record. References and data cited in this Supplemental EIS/OEIS may be made available upon request. Due to copyright restrictions of some scientific journals, reports, and articles, the Navy is unable to maintain a publicly accessible repository of all references cited in this Supplemental EIS/OEIS. Additionally, raw data is not consistently available for all resources, and some data must be held in trust for the protection of the resource.

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		As per CEQ regulations, the Navy uses a number of sources of best available science and data in this Supplemental EIS/OEIS, including external references (noted in each section of this Supplemental EIS/OEIS), technical documents (available at www.mitt-eis.com), and ongoing consultation processes with other agencies (NMFS and USFWS). Data is drawn and managed from multiple sources, including from the public during the NEPA process. Best available peer-reviewed science and data can come from sources such as academia, consultations with other resource agencies, industry, and the public. For Navy-funded and managed studies, the Navy will continue to communicate and coordinate with the CNMI government on future collaboration and information sharing. As noted in Section 3.0.1.1 (Navy Compiled and Generated Data) of this Supplemental EIS/OEIS, the Navy invests extensively in basic and applied research. Within the Study Area, the Navy has sponsored several monitoring projects to better understand marine mammal (*Small Vessel Visual Surveys*) and sea turtle distribution (*Sea Turtle Tagging in the Mariana Islands Range Complex*) and habitat use, and to assess the presence of corals and ESA-listed species at FDM. The Navy has conducted a humpback whale survey around FDM in early 2020. Additional information on studies is available on the U.S. Navy Marine Species Monitoring Program website at www.navymarinespeciesmonitoring.us. The Marine Mammal Commission (MMC, 2017) periodically collects information on Federal Agency funding for marine mammal monitoring and research. Their most recently published report in 2017 covering Fiscal Year 2015 documented that the Navy spent $35.2 million on this topic.
RB-09	2. Has the military considered launching a research center in the CNMI? If so, what does the proposed center require and what timeline is in place?	Establishing a research center in the CNMI is beyond the scope of this Supplemental EIS/OEIS.

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RB-10	3. Will the military continue to track and re-evaluate the impact of all proposed military training activities in the Mariana Islands?	The Navy conducts extensive monitoring and data collection programs as part of their compliance with the MMPA and ESA. The Navy's Marine Species Monitoring Program website provides access to reports, documentation, data, and updates on current monitoring projects. Information on current monitoring projects, technical reports, conference presentations, and data are available at www.navymarinespeciesmonitoring.us. Information gathered through the Monitoring Program is documented in annual reports, shared with NMFS, and considered in the adaptive management process. As part of the process for the reissuance of regulatory permits and authorizations under the MMPA and the ESA, the Navy will continue to analyze the impacts of at-sea training and testing activities and incorporate new, relevant information and the best available science. In addition, while outside the current scope of this Supplemental EIS/OEIS, the military satisfies Sikes Act obligations through the development and implementation of the Joint Region Marianas Integrated Natural Resource Management Plan (INRMP). The purpose of the INRMP is not to measure impacts of military training and testing activities, but to utilize adaptive management to maintain long-term ecosystem health and minimize impacts on natural resources consistent with the operational requirements of the DoD's mission. The 2019 Joint Region Marianas INRMP includes monitoring programs throughout the Mariana Islands. The CNMI Department of Lands and Natural Resources, Division of Fish and Wildlife is a signatory and participating member to the 2019 Joint Region Marianas INRMP, which details natural resource management and monitoring programs. The Navy will continue to improve coordination and collaboration with the CNMI as part of the INRMP project development and implementation. The Navy will also continue to coordinate in accordance with the Integrated Cultural Resources Management Plan.

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		The Navy will continue to follow mitigation and monitoring requirements as specified in the NMFS and USFWS Biological Opinions and MMPA compliance. These measures and requirements are presented in Chapter 5 (Mitigation). Mitigation measures in the NMFS Biological Opinion will be reflected in the Record of Decision.
RB-11	4. If the negative impact is greater than anticipated from the EIS/OEIS, will the military halt all operations? Why or why not? What procedures are in place?	Based on future readiness requirements, the Navy has proposed in this Supplemental EIS/OEIS the levels of activity necessary to fulfil those requirements and has then analyzed those activities for compliance. It is important to note that the Navy is then bound by the limits of its expected types and levels of activities. If a need arises that exceeds those predicted activities, then training and testing activities are scheduled and monitored so that levels allowed for in consultation and/or permitting documents are not exceeded. Pursuant to 40 CFR section 1502.9(c), the Navy would prepare a supplement to the Final Supplemental EIS/OEIS if it makes substantial changes in the Proposed Action that are relevant to environmental concerns (40 CFR section 1502.9(c)(1)(i)), or there are significant new circumstances or information relevant to environmental concerns and bearing on the Proposed Action or its impacts (40 CFR section 1502.9(c)(1)(ii)). In addition, the Navy is bound by provisions in the ESA to reinitiate consultation if certain "triggers" are met. These triggers are specified in 50 CFR Section 402.16 and include the following: (1) the amount or extent of taking specified in the incidental take statement is exceeded, (2) new information reveals effects of the action that may not have been previously considered, (3) the identified action is subsequently modified in a manner that causes an effect to listed species, or (4) a new species is listed or critical habitat designated that may be affected by the identified action. Additional triggers specific to species may be included in a Biological Opinion.
RB-12	5. Has the military partnered with Federal and/or Local Agencies to ensure data accuracy? And to ensure there is no impact to ongoing grant funded projects?	The Navy regularly partners with federal and local agencies to ensure the best available data are used in impact analyses. For example, the Navy partners with local, state, and federal agencies, universities, research institutions, federal laboratories, and private researchers as part of its Marine Species Monitoring Program. Additionally, the U.S. Fish and

	Comment	Navy Response
		Wildlife Service, NMFS, Guam Division of Aquatic and Wildlife Resources, and the CNMI Division of Fish and Wildlife are cooperating with the Navy on INRMP implementation. The Navy will continue to improve coordination and collaboration with the CNMI as part of the INRMP project development and implementation. The Navy is not aware of any impacts on ongoing grant funded projects.
RB-13	For a proposed project of this size, community outreach is essential for valuable input and to address concerns and questions. The Navy failed to provide adequate information in the local language and adequate time to read and comprehend such material. 1. How did the military decide the best approach to communicate with the community in the Marianas Islands? 2. Did the military survey the population to ensure the stakeholders were able to comprehend the EIS/OEIS material in one language? Were efforts made to assess language barriers among the local population? 3. How did the military compute the adequate timeline in which to conduct outreach and set deadlines? What considerations were taken into place given our distance from the U.S. mainland and natural disaster experiences (e.g., Super Typhoon Yutu, Typhoon Soudelour)? In closing, the expansion of military presence in the Mariana Islands has caused apprehension among the local population. The Navy must continue to communicate with the public and ensure the true understanding of the proposed activities. There is a fear of the cumulative impacts of all military activities in the Marianas region as we are certain there will be negative impacts and irreparable damages to our quality of life now and in the future, for ourselves and for generations to come.	Based on CEQ regulations and experience gained from the 2010 MIRC EIS/OEIS and the 2015 MITT EIS/OEIS, the Navy designed a public involvement program to both meet NEPA requirements and cultures of the local communities. The Navy understands that English is an official language of the CNMI. The Navy acknowledges that the information presented in this Supplemental EIS/OEIS is by necessity very complex; however, the Navy attempts to explain challenging concepts, methods, and the results of the analysis as clearly as possible and developed public informational materials for lay audiences. The Navy prepared project brochures, videos, a website, and posters, using layperson terms to enhance public understanding of the information presented in this Supplemental EIS/OEIS. Based on the demographics of the CNMI, a project fact sheet was also translated into Chamorro. The informational materials, including the translated fact sheet, were made available at all four public meetings and on the project website www.mitt-eis.com. The Navy held four open house public meetings, one each on Tinian (Tinian Public Library, March 14, 2019), Rota (Mayor's Conference Hall, March 15, 2019), Saipan (Kanoa Resort, March 18, 2019), and Guam (University of Guam, March 19, 2019). The public meetings were an opportunity for the public to ask questions of Navy leadership, scientists, and other experts about the analysis documented in this Supplemental EIS/OEIS. The Navy encouraged the public to attend these meetings and broadly notified the public through the media, including paid newspaper

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	Please include our office in the EIS/OEIS mailing list to receive notifications and updates.	advertisements and news releases, and direct mail, including letters, postcards, and emails. A voice recorder was provided for any member of the public who wanted to provide an oral comment in a language other than English. The Navy has received feedback from attendees that the open-house format is more conducive to promoting public understanding and constructive dialogue. Open house meetings allow a greater number of individuals to directly engage and interact with Navy team members and ask questions about this Supplemental EIS/OEIS, as well as provide comments on the document. To better accommodate stakeholders and the public, the Navy provided 75 days to review and comment on the Draft Supplemental EIS/OEIS, which is 30 days longer than the minimum required time for review. Due to the effects of Typhoon Wutip, Navy officials postponed the public meetings originally scheduled for February 26 and 27, 2019. The Navy held the rescheduled meetings on March 18 and 19, 2019, in Saipan and Guam respectively. The Navy also added meetings on Tinian (March 14, 2019) and Rota (March 15, 2019). Public notice of the rescheduled public meetings was published multiple days in the Marianas Variety, Pacific Daily News, and Saipan Tribune. The Navy issued a press release and mailed over 500 postcards to individuals and organizations. The Navy recognizes the importance and value of continued outreach and engagement and commits to continue working with CNMI and Guam stakeholders to identify opportunities to improve communication, transparency, and trust. For example, the Navy has established the CNMI Joint Region Marianas Coordination Office (CJCO) in Saipan. The Office of Representative Sheila J. Babauta is on the project mailing list.
Janice Castro, Director, CNMI Bureau of Environmental and Coastal Quality - Division of Coastal Resources Management (DCRM)		
DCRM-01	The Commonwealth of the Northern Marinas Islands (CNMI) Division of Coastal Resources Management (DCRM) has reviewed portions of the draft supplement to the 2015 Final Marianas Islands	The Navy has used the best available science to consider the direct and cumulative impacts on endangered species, nesting seabirds, and

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	Training and Testing (MITT) Draft Supplemental Environmental Impact Statement (EIS)/ Overseas Environmental Impact Statement (OEIS). CNMI Public Law 3-47, entitled the "Coastal Resources Management Act," grants DCRM regulatory authority towards activities within its jurisdictional territory that can impact the coastal resources of the CNMI. DCRM's mission is to protect and enhance the CNMI's coastal resources for residents and visitors through effective and adaptive resource management, interagency collaboration, and stakeholder engagement, in a manner that builds and sustains community resilience and well-being. Pursuant to the requirements of Section 307 of the federal Coastal Zone Management Act of 1972, as amended, and its implementing regulations found at 15 CFR 930, federal actions which may have reasonably foreseeable effects on uses or resources of the coastal zone must be undertaken in a manner which is consistent with the CRM enforceable polices as approved by the National Oceanic and Atmospheric Administration. DCRM is firm in its belief that the Technical Agreement reserves for the Commonwealth at the very least, limited jurisdiction. The Technical Agreement reserved for the Commonwealth certain rights (e.g. planning and coordination efforts regarding infrastructure and utilities, shoreline access for fishermen, recreational access to beach areas, etc.), the Commonwealth maintains its jurisdiction over the coasts and shorelines, broadly defined by law, for the safety and benefit of the general public. To that extent, we believe it mutually beneficial to establish better methods of communication and information-sharing. As outlined further in this comment, DCRM has concerns regarding the scope, extent of data sharing and lack of updated data, and the process itself that has been implemented for this MITT draft SEIS review.	nearshore reefs sedimentation. The Navy's analysis of mass movement and erosion on FDM includes historical photograph analyses and direct observations during dive surveys conducted off FDM since 1999. Additionally, the Navy will investigate methods to baseline current physical conditions on FDM and to monitor those conditions over time.This information pertaining to potential mass movement and erosion on FDM is included in Section 3.1.3.1.5.3 (Farallon de Medinilla Specific Impacts) in the 2015 MITT Final EIS/OEIS and Section 3.1.1.4 (Farallon de Medinilla) in this Supplemental EIS/OEIS. In 2017, the Navy funded additional coral reef surveys in the nearshore areas of FDM. The results are available at: https://apps.dtic.mil/dtic/tr/fulltext/u2/1069450.pdf. The 2017 survey found little evidence that training has affected coral communities at FDM. Only three relatively new ordnance items were observed, but no blast pits, craters, or significant areas of coral breakage were observed. The ordnance observed during the 2017 survey was almost exclusively old and encrusted in marine life, and was not having any discernable impact on surrounding communities. The Navy updated the MITT Final Supplemental EIS/OEIS to include the results of the 2017 survey as presented in Carilli et al (2018). The report information has been added to Section 3.1 (Sediments and Water Quality) and Section 3.8 (Marine Invertebrates). Specific text on impacts on Farallon de Medinilla is available in Section 3.1.3.1.5.3 (Farallon de Medinilla Specific Impacts) in the 2015 MITT Final EIS/OEIS, and Section 3.1 (Sediments and Water Quality) and Section 3.8 (Marine Invertebrates) of this Supplemental EIS/OEIS. In consideration on minimizing any potential erosion of the western cliffs of FDM from military training activities, the Navy relocated targets used by surface firing towards the island to locations on the plateau.

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	DSEIS/OEIS Scope DCRM provided scoping comments on the 2015 MITT Final EIS/OEIS on September 15, 2017. The agency maintains its concerns as stated in the scoping document regarding the environmental implications of MITT activities conducted on Farallon de Medinilla (FDM) and at sea, as well as those that have occurred over time and those associated with emerging technologies. The scope of the draft Supplemental Environmental Impact Statement (SEIS) and any subsequent updates should include rigorous assessment of environmental effects identified in DCRM's initial scoping comments to support meaningful analysis of the impacts and possible mitigation of these impacts. In summary, direct, indirect, and cumulative effects analysis in the SEIS should at minimum address the following using best available scientific data and clear impacts criteria: • Direct and cumulative mass wasting and sedimentation as a result of bombing activities on Farallon de Medinilla and the secondary impacts on endangered species, nesting seabirds, and nearshore reefs;	Section 3.6 (Marine Birds) of this Supplemental EIS/OEIS includes a statistical analysis of 17 years of monthly and quarterly bird counts of the three booby species that nest on FDM. The results of this analysis were also included in Section 3.6.2.6 (Rookery Locations and Breeding Activities within the Mariana Islands Training and Testing Study Area) of the 2015 Final EIS/OEIS. In the previous NEPA document, this statistical analysis was not yet published. In this Supplemental EIS/OEIS, the same information is included in the analysis, but now cites the published article (see Camp, R., C. Leopold, K. Brinck, and F. Juola, 2016). The Navy submitted a Consistency Determination to the CNMI Division of Coastal Resources Management (DCRM) in December 2019 addressing proposed military training and testing activities that may affect the CNMI's coastal zone and coastal uses. DCRM's response to the Navy's CD (dated March 9, 2020) can be found in Appendix C (Agency Correspondence). The Navy is in discussions with DCRM in order resolve any differences and reach an agreement regarding the Navy's compliance with CNMI's Coastal Management Program to the maximum extent practicable. The outcome of these discussions will be included in the ROD. The Navy has engaged with the DCRM throughout the development of this Supplemental EIS/OEIS, including meeting with staff during the scoping phase and providing notification when the Draft Supplemental EIS/OEIS was made available for public review and comment.
DCRM-02	• Direct and cumulative impacts from military-expended materials and other marine debris on water quality and marine biota including but not limited to analysis of the timing, duration, and concentration of toxic inputs (both point and non-point source), the residence times of the constituents, effects of deposition, bio-accumulation of metals and other chemical pollutants in individual organisms and on up the food chain, and potential risks stemming from unexploded ordnance;	Each biological resource section includes an analysis of secondary stressors and their potential impacts on a biological resource. Within these secondary stressor analyses in the Final SEIS, discussions of the fate and transport of specific chemicals with references to chemical properties of munitions and munitions constituents, are included. The Navy would also like to note that marine debris is addressed in the cumulative impacts chapter, and as part of the affected environment discussions within each

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		biological resource section. In summary, the Navy's analysis concludes that no federal or local guidelines would be exceeded and any releases would be *de minimis* because of the following reasons: (1) rapid and natural degradation of substances (e.g., munitions constituents and other chemicals), and (2) localized concentrations where impact would occur. These conclusions are based on evidence gathered on other military ranges in similar environments (e.g., Vieques), as well as legacy dump site studies conducted off the coast of Oahu. These studies are summarized in Section 3.1 (Sediments and Water Quality). Both this Supplemental EIS/OEIS and the 2015 MITT Final EIS/OEIS include an analysis of potential impacts from munitions, munitions constituents, metals, and other contaminants as a result of military training and testing activities on marine resources (see secondary stressor analyses in, Section 3.3, Marine Habitats; Section 3.4, Marine Mammals; Section 3.5, Sea Turtles; Section 3.7, Marine Vegetation; Section 3.8, Marine Invertebrates; and Section 3.9, Fishes). Based on the analysis presented in this Supplemental EIS/OEIS and the 2015 MITT Final EIS/OEIS, the Navy concluded that all levels of metals, chemicals, and other byproducts would be either below detectable levels or at levels below existing standards, regulations, and guidelines. These conclusions are presented in Section 3.1 (Sediments and Water Quality). Section 3.1 has been updated in the Final Supplemental EIS/OEIS to include discussion on standards, regulations, and guidelines. The results of the environmental analysis indicate that proposed training and testing activities would not impact public health or have population-level impacts on any marine resources. There are studies regarding bioaccumulation in the Mariana Archipelago that were used in the EIS, and the Navy applies federal and state water quality standards where applicable to assess potential bioaccumulation risk. Residual concentrations of contaminants resulting from Navy training and testing activities are provided in this Supplemental EIS/OEIS. In the

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		2010 Mariana Island Range Complex (MIRC) EIS/OEIS, it was noted that, "The CNMI Senate requested the Agency for Toxic Substances and Disease Registry (ATSDR) on February 19, 2008 to conduct a public health assessment on FDM of toxic substances released by bombs and the bioaccumulation of these toxins in consumable pelagic fish." The Agency, in its letter to the CNMI Senate on September 24, 2008, concluded that, "pelagic fish caught in the open water are not likely to contain high levels of explosive residues from the neighboring FDM bombing range and will not pose a public hazard to people who eat them." The conclusion is supported by the Agency's "Preliminary Assessment of Pelagic Fish Caught in the Open Pacific" (ATSDR, 2008). This Supplemental EIS/OEIS also includes information that suggests that the majority of concerns regarding bioaccumulation are associated with urban coastal environments with specific point source and non-point source contributors of pollutants. The studies concerning military sites suggest that metals exposed to seawater are of less concern because of decreased bioavailability. Studies cited in this Supplemental EIS/OEIS concerning metals deposition in the marine environment in waters off of military training ranges include multiple studies off of Vieques Island in Puerto Rico, Pamlico Sound in North Carolina, and a Canadian military site (Canadian Forces Maritime Experimental and Test Ranges near Nanoose Bay, British Columbia) for lead and lithium. Information on impacts on sediments and water quality from munitions at two additional sites, one in Hawaii and one in the Potomac River in Maryland, where military munitions have resided for decades have been added to the section.
DCRM-03	• Direct and cumulative impacts from active sonar and explosive tests on marine mammals;	The potential effects of sonar and explosives on marine mammals are quantitatively estimated using the Navy's Acoustic Effects Model (see the Technical Report, *Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing*, available on the project website for details on the quantitative

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		methodology). Predicted effects from sonar on marine mammals are presented by species in Section 3.4.2.1.2.3 (Impacts from Sonar and Other Transducers Under the Action Alternatives) and from explosives in Section 3.4.2.2.2.3 (Impacts from Explosive Stressors Under the Action Alternatives). No mortality or direct injury to any marine mammal is predicted. Behavioral responses by marine mammal species are predicted by the acoustic effects model. Research cited in this Supplemental EIS/OEIS and the 2015 MITT Final EIS/OEIS indicates behavioral responses by marine mammals exposed to underwater sound vary from no response to an immediate change in behavior, such as a change in swimming direction. Behavioral changes are temporary and not necessarily repeated, and animals frequently return to and continue their prior behavior after the initial interruption. Information on strandings in general and strandings associated with Navy training and testing activities is provided in the 2017 technical report, "*Marine Mammal Strandings Associated with United States Navy Sonar Activities*." NMFS, as the regulator, maintains the authoritative National Stranding Database.
DCRM-04	• Direct and cumulative impacts on seagrass, coral reef and other invertebrate, sea turtle, and fish populations and habitats;	The Navy used the best available data to analyze the potential effects of the Proposed Action on seagrass, coral reefs and other invertebrates, sea turtles, fish, and habitats. The analyses are presented in Section 3.3 (Marine Habitats), Section 3.5 (Sea Turtles), Section 3.7 (Marine Vegetation), Section 3.8 (Marine Invertebrates), Section 3.9 (Fishes), and Chapter 4 (Cumulative Impacts). As discussed in Sections 3.8 (Marine Invertebrates), recent surveys conducted by the Navy (Carilli et al., 2018) at FDM found that coral fauna are healthy and robust and the nearshore physical environment and basic habitat types at FDM remained unchanged. These conclusions are based on: (1) a limited amount of physical damage, (2) very low levels of partial mortality and disease (less than 1 percent of all species observed), (3) absence of excessive mucus production, (4) good coral recruitment, and (5) complete recovery by 2012 of the 2007 bleaching event. Smith and Marx (2016) also concluded that the health, abundance, and biomass of

	Comment	Navy Response
		fishes, corals, and other marine resources at FDM are comparable to or superior to those in similar habitats at other locations within the Mariana Archipelago. The Navy funded additional reef surveys in the nearshore areas of FDM in 2017. The results are available at: https://apps.dtic.mil/dtic/tr/fulltext/u2/1069450.pdf. The 2017 survey found little evidence that training has affected coral reef communities at FDM. Only three relatively new ordnance items were observed, but no blast pits, craters, or significant areas of coral breakage were observed. The ordnance observed during the 2017 survey was almost exclusively old, encrusted in marine life, and was not having any discernable impact on surrounding communities.
DCRM-05	• Direct and cumulative impacts on cultural resources and the loss of traditional access and use of Farallon de Medinilla;	The Navy used the best available data to analyze the potential effects of the Proposed Action on cultural resources in Section 3.11 (Cultural Resources). FDM and waters within 3 NM of FDM have been prohibited for decades (as noted in Article 12 of the 1983 lease agreement) to ensure the safety of the public during military activities conducted on the island and due to the presence of unexploded ordnance in nearshore waters around the island. The Navy complies with all rules and regulations under the NHPA and takes great care to respect all historic properties. Consultations are ongoing under the NHPA Section 106 process to develop the terms for updating the Guam and CNMI Programmatic Agreements. The Programmatic Agreements will include stipulations to avoid, minimize, and mitigate adverse effects on historic properties.
DCRM-06	• Direct and cumulative impacts of restricted areas on recreational and commercial fishing and transport between islands, including but not limited to public access, tourism and an analysis of impacts that would result from fishermen forced to seek alternate work areas;	The Navy used the best available data to analyze the potential effects of the Proposed Action on commercial and recreational fishing in Section 3.12 (Socioeconomic Resources and Environmental Justice). The Navy is not proposing a change to any restricted ocean areas currently used by the Navy since the 2010 MIRC Final EIS/OEIS (Section 2.1.1, MIRC Overview) and the 2015 MITT Final EIS/OEIS (Section 2.1.1, Mariana Islands Range Complex). In this Supplemental EIS/OEIS there are no new restrictions to public access of fishing areas. The Navy is committed to continuing to work

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		with the local community on issues that potentially affect the public, including access to fishing sites. The Navy regards the safety of fishermen and other boaters as a top priority. The Navy would not restrict the freedom of movement between islands. However, the permanent restriction at FDM is in accordance with Article 12(c) of the January 1986 lease, which specifically states, "Public access to Farallon de Medinilla Island and the waters of the Commonwealth immediately adjacent thereto shall be permanently restricted for safety reasons."
DCRM-07	• Direct and cumulative impacts on terrestrial lands, habitats, and species of the CNMI resulting from activities conducted both at sea and on Farallon de Medinilla;	The Navy is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities. Both this Supplemental EIS/OEIS and the 2015 MITT Final EIS/OEIS Section 3.6 (Birds) address potential impacts on seabirds that nest and visit FDM. Section 3.10 (Terrestrial Species and Habitats) addresses wildlife and plant communities and ESA-listed species known to occur on the island (Micronesian megapodes and Mariana fruit bats). In addition, the 2019 Integrated Natural Resources Management Plan (INRMP) includes additional information on biological resources on FDM and nearshore waters surrounding waters of the island. In 2015, the Navy and USFWS completed consultation for potential impacts of military training activities on FDM. The 2015 Biological Opinion determined that these activities would adversely affect ESA-listed species on FDM, and included non-discretionary measures to reduce the effect of take resulting from training activities. Activities analyzed in the Navy's Supplemental EIS/OEIS do not warrant reinitiation of Section 7(a)(2) consultation with USFWS, and the measures agreed to between the Navy and USFWS in 2015 are carried forward in this Supplemental EIS/OEIS.
DCRM-08	• Direct and cumulative environmental justice implications of continued expanded training and testing in and near the Commonwealth of the Northern Mariana Islands and the	This Supplemental EIS/OEIS fully complies with Executive Order 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations) as demonstrated by the analysis in Section 3.12 (Socioeconomic Resources and Environmental Justice). This section

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	relationship of this proposal to other related training and testing expansions proposed in this region; and	includes an analysis of impacts of proposed activities on socioeconomic resources and whether the Proposed Action would result in a disproportionate effect on minority or low-income populations. While increases in certain training and testing activities under Alternatives 1 and 2 may result in impacts on socioeconomic resources, such as accessibility to areas of co-use, these impacts are expected to be negligible. Traditional fishers in the CNMI and Guam would not be disproportionately impacted by training and testing activities because traditional fishing practices often occur in the same general areas as commercial and recreational fishing, which are typically closer to shore and far from the majority of military activities. The analysis of potential impacts on environmental justice is limited primarily to traditional fishing practices, because, with the exception of training activities at FDM, the vast majority of training and testing activities occur at sea, where potential impacts on socioeconomic resources are primarily associated with commercial, recreational, and tourism activities that take place in the marine environment, including fishing. As described in Section 3.12.1.4 (Environmental Justice), fishing for subsistence purposes is not easily distinguishable from fishing for recreation or commercial purposes in the small boat fishing communities of the CNMI. The results of surveys cited in Section 3.12.1.4 (Environmental Justice) show that fishers may accomplish all three purposes on a single fishing trip, and fishers who use their own catch as a regular source of food are not necessarily part of a minority or low-income population as described under the Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations.
DCRM-09	• Cumulative impacts resulting from all Department of Defense activities in the Marianas region, including how ongoing military readiness activities in the MITT Study Area raise the profile of the US Pacific Islands as areas of strategic importance and heighten the risk of pre-emptive or retaliatory strikes from enemies.	The Navy used the best available science and conducted a comprehensive review of past, present, and reasonably foreseeable actions to develop a robust analysis of cumulative impacts (Chapter 4, Cumulative Impacts). As required under NEPA, the level and scope of the analysis are commensurate with the potential impacts of the action as reflected in the resource-specific discussions in Chapter 3 (Affected Environment and

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		Environmental Consequences). The Navy considered proposed and ongoing activities alongside with other activities in the region whose impacts are truly meaningful to the analysis. Furthermore, the entire Supplemental EIS/OEIS provides the cumulative impacts analysis, not just Chapter 4. Chapter 3 provides the current effects of past and present impacts and environmental conditions that represent the baseline of the environment as it is; Chapter 3 also discusses the consequences or potential future impacts from Navy activities. Chapter 4 discusses other reasonably foreseeable activities, including Department of Defense activities in the Marianas regions, to the extent they are known and the incremental impact of the Navy's proposal when added to past, present, and future impacts. Considering that minimal or no impacts from training and testing are anticipated on multiple marine resources that directly or indirectly affect marine mammals, sea turtles, and marine invertebrates, the contribution from Navy training and testing activities to cumulative impacts on marine animals is expected to be negligible. In addition, the Navy is consulting with NMFS under the ESA for potential effects (including cumulative effects) on marine mammals, sea turtles, fish, and coral and received a Biological Opinion. Mitigation measures and monitoring requirements specified in the Biological Opinion are presented in Chapter 5 (Mitigation). The mission of the U.S. Department of Defense is to provide the military forces needed to deter war and to protect the security of the United States, which includes Guam and the Commonwealth of the Northern Mariana Islands. The Mariana Islands have provided an ideal location in the Indo-Asia-Pacific region for the military to maintain a global and strategic presence, and the military strives to reduce its effects on the islands while ensuring the United States and its territories are protected and safe.

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DCRM-10	Despite DCRM's requests that these impacts be considered thoroughly in the scoping comments we provided, we find data gaps and conclusory analysis plagues the Draft SEIS/OEIS, leaving the impression that these comments were not fully considered in the scoping process. An addendum to any subsequent revisions or to the final report should include where scoping concerns – and, for the final, comments on the draft – have been addressed to further support the review process.	As per CEQ regulations, the Navy uses a number of sources of best available science and data in this Supplemental EIS/OEIS, including external references (noted in each section of this Supplemental EIS/OEIS), technical documents (available on the MITT project website), and ongoing consultation processes with other agencies (NMFS and USFWS). Data is drawn and managed from multiple sources, including from the public during the NEPA process. Best available peer-reviewed science and data can come from sources such as academia, consultations with other resource agencies, industry, and the public. Public involvement is a fundamental aspect of the environmental analysis process, and the Navy welcomes and appreciates the public's participation. The Navy reviewed all comments received during the 45-day scoping period and considered all substantive comments in the preparation of the Draft Supplemental EIS/OEIS. Each resource section within this Supplemental EIS/OEIS presents a summary of the scoping comments and responses to the issues raised. In addition, the actual public comments and responses are provided in this appendix (Public Comment Responses).
DCRM-11	***Data Availability and Updates*** The MITT-EIS.com website provides five "2019 Supporting EIS/OEIS Supporting Technical Documents": (i) Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III), June 2017, (ii) Dive Distribution and Group Size Parameters for Marine Species Occurring in the U.S. Navy's Mariana Islands Training and Testing Study Area (March, 2018), (iii) Marine Mammal Strandings Associated with U.S. Navy Sonar Activities (June, 2017), U.S. Navy Marine Species Density Database Phase III for the Mariana Islands Training and Testing Area (July, 2018), and (v) Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing, (August, 2018). Firstly, it is disconcerting that after several requests to provide data and studies in advance that such reports were not	As per CEQ regulations, the Navy uses a number of sources of best available science and data, including external references from academia, industry, and the public (noted in each section of EIS/OEIS); technical documents (available on the MITT project website); and ongoing consultation processes with other agencies (NMFS and USFWS). The Navy strives to share technical information and data with the public and resource agencies. Technical reports are posted on the MITT project website at www.mitt-eis.com. For Navy-funded and managed marine research and monitoring studies, the public can access reports, documentation, data, and updates on current monitoring projects via the U.S. Navy Marine Species Monitoring Program website at www.navymarinespeciesmonitoring.us.

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	provided as a courtesy to CNMI natural resource managers when they were finalized to support timely review and meaningful engagement in the development of these reports and criteria. Instead, by releasing these reports along with the voluminous draft SEIS/OEIS, insufficient time has been time provided to assess the methods or data supplementing this report, let alone to conduct reviews of other data from non-DOD studies and institutions which would likely be helpful in supporting further discussion regarding effects analysis and related statements made in these reports. In fact, these five documents are not the entire suite of newly cited and relied upon publications, and in practice, it is challenging for small government agencies without professional journal subscriptions to find and access the reports that are being relied on. These shortcomings should be remedied in future reports. At minimum, reports supporting this draft SEIS/OEIS should be summarized and sections where data was used to support effects analysis should be clearly outlined to support review of this updated analysis. It would be helpful in the revised or updated draft SEIS/OEIS to also indicate where assessment of impacts of "new technologies" are covered by new analysis provided, or to explain how DOD plans to monitor and assess these impacts if no analysis has been done. Where updated local data is available to support this analysis, it should be shared to support this review process, ideally when that data is collected. DCRM and our partner agencies have repeatedly requested data sharing and monitoring access to further address concerns regarding impacts of current and proposed DOD activities – most recently at last year's scoping meeting when partners were informed that the pending SEIS would be focused on obtaining reauthorization of existing Endangered Species Act (ESA) and Marine Mammal Protections Act (MMPA) authorizations. In general, environmental impact assessment reports in our region would be more effective at enabling technical	The Navy will continue to communicate and coordinate with the CNMI government on future collaboration and information sharing. Additionally, the Navy conducts extensive monitoring and data collection programs as part of its compliance with the MMPA and ESA, including in the waters around the Mariana Islands. In 2017, two surveys (one in winter and one in summer) were conducted off Saipan, Tinian, and Guam to obtain data that improves the knowledge of marine mammal populations, movement patterns, and habitat use. The Navy also works with other agencies and local governments to study, monitor, and protect endangered green and hawksbill sea turtles. State-of-the-art scientific methods and technologies are used to monitor and track sea turtles in the Mariana Islands to learn more and have a better understanding of their population levels, home ranges, and habitat use. The Navy's Marine Species Monitoring Program website provides access to reports, documentation, data, and updates on current monitoring projects. Information on current monitoring projects, technical reports, conference presentations and data are available at www.navymarinespeciesmonitoring.us. In addition, while outside the current scope of this Supplemental EIS/OEIS, the military satisfies Sikes Act obligations through the development and implementation of the Joint Region Marianas INRMP. The 2019 Joint Region Marianas INRMP includes monitoring programs throughout the Mariana Islands. The CNMI Department of Lands and Natural Resources, Division of Fish and Wildlife is a signatory and participating member to the 2019 Joint Region Marianas INRMP, which details natural resource management and monitoring programs. The 2019 Joint Region Marianas INRMP details natural resource management and monitoring programs, including projects for ESA-listed corals, which either improve the understanding of these species in the wild or are designed to protect species and their habitat without infringing on the DoD's military mission.

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	review if data were provided as studies were published and if all studies could be linked to as PDFs in the report contents to support accessibility of primary documentation. To this day, raw data and primary reports being relied upon for environmental analysis are not made readily available nor are monitoring activities coordinated, making review of impacts of current activities and proposed future actions challenging. Lack of data availability and timely sharing of updated data when it is collected appears to be contrary to the DOD's NEPA implementation guidance which states that "[c]lose and harmonious planning relations with local and regional agencies and planning commissions … for cooperation and resolution of mutual land use and environmental-related problems should be established" (32.CFR.775.10). For this and other DOD proposals, DCRM would like to reiterate the request for early information sharing to provide technical staff sufficient time to review and comment on data collection methods and data that is collected. Incorporating local resource managers in study development and report review would greatly enhance the credibility of the methods being applied in existing and updated effects analysis. Lack of updated data used in the MITT draft SEIS/OEIS is also disconcerting. As discussed below, although new activities and substantial changes in the "tempo" of activities authorized under the 2015 MITT Record of Decision (ROD) are proposed, little new information appears to be analyzed, presenting procedural and substantive concerns. To assist CNMI agencies to identify and review new information, DCRM requests that DOD provide all new studies, reports, and other related data analysis and raw data used in the 2019 SEIS/OEIS as well as a list of these materials and what substantive issues they were relied upon in the supplemental analysis conducted for this proposal. Although we understand	Programs specific to coral and FDM (subject to annual funding availability) include: • Marine Habitat Mapping (benthic habitat mapping) [Naval Base Guam, Andersen Air Force Base, Farallon de Medinilla] • Fish, Coral, and Marine Surveys (visual surveys) [Farallon de Medinilla] • Assess ESA-Listed Scleractinian Corals (visual surveys and condition assessment for ESA-corals) [Farallon de Medinilla] The Navy will continue to improve coordination and collaboration with the CNMI as part of the INRMP project development and implementation. The programs mentioned above help ensure current environmental conditions are monitored regularly. Any new information or data from the Navy's monitoring programs and INRMP will be incorporated into the Final Supplemental EIS/OEIS as appropriate. As per CEQ regulations, the Navy uses a number of sources of best available science and data, including external references (noted in each section of EIS/OEIS), technical documents (available on the MITT project website), and ongoing consultation processes with other agencies (NMFS and USFWS). Data is drawn and managed from multiple sources/points, including from the public during the NEPA process. Data are available in tables in this Supplemental EIS/OEIS and technical reports on the website. Best available peer-reviewed science/data can come from sources such as academia, other resource agencies, industry, and the public. For Navy-funded and managed studies, the Navy will continue to communicate and coordinate with the CNMI government on future collaboration and information sharing.

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	discussion of new technologies is privileged information, some demonstration that new impacts of these technologies have been meaningfully considered could also be included in supporting data sharing.	
DCRM-12	***Procedural Concerns*** The additional of new technology for training and testing under the MITT has not been meaningfully discussed with CNMI reviewing agencies, raising both substantive and procedural concerns. It is unclear whether the direct, indirect, and cumulative impacts have been considered. As the Department of Defense's procedures for implementing the National Environmental Policy Act details, the "fact that a proposed action is of a classified nature does not relieve the proponent of the action from complying with NEPA and the CEQ regulations. Therefore, environmental documents shall be prepared, safeguarded, and disseminated in accordance with the requirements applicable to classified information" and that "[e]ven though the classified EA/EIS does not undergo general public review and comment, it must still be part of the information package to be considered by the decisionmaker for the proposed action" (32 CFR 775.5). It appears some additional information confirming the consideration of the impacts of these new technologies would be warranted. Moreover, the proposed increase in use of explosive ordnance and the use of "new technologies" envisioned in this draft SEIS/OEIS appears to be substantial, especially when details regarding what those technologies are remains unknown. DOD's NEPA guidance further states that a "substantial change in a continuing activity (such as a substantial change in tempo, area of use, or in methodology/ equipment) which has the potential for significant environmental impacts should be considered a proposal for a new action and be documented accordingly" (32 CFR 775.6(c)(2)). Thus, it is unclear, given the addition of new technology and significant	Pursuant to 40 CFR section 1502.9(c), a supplemental EIS is prepared when the agency makes substantial changes in the proposed action that are relevant to environmental concerns (40 CFR section 1502.9(c)(1)(i)); or there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts (40 CFR section 1502.9(c)(1)(ii)). An agency may also supplement a final EIS when the agency determines that the purpose of NEPA will be furthered by doing so (40 CFR section 1502(c)(2)). Pursuant to CEQ regulations, the Navy prepared the supplement to the 2015 MITT Final EIS/OEIS to consider future activities conducted at sea and on FDM, and updated training and testing requirements; incorporated new information from an updated acoustic effects model and updated marine mammal density data; and incorporated evolving and emergent best available science. This Supplemental EIS/OEIS also supports any reissuance of federal regulatory permits and authorizations under the MMPA and the ESA using the best available science and analytical methods to assess potential environmental impacts. Section 2.3.1 (Changes to Proposed Activities) describes activities that changed and were therefore analyzed in this Supplemental EIS/OEIS. New training activities include the use of new technology which must be tested and evaluated before use during deployment. As shown in Table 2.5-1, the only new training activity proposed is Surface Ship Object Detection. As shown in Table 2.5-2, proposed new testing activities (inclusive of new technology) include Radar and Other System Testing and Simulant Testing and may include the use of military or commercial radar, communication systems or simulators, or high-energy lasers. These activities and associated systems have already been tested by the Navy in other locations, but not the MITT Study Area. They are new to the Study Area

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	increase in use of explosive ordnance detailed in chart 2.5, why a new DEIS/OEIS has not been prepared to address this action. Should the DOD determine this approach is prudent, DCRM encourages that you work with our office and our agency partners to ensure that issue scoping is conducted and information is shared in advance of the official notice and comment period to support CNMI's ability to review and comment on these activities.	and therefore have been analyzed for environmental impacts in this Supplemental EIS/OEIS. These changes to proposed training and testing activities are part of the overall Navy program and are not unique to the MIRC. Appendix A (Training and Testing Activities Descriptions) provides detailed data sheets describing each training and testing activity. Section 2.3.1.1 (New Technologies and Capabilities) of this Supplemental EIS/OEIS provides additional information on new technology and capabilities.
DCRM-13	***Substantive Concerns*** <u>Significance of Effects at FDM</u> Significance of effects at FDM has primarily focused on coral impacts, although impacts to water quality and public access also remain concerns for DCRM. It appears that the "significance" of effects to coral around FDM has been qualitatively assessed based on surveys from two sets of researchers affiliated with the Navy's Space and Naval Warfare Systems Center Pacific (SSC Pacific). The "Smith and Marx" surveys were conducted between 1999-2012, and the most recent "Carilli et al" survey was conducted in 2017. Although the Carilli et al study was referenced in this draft SEIS/OEIS, this report and supporting data are not included in the 2019 SEIS/OEIS documents, making location of the file itself challenging. DCRM once again requests that supporting reports prepared for the MITT and other DOD build-up activities be provided when they are finalized to support meaningful review, and to this end we request copies of all of the Smith and Marx and Carilli surveys and associated raw data. Moreover, especially given the "discovery" of three new Acropora species, DCRM views the 2017 survey efforts as a missed opportunity for locally coordinated monitoring and assessment activities around FDM – a request for coordination that has been made repeatedly by local resource managers and still remains unaddressed. Collected data should be shared with CNMI to further inform discussion of monitoring protocols and impact analysis which are ongoing through this NEPA	See above response DCRM-04 (to the CNMI Bureau of Environmental and Coastal Quality, Division of Coastal Resources Management) regarding FDM and coral surveys. The Navy does not routinely allow independent, third-party access to live-fire ranges due to safety concerns. For Navy-funded and managed studies, the Navy will continue to communicate and coordinate with the CNMI government on future collaboration and information sharing. For instance, in Fiscal Year 2020, the Navy authorized and included a CNMI biologist to observe (on at least three occasions) FDM sea turtle surveys.

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	process as well as Integrated Natural Resources Management Planning dialogs. Without having access to these raw data and annual reports – and ideally access to the submerged lands around FDM itself for our own monitoring – it is difficult to find the significance assessment relating to impacts to coastal resources to be credible. This is especially true due to conclusory statements made in these studies, which were apparently qualitative in nature and lacking a "control" for comparison of effects in an area that is not experiencing active bombing practice. The Carilli et al. 2018 report distributed from the Navy Marine Species Monitoring resource library identifies 101 occurrences of exploded and unexploded ordnance on the sea floor within the 2017 survey area in Appendix E. That table lists over 4300 photographs, which again, would be helpful data to share with resource management agencies. In discussing "in-water effects of training" Carilli et al. note that "[t]wo bombs were classified as 'fresh' because they had little marine growth on them [and] all other items were classified as 'old', suggesting they had been submerged for at least several months and in some bases probable many years" and also that a "number of large ordnance items (750 and 2,000 pound bombs) which had been repeatedly sighted during past surveys were no longer at the same locations where they had been observed in the past [and] the divers speculated that these items had moved downslope due to wave and/or earthquake events". Despite noting that large bombs both intact and in pieces are being deposited around the island, and evidence that these bombs are shifting on the sea floor, the paper concludes that there was "overall little evidence of any adverse impacts to coral from training activities" although this conclusion seems primarily based in the qualitative observation that all corals within the study area were	

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	actually under stress. With over 77% of corals surveyed in this study showing signs of bleaching, additional stress from physical impacts of bombs bouncing from land and then sliding down the sea floor as well as indirect impacts from increasing erosion and sedimentation from the adjacent island are surely significant cumulatively and warrant at least a serious assessment of possible monitoring, mitigation, restoration, and compensation alternatives. To remedy observed shortcomings in data sharing and coastal resources effects analysis, DCRM urges the DOD to share all relevant raw data and analysis reports and invite DCRM and other resource managers in CNMI to join in the development and implementation of monitoring protocols at FDM. Additional studies to provide localized data to assess impacts to water quality and public access should also be considered in subsequent monitoring and re-permitting dialogs. In drafting environmental impact statements, clear use of the significance criteria being used would also be most helpful in supporting review of these statements. Robust monitoring should be ensured to provide data to assess whether current mitigation measures are sufficient and document changes relative to local and global events as they occur.	
DCRM-14	It also appears that the 2017 survey had relatively little coverage of the submerged lands adjacent to Impact Area 3, which would seem to be necessary due to the newly listed coral species that could occur in this area. Quarterly surveys of the full area of potential deposition of ordnance around FDM would seem reasonable given the high frequency of range use and the considerable ramp up in the "tempo" of the use of large explosive ordnance being proposed. More regular survey frequencies could also provide training opportunities to reclaim, disarm, and remove bombs from the terrestrial and marine environment to further reduce concerns regarding direct, indirect, and cumulative impacts of these activities.	See above responses to DCRM-01 and DCRM-04 (to the CNMI Bureau of Environmental and Coastal Quality, Division of Coastal Resources Management) regarding the 2017 Carilli et al. (2018) surveys. The Navy continues to monitor general ecological conditions on FDM through the use of aerial images and routine surveys. The Navy has an Operational Range Clearance plan (2013) for land-based areas of FDM, which includes provisions for vegetation management and removal/disposal of materials that may present an explosive risk. Clearance of the range occurs every 2–4 years, depending on the type of ordnance targeted for removal or destruction.

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DCRM-15	Significance of Water Quality Effects As the draft SEIS/OEIS outlines, explosives and explosive byproducts in addition to other materials expended during the proposed training and testing would "not exceed regulatory thresholds and guidelines" for sediment and water quality. Because it is unclear what guidelines are being referenced here, and what baseline and current data is being used to quantify existing levels of heavy metal load in the jurisdictional waters of FDM, further clarification is requested. Additional details regarding qualitative and/or quantitative criteria being used to assess the "significance" of in-water effects would enable CNMI to better understand the effects analysis supporting claims that existing and proposed increases of explosive ordnance is not having significant effects on coastal resources of concern. An updated or final EIS/OEIS should clearly identify what water pollutants of concern have been tested for on land and in the waters surrounding FDM and provide clear evidence that the ordnance being deposited from training activities does not pose direct, indirect, or cumulative risks to water quality and associated human uses of these coastal resources.	The Final Supplemental EIS/OEIS has been updated to include Table 3.1-1 within Section 3.1 (Sediments and Water Quality) which includes water quality standards, criteria, and applicable water use areas for waters surrounding Guam and islands within the CNMI. Specifically for waters surrounding CNMI, the Navy references Chapter 65-130 Part 400, which provides water quality standards for water use areas in nearshore waters of the CNMI. Table 3.1-1 lists each standard with specific criteria in CNMI's regulations and applicability to each water use area. The water quality standards include criteria for microbiological concentrations (Enterococci, and *E. coli*), pH, nutrients (nitrate-nitrogen, total nitrogen, orthophosphate, ammonia), dissolved oxygen, total filterable suspended solids, salinity, temperature, turbidity, radioactive materials, oil and petroleum products, toxic pollutants, and other general considerations. The military readiness activities that generate stressors to water quality do not occur in the water use areas; rather, they occur outside of the CNMI coastal zone and are analyzed in the context of their potential to induce reasonably foreseeable effects into Class "AA" or Class "A" water use areas. The Navy does not believe that testing for water quality pollutants of concern is warranted in waters surrounding FDM. Based on the multi-year dive surveys discussed within Section 3.1 (Sediments and Water Quality), there are no indications of adverse impacts on fish, shellfish, or wildlife within the coastal waters surrounding FDM, with the dive surveys showing healthy ecosystem functions and wildlife abundance within these waters. While no quantitative sampling for metals in training areas have been completed, there are a number of studies conducted in marine training and testing locations that have attempted to measure metal content where military activities occur. In one study, the water was sampled for lead, manganese, nickel, vanadium, and zinc at a shallow bombing range in Pamlico Sound (state waters of North Carolina) immediately following a training event with non-explosive practice bombs. All water quality

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		parameters tested, except nickel, were within the state limits. The nickel concentration was significantly higher than the state criterion, although the concentration did not differ significantly from the control site located outside the bombing range. The results suggest that bombing activities were not responsible for the elevated nickel concentrations (U.S. Department of the Navy, 2010). A recent study conducted by the U.S. Marine Corps sampled sediments and water quality for 26 different constituents related to munitions at several U.S. Marine Corps water-based training ranges. Metals included lead and magnesium. These areas were also used for bombing practice. No munitions constituents were detected above screening values used at the U.S. Marine Corps water ranges (U.S. Department of the Navy, 2010). A study by Pait et al. (2010) of previous Navy training areas at Vieques, Puerto Rico, found generally low concentrations of metals in marine sediments. Areas in which live ammunition and loaded weapons were used ("live-fire areas") were also included in the analysis.
DCRM-16	When discussing cumulative impacts, the 2019 DEIS references the 2015 MITT Final EIS/OEIS analysis, stating that training and testing activities under each alternative could result in local, short- and long-term changes in sediment and water quality, but that "chemical, physical, or biological changes remained within standards, regulations, and guidelines" (DEIS, 4-22). It would be very helpful to have some additional discussion regarding what those "changes", how they are being detected and monitored, and how it is clear that applicable standards are not being and will not be exceeded. The DEIS goes on to rely on 2015 MITT analysis that, for short-term impacts "from explosions and the byproducts of explosions and combusted propellants" it would be "unlikely that these short-term impacts would overlap in time and space with other future actions that produce similar constituents" and "[t]herefore, the short-term impacts did not contribute to cumulative impacts" (DEIS 4-22). This is an unreasonable omission	See above responses to DCRM-01, DCRM-02, DCRM-09, and DCRM-15 (to the CNMI Bureau of Environmental and Coastal Quality, Division of Coastal Resources Management) regarding cumulative impact analysis, water quality and sediments, and FDM. The Navy used the best available science and conducted a comprehensive review of past, present, and reasonably foreseeable actions to develop a robust analysis of cumulative impacts (Chapter 4, Cumulative Impacts). As required under NEPA, the level and scope of the analysis are commensurate with the potential impacts of the action as reflected in the resource-specific discussions in Chapter 3 (Affected Environment and Environmental Consequences). The Navy considered proposed and ongoing activities alongside other activities in the region whose impacts are truly meaningful to the analysis. Furthermore, the entire Supplemental EIS/OEIS provides the cumulative impacts analysis, not just Chapter 4. Chapter 3 provides the current effects of past and present impacts and

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	from this environmental impact analysis that may lead to substantially flawed understanding of impacts and necessary mitigation actions. Cumulative effects analysis should most certainly consider the combine direct and indirect impacts of the currently sanctioned and proposed additional use of munitions on FDM and within the waters of MITT range complex. As previously noted in scoping comments, the revised or final report should include direct and cumulative impacts from military-expended materials and other marine debris on water quality and marine biota including but not limited to analysis of the timing, duration, and concentration of toxic inputs (both point and non-point source), the residence times of the constituents, effects of deposition, bio-accumulation of metals and other chemical pollutants in individual organisms and on up the food chain, and potential risks stemming from unexploded ordnance. This assessment should be conducted for the proposed seven-year extension of currently sanctioned activities at 2015 MITT ROD levels and at leaves of proposed alternatives 1 and 2 to provide for more meaningful analysis of impacts within the MITT range for the duration of the currently proposed action.	environmental conditions that represent the baseline of the environment as it is; Chapter 3 also discusses the consequences or potential future impacts from Navy activities. Chapter 4 discusses other reasonably foreseeable activities to the extent they are known and the incremental impact of the Navy's proposal when added to past, present, and future impacts.
DCRM-17	When discussing long-term impacts, the DEIS notes that, similar to the 2015 Final EIS/OEIS long-term cumulative impacts would be "negligible" because: • Most training and testing activities are widely dispersed in space and time. • Where activities are concentrated (i.e., Farallon de Medinilla [FDM]), marine habitat conditions observed over multiple years through dive studies indicate that ecological services that maintain water quality have not been inhibited at FDM. • Most components of expended materials are inert or corrode slowly.	See above responses to DCRM-03, DCRM-14, and DCRM-15 (responses to the CNMI Bureau of Environmental and Coastal Quality, Division of Coastal Resources Management) regarding water quality and sediments (see Section 3.1, Sediments and Water Quality), FDM, operational range clearance, and sonar. Section 3.6 (Birds) and Section 3.10 (Terrestrial Species and Habitats) include comparisons of how munitions use would change under the Navy's Proposed Action compared to baseline activities. The comparisons are provided in the context of number of munition items, net explosive weight, and number of activities. Chapter 2 provides a summary of the total hours of sonar use.

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	• Numerically, most of the metals expended are small-and medium-caliber projectiles, metals of concern comprise a small portion of the alloys used in expended materials, and metal corrosion is a slow process that allows for dilution. • Most of the components are subject to a variety of physical, chemical, and biological processes that render them benign. • Potential areas of impacts would be limited to small zones immediately adjacent to the explosive, metals, or chemicals other than explosives. (DEIS, 4-23). To be at least minimally responsive to initial scoping requests, answers to the following questions should be provided: • How many total tons of munitions and hours of sonar are being proposed for the timeline of the current proposal, which we understand to be though the next MMPA / ESA permitting period which has been extended from five to seven years? • What studies have been conducted around FDM to demonstrate current water quality and water quality before compared to after explosive munitions use? What parameters have been tested for and at what frequency? Please provide copies of these studies to DCRM. • Which components of expended materials are inert, which corrode slowly, and which are listed as known pollutants of concern? What would the total volume of these materials left on shore and in the marine environment be if the current 2015 MITT ROD is extended and under Alternative 1 and 2? What best practices are in place on other DOD ranges to ensure these materials do not pose risks to people and the environment? Are there mitigating actions that could be taken to further reduce risks of large ordnance "bouncing" from land into the marine environment? • What are current heavy metal loads in sediment and waters surrounding FDM? How does this compare to more remote	• Section 3.0 (Introduction) includes several tables that provide details on the munitions and sonar proposed as part of the Proposed Action. Table 3.0-2 presents the source class categories of sonar and the units proposed under Alternative 1 and Alternative 2 (the Preferred Alternative). The 2015 MITT Final EIS/OEIS units are also presented in the table for comparison. Table 3.0-18 presents the different military expended material and the area of potential impact (acre). The table presents the acres within the 2015 MITT Final EIS/OEIS and Alternative 1 and 2 of this Supplemental EIS/OEIS. According to Table 3.0-18, the surface area of the ocean bottom that could be impacted by the use of military expended materials as proposed in this Supplemental EIS/OEIS would decrease from the amount analyzed in the 2015 MITT Final EIS/OEIS. • In response to DCRM's comment requesting studies conducted around FDM to compare current water quality and water quality before and after explosive munitions use, along with parameters tested (and frequency), the Navy has updated Section 3.1 (Sediments and Water Quality) with additional information. Although no quantitative sampling for metals in training areas have been completed, there are a number of studies conducted in marine training and testing locations that have attempted to measure metal content where military activities occur. In one study, the water was sampled for lead, manganese, nickel, vanadium, and zinc at a shallow bombing range in Pamlico Sound (state waters of North Carolina) immediately following a training event with non-explosive practice bombs. All water quality parameters tested, except nickel, were within the state limits. The nickel concentration was significantly higher than the state criterion, although the concentration did not differ significantly from the control site located outside the bombing range. The results suggest that bombing activities were not responsible for the elevated nickel concentrations (U.S. Department of the Navy,

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	islands of the CNMI that have not been being used for live fire training since the 1970s? How quickly do these metals corrode in our island environment? What best practices are in place on other DOD ranges to reclaim lead projectiles or otherwise ensure that heavy metals are not left in the terrestrial or marine environment? • What are the components of the ordnance being used that would be rendered "benign" through physical, chemical, and biological processes? What are these processes and how long do they take? What components are not rendered "benign" through these processes? • How have the direct, indirect, and cumulative effects on the "small zones immediately adjacent to the explosive, metals, or chemicals other than explosives" been assessed for the impact zones on FDM? Without robust data to support analysis regarding these questions, it is indefensible to state that the cumulative impacts of the proposed 2019 SEIS/OEIS and future extensions of this proposal for the "foreseeable future" will not have significant impacts on the water quality, sediments, and surrounding coastal resources of FDM and the lands and waters of the CNMI. If information regarding water quality is lacking, data should be gathered, and DCRM would welcome the opportunity to join and support data collection, analysis, and further monitoring efforts.	2010). A recent study conducted by the U.S. Marine Corps sampled sediments and water quality for 26 different constituents related to munitions at several U.S. Marine Corps water-based training ranges. Metals included lead and magnesium. These areas were also used for bombing practice. No munitions constituents were detected above screening values used at the U.S. Marine Corps water ranges (U.S. Department of the Navy, 2010). A study by Pait et al. (2010) of previous Navy training areas at Vieques, Puerto Rico, found generally low concentrations of metals in marine sediments. Areas in which live ammunition and loaded weapons were used ("live-fire areas") were also included in the analysis. • Other than targeting restrictions (i.e., limiting certain ordnance types to specific impact areas on FDM), there are no additional mitigative actions to reduce risks of large ordnance skipping off the surface into the marine environment. These "bounces," however, are reported in the form of after-action reports to JRM. • As stated in Section 3.1.1.1.4 (Farallon de Medinilla), range condition assessments are conducted at all operational ranges within the Mariana Islands Range Complex in accordance with Department of Defense (DoD) Instruction 4715.14, Operational Range Assessments; and the Chief of Naval Operations Range Sustainability Environmental Program Analysis Policy. The Navy is committed to surveying the FDM coral reef environment every five years, as well as performing the routine clearance of unexploded ordnance and other range debris from the FDM impact areas. No comparison studies between nearshore waters of FDM and other islands within the CNMI not used for military training activities have been conducted. The Navy does not believe these studies are warranted, based on conclusions reached in other quantitative sampling conducted in in-water ranges, as well as observations of reef health reported in multi-year dive surveys surrounding FDM.

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		• Direct, indirect, and cumulative effects analysis of localized impacts within waters surrounding FDM has been conducted qualitatively, based on the best available science (for FDM, this includes multi-year dive survey reports; for military ranges in general, see quantitative sampling discussions included above that have occurred within other in-water ranges).
DCRM-18	Significance of Effects to Public Access The DEIS/OEIS reports that "[a]ccess to waters around FDM between 3 and 12 NM was restricted for an average of 160days per year (peak of 201 in the year 2012)" and "[a]ccess to waters within 3 NM of FDM is restricted at all times to ensure public safety during military activities using explosive munitions" (DEIS 3.12-17). Although the DOD acknowledges that "[t]raining and testing activities have the potential to temporarily limit access to areas of the ocean, which has the potential to impact traditional fishing practice in the Study Area" (DEIS 4.48) these potential effects are not well detailed in the draft DEIS/OEIS. Disconcertingly, the 2019 report states that as "a result of the training and testing activities associated with this SEIS/OEIS, areas within 3 NM of FDM are permanently restricted to maintain public safety. Even when hazardous activities are not occurring at FDM, the potential occurrence of unexploded ordnance in waters surrounding the island is a constant threat to public safety" (DEIS 4-49). If this is the case, the DOD should take steps to ensure dangerous ordnance on land and in the water is regularly controlled to reduce threats to all people within the training area. This is especially true as the DOD is a temporary 58ease of this land and has no legal authority to "permanently" restrict access. It is unclear how this SEIS/OEIS can credibly assess direct and cumulative impacts on public access, cultural resources, and the loss of traditional access and use of Farallon de Medinilla, but the treatment of these impacts in the current draft is dismissive and insufficient. Training and testing activities should not be allowed to pose "constant threats to public	The Navy is committed to continuing to work with the local community on issues that potentially affect the public, including access to fishing sites while ensuring public safety at all times. The military actively promotes compatible use of ocean areas by minimizing public access restrictions and limiting the extent and duration of necessary closures. To clarify information presented in the Draft Supplemental EIS/OEIS, range access would not always be restricted when a range is in use; therefore, no change has been made to the document. Range access is dependent on the nature and type of activity being conducted. The Navy does not propose a change to the ocean areas currently used by both the Navy and the public. Restrictions on accessing areas of co-use would continue to be infrequent and short-term, while other fishing sites in the Study Area would continue to be available to the public. The Navy recognizes that limited or no access to productive fishing areas would impact fishers. While the analysis concludes that impacts could occur, the Navy does not anticipate significant impacts on commercial and recreational fishing in the Study Area, as described in both this Supplemental EIS/OEIS and the 2015 MITT Final EIS/OEIS, given the availability of other fishing areas in the CNMI. The Navy regards the safety of fishermen and other boaters as a top priority. The Navy would not restrict the freedom of movement between islands. However, the permanent restriction at FDM is in accordance with Article 12© of the January 1986 lease, which specifically states, "Public access to Farallon de Medinilla Island and the waters of the

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	safety" and the DOD should take necessary actions to ensure training areas do not become permanent waste lands.	Commonwealth immediately adjacent thereto shall be permanently restricted for safety reasons." Various means are used to communicate information to the public about areas restricted to public or commercial activities and are described in Section 3.13 (Public Health and Safety). As specified in Title 33 CFR Subpart 72.01, Notices to Mariners, the U.S. Coast Guard issues information to the public concerning maritime navigation. When notices to mariners are issued, the restriction is not necessarily for a full 24-hour period because many training activities last less than a full day. Additionally, nautical charts issued by the National Oceanic and Atmospheric Administration include these federally designated zones and areas. Operators of recreational and commercial vessels have a duty to abide by maritime regulations administered by the U.S. Coast Guard. The Navy will continue to communicate closures to the public and fishing community, including using a public Facebook page. As discussed above, the Navy has an Operational Range Clearance plan (2013) for FDM, which includes clearance of the range every 2–5 years, depending on the type of ordnance targeted for removal or destruction. In compliance with the terms of the 1983 lease, the United States would remove unexploded ordnance and exploded ordnance fragments from FDM to the extent practicable before returning to the CNMI.
DCRM-19	<u>Questions Regarding Proposed "Increase in Tempo"</u> The current MITT proposal seeks a significant increase in use of munitions at FDM in addition to use of "new technologies" throughout the nearly one million nautical mile "MITT range" that is our exclusive economic zone. It would be helpful if the final EIS/OEIS clarify why substantial increases in the amount of munitions – for example, 1,000 Naval Surface Fine Support Exercise Landbased Targets authorized annually under the 2015 Record of Decision to 4,200 being proposed now. What do these increases in "tempo" mean for activities within the MITT range area and how long is this increase anticipated to continue for? What is the total	Section 2.3.1 (Changes to Proposed Activities) describes those activities that changed and were therefore analyzed in this Supplemental EIS/OEIS. As shown in Table 2.5-1, the only new training activity proposed is Surface Ship Object Detection. As shown in Table 2.5-2, proposed new testing activities include Radar and Other System Testing and Simulant Testing. These activities and associated systems have already been tested by the Navy in other locations, but not the Study Area. They are new to the Study Area and therefore have been analyzed for environmental impacts in this Supplemental EIS/OEIS. These changes to proposed training and testing activities are part of the overall Navy program and are not unique to the

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	number of bombs and explosive potential sanctioned under the 2015 ROD and how is this proposal different? How many more tons of payload would proposed increases amount to? What if any alternatives were considered to this "solution" to accomplish training needs while also preserving the physical integrity of FDM and its surrounding waters? ***Conclusion*** To summarize, we request additional coordination with our office and more effective outreach to garner community engagement on the environmental and socioeconomic impacts to the study area. Where data and analysis are lacking, studies should be done working with CNMI resource management agencies to build trust and ensure we are answering research questions that should be resolved, rigorously assessing impacts, and ensuring mitigating actions are taken should significant impacts be identified. DCRM is appreciative of the opportunity to comment on the Draft Supplemental EIS/ OEIS and we thank you for your consideration. If you have any questions or concerns, please feel free to contact me at jcastro@dcrm.gov.mp.	MIRC. Appendix A (Training and Testing Activities Descriptions) provides detailed data sheets describing each training and testing activity. The tempo and types of training and testing activities have fluctuated because of the introduction of new technologies (such as unmanned vehicles and new sensors), the evolving nature of international events, advances in warfighting doctrine and procedures, and changes in force structure, such as the organization of ships, submarines, aircraft, weapons, and Sailors. Such developments influence the frequency, duration, intensity, and location of required training and testing activities. On FDM, the ordnance numbers and types differ from what was proposed in the 2015 MITT EIS/OEIS; however, these changes do not exceed what was analyzed in terms of frequency of use or net explosive weight in the 2015 Biological Opinion provided to the Navy by USFWS for the continued use of FDM as a live-fire range. Section 3.6 (Birds) and Section 3.10 (Terrestrial Species and Habitats) discuss the changes in detail, as well as their potential impacts on biological resources on FDM.
Lynda Bordallo Aguon, Guam State Historic Preservation Officer (SHPO)		
SHPO-01	a. Table of Contents, page ix, 3.11 Cultural Resources, 3.11.1.1 Guam. After Guam, add Mariana Islands, i.e., Guam, Mariana Islands.	Text within the Final Supplemental EIS/OEIS will be revised to Section 3.11.1.1 (Guam, Mariana Islands).
SHPO-02	b. What recent literature was reviewed to indicate that no additional submerged cultural resources have been identified around Guam? Our review indicate there are 119 submerged resources rather than the 84 stated in the Final EIS.	Consistent with Section 106 of the NHPA, the Navy made a "reasonable and good faith effort" to identify historic properties. Literature reviewed is cited in the references section of this Supplemental EIS/OEIS and 2015 Final MITT EIS/OEIS. Chapter 3.11 (Cultural Resources) has been updated to include a map of known wrecks, obstructions, or occurrences with the U.S. Territorial Waters.
SHPO-03	A systematic submerged resource survey around Guam must be conducted before any MITT activities occur.	Consistent with Section 106 of the NHPA, the Navy made a "reasonable and good faith effort" to identify historic properties. The Draft

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		Supplemental EIS/OEIS relies on the best available science and no new cultural resource surveys are required or planned.
SHPO-04	c. Page 3.11.1, 3.11. l.2.1 Farallon de Medinilla. What recent literature was reviewed to indicate that no additional submerged cultural resources, land-based archaeological site, or isolated non-modern artifacts have been identified around or on Farallon de Medinilla? Please provide copies of the literature to the Guam Public Library. See last paragraph under d.	Literature reviewed is cited in the references section of this Supplemental EIS/OEIS and 2015 Final MITT EIS/OEIS. The Navy conducted a review of literature and no new submerged resources have been identified, and there is no new literature on FDM.
SHPO-05	d. Page 3.11.6, 3.11.3 Public Scoping Comments. The Lead Agency (U.S. Department of the Navy) must conduct more community outreach and public meetings when consulting with the indigenous people of the Mariana Islands. The 2009 Mariana Islands Range Complex (MIRC) Programmatic Agreement is mentioned in numerous sections in the EIS/SEIS -and more importantly, is expiring December 2019. What document will be used in the interim before a new Programmatic Agreement is negotiated, and will any of the activities be held in abeyance until such time an agreement is executed? Yes, the MIRC Programmatic Agreement was negotiated with the Guam SHPO and CNMI SHPO, but public participation was lacking and there was not one consulting party that communicated the interest and concerns of the public. The lead agency did not seek or consider the views of the public as required in the process.	The Navy is required to complete independent statutory obligations under both NEPA and NHPA. Thus, the Navy has prepared this Supplemental EIS/OEIS and continued compliance with NHPA under the Section 106 process. The MIRC Programmatic Agreement expired in December 2019. In anticipation of this, the Navy initiated a NHPA Section 106 consultation in January 2019 with an eye toward developing new updated Programmatic Agreements. The Navy has held five consultation meetings open to consulting and interested parties on Guam and eight throughout the CNMI. Additionally, site visits, and working group sessions with the SHPOs and the National Park Service have taken place. The Navy is required to comply with NHPA Section 106 to support its undertaking. A Programmatic Agreement is one of several methods of ensuring compliance under Section 106 but is most appropriate for undertakings that involve routine and redundant activities where a federal agency plans to resolve potential adverse effects to historic properties through avoidance, minimization, and/or mitigation. An interim Programmatic Agreement for Guam that follows the exact terms of the 2009 MIRC Programmatic Agreement has been executed and is intended to “bridge” the expiration of the current Programmatic Agreement with the execution of the new Programmatic Agreement being developed. With regard to the CNMI, Cultural Resources staff at Joint Region Marianas have already taken action to conduct NHPA Section 106 consultation on individual training events following the expiration of the 2009 MIRC Programmatic

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		Agreement to ensure compliance as the Navy continues the consultation process.
SHPO-06	As stated in the last paragraph, a preliminary archaeological field survey of FDM was conducted in 1996 and reported no archaeological sites or isolated non-modem artifacts were observed (Welch 2010). This report does not support the knowledge that pre-contact Chamorros have known this island and gave it the name No 'os (a variation of Noos, J. Garrido). Fritz, during the German Administration, visited the island and noted that Medinilla contained "remains which suggested that the island was formerly inhabited or visited by Chamorros, presumably in the pre-contact period."(1989:11)." (Russell 1998).	The NHPA Section 106 process has received input regarding surveys for cultural resources on and in the waters surrounding FDM. The Navy has consulted at length with the CNMI State Historic Preservation Officer on the feasibility of conducting surveys at FDM and is confident that a mutually beneficial outcome will be incorporated in the development of the new Programmatic Agreement.
SHPO-07	Lastly, it is important to note, that in a space of almost 4 years from the time the 2015 EIS was implement to the 2019 Supplemental EIS, more cultural resources have been located, excavated, and recorded that are eligible and or listed in the National Register of Historic Places. A systematic literature review and resurveys of areas surveyed 20 or more years ago will result in a figure way beyond the 540 mentioned in the 2015 EIS. Thank you for the opportunity to comment. Si Yu'os Ma'cise'.	Consistent with Section 106 of the NHPA, the Navy made a “reasonable and good faith effort” to identify historic properties. Literature reviewed as part of the analysis is presented in the references section of this Supplemental EIS/OEIS and the 2015 MITT Final EIS/OEIS. Chapter 3.11 (Cultural Resources) has been updated to include a map of known wrecks, obstructions, or occurrences with the U.S. Territorial Waters. Locations of submerged sites included data that was compiled from records through the CNMI HPO.
Ralph DLG. Torres, Governor of the Commonwealth of the Northern Mariana Islands (Gov CNMI)		
Gov CNMI-01	The Office of the Governor for the Commonwealth of the Northern Mariana Islands (CNMI) presents the following comments on the 2019 Mariana Islands Training and Testing (MITT) Draft Supplemental Environmental Impact Statement / Overseas Environmental Impact Statement (SEIS/OEIS). Given the fact that the CNMI is still recovering from the damage caused by Super Typhoon Yutu, the limited review period for this extensive document is quite administratively challenging. As such, this review is focused primarily on procedural points and substantive questions	The Navy has been conducting training and testing activities in the Study Area for decades and this supplement to the 2015 MITT Final EIS/OEIS supports the continuation of that training and testing. The activities analyzed in this Supplemental EIS/OEIS are largely a continuation of the ongoing training and testing activities that were analyzed in the 2015 MITT Final EIS/OEIS, 2010 MIRC EIS/OEIS, and 1999 Mariana EIS/OEIS. Proposed training and testing activities are needed to achieve and maintain military readiness within the Study Area. In this regard, this Supplemental EIS/OEIS

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	as they relate to sustainable development principles including the scope, duration, and underlying assumptions upon which discussion of effects on the CNMI' s resources have been premised. We apologize in advance if the answers to the questions posed here are present within the 1,452 pages of Volumes 1 and 2 in addition to the numerous supporting technical documents, however, clarification on the following points would be especially helpful for the CNMI as we work to plan for socio-economic and ecological resilience for the Northern Mariana Islands. We hope these comments will also help improve the discussion of impacts, significant effects, and appropriate mitigation measures of this action. **Questions Regarding Scope and Duration** The Executive Summary notes that the "Supplemental EIS (SEIS)/OEIS considers ongoing and future activities conducted at sea and on Farallon de Medinilla (FDM), updated training and testing requirements, incorporates new information from an updated acoustic effects model, updates, marine mammal density data, and incorporates evolving and emergent best available science"(ES-1) however, it is unclear from this document the extent and duration of the activities being proposed and how these activities differ from those identified in the 2015 MITT Record of Decision (ROD). A simple chart detailing differences from the 2015 ROD and any proposed changes under proposed alternatives in the 2019 SEIS/OEIS in the Executive Summary would make the review of this voluminous document more accessible to experts and the general public alike and encourage public participation in this process as is the stated intent of the National Environmental Policy Act (NEPA). Instead, the matrices provided in Tables 2.5 and 2 .7 as well as Appendix F demonstrate that numerous changes may or may not result in additional stressors by training activity and resource type,	furthers the Navy and other military services' execution of their roles and responsibilities under 10 U.S.C. section 5062. This Supplemental EIS/OEIS: (1) includes the analysis of activities at sea and on FDM necessary to meet readiness requirements beyond 2020 and into the reasonably foreseeable future; (2) includes any changes to those activities previously analyzed; and (3) reflects the most up-to-date compilation of training and testing activities deemed necessary to accomplish military readiness requirements. The tempo and types of training and testing activities have fluctuated because of the introduction of new technologies (such as such as unmanned vehicles and new sensors), the evolving nature of international events, advances in warfighting doctrine and procedures, and changes in force structure, such as the organization of ships, submarines, aircraft, weapons, and Sailors. Such developments influence the frequency, duration, intensity, and location of required training and testing activities. The Navy routinely predicts the activities it will be conducting years in the future and analyzes the activities for environmental and regulatory compliance. This Supplemental EIS/OEIS supports the issuance of federal regulatory permits and authorizations under the MMPA and the ESA. The MMPA authorization for this Supplemental EIS/OEIS would be valid for seven years. It is important to note that the Navy is then bound by the limits of its expected types and levels of activities to comply with the permits and authorizations. If a need arises that exceeds those predicted activities, the Navy would be required to conduct additional environmental analyses. The Navy strives to create an accessible document for the public to review. To provide greater clarity, the Navy summarized ongoing training and testing activities analyzed in the 2015 MITT Final EIS/OEIS and the proposed activities analyzed in this Supplemental EIS/OEIS (Tables 2.5-1 and 2.5-2 in Chapter 2 [Description of Proposed Action and Alternatives]). These tables are color coded to reflect activities by alternative that are proposed to decrease, increase, or stay the same (no change) in

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	but the extent of these changes is nebulous at best, and activities have to be cross-referenced to Appendix A to get a general sense of what actions are actually being proposed. Some refinement here would improve readability and accessibility of this information to reviewers. Similarly, rather than providing a clear statement of the proposed change in scope and duration of activities, the Executive Summary notes that in this draft SEIS/OEIS the Navy: • analyzes at-sea and FDM activities necessary to meet readiness requirements beyond 2020 and into the reasonably foreseeable future, including any changes to those activities previously analyzed, and reflects the most up-to-date compilation of training and testing activities deemed necessary to accomplish military readiness requirements; • adjusts types and tempo (increases or decreases) of training and testing events from the 2015 MITT Final EIS/OEIS to the level needed to meet readiness requirements beyond 2020 and into the reasonably foreseeable future; • presents the results of the evaluation of relevant new information, which has been incorporated into revised analyses where appropriate (each resource area analyzed within the 2015 MITT Final EIS/OEIS has been evaluated to determine the need for reanalysis within this SEIS/OEIS); • updates the environmental impact analyses in the previous documents to account for changes to tempo of activity, renaming or combining related types of activities, acknowledging discontinuation of some activities assessed in 2015, and assessing new activities, such as those involving high energy lasers, to enable the Navy to adopt new technology and new capabilities; • updates environmental analyses with the best available science and most current acoustic analysis methods to evaluate the	comparison to the 2015 MITT Final EIS/OEIS. A footnote has been added to Tables 2.5-1 and 2.5-2 to better define ongoing activities.

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	potential effects of training and testing on the marine environment; and • supports reauthorization of incidental takes of marine mammals under the MMPA and incidental takes of threatened and endangered marine species under the ESA. To assist with community review of this proposal, it would be very helpful if the updated or final SEIS/OEIS be refined to provide a clear description of the proposed changes in activities that are necessary to meet readiness requirements as well as a time-bound range specifying what is meant by the repeated use of the phrase "beyond 2020 and into the reasonably foreseeable future". Understanding the scope and duration of these proposed activities as well as a clear statement of the difference between the scope and duration reflected in the current proposed action and the 2015 ROD would support meaningful public review of this proposal as well as CNMI' s long-term sustainable development planning efforts.	
Gov CNMI-02	**Procedural Concerns and Suggestions** There are legitimate procedural concerns with this SEIS/OEIS review process. One of our chief concerns is regarding community engagement. The Council on Environmental Quality's Environmental Justice Guidance Under the National Environmental Policy Act (CEQ EJ Guidance) states that "each Federal agency must provide opportunities for effective community participation in the NEPA process, including identifying potential effects and mitigation measures in consultation with affected communities and improving the accessibility of public meetings, crucial documents, and notices." Specifically, CEQ's EJ Guidance also advises that "[a]gencies should develop effective public participation strategies. Agencies should, as appropriate, acknowledge and seek to overcome linguistic, cultural, institutional, geographic, and other	The Navy recognizes the importance of public participation in the development of this Supplemental EIS/OEIS. This Supplemental EIS/OEIS complies with NEPA, CEQ requirements, and Navy instructions for implementing NEPA. The paragraphs below discuss the enhanced outreach efforts completed as part of the NEPA process. The enhanced outreach efforts were inclusive of public participation strategies suggested in the CEQ's environmental justice guidance and are described below. The Navy acknowledges that the information presented in this Supplemental EIS/OEIS is, by necessity, very complex. This Supplemental EIS/OEIS contains a rigorous scientific analysis of the potential impacts of the Navy's proposal, and thoroughly explains the scientific analysis and findings. The Navy attempts to explain challenging concepts, methods, and the results of the analysis as clearly as possible and developed public informational materials for lay audiences. The Navy prepared project

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	barriers to meaningful participation, and should incorporate active outreach to affected groups." We do not believe the U.S. Navy satisfied its responsibility to provide opportunities for effective community participation in the NEPA process. It is acknowledged that public involvement may have been a challenge in part because the public hearings scheduled for the end of February had to be moved to the end of March due to typhoon activity and travel schedules. However, providing two weeks for comment development after the public meeting is an incredibly short time for stakeholders to review and develop substantive comments when considering the length of the SEIS document and its supporting materials. Given the low tum-out at the public meeting on Saipan, which was attended primarily by state agency representatives and non-profit groups monitoring proposed build -up activities, it seems more could be done to ensure meaningful participation within the NEPA process for this and future Department of Defense actions. There are also procedural concerns with the SEIS/OEIS documents. As stated in the CEQ's EJ Guidance, an agency's community engagement includes making the documents accessible to the community and reviewers. This includes not only making the documents physically accessible but comprehensible to the community and reviewers. The CNMI does not believe the U.S. Navy satisfied this requirement. Critical documents being used to support statements of fact and significance analysis within the SEIS/OEIS are not readily available for cross-referencing. Much of the analysis also refers back to analysis within the 2015 MITT, often without citations to specific pages, making third party review cumbersome. The U.S. Navy's actions, or inactions in the provided example, has made the Draft SEIS/OEIS largely inaccessible to the public and the CNMI government.	brochures, videos, a website, and posters, using layperson terms to enhance public understanding of the information presented in this Supplemental EIS/OEIS. Based on the demographics of the CNMI, a project fact sheet was also translated into Chamorro. The informational materials, including the translated fact sheet, were made available at all four public meetings and on the project website (www.mitt-eis.com). The Navy held four open house public meetings, one each on Tinian (Tinian Public Library, March 14, 2019), Rota (Mayor's Conference Hall, March 15, 2019), Saipan (Kanoa Resort, March 18, 2019), and Guam (University of Guam, March 19, 2019). The public meetings were an opportunity for the public to ask questions of Navy leadership, scientists, and other experts about the analysis documented in this Supplemental EIS/OEIS. The Navy encouraged the public to attend these meetings and broadly notified the public through the media, including paid newspaper advertisements and news releases, and direct mail, including letters, postcards, and emails. A voice recorder was provided for any member of the public who wanted to provide an oral comment in a language other than English. The Navy has received feedback from attendees that the open-house format is more conducive to promoting public understanding and constructive dialogue. Open house meetings allow a greater number of individuals to directly engage and interact with Navy team members and ask questions about this Supplemental EIS/OEIS, as well as provide comments on the document. Although the Navy took cultural and religious holidays into account when planning the dates and locations for public meetings, those considerations had to be balanced with the deadlines and schedules of the large number of federal and local agency stakeholders, as well as the overall schedule of this Supplemental EIS/OEIS. To better accommodate stakeholders and the public, the Navy provided 75 days to review and comment on the Draft Supplemental EIS/OEIS, which is 30 days longer than the minimum required time for review.

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	For this document and most definitely for the future, the U.S. Navy must provide better opportunities for effective community participation. Small steps such as posting meeting notices at public meeting spaces and holding public hearings at community venues such as schools can greatly improve community engagement. The CNMI urges the U.S. Navy to work closely with the Office of the Governor's Civil Military Liaison Office to ensure an engagement strategy is developed and implemented to support more meaningful public involvement in the NEPA process moving forward. Discussing review timelines with the Office of the Governor would also help avoid review periods during cultural and religious holidays that may affect availability of the public as well as reduce conflicts with government deadlines such as grant reporting and budget submissions which also hampers review efforts at the state level. These simple actions, actions the U.S. Navy failed to take for this SEIS/OEIS, will support its responsibility of providing effective community engagement.	During the week of the Draft Supplemental EIS/OEIS public meetings in March 2019, the Navy participated in TV and radio interviews and briefed elected officials. The Navy appreciates input received from local government agencies and communities on how it can improve public notification and outreach efforts. The Navy recognizes the importance and value of continued communication and engagement with local governments, resource agencies, and the public and took steps to engage stakeholders during the public review and comment period for the Draft Supplemental EIS/OEIS. The Navy met with local elected officials, resource agency representatives, and the public in Guam, Saipan, Tinian, and Rota to discuss the Proposed Action and answer questions for improved dialogue, understanding, and transparency. The Navy will engage the Governor’s Civil Military Liaison Office in future outreach planning efforts.
Gov CNMI-03	**Questions Regarding Effects Criteria and Unsupported Factual Statements** *Defining Significance and Mitigating Effects* In addition to requiring public engagement, NEPA directs the proposing agency to provide sufficient information to support meaningful review of the significance of impacts. The U.S. Navy publishes guidance describing the Navy's policies, requirements, and procedures for complying with the National Environmental Policy Act (NEPA) and the Council on Environmental Quality's (CEQ) implementing regulations. (OPNAVINST 5090.1B). For major Federal actions, it addresses the determination of significance and identifies procedures for categorical exclusions, environmental assessments, and environmental impact statements. This guidance further outlines the Navy's commitments to "effectively operate world-	This Supplemental EIS/OEIS to the 2015 MITT Final EIS/OEIS supports the continuation of training and testing conducted at sea and on FDM beyond 2020. As previously mentioned, this Supplemental EIS/OEIS supports the issuance of federal regulatory permits and authorizations under the MMPA and the ESA. The MMPA authorization for this Supplemental EIS/OEIS would be valid for seven years. NEPA encourages the use of relevant data and analyses from other impact assessments. Training and testing activities conducted within other Navy study areas, such as Hawaii and Southern California, are the same or very similar to activities being conducted in the Study Area. The Navy has studied and continues to study its environmental impacts in these areas for over two decades, and relevant studies exist. If there is a lack of data in the Study Area, it is acceptable to use the best available scientific data as

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	wide in an environmentally responsible manner, both ashore and afloat." (OPNAVINST 5090.1C). In discussing processes, applicable laws, and terminology, this guidance notes that '"significantly,' as used in NEPA and E.O. 12114, requires consideration of both context and intensity of the environmental effects of an action" and that the "[a]ction's proponents should also consider the following factors in evaluating an action's significance: a. the geographic extent of the action; b. the duration of the action's effects, and c. the risk of environmental impacts." (OPNAVINST 5090.1C 5-1.3.34). CEQ further instructs that an environmental impact statement "shall provide full and fair discussion of significant environmental impacts and shall inform decision makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment." (40 CFR § 1502). To properly frame discussion of potential effects of this activity, some clarification of the projected timeline for activities over the 984,601 square nautical mile MITT range extending "beyond 2020 and into the reasonably foreseeable future" would be helpful. The "human environment" is in fact broadly defined under NEPA, with CEQ directing that the term "shall be interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment." (40 CFR § 1508). Therefore, when discussing the significance of potential impacts and possible mitigation measures, it is essential that this dialog be framed within a relevant local context, with appropriate deference to regional conditions and the views of the community most likely to be affected by the proposed activities. Although the summaries of scoping comments indicate community concerns regarding the potential significance of effects of ongoing training and testing activities ranging from ocean navigability to water quality to marine animal harassment , in numerous instances which	appropriate to determine potential impacts. Therefore, it is acceptable to use data from Hawaii and Southern California, as the same or similar activities are conducted in a similar environment to the Marianas. The Navy uses local jurisdictional data to supplement the impact analyses, for example monitoring and site-specific analysis, such as coral and sea turtle surveys. Additionally, the Navy conducts extensive monitoring and data collection programs as part of their compliance with the MMPA and ESA, including in the waters around the Mariana Islands. The Navy's Marine Species Monitoring Program website provides access to reports, documentation, data, and updates on current monitoring projects. Information on current monitoring projects, technical reports, conference presentations, and data are available at www.navymarinespeciesmonitoring.us. In addition, while outside the current scope of this Supplemental EIS/OEIS, the military satisfies Sikes Act obligations through the development and implementation of the Joint Region Marianas INRMP. The 2019 Joint Region Marianas INRMP includes monitoring programs throughout the Mariana Islands. The CNMI Department of Lands and Natural Resources, Division of Fish and Wildlife is a signatory and participating member to the 2019 Joint Region Marianas INRMP which details natural resource management and monitoring programs. The Navy will continue to improve coordination and collaboration with the CNMI as part of the INRMP project development and implementation. The programs mentioned above help ensure current environmental conditions are monitored regularly. Any new, relevant information or data from the Navy's monitoring programs or the INRMP was incorporated into the Final Supplemental EIS/OEIS as appropriate.

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	are discussed in more detail as they pertain to the sustainable development of CNMI in this letter, it appears these questions and comments are often summarily dismissed citing "lack of data" or conclusively treated as non-issues based on reliance on studies or environment impact analysis from other jurisdictions or older surveys funded by the Department of Defense with limited peer review by third-party reviewers. We do not think this is proper. We also think it is not proper for the U.S. Navy to rely as it does on prior findings from other jurisdictions or old RODs. The present 2019 MITT draft SEIS/OEIS appears to include updated discussions regarding the significance of effects of some activities and that discussion of impacts in Section 3 relies heavily on other Department of Defense (DoD) Findings of No Significant Impacts (FONSI) from other jurisdictions or from prior records of decision in the Marianas. If studies are not available to support place-based analysis of impacts, we believe it more appropriate to establish and implement robust monitoring programs. Such programs would ensure that data reflecting current conditions as well as potential and actual effects of MITT activities to the "human environment," including information on socio-economic effects, can be collected and analyzed to continue to inform decision-making through ongoing NEPA review processes for this and related actions. Wherever possible it is recommended that such programs should be established in coordination with the CNMI's resource management agencies and community members with subject matter expertise to build transparency and trust in these assessments to support ongoing environmental assessment and decision-making. Sharing of data collected for impact monitoring purposes and future effects analysis should be regularly shared with the CNMI to further inform adaptive management dialogs and ensure that stakeholders receive updates in a timely manner.	

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Gov CNMI-04	*Significant Impacts to Public Access and Use Adjacent to Farallon de Medinilla (FDM)* The 2015 Record of Decision noted that the "[p]otential for reduced accessibility may result in impacts on commercial and recreational fishing, subsistence use, or tourism when area of co-use are temporarily inaccessible to ensure public safety during military training and testing activities." The 2015 ROD went on to declare that the "military will continue to collaborate with local communities to enhance existing means of communication with the public that are intended to reduce the potential effects of limiting accessibility" but concluded that "[i]mpacts on socioeconomic resources from physical disturbance and strike, airborne acoustics, and secondary stressors are not anticipated." As highlighted in the SEIS/OEIS scoping comments, potential ramp-up in live fire activities prompting implementation of a "danger zone" around FDM remains an issue of concern. The 2015 MITT FEIS/OEIS noted that the twelve nautical mile "danger zone" around Farallon de Medinilla "does not affect the continued implementation of the current restricted access as indicated in the lease agreement; therefore, no trespassing is permitted on the island or nearshore waters and reef at any time" and that "public access to Farallon de Medinilla will remain strictly prohibited and there are no commercial or recreational activities on or near the island." The current draft SEIS/OIES further states that "because dangerous military activities are conducted on FDM and up to 12 nautical miles around the island, restricted airspace has been established " during times of military use, and notes that civilian vessels may access the area up to the 3 nautical mile radius around the island when activities are not ongoing. As scoping comments and comments on prior MITT analyses has indicates, this amounts to a significant spatial restriction for community members of the	The Navy regards the safety of fishermen and other boaters as a top priority. The Navy is also aware that the 12 nautical miles (NM) restricted airspace and pending designation of the matching danger zone may affect access to fishing sites and create inconveniences for fishermen and boaters. The Navy understands that fishing is an important socioeconomic and cultural resource for the people of the CNMI and will continue to work with the fishing community to enable safe access to fishing areas around FDM. The designation (via rule making) of the 12 NM danger zone by the U.S. Army Corps of Engineers under 33 CFR Part 334 is necessary to ensure public safety. The intent of the 12 NM danger zone is to ensure safety for the public when certain activities are taking place at FDM. A change in training did not drive the creation of the 12 NM danger zone. It is important to note that the area between 3 NM and 12 NM is not a permanent closure. While the number of proposed activities would increase under Alternatives 1 and 2, the increase may not result in a proportional increase in the number of days the 12 NM danger zone would be temporarily closed. Only the 3 NM area surrounding FDM would continue to be permanently closed. The increase in the number of activities could translate to an increase in closure time for one day but not necessarily additional days. While some areas within the 12 NM danger zone would not be accessible for safety reasons during certain activities, access would only be limited temporarily and not for all activities occurring at FDM. The Navy currently issues notices to mariners out to 12 NM around FDM. As specified in Title 33 CFR Subpart 72.01, Notices to Mariners, the U.S. Coast Guard issues information to the public concerning maritime navigation. When notices to mariners are issued, the restriction is not necessarily for a full 24-hour period because many training activities last less than a full day. Additionally, nautical charts issued by the National Oceanic and Atmospheric Administration include these federally designated zones and areas. Operators of recreational and commercial

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	CNMI especially for fishermen and captains of small transiting vessels. We believe that mitigation measures need to be developed in terms of impacts to fishing, navigation, and associated economic actives in the Northern Islands. It is worth noting that although the CNMI's 1976 Covenant provides for the lease of Farallon de Medinilla island "and the waters immediately adjacent thereto" (Section 802) for fifty years with an option to renew for an additional fifty years (Section 803), extending the restricted area around Farallon de Medinilla (FDM) to twelve nautical miles appears to go beyond the intent of the phrase "immediately adjacent" waters. This expansive danger zone has been raised as a concern by residents of and visitors to the Northern Mariana Islands as this is a significant area to have to circumnavigate, especially for small craft making their way up the chain for subsistence fishing or to travel to and from their homes in the islands north and south of Farallon de Medinilla. Additional discussion regarding public access and impacts to navigation due to the proposed danger zone should include updated socio-economic use data from ongoing resettlement and ecotourism efforts concentrated in the Northern Islands. It would be helpful if the revised SEIS/OEIS could clearly state the general duration of time that the island of FDM would be impassible for small craft to support more rigorous analysis of impacts and potentially appropriate mitigation strategies.	vessels have a duty to abide by maritime regulations administered by the U.S. Coast Guard. The Navy will continue to communicate closures to the public and fishing community, including using Facebook.
Gov CNMI-05	*Clarifying Effects through Discussion of Use and Duration* While the CNMI understands that the U.S. military must train personnel and test new technologies to defend the United States, it is unclear why changed tempo and expanded activities are only appropriate within the Marianas chain as the scope of the proposed action indicates, and why the increased use of explosive ordnance is necessary to support training needs which were already supposedly satisfied by the 2015 ROD. It is also challenging to	The Mariana Islands are strategically significant to the U.S. military services for accomplishing their missions. For decades, the Mariana Islands have provided an ideal location in the Indo-Asia-Pacific region for the military to maintain a global and strategic presence. The Mariana Islands are the only training area within the Western Pacific that is a territory of the United States where military personnel who are homeported, deployed to, or returning from regions in the Western Pacific and the Indian Ocean may

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	review effects of actions that are only generally described. Further, although we appreciate the importance of national security necessitating the lack of detail regarding "new technologies," we still believe that this is an issue that could be discussed in more detail in order to enhance the CNMI government's understanding of the actual actions being proposed through this authorization process. Even if actions cannot be fully divulged, potential impacts should be rigorously addressed and supported with relevant, current data. Since 2015, increased commercial, recreational, and cultural activities have focused development interests in the Northern Mariana Islands such that it is unclear how the statement that "there are no commercial or recreational activities on or near the island" can be made. The CNMI encourages the U.S. Navy to provide clear documentation in the updated or final SEIS/OEIS the socio-economic analysis upon which this statement is based. Such analysis may also support identification of mitigation opportunities beyond the limited areas of the Marpi Reef and Chalan Kanoa Reef area identified in the current draft SEIS/OEIS. Additionally, clear statements in the executive summary and supporting fact sheets regarding proposed duration of activities - and in particular, the extent of anticipated airspace restriction for the 12 nautical mile "danger zone" around FDM and proposed increases in total tonnage of explosive materials now being proposed in Alternatives 1 and 2 in this SEIS - would help clarify impacts and more appropriately frame mitigation dialogs. As MITT activities constitute a "continuing action", analysis of a "no change in training" alternative that only extends the MMPA/ESA permit authorizations as previously discussed with the CNMI would also appear to be more realistic and responsive to NEPA's call to provide	conduct all levels of training, from basic to advanced, including integrated and joint events and exercises. As stated above, the Navy routinely predicts the training and testing activities it will be conducting years in the future based on evolving requirements or to anticipate necessary readiness levels due to emergent world events. Some activities may increase while others may decrease based on these predictions. The increase in certain activities, such as anti-air MISSILEX, which may use explosives (and therefore increase the net explosive weight of total munitions use on FDM) are based on updated readiness requirements described in Chapter 2 of this Supplemental EIS/OEIS. These activity increases will result in small increases in the total net explosive weight expended on the island. The potential impacts of these increases are discussed and analyzed in Section 3.10.2.1.1 (Impacts from Acoustic Stressors under Alternative 1). Section 2.3.1 (Changes to Proposed Activities) describes those activities that changed and were therefore analyzed in this Supplemental EIS/OEIS. As shown in Table 2.5-1, the only new training activity proposed is Surface Ship Object Detection. As shown in Table 2.5-2, proposed new testing activities (inclusive of new technology) include Radar and Other System Testing and Simulant Testing and may include the use of military or commercial radar, communication systems or simulators, or high-energy lasers. These activities and associated systems have already been tested by the Navy in other locations but not in the MITT Study Area. They are new to the Study Area and therefore have been analyzed for environmental impacts in this Supplemental EIS/OEIS. These changes to proposed training and testing activities are part of the overall Navy program and are not unique to the MIRC. Appendix A (Training and Testing Activities Descriptions) provides detailed data sheets describing each training and testing activity. Section 2.3.1.1 (New Technologies and Capabilities) of this

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	a no action alternative as opposed to the currently assessed sole no action alternative to end all MITT activities.	Supplemental EIS/OEIS provides additional information on new technology and capabilities. Regarding increased commercial, recreational, and cultural activities in the CNMI, specifically FDM, public access to FDM and within 3 NM of FDM is restricted. The Final Supplemental EIS/OEIS clarifies that there are no commercial or recreational activities allowed within 3 NM and on FDM. Current and proposed training activities would not change the way commercial or recreational ships operate within the Study Area and would not impact tourism related to cruise ships. The Final Supplemental EIS/OEIS has been updated to include tourism and transit activities within the Study Area. Regarding providing a "continuing action" No Action Alternative, the Navy applied a scenario where no authorizations or permits are issued and the Navy's training and testing activities do not take place. The resulting environmental effects from this scenario were compared with the effects of the Proposed Action (refer to Section 2.4.2.1, No Action Alternative). This approach supports NMFS' regulatory process by presenting the scenario where no authorization would be issued. Additionally, this approach responds to comments submitted at various stages of the 2015 MITT Final EIS/OEIS and the scoping phase of this Supplemental EIS/OEIS. Section 2.4.1 (Alternatives Eliminated from Further Consideration) has been expanded to include a Continuing Action Alternative. This alternative includes no change to the training and testing activities as approved in the 2015 MITT Final EIS/OEIS and the Navy consulting with NMFS under the MMPA. The Navy determined this alternative did not meet the purpose of and need for the Proposed Action. Table 2.5-1 and Table 2.5-2 of the MITT Final Supplemental EIS/OEIS compare the Proposed Action to the 2015 MITT Final EIS/OEIS activities.
Gov CNMI-06	**Questions Regarding Socioeconomic Assessment and Environmental Justice** In discussing potential socioeconomic impacts of the MITT activities, it appears that the value of and potential impacts to	Comments regarding socioeconomic impacts are responded to below following response to comments on coral reefs around FDM.

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	subsistence fishing were not rigorously assessed. In Section 3.12.1.2.2, the DEIS notes that "Hospital and Beavers (2014) concluded that the CNMI small boat fisheries are a complex mix of subsistence, cultural, recreational, and quasi-commercial fishing practices and validated the socioeconomic importance of fishing to the people of the CNMI." (DEIS, 3.12- 9). The DEIS discusses "ambiguous" trends in commercial fisheries landings between 2010 - 2015 and notes that, since the 1950s, it is estimated that commercial and non-commercial landings have declined by 39-73 percent; such decline due to both increasing fishing pressures as well as a decline in the health and extent of coral reefs. It goes on to note that: > Some activities, such as those occurring at FDM, have the potential to affect coral reefs and, by extension, the coral reef fishery. Surveys conducted by Smith and Marx (2016) indicate that the health, abundance, and biomass of reef fish populations in the vicinity of FDM are comparable or superior to populations at other locations in the CNMI, likely due to the de facto protection from fishing that results from restricting access to the area around FDM (Thompson et al., 2017). The authors conclude that training and testing activities are having little to no negative impact on the reef fish fishery. Having a de facto protected area around FDM may benefit the reef fish fishery in the CNMI, beyond the restricted area around FDM; however, restricting access to nearshore areas (within 3 NM) around FDM where target species occur limits the ability for fishers to gain access to potentially productive fishing sites (DEIS, 3.12-9-10). It is disconcerting to see such far-reaching conclusions being made based on very limited qualitative data. To address potential effects of increased training at FDM, the United States Environmental	As discussed in Section 3.8 (Marine Invertebrates), recent surveys conducted by the Navy (Carilli et al., 2018) at FDM found that coral fauna are healthy and robust and the nearshore physical environment and basic habitat types at FDM remained unchanged. These conclusions are based on (1) a limited amount of physical damage, (2) very low levels of partial mortality and disease (less than 1 percent of all species observed), (3) absence of excessive mucus production, (4) good coral recruitment, and (5) complete recovery by 2012 of the 2007 bleaching event. Smith and Marx (2016) also concluded that the health, abundance, and biomass of fishes, corals, and other marine resources at FDM are comparable to or superior to those in similar habitats at other locations within the Mariana Archipelago. In addition, the Navy funded additional reef surveys in the nearshore areas of FDM in 2017. The results are available at: https://apps.dtic.mil/dtic/tr/fulltext/u2/1069450.pdf. The 2017 survey found little evidence that training has affected coral reef communities at FDM. Only three relatively new ordnance items were observed. No blast pits, craters, or significant areas of coral breakage were observed. The ordnance observed during the 2017 survey was almost exclusively old, encrusted in marine life, and not having any discernable impact on surrounding communities. The Navy has reviewed and incorporated the best available science to support the impact analysis and conclusions for the coral reef communities at FDM. Dive details (such as the duration of the dives) are not necessary if surveys and data are representative of the area. Coral surveys performed at FDM were completed in accordance with the 2015 Biological Opinion issued by NMFS. The Navy consulted with NMFS regarding potential effects on coral, as required under the Endangered Species Act. Mitigation measures and monitoring requirements specified in the Biological Opinion, such as survey and reporting requirements for ESA-listed coral, are

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	Protection Agency recommended that the Navy commit to annual dive surveys to continue to monitor the marine resources and the coral barnacle infestation at FDM and that the results of these surveys be made available to government agencies and the public in the 2015 FEIS/OEIS. Relying on the 1999-2012 Smith and Marx surveys, the Navy responded that preservation effects "clearly outweigh the minor impacts of training" and stated "the next dive survey of FDM will be conducted no later than 2018" (2015 ROD, pg. 17). In 2017, one set of coral reef surveys were conducted at Farallon de Medinilla from September 27 to October 1 by the Space and Naval Warfare Systems Center Pacific (SSC Pacific), Scientific Diving Services (SDS) "to satisfy requirements of the Mariana Islands Training and Testing Area Biological Opinion (MITT BO) issued by the National Marine Fisheries Service in 2015." (Carilli et al., 2018). As the resulting paper reported , 50 transects were established around FDM in <20 meters of water depth to (i) quantify and abundance and location around the island of Endangered Species Act (ESA)-listed corals, quantify coral reef health (percent cover of living coral, coral species, coral composition, and coral condition), and compile observations of ordnance impacts, and (ii) record incidental observations of any other ESA-listed species encountered while fulfilling those primary objectives. That study indicates that ESA-listed corals are "present, but rare, in waters of <20m depth around FDM" and that "potentially new (undocumented in scientific literature) species of Acropora corals were recorded". This finding alone should warrant additional studies of coral in this area. In addition to lacking control survey sites, gaps in survey methodology and reporting include lacking details such as dive duration and area covered. The report notes that commonly encountered ordnance on these dive surveys included rifle shells,	presented in Chapter 5 (Mitigation) and further detailed in the NMFS Biological Opinion. Because FDM is an active range, it is not feasible to allow non-military personnel, including CNMI resource management agency representatives, on the island due to safety and special explosive ordnance disposal certification requirements. In addition, pursuant to 40 CFR 1502.6, the Navy will make available any underlying documents to the public upon request. Documents would be provided without charge to the extent practicable as some references require purchased access to the source sites. The Navy-funded dive surveys, most recently published in 2018, are the best available science for determining the condition of reefs and water quality in waters surrounding FDM. The 1999–2004 surveys were completed by a Navy contractor and representatives from the U.S. Fish and Wildlife Service, NMFS, and the CNMI. All surveys since 2004 have been performed by Naval Facilities Engineering Command and Expeditionary Warfare Center's Scientific Diving Services. Direct ordnance impacts upon the submerged physical environment, which were clearly attributable to training activities, were detected in dive surveys conducted in 2007, 2008, 2010, and 2012. Indirect impacts, such as ordnance that skipped or eroded off the island and rock and ordnance fragments blasted off the island, were detected every year. However, natural phenomena such as typhoons, tropical storms, large wave events, tsunamis/micro-tsunamis, and earthquakes are the primary disturbances, which shape and modify FDM's physical environment between the intertidal zone and depths of 30 m. During the 2004 survey the dive survey team (which included representatives of stakeholder agencies cited above and a Navy contractor) noted changes to the submerged lands relative to observations made between 1999 and 2003. These physical changes included (1) new boulder/rock slides, (2) submerged rock areas off the southern tip of FDM

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	MK 76 25lb, MK 82 500lb, M 117 750 lbs, MK 83 l000lb, and MK 84 2000lb ordnance (Id., pg. 12), and details 101 occurrences of these materials in Appendix E, of which 3% re assessed to be "recent" occurrences. However, lacking additional spatial details regarding area covered, it is unclear how representative these samples are. Although dive details - including date, site location, depth, photo numbers, and start time of the 16 dives conducted in 2017 are listed in Appendix B, dive end times are not included so it is unclear for how long divers were in the water. Based on a single additional survey between 2015 and today, and ignoring observed bleaching, invasive species outbreaks, and deposition of ordnance, the draft SEIS/OEIS states that the "nearshore physical environment and basic habitat types at FDM have remained unchanged over the 13 years of survey activity." (DEIS, 3.8.1). Conclusory statements in this supposedly scientific study and resulting analysis are especially problematic. The study further documents that there are "severe coral bleaching events underway at FDM during the surveys, caused by regional anomalously warm sea surface temperatures " with on average 77.4% of corals surveyed exhibiting some form of bleaching. Because coral bleaching is caused by heat stress combined with existing stressors including nonpoint source pollution, lacking a control study, it is not scientifically defensible to conclude that this bleaching occurred only due to regional sea temperatures and that there is "little overall evidence of any adverse impacts to coral from training, including the use of high-explosive bombs" given the known causal relationship between changes in water quality and sedimentation that are known to be associated with active live fire activities on the adjacent land mass and coral stress. It is unclear how this report "quantitatively" concludes that no impacts are occurring due to training activities or otherwise around	that appeared to have been peeled back to expose bright yellow-orange patches of underlying rock, and (3) cracked and broken coral colonies. The 2004 report (released in 2005) stated: "Examination of photographs from 1944 indicate that changes in the geologic structure of the island by erosion and mass wasting…have been going on for decades." No newly submerged cliff blocks were observed between 2005 and 2012. The detonation of live ordnance and the impact of inert ordnance both act to fracture rock and make the island more susceptible to the impacts of earthquakes, typhoons, and other natural erosional forces. Small to moderate sized (generally <30 cm) new rock fragments have been observed yearly. Many, if not most of these, are clearly the result of training activities. However, the number and size of these items and the locations in which they occur have not resulted in any significant changes to the topography or significant adverse impacts on marine biological resources. The 2019 Joint Region Marianas INRMP includes monitoring programs throughout the Mariana Islands, including specific management goals associated with coral surveys (subject to annual funding). The CNMI Department of Lands and Natural Resources, Division of Fish and Wildlife is a signatory and participating member to the 2019 Joint Region Marianas INRMP that details natural resource management and monitoring programs. The reference to Thompson et al., 2017 was removed in the Final Supplemental EIS/OEIS per the comment. Both this Supplemental EIS/OEIS and the 2015 MITT Final EIS/OEIS include an analysis of potential impacts from metals and contaminants as a result of military training and testing activities on marine resources. This analysis is presented in Section 3.1.2.2 (Metals), Section 3.4.2.7 (Secondary Stressors), Section 3.5.2.7 (Secondary Stressors), Section 3.7.2.3 (Secondary Stressors), Section 3.8.2.7 (Secondary Stressors), and Section

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	FDM, nor can it be concluded that recorded ordnance is not affecting water quality without additional studies. Conclusory statements that are based on limited observations - the most recent of which occurred during a global bleaching event - should not be relied upon to asset there are "no significant impacts" from direct, indirect, and cumulative effects of ongoing and proposed increases in use of explosive munitions. To provide meaningful data collection and analysis, periodic surveys should be conducted - ideally at least on a biannual if not quarterly basis over time periods that would reflect conditions before and after training activities on FDM. If monitoring is not being conducted by non-military contractors at minimum it would be optimal if CNMI resource management agencies could be involved in these data collection and analysis efforts. Moreover, as noted above, it seems myopic to dismiss concerns from community members and local resource managers regarding the potential significance of impacts to coral and related fishing and fish habitats based on the DoD-funded surveys performed by consultants from the "U.S. Navy- Space and Naval Warfare Systems Center Pacific Energy and Environmental Science Group." These surveys appear to have qualitatively determined, without reference sites or other controls, that, despite the fact that the U.S. military's use of FDM as a bombing range since 1971 has caused "the loss of vegetation over the past decades [that] has accelerated erosion of soils and limestone weathering on the island," this sedimentation is not significantly affecting species or water quality. (Smith & Marx, 2016, Carilli et al., 2018). Ideally, effects analysis would include quantitative data collection at FDM and an appropriate reference site where live fire activities are not being conducted. Given the importance of maintaining water quality and corals that support fish habitat and ecosystem functions overall, at minimum updated monitoring data should be collected, shared, and analyzed to	3.9.2.7 (Secondary Stressors). Based on the analysis presented in this Supplemental EIS/OEIS and the 2015 MITT Final EIS/OEIS, the Navy concluded that all levels of metals, chemicals, and other byproducts would be either below detectable levels or at levels below existing standards, regulations, and guidelines.

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	support meaningful review of direct, indirect, and cumulative effects over time.	
Gov CNMI-07	Similarly, although the Hospital and Beavers survey did note that "86% of those surveyed consider pelagic fish they catch to be an important source of food", and concluded that "[t]hese findings validate the importance of fishing in terms of building and maintaining social and community networks, perpetuating fishing traditions, and providing fish to local communities as a source of food security" it is also insufficient to base the entirety of the socio-economic assessment of potential impacts to fishing of the SEIS/OEIS on an "empirical snapshot" based on cost-earning surveys of the small boat fishing fleet in CNMI conducted in 2011 with 112 responding fishermen. (Hospital & Beavers, 2014). Additional analysis regarding the socioeconomic impacts of restricted fishing and loss of access to traditional fishing areas with acknowledged high abundance of species as well as altered navigational patterns should be provided in the FEIS/OEIS. Statements of fact should also be clearly referenced so reviewers can visit primary references to understand the data substantiating claims and the context within which such claims have been made. If data gaps exist, it is suggested that these be identified and addressed through monitoring activities to enable ongoing adaptive management discussions to support the accomplishment of the Navy's stated need for training and interest in ensuring environmentally responsible operations. Scoping comments requested assessment of direct and cumulative impacts on recreational and commercial fishing as well as transport between islands (see DEIS 3-12). It appears instead of conducting data collection and analysis in this regard, this SEIS/OEIS restates old and "ambiguous" commercial fishing data without meaningful assessment of potentially significant impacts. In Section 3.12.1.2.2 the report notes that restricting nearshore access around FDM	The Navy understands that fishing and tourism is an important socioeconomic and cultural resource for the people of the CNMI and will continue to work with the fishing community to enable safe access to fishing areas around FDM. The Navy is committed to continuing to work with the local community on issues that potentially affect the public, including access to fishing sites. The analysis presented in Section 3.12 (Socioeconomic Resources and Environmental Justice) of the Draft Supplemental EIS/OEIS uses the best available data. The quantity and value of fisheries landings in the CNMI from 2010 through 2015 are shown in Figure 3.12-2. The data from the NMFS Pacific Islands Fisheries Science Center show that both value and amount fluctuated over that timespan with no clear trend. These data have been updated for the Final Supplemental EIS/OEIS with the most recent available fisheries landings data. To supplement the results from the Hospital and Beavers (2014) survey of CNMI fishers, the Navy incorporated information from the following references on fisheries in the CNMI into the Final Supplemental EIS/OEIS: • Ayers, A. L. (2018). The Commonwealth of the Northern Mariana Islands fishing community profile: 2017 update. • Grace-McCaskey, C. 2014. Examining the potential of using secondary data to better understand human-reef relationships across the Pacific. Pacific Islands Fish. Sci. Cent., Natl. Mar. Fish. Serv., NOAA, Honolulu, HI 96818-5007. Pacific Islands Fish. Sci. Cent. Admin. Rep. H-14-01, 69 p. • MacDuff, S. & Roberto, R. (2012). Chapter 3: Commonwealth of Northern Mariana Islands Fishery Ecosystem Report. In: M. Sabater (Ed.), WPRFMC 2012. Archipelagic Fishery Ecosystem Annual Report.

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	"limits ability of fishers to gain access to potentially productive fishing sites" but does not appear to actually analyze the extent of these impacts in the context of changed tempo of the proposed activities or discussion of current data, instead relying on the Hospital and Beavers cost-earning survey that was conducted in 2011. Although concerns about potential effects of expanding training and testing activities throughout the MITT study area have been raised, necessitating analysis of these effects throughout the whole study area, the report appears to dismiss these concerns by relying on one "ambiguous" study focused on the small boat fishery within the nearshore range and simply stating "no data" is available for the transit corridor to establish the significance of these impacts and, furthermore, that these restrictions are justified to ensure public safety. While ensuring public safety is an indisputable priority, this does not alleviate the requirement to conduct analysis of additional socio-economic impacts due to environmental effects. In the absence of good data to support effects analysis, opportunities should be leveraged to collect that data, especially for actions which cover a wide range of training and testing activities that will extend through 2020 and the "reasonably foreseeable future". As the Council on Environmental Quality's NEPA Guidance at 40 CFR § 1502.22(a) directs, when an agency is evaluating reasonably foreseeable significant adverse effects on the human environment in an environmental impact statement and there is incomplete or unavailable information, if the incomplete information relevant to reasonably foreseeable significant adverse impacts is essential to a reasoned choice among alternatives and the overall costs of obtaining it are not exorbitant, the agency shall include the information in the environmental impact statement. Understanding the socioeconomic impacts of the proposed actions, especially upon the most economically vulnerable members of the CNMI	Honolulu, Hawaii Western Pacific Regional Fishery Management Council. • Western Pacific Regional Fishery Management Council. (2019). Annual Stock Assessment and Fishery Evaluation Report for the Mariana Archipelago Fishery Ecosystem Plan 2018. Remington, T., Sabater, M., Ishizaki, A., Spalding, S. (Eds.) Western Pacific Regional Fishery Management Council. Honolulu, Hawaii 96813 USA. 276 pp. + Appendices. The Hospital and Beavers (2014) survey results provide insight into the socioeconomic characteristics of fishing and fisheries in the CNMI. The Hospital and Beavers (2014) report presents quantitative data summarizing socioeconomic characteristics of fishing and the concerns of fishers in the CNMI, including concerns over impacts from military activities. While the survey relies on the responses from 112 fishers, it is fairly comprehensive with 64 questions, reports on the three primary fisheries in the region, and includes data on fishing off Saipan, Tinian, and Rota. A companion survey conducted in 2011 off Guam involving the same fisheries reported similar results from 147 respondents, supporting the feedback received from CNMI fishers as regionally relevant (Hospital and Beavers, 2012). Section 3.12.2.1 (Accessibility [to the Ocean and Airspace]) explains that proposed changes in the training and testing activities conducted in the Study Area would not change the conclusions regarding accessibility as presented in the 2015 MITT Final EIS/OEIS and that those conclusions remain valid. As a metric for assessing impacts on accessibility, the Draft Supplemental EIS/OEIS presents data on the number of Notices to Mariners and the number of days of access restrictions. Both datasets show fluctuations in Notices to Mariners and days of access restrictions from 2010 through 2017 (see Figures 3.12-3 and 3.12-4), and, given a lack

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	community that rely on subsistence fishing is essential to making informed decisions about the proposed action as well as mitigation measures that may be necessary to offset the impacts of this action. A simple survey of fisherman and residents of the Northern Islands to obtain current information about these potential impacts would not be cost prohibitive and would provide important data to decision makers in this regard. Lacking this data, it is more likely than not that a twelve-mile hazard zone at FDM would have significant impacts to fishing communities and transiting inhabitants of the Northern Islands. Therefore, data from a survey should be collected and included in the FEIS that provides additional analysis regarding impacts and discussion of appropriate mitigation measures. This survey could also assess the desirability of mitigation measures such as the installation of emergency communications equipment on subsistence fishing boats that will have to travel further from FDM during periods of posted activities as well as potentially providing mooring on neighboring islands so these vessels can safely anchor should these activities continue during prolonged periods during the fishing season. To further reduce impacts to fishing and travel, the FEIS could consider limiting activities to periods of time when fewer residents and fishing vessels travel north in the winter months. Meaningful assessment of impacts and possible mitigation measures would help ensure better outcomes from this NEPA analysis. Likewise, limited discussion of potential impacts to tourism in the CNMI does not appear to consider growing economic investment and activities in the Northern Islands. Instead, the DEIS concludes that "even though trends in tourism are positive, the existing conditions, as presented in the 2015 MITT Final EIS/OEIS, and the results of analysis on impacts on tourism remain valid" and	of data on direct impacts on fishers, are used as a proxy for predicting that impacts on fishers would be similar to impacts in preceding years. The Navy is not aware of any data or published information on how closures around FDM have directly impacted fishers. However, the Navy recognizes that limited or no access to productive fishing areas would impact fishers and is committed to increasing engagement with the CNMI and Guam fishing communities. While the analysis concludes that impacts could occur, the Navy does not anticipate significant impacts on commercial and recreational fishing in the Study Area, as described in both this Supplemental EIS/OEIS and the 2015 MITT Final EIS/OEIS, given the availability of other fishing areas in the CNMI. As the Governor's Office is aware, fishing within 3 NM of FDM has been prohibited for decades (as noted in Article 12 of the 1983 lease agreement) to ensure the safety of the public during military activities conducted on the island and the presence of unexploded ordnance in nearshore waters around the island. The Navy is also unaware of any commercial, recreational, or subsistence fishing that occurs in the transit corridor extending between the Study Area and Hawaii. Current and proposed training activities within the transit corridor would not change the way cruise ships operate within the Study Area and not impact tourism related to cruise ships. The Final Supplemental EIS/OEIS has been updated to include tourism and transit activities within the Study Area. This Supplemental EIS/OEIS fully complies with Executive Order 12898. Environmental justice is analyzed in Section 3.12 (Socioeconomic Resources and Environmental Justice) and Executive Order 12898 is listed as one of the environmental compliance requirements considered in preparing this Supplemental EIS/OEIS (Table 6.1-1). Section 3.12 (Socioeconomic Resources and Environmental Justice) includes an analysis

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	furthermore that it is "assumed there is no tourism activity within the transit corridor due to the distance from land and because the majority of tourism activities occur in nearshore waters." (DEIS 3.12-11 - 12). In the past two years, several cruise ships and eco-tourism expeditions have focused activities on the Northern Islands and deep-sea fishing expeditions have increased. These growing economic opportunities are significant to the CNMI, and, like impacts to fishing communities, disturbance of these new industries could have significant impacts to the growing economy of the Northern Islands. Therefore, the FEIS/OEIS should gather updated data that is currently available or that would be forthcoming with minimal additional effort through impact-specific information requests to the Northern Islands Mayor's Office and relevant state resource management agencies to assess the current tourism and transit activities in this area and provide meaningful analysis of the data that is collected. Additionally, the FEIS should include a meaningful analysis of likely significant environmental justice impacts of the proposed activity. In Section 3.12.1.4, the SEIS/OEIS states that "[t]he U.S. Environmental Protection Agency defines environmental justice as the 'fair treatment' and 'meaningful involvement ' of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies" and goes on to discuss 2010 census data reflecting that "approximately 3 percent of the working age population in the CNMI reported participating in a subsistence activity in the year 2010." (DEIS 3.12- 12 - 13). While engagement is an important component of environmental justice considerations, this inappropriately narrow framing of the scope of environmental justice considerations ignores the mandates of Executive Order 12898, which directs federal agencies	of impacts of proposed activities on socioeconomic resources and whether the Proposed Action would result in a disproportionate effect on minority or low-income populations. While impacts on certain resources, such as accessibility to fishing sites, may increase under Alternatives 1 and 2, impacts are not expected to be substantial. Traditional fishers in Guam and the CNMI would not be disproportionately impacted by training and testing activities because traditional fishing practices likely occur in the same general areas as recreational fishing, which are close to shore and far from the majority of military activities. The analysis of potential impacts on environmental justice is limited primarily to traditional fishing practices because, with the exception of training activities at FDM, the vast majority of proposed activities occur at sea, where potential socioeconomic impacts are limited to commercial, recreational, and tourism activities that take place in the marine environment, including fishing. As described in Section 3.12.1.4 (Environmental Justice), fishing for subsistence is not easily distinguishable from recreational or commercial fishing in the small boat fishing communities of the CNMI, even for a single fishing trip, and fishers who use their own catch as a regular source of food are not necessarily minority or low-income. This Supplemental EIS/OEIS does not propose a change to the ocean areas currently used by both the Navy and the public. Restrictions on accessing areas of co-use would continue to be infrequent and short-term, while other fishing sites in the Study Area would continue to be available to the public.

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	to identify and address the disproportionately high and adverse human health or environmental effects of their actions on minority and low-income populations to the greatest extent practicable (59 FR 7629, Feb. 16, 1994). According to the same 2010 Census, the majority of CNMI residents can be considered minority and low-income. As such, the Navy has an obligation to conduct detailed assessment of impacts to health and the environment in terms of potentially disproportionate exposure risks associated with direct, indirect, and cumulative effects of proposed and ongoing and training and testing activities. Furthermore, discounting engagement of the employed workforce in cultural fishing practices overlooks a large segment of the subsistence and commercial fishing population, many of whom rely on pelagic fish from areas within the MITT activity area. Given the considerable amount of remaining unexploded ordnance and the risk that proposed activities may result in additional deposits of unexploded munitions as well as exploded ordnance and other debris, robust discussion of economic impacts and potential health effects as well as mitigation plans to reduce the environmental and associated socio-economic impacts of these activities especially on discrete and insular minorities should be meaningfully addressed in the discussion of environmental justice considerations in the updated FEIS/OEIS.	
Gov CNMI-08	**Questions Regarding Responsiveness to Scoping Questions** As the Council on Environmental Quality outlines, scoping aims in part to support identification of significant issues to be analyzed in depth in the environmental impact statement. (40 C.F.R. § 1501.7). Public scoping comments summarized in Chapter 8 of the draft SEIS/OEIS include concerns regarding lack of data addressing potential impacts around Farallon de Medinilla (FDM) and suggestions that a range of alternatives be considered including time or seasonal restrictions, restrictions in biologically sensitive areas, reduced training and testing tempo, and mitigated	Public involvement is a fundamental aspect of the environmental analysis process, and the Navy welcomes and appreciates the public's participation. The Navy reviewed all comments received during the 45-day scoping period and considered all substantive comments in the preparation of the Draft Supplemental EIS/OEIS. Each resource section within this Supplemental EIS/OEIS presents a summary of the scoping comments and responses to the issues raised. In addition, the actual public comments received on the Draft Supplemental EIS/OEIS and the Navy's

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	alternatives (SEIS 8-18). Concerns regarding disruptions to economically important fishing areas and potential contamination in the local food supply as well as socioeconomic impacts of increased transit times due to area restrictions were also raised. (SEIS 8-19). Although each chapter includes a subsection on public scoping comments, because the comments themselves are only summarized, it is unclear if or how these scoping comments were meaningfully addressed in the draft EIS/OEIS. It would be helpful if comments and responses could be included in an appendix to reflect the Navy's thorough consideration of the issues raised. In terms of readability and responsiveness to scoping comments, it would be helpful if the final SEIS/OEIS includes the actual comments received and the direct responses instead of simply summarizing comments, which can be confusing to members of the public and leave them unsure as to whether their comments were received and responded to. Responses to scoping comments and the environmental analysis of the proposal itself should also be sensitive to regional conditions. For example, in responding to public concerns regarding potential impacts on marine species from copper and lead which will be introduced into seawater and sediments due to Navy training and testing activities, the report responds that "[f]ishes may be exposed by contact with the metal, contact with contaminants in the sediment or water, and ingestion of contaminated sediments. Concentrations of metals in sea water are orders of magnitude lower than concentrations in marine sediments. It is extremely unlikely that fishes would be indirectly impacted by toxic metals via the water." (SEIS/OEIS 3.9-62). Additionally, discussing impacts to sediments and water quality, the report notes that "[w]hile no quantitative sampling for metals in training areas have been completed," based on other studies the report concludes that "[i]t	responses to those comments are provided in Appendix K (Public Comment Responses). This Supplemental EIS/OEIS, as well as the 2015 MITT Final EIS/OEIS, include discussion of the fate and transport of specific chemicals with references to chemical properties of munitions and munitions constituents. Elevated levels of metals in sediments would be restricted to a small zone around the metal, and any release to the overlying water column would be diluted and influenced by mixing and diffusion. There are studies regarding bioaccumulation in the Mariana Archipelago that were used in the EIS, and the Navy applies federal and state water quality standards where applicable to assess potential bioaccumulation risk. Residual concentrations of contaminants resulting from Navy training and testing activities are provided in this Supplemental EIS/OEIS. In the 2010 Mariana Island Range Complex (MIRC) EIS/OEIS, it was noted that, “The CNMI Senate requested the Agency for Toxic Substances and Disease Registry (ATSDR) on February 19, 2008 to conduct a public health assessment on FDM of toxic substances released by bombs and the bioaccumulation of these toxins in consumable pelagic fish.” The Agency, in its letter to the CNMI Senate on September 24, 2008, concluded that, “pelagic fish caught in the open water are not likely to contain high levels of explosive residues from the neighboring FDM bombing range and will not pose a public hazard to people who eat them.” The conclusion is supported by the Agency’s “Preliminary Assessment of Pelagic Fish Caught in the Open Pacific” (ATSDR 2008). There are also several studies in other jurisdictions cited in the 2015 MITT Final EIS/OEIS concerning metals deposition in the marine environment in waters off of military training ranges. The Navy reviewed these quantitative analyses of military munitions over a period of decades. This Supplemental EIS/OEIS discusses multiple studies off of Vieques Island in Puerto Rico, Pamlico Sound in North Carolina, and a Canadian military site (Canadian Forces Maritime Experimental and Test Ranges near Nanoose Bay, British Columbia) for lead and lithium (see Section 3.1.1.1.4, Farallon de Medinilla, in Section

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	is unlikely that metals in sediments or the water column from military training activities would exceed federal thresholds in the Study Area." Qualitative assessment alone does not seem to meaningfully respond to commenter concerns regarding heavy metal accumulation in fish and potential impacts to people, the economy, and the environment. Additional quantitative assessment regarding heavy metal loading in food fish and fish consumption trends would appear to be warranted in this highly fish dependent region. It is suggested that data be provided to fill this gap. Moreover, it is recommended that the monitoring plan for the MITT and related activities include collection of baseline data to show existing levels of heavy metals in water and sediment adjacent to live fire use areas and control areas where such activities are not being conducted and that these studies continue at regular intervals for the duration of these exercises in order to address the public's legitimate concerns regarding risks of heavy metal contamination of water, sediment, and fish stocks, as well as socio-economic effects of these potential impacts.	3.1, Water and Sediment Quality). Information regarding impacts on sediments and water quality from munitions at two additional sites, one in Hawaii and one in the Potomac River in Maryland, where military munitions have resided for decades have been added to the section. This Supplemental EIS/OEIS also includes information that suggests the majority of concerns regarding bioaccumulation are associated with urban coastal environments with specific point source and non-point source contributors of pollutants. The studies concerning military sites suggest that metals exposed to seawater are of less concern because of decreased bioavailability.
Gov CNMI-09	**Conclusion** In summary, overall, additional coordination and outreach to the public as well as more meaningful data collection and analysis regarding environmental and socio-economic impacts would be helpful in framing discussions regarding the significance of effects and possible mitigation measures. As champions of environmental stewardship, the U.S. Navy has an opportunity to support the CNMI in filling data gaps to enable informed resource management decisions as a mitigating outcome that would advance the purposes of the proposed ongoing training and testing activities in the region. To fill data gaps regarding subsistence fish consumption or economic uses that may be impacted by travel restrictions around FDM or baseline environmental conditions relating to water quality and soil contamination or robust distribution data for marine mammals, the CNMI encourages the Navy to work closely with the	The results of the Navy's monitoring are posted annually and are available on the Navy's public website www.navymarinespeciesmonitoring.us. The Navy will continue to work with local partners in Guam and the CNMI to engage in collaborative research efforts. Many of these efforts are part of the larger collaborative effort with NOAA Fisheries, Guam Division of Aquatic and Wildlife Resources, CNMI Department of Lands and Natural Resources, Naval Base Guam, and the U.S. Pacific Fleet Environmental Readiness Office. The most recent collaborative research effort was sea turtle tagging in the Mariana Islands Range Complex (Martin, S. L., A. R. Gaos, and T. T. Jones. [2019]). Research funding is allocated via the Integrated Comprehensive Monitoring Program (U.S. Department of the Navy, 2010, 2013a), which provides the overarching framework for coordination of the Navy's marine species research and monitoring efforts and serves as a planning tool to focus Navy monitoring priorities pursuant

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	CNMI's resource management agencies to collect and analyze data. This information will provide numerous benefits to the CNMI as we work to identify a path towards sustainable long-term growth. Similarly, ongoing community engagement and information sharing about proposed actions from the Department of Defense (DoD) will help provide transparency and build community engagement and trust through the NEPA process. This process is only as good as the data going into it and the community engagement being initiated to support meaningful review and feedback, and the CNMI appreciates the DoD's ongoing commitment to investing in positive growth outcomes in our region. Thank you for this opportunity to provide feedback and for your consideration of the CNMI' s comments and suggestions.	to ESA and MMPA requirements. The purpose of the Integrated Comprehensive Monitoring Program is to coordinate monitoring efforts across all regions and to allocate the most appropriate level and type of monitoring effort for each range complex based on a set of standardized objectives, regional expertise, and resource availability. Although the Integrated Comprehensive Monitoring Program does not identify specific field work or individual projects, it is designed to provide a flexible, scalable, and adaptable framework using adaptive management and strategic planning processes that periodically assess progress and reevaluate objectives.
Mayor Edwin P. Aldan, Tinian Mayor's Office (TMO)		
TMO-01	I submit these comments on behalf of the people Tinian and Aguiguan, Commonwealth of the Northern Mariana Islands (CNMI). I want to also thank the Navy for extending the scoping period so that the community can have additional time to review the Supplemental EIS. First, I want to reiterate our position that the MITT and the CNMI Joint Military Training (CJMT) EIS are all part of one concerted effort to expand military training activities in Guam and the CNMI as a result of the Marine's Asia Pacific Realignment. As such, the environmental impacts of the MITT and the CJMT should be analyzed under one EIS to determine the true cumulative impacts that these proposed activities will have on the land, air, sea and the people of the Commonwealth.	The Navy has been conducting training and testing activities in the Study Area for decades, and this supplement to the 2015 MITT Final EIS/OEIS analyzes and supports the continuation of that training and testing. This Supplemental EIS/OEIS: (1) includes the analysis of activities at sea and on FDM necessary to meet readiness requirements beyond 2020 and into the reasonably foreseeable future, (2) includes any changes to those activities previously analyzed, and (3) reflects the most up-to-date compilation of training and testing activities deemed necessary to accomplish military readiness requirements. The training and testing activities included in this Supplemental EIS/OEIS within the Study Area are not dependent on other DoD activities. It is important to note that proposed military actions are not dependent on each other for their justification. For example, activities proposed under this Supplemental EIS/OEIS and ongoing training and testing activities within the Study Area under the 2015 Final MITT EIS/OEIS would proceed regardless of whether other proposed actions are taken, such as the training proposed in the CNMI Joint Military Training EIS/OEIS. According

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		to CEQ regulations, training and testing activities in the Study Area may logically be viewed in isolation because they have independent utility, as they are ongoing activities. In addition, courts have upheld federal agencies' decisions to organize and plan their actions in a reasonable or rational manner. Cumulative impacts of these independent actions are analyzed in Chapter 4 (Cumulative Impacts) of this Supplemental EIS/OEIS.
TMO-02	We take this opportunity to reiterate our concerns regarding the expansiveness and the nature of the proposed activities' impacts on the overall balance of the marine eco-system which surround the CNMI. Specifically, the impacts on not only the species within the MITT Study Area listed under the Endangered Species Act (ESA) such as the hammerhead shark, the oceanic whitetip shark and the giant manta ray, but the overall supply of fish stock in the Commonwealth water. The 2019 Supplemental EIS (hereinafter SEIS) indicates that the species of concern do not have substantive protections under the SEIS and states that the species listed are "declining because of the impacts from fishing and habitat degradation." However, there is no study cited to which speaks to how long-term exposure to these types of activities will impact the survivability of species already identified as either threatened or species of concern.	The Navy uses the best available science to support the impact analysis and conclusions. As described in Section 3.9.1.3 (Endangered Species Act Species), information on threats to ESA-listed species have not changed since the publication of the 2015 MITT Final EIS/OEIS; and the information and analysis remains valid. Regulatory agencies like NMFS typically study long-term effects and publish five-year reviews for many of the ESA-listed fish species. For example, the most recent status review for scalloped hammerhead sharks was by Miller et al. (2014) and was cited in this Supplemental EIS/OEIS. In addition, the Navy's consultation with NMFS includes the analysis of potential effects to the three ESA-listed fish species within the Action Area (the area considered for analysis in an ESA consultation).
TMO-03	The study has included an extensive listing of federally managed fish species within the study area to include bottom fish, reef fish, and pelagic fish. The SEIS points to modifications to the quantify and type of acoustic and explosive stressors under the proposed alternatives. The studies cited to demonstrate the potential impact to fish, specifically catfish, herring and rainbow trout, and those kept in a fish tank. We find these studies to be insufficient to give a real indication as to how the nature of these activities will impact the fish species within the study area. For example, it is unclear how the study can conclude that sonar signals would result only in the limited probability of a masking effect when the SEIS cites the	Regarding acoustic stressors and fish, although the ANSI Sound Exposure Guideline technical report does not propose specific criteria/thresholds for masking from sonar exposure, it is understood that masking occurs where masking noise exceeds the absolute hearing threshold of an animal and that an animal must be able to hear a particular sound source for masking to occur. Discussion is shown on page 3.9-21: "The ANSI Sound Exposure Guideline technical report (Popper et al., 2014) highlights a lack of data that exists for masking by sonar but suggests that the narrow bandwidth and intermittent nature of most sonar signals would result in only a limited probability of any masking effects. In addition, most sonars (mid-, high-,

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	ANSI Sound Exposure Guideline technical report which states that data is lacking to support a clear statement of impact. What is clear in the SEIS is that it should be anticipated that fish will experience hearing loss, masking, physiological stress, and behavioral reactions on levels that cannot be qualitatively quantified raising serious concerns of the long-term cumulative impact on the fish stock within the study area. Besides sonar testing, the proposed activities include the use of explosives both in the water or near the surface water. The SEIS anticipates a ten percent mortality rate from in-water explosion for fishes with a swim bladder. The SEIS states that there have been few studies of the impact of underwater explosives on early life stages of fish and that explosive energy poses the greatest potential threat for injury and mortality in marine fishes. The study cites that there are no direct measurements as to hearing loss, limited research in masking effects, physiological stress, and behavioral reactions but generally concludes that there would be no significant or negligible impact on the population. Moreover, the SEIS suggest that the implementation of mitigation to avoid potential impacts on ESA species and the fact that most scheduled training and testing activities would occur more than 3NM from shore will help avoid potential impacts on fishes that shelter and feed on the reefs. Given what the SEIS states that there is limited available qualitative data on the long-term impacts of the nature of these activities, it is unclear how it can be stated that there would be no significant cumulative impact or if there are impacts, due to the above-mentioned stressors, such impacts would be negligible. The assumption that by conducting an activity 3NM from shore assumes that these activities are conducted in an environment similar to that of an aquarium where the flow of sediments, acoustic stressors, metals and other foreign debris such as parachutes that	and very high-frequency) are above the hearing range of most marine fish species, eliminating the possibility of masking for these species. In most cases, the probability of masking would further decrease with increasing distance from the sound source." With respect to the commenter's concerns regarding the long-term cumulative impact on fish stocks within the Study Area, most Navy training and testing activities involving the use of sonar and explosives would be dispersed in space and time, therefore limiting the potential overlap of these activities with fishes. It is acknowledged in this Supplemental EIS/OEIS that some individual fish may be impacted by these activities but again, due to the limited use over a widely dispersed Study Area, these individual impacts would not be anticipated to lead to long-term consequences for populations or stocks of fish in the area. As described under Section 3.9.2.1.1 (Background), although there are numerous publications on the effects of human-generated sound on fishes, it is not possible to conduct studies on all 34,000 marine and freshwater species (including species of concern and ESA-listed fish due to their protected status). In addition, it is not always possible to test these impacts in open ocean environments due to research facility testing and resource limitations or under realistic Navy testing and training scenarios across the variable environments in which these activities occur. Instead, the Navy must rely on all forms of best available science during the development of its environmental impact analyses. This includes using studies conducted on surrogate species (i.e., species within the same defined hearing groups as those that occur in a particular Study Area or with other similar physiological traits), in laboratories, or using surrogate acoustic sources (both impulsive and non-impulsive). For example, although the specific effects of human-generated sound on ESA-listed sharks and manta rays in the Study Area are not available, effects on "fishes without a swim bladder" (i.e., fishes in the same hearing group) are

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	will sink down to the ocean floor, will be contained within a certain area. The facts and logic simply do not support this supposition.	available and are used in this Supplemental EIS/OEIS analysis to support the Navy's conclusions. In cases where impacts on surrogate species are not available, reactions or impacts observed in more sensitive species/hearing groups are utilized as a baseline of understanding in the overall analysis. In response to the comment regarding the 10 percent mortality rates, please note that this is existing data reported by O'Keeffe (1984) to be considered in the overall analysis. This example data is meant to allow the reader to better understand how ranges to mortality may vary depending on specific variables such as the net explosive weight of the charge, the depth of the explosion, and the weight of the fish. Estimated ranges to effect are provided in Section 3.9.2.2.2.2 (Impact Ranges for Explosives) and specifically in Tables 3.9-8 and 3.9-9. Similar to the response to the above comment, although there are few studies available on the direct impacts of explosives on species that occur in the Study Area, surrogate studies are utilized to better estimate and understand potential impacts. In most cases where explosive data is not available, other studies that utilize impulsive sources (such as pile driving or air guns) can be used instead. Based on best available science and surrogate information as described in Section 3.9.2.2.1 (Background), it is acknowledged that some individual fish, and even some schools, may be injured or behaviorally disturbed by explosive activities. However, due to the dispersed nature of explosive activities, it is not anticipated that overall impacts on the stocks would occur. In addition, mitigation measures would prevent the use of explosives within a specified distance of shallow-water coral reefs, live hard bottom, and artificial reefs (except within designated training areas) to help the Navy avoid potential impacts on fishes in these habitats.
TMO-04	The point is, we the people of Tinian heavily rely on the waters both near shore and off shore, not only to feed our families but for economic self-sustainability. The MITT training areas are critical to our food security and economic self-sustainability. Although the SEIS provides additional information on the nature of the impact	Section 3.12 (Socioeconomic Resources and Environmental Justice) contains information on fishing and fisheries in the CNMI. The section has been updated in the Final Supplemental EIS/OEIS to include the latest available information on the status of fisheries and fishing in the CNMI, including information from the Western Pacific Regional Fishery

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	that these activities will have on the fish, the general conclusions drawn with regards to the cumulative impacts are not supported by the narrative which generally states that there is currently not enough study or information that is available to sustain the claim that there will be no adverse impact or that if there are impacts, they will be negligible.	Management Council annual stock assessment report (WPRFMC, 2019. Annual Stock Assessment and Fishery Evaluation Report for the Mariana Archipelago Fishery Ecosystem Plan 2018. Remington, T., Sabater, M., Ishizaki, A., Spalding, S. (Eds.) Western Pacific Regional Fishery Management Council. Honolulu, Hawaii 96813 USA. 276 pp. + Appendices).
TMO-05	I want to also reiterate the concerns which have previously been expressed by the Municipality with regards to underwater testing activities using sonars and explosives as it relates to marine mammals. A recent article published in the Pacific Daily News reported a beaked whale off the waters of Agat on Jan 17, 2019. The whale's stranding coincided with the Navy's anti-submarine warfare training. According to the same article, the first documented incident of a beaked whale washing ashore in Micronesia was in the Marshall Islands in 1975. The next stranding was not until 2007 in Piti, 35 years later. And just within these last 10 years whale stranding went from 1 in 35 years, to 6 in 10 years which some has linked to the increase in military activities in our oceans. In the Canary Islands, where it used to be a hotspot for mass stranding, there have been no mass stranding since a ban on sonar was imposed by the Spanish government.	Although records of marine mammal strandings exist as far back as 1878 in Guam, reporting of marine mammal strandings across the Mariana Islands has likely only become consistent in recent years, similar to other regions, whereas sonar use has occurred in the area around the Mariana Islands for decades. While exact causes of strandings are uncertain, scientists have identified potential contributing factors for strandings including age, illness, or disease; ingestion of marine debris/plastics; contaminant load; and manmade sources. A small number of strandings have been associated with the use of U.S. Navy sonar; none of these have occurred in the Study Area. Information on strandings associated with Navy training and testing activities is provided in the 2017 technical report, "Marine Mammal Strandings Associated with United States Navy Sonar Activities." NMFS, as the regulator, maintains the authoritative National Stranding Database. The Navy is committed to protecting marine life by implementing mitigation measures when training or testing using active sonar or explosives, working with regulatory agencies, and furthering our understanding of marine mammals through research and monitoring. Section 3.4.2.1.1.6 (Stranding) further discusses the best available information about strandings of beaked whales in the Mariana Islands and the Navy's support of efforts to better understanding the causes of marine mammal strandings. Section 3.0.1.1.1 (Marine Species Monitoring and Research Programs) provides an overview of U.S. Navy-supported research on marine species. These programs support coordinated science, technology, research, and

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		development focused on understanding the effects of sound on marine mammals, including physiological, behavioral, ecological, and population-level impacts. Additional information on these programs and other ocean resources-oriented initiatives can be found at the Department of the Navy's Energy, Environment, and Climate Change website (https://navysustainability.dodlive.mil).
TMO-06	What is becoming evident is that stranding has increased with the increase of military training activities in our waters. As previously submitted, the Cetacean Monitoring in the Marianas Range Complex, 2016 confirms a total of 42 cetacean groups in our waters. While the report indicates that "it is not yet possible to determine how many animals may be impacted by explosive or sonar exercises in the region annually and we are unable to make any evaluation of exposure to cetacean species," reports from different parts of the world indicate a direct correlation between stranding and sonar testing. Given the increased number of stranding just in Guam coinciding with increased military testing and training activities in the Marianas, there are serious concerns as to the long- term cumulative impact on the overall health mammals and of the marine eco-system.	The overall use of sonar and other transducers for training and testing activities would be similar to what is currently conducted (see Table 3.0-2 of the MITT Draft Supplemental EIS/OEIS for details). The Navy will continue to implement mitigation measures to avoid or reduce potential impacts on marine species. Information about the quantitative analysis is described in detail in the 2018 technical report Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing. The Navy's acoustic and explosive effects analysis looks at multiple factors such as marine mammal abundance across the study area in each season, the levels of sound that may cause certain effects, and the Navy's proposed time and space use of noise-producing activities. This analysis uses estimates of marine mammal presence and density based on best available science as described in the technical report titled U.S. Navy Marine Species Density Database Phase III for the Mariana Islands Training and Testing Study Area (July 2018). Both of these technical reports are available at www.mitt-eis.com. As discussed in this Supplemental Draft EIS/OEIS in Sections 3.4.2.1 (Acoustic Stressors) and 3.4.2.2 (Explosives Stressors), a few instances of behavioral impacts per year would not cause long-term consequences for individuals or populations. Although records of marine mammal strandings exist as far back as 1878 in Guam, reporting of marine mammal strandings across the Mariana Islands has likely only become consistent in recent years, similar to other regions, whereas sonar use has occurred in the area around the Mariana Islands for decades. While exact causes of strandings are uncertain, scientists have

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		identified potential contributing factors for strandings, including age, illness, or disease; ingestion of marine debris/plastics; contaminant load; and manmade sources. A small number of strandings have been associated with the use of U.S. Navy sonar; none of these have occurred in the Study Area. Information on strandings associated with Navy training and testing activities is provided in the 2017 technical report, "Marine Mammal Strandings Associated with United States Navy Sonar Activities." The Center for Naval Analysis (CNA) recently conducted a statistical study of correlation of beaked whale strandings around the Mariana Islands with the use of U.S. Navy sonar, finding that insufficient evidence of a correlation exists. The CNA study used the complete record of all U.S. Navy sonar use between 2007 and 2019, including major training events, joint exercises, and unit level training/testing. The analysis also included the complete beaked whale stranding record for the Mariana Islands through 2019. Following the methods in Simonis et al. (2020), the CNA analysis found insufficient evidence of a correlation between sonar use and beaked whale strandings when considering the complete sonar use record. The CNA finding is in contrast to the finding in Simonis et al. (2020), which depicted a significant correlation between beaked whale strandings and Navy sonar use. However, the Simonis et al. (2020) result relied on substantially incomplete or inaccurate assumptions about U.S. Navy sonar use around the Mariana Islands. CNA also conducted statistical analyses specific to each island where beaked whale strandings have been observed in the Mariana Islands, similarly finding insufficient evidence of a correlation to sonar use. Additional information on the findings of the CNA analysis are presented in Section 3.4.2.1.1.6 (Stranding) in Chapter 3.4 (Marine Mammals). Section 3.4.2.1.1.6 (Stranding) further discusses the best available information about strandings in the Mariana Islands and the Navy's support of efforts to better understand the causes of marine

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		of marine mammal strandings. NMFS, as the regulator, maintains the authoritative National Stranding Database. As described in Section 5.1.2.2.1 (Marine Species Research and Monitoring Programs), for this Final Supplemental EIS/OEIS, the Navy agreed to several additional research and monitoring initiatives designed to help advance the understanding of beaked whales and strandings in the MITT Study Area. The Navy will co-fund the Pacific Marine Assessment Program for Protected Species (PACMAPPS) Mariana Islands survey in spring-summer 2021 and future studies starting in 2022 to help document beaked whale occurrence, abundance, and distribution in the Mariana Islands. The Navy will also fund additional stranding response and necropsy analyses for the Pacific Islands region, and research on a framework to improve statistical stranding analysis. Collaboratively with NMFS, the Navy will fund and organize an expert panel to provide recommendations on scientific data gaps and uncertainties for further protective measure consideration to minimize potential impacts of Navy training and testing activities on beaked whales in the Mariana Islands.
TMO-07	It is the Municipality's understanding that the reason for the supplemental study of the 2015 MITT EIS/OEIS is to update the 2015 analysis to provide "revised acoustic effects criteria and updated species densities" and to provide "new scientific research," and that the proposed activities within the MITT Study Area include the use of active sonar and explosives of the coast of Guam and the CNMI throughout the in-water areas around the MIRC, the transit corridor between the MIRC and the Hawaii Range Complex. In the 2015 MITT EIS/OEIS, the Navy states that its primary purpose was to comply with the Marine Mammal Protection Act (MMPA) and the Endangered Species Act. However, in reviewing the SEIS, there are concerns of new or increased activities on Tinian. While the SEIS states that the Navy is	The Navy analyzed land-based activities on Guam, Saipan, Tinian, and Rota in the 2015 MITT Final EIS/OEIS; the Navy did not reanalyze land-based activities in this Supplemental EIS/OEIS because no changes are proposed to those land-based activities. In this Supplemental EIS/OEIS, the Navy analyzes only the training and testing activities conducted at sea and on FDM within the Study Area. Locations of the proposed activities are included in the Chapter 2 (Description of Proposed Action and Alternatives) tables, and additional details are available in Appendix A (Training and Testing Activities Descriptions). Table 2.5-1 of this Supplemental EIS/OEIS has been updated to reflect that there would be no increase in amphibious assault training. In addition, text has been added to clarify that proposed increases in Personnel Insertion/Extractions, Parachute Insertions, and Intelligence, Surveillance, Reconnaissance would

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	not "proposing any changes to those land-based activities on Guam, Saipan, Tinian, and Rota, the Navy will continue to rely on the 2015 MITT Final EIS," Table 2.5-1 indicates of potential location of new or increased training activities which includes the possibility of these new or increased activities on Saipan, Tinian, or Rota. The table indicates increases in amphibious assault trainings on Tinian, increases in personnel insertion/extractions on Tinian and Rota, increases in parachute insertion trainings on Tinian and Rota; and new intelligence, surveillance, and reconnaissance trainings on Saipan, Tinian, and Rota. Per Tables 2.5-1 and 2.5-2, several new or increased training or testing activities, are designated to take place at "Mariana Littorals," "Mariana Island Anchorages," or simply in the Study Area or the MIRC without further specification. The Municipality did not anticipate having to be consider the implications of additional trainings in light of other ongoing proposals by DOD under this SEIS. Moreover, the fact that the new and or increased training activities are just slithered into this SEIS without specifying what or where these new trainings are, other that they are within the Study Area or the MIRC, without any public input is disconcerting and we are therefore requesting additional information and further specification.	not occur on land (Tinian, Rota or Guam). Proposed increases in those activities would only occur offshore within the MIRC.
Christopher Tenorio, Commonwealth Ports Authority (CPA)		
CPA-01	The Commonwealth Ports Authority hereby submits the following four comments regarding the MITT draft supplemental EIS/OBIS: **1. Airspace Clarification Requested** The 2019 MITT Supplemental EIS seems to be consistent with the 2015 MITT Final EIS as to the proposed restricted airspace. However, in Section 3.13.1.2, the following is stated:	No changes in airspace are being proposed as part of this Supplemental EIS/OEIS. Information referenced under Section 3.13.2.1.2 (Airspace) are associated with the 2015 MITT Final EIS/OEIS. The Final Supplemental EIS/OEIS has been revised to clarify text and note that no changes in airspace are proposed.

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	"General information on airspace within the Study Area can be found in the 2015 Mitt Final EIS/OBIS (Section 3.13.2.1.2, Airspace); however, there have been changes to special use airspace within the Study Area in order to enhance safety. Changes include the addition of one new restricted area and new warning areas (U.S. Department of the Navy, 2015)." Is this statement referring to changes made based on the 2015 MITT Final EIS - in other words, the changes in airspace that are in place today? Or is the 2019 MITT Supplemental EIS proposing new airspace changes beyond R-7201, R-7201A, W-llA, W-llB, W-12, W-13A, W-13B, W- 13C, and W-517?	
CPA-02	Also, CPA understands the following minimum distances within the Study Area from land apply to certain training activities: • Air Warfare > 12 NM from land • Anti-Submarine > 3 NM from land • Electronic Warfare > 12 NM from land • Surface Warfare > 12 NM from land • BOMBEX > 50 NM from land • Torpedo Exercise > 3 NM from land • MISSLEX > 50 NM from land • GUNEX Ship > 12 NM from land • SINKEX > 50 NM from land • GUNEX Boat (medium caliber) > 12 NM from land • GUNEX Boat (small caliber) > 3 NM from land • Small Boat Attack (non-blanks) > 3 NM from land • Submarine Sonar Maintenance > 3 NM from land • Surface Ship Sonar Maintenance > 3 NM from land • Air-to-Surface Missile Test > 50 NM from land • Anti-Submarine Warfare Test > 3NM from land • Electronic Warfare Test > 3 NM from land	The Navy will continue to adhere and honor the minimum training distances as identified for training and testing activities listed in Table 2.5-1 and 2.5-2 and Appendix A (Training and Testing Activities Descriptions). Due to operational requirements, the Navy is unable to increase these minimum distances from Saipan, Tinian, and Rota. The distances cited in the comment letter are correct with the exceptions of Electronic Warfare, Submarine Sonar Maintenance, and Surface Ship Sonar Maintenance. Specifically: a) Electronic Warfare. Table 2.5-1 contains four range activities under this heading, and have been assessed for potential environmental impacts with the following locations/distances: i. Electronic Warfare Operations (EW Ops) may be conducted anywhere appropriate within the "Study Area." ii. Counter Targeting Flare Exercise (FLAREX) – Aircraft activities may be conducted within the "Study Area > 12 NM from land." iii. Counter Targeting Chaff Exercise (CHAFEX) – Ship activities may be conducted within the "Study Area > 12 NM from land."

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	Remembering its responsibilities to manage the ports of the Commonwealth and to those who use those ports, CPA expects these distances to be honored. CPA encourages the Navy to increase these minimum distances away from Saipan, Tinian, and Rota to further protect our ports, their users, and our community from the impacts of these activities.	iv. CHAFFEX – Aircraft activities may be conducted within the "Study Area > 12 NM from land." b) Submarine Sonar Maintenance. Table 2.5-1 contains one range activity under this heading and has been assessed for potential environmental impacts with the following locations/distances: i. Submarine Sonar Maintenance may be conducted within the "Study Area > 12 NM from land; Inner Apra Harbor and channel; Transit Corridor" c) Surface Ship Sonar Maintenance. Table 2.5-1 contains one range activity under this heading and has been assessed for potential environmental impacts with the following locations/distances: i. Surface Ship Sonar Maintenance may be conducted within the "Study Area > 12 NM from land; Inner Apra Harbor and channel; Transit Corridor"
CPA-03	**2. No Additional Use of CPA Airports** At p. 3.12-23, the 2019 Supplemental EIS states: "Therefore, no impacts to tourism would be anticipated because ... military aircraft generally depart from Andersen Air Force Base ..." The draft does not state that CPA's airports will not be used or rule out that possibility. CPA would object to any use of its airports by the Navy in support of testing or training activities contemplated under the 2019 MITT Supplemental EIS beyond those uses already allowed under the terms of existing agreements between the United States and CPA/the CNMI and CPA's FAA Airport Sponsor Assurances. CPA requests that the Navy confirm that it does not intend to use and will not use CPA's airports in relation to the testing and training activities contemplated under the 2019 Supplemental EIS unless it is in compliance with these existing agreements. CPA further requests that the Navy confirm that: (1) any such use by the Navy	The Navy will continue to abide by all agreements with the CNMI Commonwealth Ports Authority. The Navy does not intend to change the use CPA's airports as part of the Proposed Action for this Supplemental EIS/OEIS.

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	will be no greater than that contemplated under the 2015 MITT Final EIS; and (2) that any such use will be coordinated with CPA according to the policies and procedures of CPA. Further, if the Navy does intend to utilize CPA's airports in relation to the testing and training activities contemplated under the 2019 MITT Supplemental EIS, CPA requests that the Navy specify such intended use in the updated or final version of the 2019 MITT Supplemental EIS.	
CPA-04	Last, on page 2-38 of the draft, at "Unmanned Aerial Training and Certification," Table 2.5-1 lists that this training activity will occur at "MIRC airfields." It then indicates a footnote, but it leads to no note or other definition of what is meant by "MIRC airfields." CPA requests that the Navy clarify this reference.	The Final Supplemental EIS/OEIS has revised the note associated with "Unmanned Aerial Training and Certification" in Table 2.5-1, to define MIRC airfields as Orote Point Airfield, Guam; Northwest Airfield, Guam; North Airfield, Tinian.
CPA-05	**3. Communications with CPA** The 2019 MITT Supplemental EIS makes efforts to discuss outreach activities by and on behalf of the Navy to communicate to the public regarding upcoming and ongoing Navy testing or training activities in the Study Area. CPA encourages the Navy to further its efforts in such outreach to improve communications on Navy activities contemplated under the 2019 MITT Supplemental EIS. CPA encourages the Navy to work with CPA on improving such communications so that the information on the activities, and the closure of any warning areas, may be readily available and delivered to the users of CPA' s ports.	Public safety is important to the Navy. Various means are used to communicate information to the public about areas restricted to public or commercial activities and are described in Section 3.13 (Public Health and Safety). As specified in Title 33 CFR Subpart 72.01, Notices to Mariners, the U.S. Coast Guard issues information to the public concerning maritime navigation. Additionally, nautical charts issued by the National Oceanic and Atmospheric Administration include these federally designated zones and areas. Operators of recreational and commercial vessels have a duty to abide by maritime regulations administered by the U.S. Coast Guard. Waters around FDM within 3 NM from shore are permanently closed for safety reasons due to the potential presence of unexploded ordnance. When necessary, the military also requests that the Federal Aviation Administration issue a Notice to Airmen to make the public aware of upcoming military activities requiring the exclusive use of airspace. The Navy has coordinated with the CNMI Emergency Management Office and Office of Homeland when closures of sea or air space are in effect and the Navy has added the CNMI Commonwealth Ports Authority to the Safety Notification List. The Navy will continue to coordinate with the CNMI

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		Commonwealth Ports Authority and the Mayor's offices when major training events are scheduled.
CPA-06	**4. Potential Increased Activities on Saipan, Tinian, and Rota** The 2019 MITT Supplemental EIS states: "As the Navy is not proposing any changes to those land-based activities on Guam, Saipan, Tinian, and Rota, the Navy will continue to rely on the 2015 MITT Final EIS." But in its Table 2.5-1, the potential location of new or increased training activities includes the possibility of these new or increased activities on Saipan, Tinian, or Rota, including: • Increases in amphibious assault training on Tinian; • Increases in personnel insertion/extraction on Tinian and Rota; • Increases in parachute insertion training on Tinian and Rota; and • New intelligence, surveillance, and reconnaissance training on Saipan, Tinian, and Rota. Further, several new or increased training or testing activities, per Tables 2.5-1 and 2.5-2, are designated to take place at "Mariana Littorals," "Mariana Island Anchorages," or simply in the Study Area or the MIRC without further specification. CPA requests that the Navy specify whether new or increased testing and/or training activities contemplated by the 2019 Supplemental EIS will occur on or along the shoreline of Saipan, Tinian, or Rota.	The Navy analyzed land-based activities on Guam, Saipan, Tinian, and Rota in the 2015 MITT Final EIS/OEIS; the Navy did not reanalyze land-based activities in this Supplemental EIS/OEIS because no changes are proposed to those land-based activities. Training and testing activities proposed to increase within this Supplemental EIS/OEIS are summarized in Tables 2.5-1 and 2.5-2 in Chapter 2 (Description of Proposed Action and Alternatives) of this Supplemental EIS/OEIS. Locations of the proposed activities are included in these tables, and additional details are available in Appendix A (Training and Testing Activities Descriptions). Table 2.5-1 of this Supplemental EIS/OEIS has been updated to reflect that there would be no increase in amphibious assault training. In addition, text has been added to clarify that proposed increases in Personnel Insertion/Extractions, Parachute Insertions, and Intelligence, Surveillance, Reconnaissance would not occur on land (Tinian, Rota or Guam). Proposed increases in those activities would only occur offshore within the MIRC.
Senator Kelly Marsh (Taitano), Office of Senator Kelly Marsh (Taitano) (OSM)		

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OSM-01	As chairwoman of the Committee on Heritage, it is imperative to ensure Guam's natural resources and cultural heritage remain protected and not further diluted or adversely impacted. It is also important to ensure that the military lives up to their commitments to One Guam, Green Guam, a Net Negative Footprint, and being culturally sensitive. The Indigenous CHamoru people of Guåhan and the Indigenous Chamorro and Refaluwásch peoples in and the Northern Marianas are inextricably connected socially, culturally, and otherwise to their environments and the plants and animals that share the islands, the waters, and the air with them. Place names, oral narratives, and certain cultural traditions inform us of these special connections. They tell us how the universe was created; our roles within society; the core values that are important; why species look and behave as they do; why our landscape exists as it does; opportune times to fish, hunt, and gather; which foods are appropriate when and for whom; the many ways that we are connected throughout the archipelago; and more. CHamorus/Chamorros and Refaluwásch are also inseparably connected to their homelands through their ancestors. Their ancestors tread, voyaged, fished, hunted, planted, and gathered resources throughout the archipelago. Nearly every island within the archipelago was inhabited, and perhaps all were places of important resources. Their ancestors have been buried within the archipelago for numerous generations—ancestors who never leave and remain connected to their homeland islands to this day. Further, an almost countless number of places on the land and in the sea are imbued with special meanings and powers. For these many reasons, the Mariana Islands are special and sacred.	This Supplemental EIS/OEIS fully complies with NEPA, includes extensive studies and analysis, and, using the best available science, exceeds the required hard look at impacts on the human and natural environment. The Navy is committed to protecting the environment while training and conducting testing. A comprehensive analysis of potential effects on environmental resources from Navy training and testing activities is presented in Chapter 3 (Affected Environment and Environmental Consequences) of the Draft Supplemental EIS/OEIS. These resources include water quality and sediment quality, marine habitats, marine mammals, fish, sea turtles, birds, socioeconomics, cultural resources, and invertebrates. While some impacts would occur from training and testing activities, the analysis concludes that impacts would be minimal and would not have a significant impact on the environment. Also, as described in Section 2.3.3 (Standard Operating Procedures) and Chapter 5 (Mitigation), the Navy implements, to the maximum extent possible, mitigation measures during its training and testing activities. The Navy has been conducting training and testing activities in the Study Area for decades and this supplement to the 2015 MITT Final EIS/OEIS supports the continuation of that training and testing. This Supplemental EIS/OEIS (1) includes the analysis of activities at sea and on FDM necessary to meet readiness requirements beyond 2020 and into the reasonably foreseeable future, (2) includes any changes to those activities previously analyzed, and (3) reflects the most up-to-date compilation of training and testing activities deemed necessary to accomplish military readiness requirements. The Navy is required to complete independent statutory obligations under NEPA, MMPA, ESA, MSA and NHPA. Thus, the Navy has prepared this Supplemental EIS/OEIS and is consulting with NMFS under the MMPA, ESA, and MSA, and conducting a Section 106 consultations with the CNMI HPO and Guam HPO. Mitigation, monitoring, or conservation

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	The health and well-being of the CHamoru/Chamorro and Refaluwásch cultures and their cultural identities are reliant upon keeping our environments and the plants and animals that live within them healthy; upon having unimpeded access to our air, waters, and lands; and upon providing appropriate respect to powerful and sacred places. Destruction of places (land or sea) important to CHamoru/Chamorro and Refaluwásch peoples, testing or training activities that do not provide appropriate respect of their powerful and sacred spaces, takes (harassment, harms, injuries, or kills) to the plants and animals adversely impact not only not only the plants, animals, and environments themselves but the very culture and cultural identity of CHamoru/Chamorro and Refaluwásch. When was the last time we saw a fanihi (fruitbat) in our skies? When was the last time we saw a Marianas Eight-spot butterfly? When was the last time we saw ko'ko' or a slew of other types of native birds in our skies or nesting on the ground? When was the last time we caught and ate a large palakse' or went hunting for small clams with our family? The loss of each of those and other such activities, which used to be so common, is a loss of who we are as a community and who we want to be. I stand against testing and training that causes substantive and irreversible adverse impacts to our special plants, animals, and environments which thus challenge the continuation of the CHamoru/Chamorro and Refaluwásch cultures and cultural identities, as well as the identities of our larger diverse island communities. Potential for many types of such harms are noted within the MITT SEIS-OEIS (e.g., Table ES.6-1). A wide variety of species of plants and	requirements are presented in Chapter 5 (Mitigation). Mitigation measures in the NMFS Biological Opinion will be reflected in the Record of Decision.

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	animals and our cultural, community, and economic activities have the potential to be negatively impacted. These include (but are not limited to)—our marine life, including fishes and sea turtles, among others. Other potential impacts are noted for commercial and recreational fishing, traditional fishing practices, and tourism. They will be impacted by such things as explosions, being hit by debris or a vessel, becoming entangled, or ingesting something harmful impacts that have and do happen as noted by experts at Guam's environmental agencies. I call for the assessment of such potential harms to the plants, animals, environments, and cultural resources to more fully reflect CHamoru/Chamorro and Refaluwásch cultural perspectives and standards. I further call for the significance of the impact of MITT undertakings and activities to be also be determined by examining their impact the continuation of their culture, cultural practices, and cultural identity.	
GEPA-01	The Guam Environmental Protection Agency is submitting the following comments for the document, the 2019 Mariana Islands Training and Testing Supplemental EIS/OEIS (MITT). Several comments pertain to the 2015 Mariana Islands Training and Testing EIS/OEIS (2015 MITT), and the rest to the 2019 MITT Supplemental, as we feel these issues have not been specifically addressed in either document. 1. The Navy does a respectable job of notifying the local regulatory agencies of upcoming underwater Mine Detonation activities within Outer Apra Harbor and Agat Bay. But the public nor the regulatory agencies ever receive any form of feedback/after action reports on outcome of these activities. Specifically, if any environmental damages occurred. Guam EPA request that some form of report be produce outlining these activities and highlight any issues regarding	As discussed in Section 5.1.2.2 (Monitoring, Research, and Reporting Initiatives), the Navy developed its reporting requirements in conjunction with NMFS to be consistent with mission requirements and balance the usefulness of the information to be collected with the practicality of collecting it. The Navy's training and testing activity reports and incident reports are designed to verify implementation of mitigation; comply with current permits, authorizations, and consultation requirements; and improve future environmental analyses. The Navy reports to NMFS if mitigation was implemented during sinking exercises (e.g., number of times explosive detonations were delayed due to marine mammal sightings). For major training exercises, the Navy's annual training and testing activity reports include information on each individual marine mammal sighting related to mitigation implementation. In the unlikely event that a vessel strike of a marine mammal should occur, the Navy would provide NMFS with relevant information pertaining to the incident, including but not limited to vessel speed. Additional reporting would be

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	water quality, fish kills, protected species sightings, and marine debris be made available to the public and local agencies.	ineffective for the reasons detailed in Section 5.6.7 (Reporting Requirements). The Navy is obligated under the ESA and MMPA to provide information on any incidents involving ESA-listed species. Therefore, the Navy will continue to submit the appropriate reports to NMFS immediately, or as soon as operational security considerations allow, if it observes an incident that is or may be attributable to Navy activities, including (1) a vessel strike of a marine mammal or sea turtle during training or testing; (2) a stranded, injured, or dead marine mammal or sea turtle during training or testing; or (3) an injured or dead marine mammal, sea turtle, or ESA-listed fish species during post-explosive activity monitoring.
GEPA-02	2. In the past, pre-coordination meetings on Mine Detonation activities were conducted with the local regulatory agencies. Guam EPA requests to make these meetings standard operating procedures, at a minimum of bi-annual basis.	Following receipt of notices to mariners, the Guam EPA is welcome to observe the underwater detonation training events and following the completion of the event may survey the area after it has been cleared. Guam EPA is also welcome to contact the Navy to request meetings as needed.
GEPA-03	3. At a minimum, a yearly report should be produced summarizing all activities identified in the MITT. There is no current mechanism to evaluate if the activities and quantities identified in the MITT are met or exceeded. Report should also address any impacts to stressor types.	See response GEPA-01 (to W.S. Leon Guerrero, Guam Environmental Protection Agency), regarding monitoring and reporting.
GEPA-04	4. Neither the 2015 MITT nor the 2019 Supplemental MITT have a discussion on the rational for an increase from a I0 lbs. underwater mine charge to the new standard of a 20 lbs. charge for the listed mine detonation activities. What is the justification for the increase? This needs to be further explained and justified.	The proposed training and testing activities in this Supplemental EIS/OEIS are needed to achieve and maintain military readiness within the Study Area. This includes the use of underwater mine charges up to 20 lb. at the Agat underwater detonation site. Underwater detonation activities at Apra Harbor and Piti would remain a charge of 10 lb. The increase to 20 lb. at the Agat underwater detonation site was included in the 2015 MITT Final EIS/OEIS and has not changed in the 2019 Supplemental Draft EIS/OEIS. This Supplemental EIS/OEIS furthers the Navy and other military services' execution of their roles and responsibilities under 10 U.S.C. section 5062.

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GEPA-05	5. In the 2015 MITT, page 3.1-18, Section 3.1.3, it states that Amphibious assaults and raids sediment plumes are temporary and since no military material s are expended, "...no further analysis of this training activity is provided ...." In previous training assaults on Guam, it has been observed that physical damages (corals crushed or turned over) from these training activities occurred. Further discussion on this activity and a review of the potential impacts and mitigation needs to occur.	Due to the accidental grounding of the French Navy Landing Craft that occurred on May 12, 2017, the Navy has implemented additional standard operating procedures for amphibious assault and raid activities. The Navy requires the following standard operating procedures for amphibious landings at Reserve Craft Beach: (1) Concept of Operations for the event and for notification/coordination with Naval Base Guam Operations Officer, (2) Presence of craft master who will coordinate planned routes with Mariana Islands Range Complex Ops and Naval Base Guam, (3) Presence of a beach master (observers) to assist in approach to shore and restore beach to original condition, and (4) Distribution of the Reserve Craft Beach Training Aid to all vessel Captains participating in any training event in the vicinity of Reserve Craft Beach. The Final Supplemental EIS/OEIS has been updated to include the additional standard operating procedures outlined above.
GEPA-06	6. Neither the 2015 MITT nor the 2019 Supplemental MITT have a discussion in the Cumulative Impacts section that describes the total cumulative impacts that the individual activities impact would have on the environment. For instance, the 2015 MITT states that the impact from two vessel sinking's a year are minimal. But there is no discussion on what the impact would be for a 5-year period where a total of 10 vessels would be sunk. The document continues to state that for Preferred Alternative, 237 tons of metal would be release into the MITT range complex. This is a 1 .3% increase over the "No Action" alternative. Expand this out for a 5-year period, this would equate to 6.5o/o increase and 1, 185 tons of metal. At what point does this become significant. There really is no temporal discussion of the additive impact of any stressors to the environment.	For the MITT Study Area, the substrate would be primarily clays and silts. As described and analyzed in the 2015 MITT Final EIS/OEIS, SINKEX activities would not occur in the same location. Under the Navy's preferred alternative (Alternative 2), the seafloor footprint for SINKEX would be less than what was analyzed in 2015. In addition, regulations involving SINKEX require that activities take place more than 50 miles from the coast and in waters at least 6,000 ft. deep (40 CFR section 229.2). The vessel hulk would create a hard substrate, which could act as an anchoring point for marine life in the open ocean where the predominant habitat is soft bottom.
GEPA-07	7. In the 2019 Supplemental MITT, Section 3. 1 .2.4 Other Materials section, explains that detonations, explosions, and other activities may result in dispersant of glass, carbon fibers, plastics, rubber, steel, iron, concrete, etc. There is no discussion if any effort to clean	Other military expended materials, such as marine markers and flares, chaff, unrecovered towed and stationary targets, sonobuoys, fiber-optic cables, and miscellaneous plastic and rubber components of other expended objects are expected to sink to the seafloor and become buried

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	up the marine debris as a result of the MITT activities are done or completed. There needs to be a discussion on this topic.	in sediments. Materials that sink and settle on the ocean bottom in very deep water make it impractical to recover. However, depending on the environmental conditions, including the availability of oxygen in sediments and water temperature at the seafloor, and the type of material (e.g., metal or plastic), expended material may degrade relatively quickly or persist in the environment indefinitely. Plastic and other persistent materials could incrementally contribute to marine "garbage patches" or other areas with accumulated debris but still have only minimal impact compared to other sources of debris. The Navy has standard operation procedures in place to reduce the amount of military expended materials, including recovering targets and associated parachutes to the maximum extent practical.
GEPA-08	8. In the 2019 Supplemental MITT, Section 3.1.3 Public Scoping Comments states that Guam does not maintain screening standards for metals in sediments of water, and sites USEPA thresholds. Update Reference to Suggested Parameters for Bulk Sediment Analyses and Elutriate Analyses under Permit information Requirements regarding Section 401 Water Quality Certification and the Pacific Basin Environmental Screening Levels. Every effort should be made to use site specific values.	Both this Supplemental EIS/OEIS and the 2015 MITT Final EIS/OEIS include an analysis of potential impacts from metals and contaminants as a result of military training and testing activities on marine resources; however, this Supplemental EIS/OEIS includes updated information to better inform the analysis. For example, this Supplemental EIS/OEIS has been updated to include Table 3.1-1 within Section 3.1 (Sediments and Water Quality), which includes water quality standards, criteria, and applicable water use areas for waters surrounding Guam and islands within the CNMI. Specifically, for waters surrounding Guam, the Navy references Title 22 Division II Chapter 5 Section 102 of the Guam Administrative Code (22 GAR Section 5102) defines marine waters as all coastal waters off shore, including estuarine waters, lagoons, bays, brackish areas, wetlands, and other inland waters that are subject to the ebb and flow of tides. Table 3.1-1 lists each standard with specific criteria in Guam's regulations and applicability to each water use area. The water quality standards include criteria for microbiological concentrations (Enterococci, and *E. coli*), pH, nutrients (nitrate-nitrogen, total nitrogen, orthophosphate, ammonia), dissolved oxygen, total filterable suspended solids, salinity, temperature, turbidity, radioactive materials, oil and petroleum products, toxic

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		pollutants, and other general considerations. The military readiness activities that generate stressors to water quality do not occur in the water use areas; rather, they occur outside of the Guam coastal zone and are analyzed in the context of their potential to induce reasonably foreseeable effects into Class "AA" or Class "A" water use areas. While no quantitative sampling for metals in training areas have been completed, there are a number of studies conducted in marine training and testing locations that have attempted to measure metal content where military activities occur. In one study, the water was sampled for lead, manganese, nickel, vanadium, and zinc at a shallow bombing range in Pamlico Sound (state waters of North Carolina) immediately following a training event with non-explosive practice bombs. All water quality parameters tested, except nickel, were within the state limits. The nickel concentration was significantly higher than the state criterion, although the concentration did not differ significantly from the control site located outside the bombing range. The results suggest that bombing activities were not responsible for the elevated nickel concentrations (U.S. Department of the Navy, 2010). A recent study conducted by the U.S. Marine Corps sampled sediments and water quality for 26 different constituents related to munitions at several U.S. Marine Corps water-based training ranges. Metals included lead and magnesium. These areas were also used for bombing practice. No munitions constituents were detected above screening values used at the U.S. Marine Corps water ranges (U.S. Department of the Navy, 2010). A study by Pait et al. (2010) of previous Navy training areas at Vieques, Puerto Rico, found generally low concentrations of metals in marine sediments. Areas in which live ammunition and loaded weapons were used ("live-fire areas") were also included in the analysis. Information from the National Coastal Condition Assessment report (IV), which evaluated waters and sediments around Guam based on data from 2003 to 2006, was also cited for background information.

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GEPA-09	9. In the 2019 Supplemental MITT, Section 5.1.2.2.1. l Adaptive Management states that the adaptive management process is to help the Navy have better knowledge on ecological systems. The process involves technical review meetings and ongoing discussions between the Navy, NMFS, the Marine Mammal Commission, and other experts in the scientific community. This process makes no mention of local stakeholders or other local natural resources managers like Guam EPA, Department of Agriculture, Bureau of Statistics and Plans, etc. Section should be revised to include all local Agency and Departments.	The Navy is fully engaged with NMFS through an adaptive management program that allows the Navy and NMFS to reevaluate impacts on marine resources using new scientific findings. The adaptive management group only includes Navy and NMFS (Headquarters Marine Mammal Protection Act and Endangered Species Act) staff. The adaptive management program is an internal opportunity for Navy and NMFS to jointly review the preceding year's monitoring for a given range complex in the Pacific (including the Mariana Islands Range Complex) and see if monitoring priorities need adjusting. The results of the Navy's monitoring are posted annually and are available on the Navy's public website www.navymarinespeciesmonitoring.us.
GEPA-10	10. In the 2019 Supplemental MITT, Section 5.1.2.2.3 Incident Reports states that the Navy will submit annual reports to National Marine Fisheries Service (NMFS) that include any incidents that may affect shallow water coral reefs. They will also be reporting on any effects to Endangered Species Act (ESA) listed species. Do these ESA-listed species include the new ESA-listed corals? There needs to be a discussion on this topic.	Section 3.8.1.3 (Endangered Species Act-Listed Species) of this Supplemental EIS/OEIS includes the three coral species (*Acropora globiceps*, *A. retusa*, and *Seriatopora aculeata*) listed under the ESA occur in the Study Area. The Navy analyzed potential impacts on these species from proposed training and testing activities and will continue to comply with the Biological Opinion issued by NMFS.
GEPA-11	11. Any and all construction that is related to either the 2015 MITT or the 2019 Supplemental MITT must be permitted by the Guam Environmental Protection Agency (GEPA), and must therefore meet all relevant requirements of GEPA regulations. These include, but are not limited to, clearing and grading requirements as specified in the Guam Soil Erosion and Sediment Control Regulations (22 GAR Chapters 10 and 45) and the 2006 CNMI and Guam Stormwater Management Manual, as adopted through Executive Order 2012-02; groundwater development and protection require1nents as specified under the Water Resource Development and Operating Regulations (22 GAR Chapter 7), the Underground Injection Control Regulations (22 GAR Chapter 9), and the Guan1Water Quality Standards (22GAR Chapter 5); wastewater disposal requirements as specified under the Individual Wastewater Disposal Systems	The Navy analyzed land-based activities on Guam, Saipan, Tinian, and Rota in the 2015 MITT Final EIS/OEIS; the Navy did not reanalyze land-based activities in this Supplemental EIS/OEIS because no changes are proposed to those land-based activities. Tables 2.5-1 and 2.5-2 in Chapter 2 (Description of Proposed Action and Alternatives) present the current and proposed training and testing activities. The Proposed Action does not include construction activities.

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	Regulations (22 GAR Chapter 12), the Connection to Sewer Regulations (22 GAR Chapter 25), and the Guam Water Quality Standards (22 GAR Chapter 5); requirements pertaining to the design, construction, and operation as contained in the Guam Safe Drinking Water Regulations (22 GAR Chapter 6) the Water Resource Development and Operating Regulations, Part II: Guidelines for Water Works Development (22 GAR Chapter 7), and the Water and Wastewater Operator Certification Regulations (22 GAR Chapter 11	
GEPA-12	12. The 2019 MITT Supplemental states there have been no new information since the 2015 MITT. But the 2015 MITT identifies specific data gaps about the environmental impact of previously used ammunition and/or the degradation products on the marine ecosystems in that area. There needs to be a discussion on this topic.	See response GEPA-08 (to W.S. Leon Guerrero, Guam Environmental Protection Agency), regarding sediment and water quality.
Anthony T. Benavente, Secretary, CNMI Department of Lands and Natural Resources (CNMI DLNR)		
CNMI DLNR-01	The Commonwealth of the Northern Mariana Islands' (CNMI) Department of Lands and Natural Resources (DLNR) appreciates having the opportunity to share its concerns on the Draft Supplemental Environmental Impact Statement (DSEIS) on the Marianas Islands Training Testing (MITT) Activities proposed by United States Department of the Navy. Due to time constraints this review focuses on questions and comments regarding general concerns and suggested improvements for mitigation of anticipated impacts associated with the expanded timeline and scope of activities proposed in Preferred Alternatives 1 and 2 of the DSEIS. We lacked sufficient time to fully assess the background information and reports associated with this document. We also met with MITT representatives on March 18th' 2019. Several issues, including requests for background information, were brought up that required follow-up. We have yet to receive the promised information. DLNR submitted extensive comments during the previous MITT comment period in 2013. We were not satisfied with	The Navy provided background studies and reports to the CNMI Bureau of Military Affairs in early 2020. The Navy uses the best available science to support the impact analysis and conclusions. The most recent survey report is Carilli J, Smith SE, Marx Jr. D, Bolick L. 2018. Farallon de Medinilla 2017 Coral Reef Survey Report. This report has been added to the Final Supplemental EIS/OEIS. Data cited in this Supplemental EIS/OEIS is also available by request. In addition, while outside the current scope of this Supplemental EIS/OEIS, the military satisfies their Sikes Act obligations through the development and implementation of the Joint Region Marianas Integrated Natural Resource Management Plan (INRMP). The 2019 Joint Region Marianas INRMP includes monitoring programs throughout the Mariana Islands. The CNMI Department of Lands and Natural Resources, Division of Fish and Wildlife is a signatory and participating member to the 2019 Joint Region Marianas INRMP, which details natural resource management and monitoring programs. The Navy will continue to coordinate with the CNMI as part of

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	how our comments were addressed in the previous Record of Decision. We therefore have limited faith in this process. DLNR remains concerned regarding the significance criteria used in the DSEIS as well as the overall validity and credibility of the assessment of risk to marine and terrestrial environments and cultural and socioeconomic conditions, as well as compliance with the requirements of NEPA to ensure adequate identification and mitigation of significant impacts. The uses of terms like "slightly" are meaningless; these should be changed to percentage or some other measurable term. The DSEIS also repeatedly down-plays benefits of the No Action Alternative by the use of "not measurably improve" when previous statements indicate this is false. For example, without disturbance, birds on Farallon de Medinilla would change distribution and likely abundance; the DSEIS states that it would not measurably improve distribution and abundance. **General concerns.** Proposed activities will have significant impacts on the ecological, cultural, and socioeconomic resources of the CNMI and its surrounding waters. Some impacts, such as the degradation of landscapes, restriction of access to resource users, and the diminishment of cultural value are impossible to monitor, measure, mitigate, and recover. DLNR is particularly concerned about the cumulative impact of military build-up and training activities (including the MITT, MIRC, CJMT, Divert, etc.) will have in its jurisdiction. As a reminder, DLNR has management jurisdiction of the 0-3 nautical miles (nm) from the shoreline of the islands, as well as oversight over impacts to habitats and species of the CNMI. Any activities within 12nm should still be coordinated DLNR. This document mentions nothing regarding following CNMI laws, regulations, and permitting processes. General concerns for the MITT DSEIS include:	the INRMP implementation, which allows for data sharing between the Navy, Guam and the CNMI. The Navy has reviewed and incorporated the best available science to support the impact analysis and conclusions for the coral reef communities. The Navy is consulting with NMFS under the ESA and received a Biological Opinion. Mitigation measures and monitoring requirements specified in the Biological Opinion are presented in Chapter 5 (Mitigation). The Navy used the best available science and conducted a comprehensive review of past, present, and reasonably foreseeable actions to develop a robust analysis of cumulative impacts (Chapter 4, Cumulative Impacts). As required under NEPA, the level and scope of the analysis are commensurate with the potential impacts of the action as reflected in the resource-specific discussions in Chapter 3 (Affected Environment and Environmental Consequences). The Navy considered proposed and ongoing activities alongside with other activities in the region whose impacts are truly meaningful to the analysis. Furthermore, the entire Supplemental EIS/OEIS provides the cumulative impacts analysis, not just Chapter 4. Chapter 3 provides the current effects of past and present impacts and environmental conditions that represent the baseline of the environment as it is; Chapter 3 also discusses the consequences or potential future impacts from Navy activities. Chapter 4 discusses other reasonably foreseeable activities to the extent they are known and the incremental impact of the Navy's proposal when added to past, present, and future impacts.

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CNMI DLNR-02	DLNR and DFW, and our CNMI agency partners are rarely afforded the opportunity to conduct independent, third-party monitoring of the impact of ongoing military training activities, particularly those at sea and on remote northern islands in the archipelago. Studies relied on for the claim that live fire training on Farallon de Medinilla (FDM) do not appear to have been updated since 2016 and those annual surveys were limited in scope and appear to be lacking in scientifically rigorous data collection and analysis. There is also a lack of plant surveys. Active or 'live fire' areas do not preclude independent surveys as demonstrated by other military bases.	The Navy does not routinely allow independent, third-party access to live-fire ranges due to safety concerns. For Navy-funded and managed studies, the Navy will continue to communicate and coordinate with the CNMI government on future collaboration and information sharing. For instance, in Fiscal Year 2020, the Navy has authorized a CNMI biologist to observe FDM sea turtle surveys. The Navy has used the best available science that is reasonably attainable for the island used as a live-fire range. Plant communities are broadly described within Section 3.10 (Terrestrial Species and Habitats), along with an analysis of changes in the vegetation successional state as derived from recent and historical imagery. Focus surveys for plants on FDM is not feasible for a variety of safety reasons.
CNMI DLNR-03	Few data collected by Department of Defense (DOD) and its contractors in monitoring and mitigation activities associated with prior and ongoing training activities in the region are shared with DLNR despite repeated requests for sharing of raw data that is collected. Lack of data sharing and physical restrictions around FDM are preventing the CNMI from monitoring or measuring the impact of military activities in its territorial waters and terrestrial habitats. DLNR and DFW are also prevented from being able to model or predict the likely impact of DOD training activities in its jurisdiction.	The Navy does not routinely allow independent, third-party access to live-fire ranges due to safety concerns. For Navy-funded and managed studies, the Navy will continue to communicate and coordinate with the CNMI government on future collaboration and information sharing. As per CEQ regulations, the Navy uses in this Supplemental EIS/OEIS a number of sources of best available science and data, including external references (noted in each section of EIS/OEIS), technical documents (available on the MITT project website), and ongoing consultation processes with other agencies (NMFS and USFWS). Data is drawn and managed from multiple sources/points, including from the public during the NEPA process. Data are available in tables in this Supplemental EIS/OEIS and technical reports on the MITT project website. Best available peer-reviewed science/data can come from sources such as academia, consultations with other resource agencies, industry, and the public.
CNMI DLNR-04	DLNR and DFW are rarely invited to collaborate with DOD on the design, execution, and scientific review of monitoring activities. Recommendations that have been made in the Integrated Resource Management Planning process have not been implemented, and if monitoring is occurring, data has not been shared or included in the DSEIS.	Because FDM is an active range, it is not feasible to allow non-military personnel, including CNMI resource management agency representatives, on the island due to safety and special explosive ordnance disposal certification requirements. For Navy-funded and managed studies, the Navy will continue to communicate and coordinate with the CNMI government on future collaboration and information sharing. In addition,

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		pursuant to 40 C.F.R. 1502.6, the Navy will make available any underlying documents to the public upon request. Documents would be provided without charge to the extent practicable as some references require purchased access to the source sites. The Navy is committed to monitoring natural resources as described in the Final 2019 JRM INRMP. The INRMP, signed by CNMI Department of Lands and Natural Resources, Division of Fish and Wildlife, includes implementation procedures (Chapter 13). Monitoring efforts, as prescribed by the 2015 Biological Opinion, are ongoing (megapodes, habitat, fruit bats), and data is incorporated into the INRMP and the USFWS annual report.
CNMI DLNR-05	Military activities are stated as number of events per year but lack the spatial and temporal information to assess the actual impacts of the proposed activity. Without this information cumulative impact of training activities (ecological, cultural and/or socioeconomic) cannot be predicted or monitored. Additive/consecutive activities would instill a level of chronic environmental risk. There is no data to substantiate DOD claims regarding significance of impacts. The DSEIS ignores the environmental impacts of increased bombing activities in waters surrounding Farallon de Medinilla, specifically within the 3 nm permanent Restricted Area (R-7201). There is a strong likelihood that aberrant ordnance will adversely affect the surrounding coral reef and associated fauna (fish, sea turtles, and marine mammals) and in fact impacts to benthic habitat were observed in the Smith & Marx reports summarizing the surveys that were last conducted in 2012. When it is updated the revised EIS should provide an ordnance-specific probability estimation of land versus sea detonation based on known target success of the specific weapons applied as well as anticipated impacts of "new technologies" that will be used under this proposal.	The Navy's training and testing activities are based on emergent needs; as such, a conservative approach of analyzing the number of events per year was used to determine potential impacts. In addition, the Navy fully analyzed cumulative impacts through the regulatory processes for the Marine Mammal Protection Act (MMPA) and Endangered Species Act (ESA), administered by the National Marine Fisheries Service (NMFS). The Navy used the best available science and conducted a comprehensive review of past, present, and reasonably foreseeable actions to develop a robust analysis of cumulative impacts (Chapter 4, Cumulative Impacts). As required under NEPA, the level and scope of the analysis are commensurate with the potential impacts of the action as reflected in the resource-specific discussions in Chapter 3 (Affected Environment and Environmental Consequences). The Navy considered proposed and ongoing activities alongside other activities in the region whose impacts are truly meaningful to the analysis. Furthermore, the entire Supplemental EIS/OEIS provides the cumulative impacts analysis, not just Chapter 4. Chapter 3 provides the current effects of past and present impacts and environmental conditions that represent the baseline of the environment as it is; Chapter 3 also discusses the consequences or potential future

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		impacts from Navy activities. Chapter 4 discusses other reasonably foreseeable activities to the extent they are known and the incremental impact of the Navy's proposal when added to past, present, and future impacts. In the section 7 ESA consultations between the Navy and NMFS pertaining to military training activities occurring on FDM, the Navy estimated miss rates for different ordnance classifications. These rates are included in Table 60 of the 2017 NMFS Biological Opinion. Based on these miss rates, potential impacts on nearshore habitats were analyzed accordingly. NMFS used these estimations to base effects determinations on potential colonies of ESA-listed *Acropora globiceps*. In support of the Navy's preferred alternative (Alternative 2) described in this Supplemental EIS/OEIS, the Navy and NMFS entered into consultation pursuant with section 7 of the ESA. During this consultation, the Navy and NMFS used the same methods to estimate miss rates and impact footprints in the nearshore environments. Based on this analysis, revising the impact conclusions included in the 2015 MITT Final EIS/OEIS was not warranted in relation to nearshore impacts on coralline environments, including species-specific effects on ESA-listed species. FDM will continue to be operated in accordance with the terms and conditions specified in the 2015 Biological Opinion (U.S. Fish and Wildlife Service, 2015). The impact assessment for nearshore waters surrounding FDM does consider long-term negative impacts. The Navy, based on multi-year dive surveys conducted since 1999, with the most recent dive survey available from 2017, agrees that nearshore impacts can occur from errant ordnance targeted at FDM; however, these impacts are short-term and localized, with no evidence of coral reef impacts from sedimentation and associated fauna. The Navy is consulting with NMFS on the impact of training activities on ESA-listed corals at FDM and will implement terms and conditions of the NMFS BO.

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CNMI DLNR-06	There are few detailed maps showing coral habitat for Farallon de Medinilla (contrast Section 3.3-11 to the maps provided for Tinian in Section 3.3-12). Military-funded surveys have been performed on Farallon de Medinilla in the past, and data from these surveys should be incorporated on the standard series of maps.	The Navy has added an updated map for habitats around FDM to the Final Supplemental EIS/OEIS, which includes coral cover from the latest coral reef surveys.
CNMI DLNR-07	The real ecological impact of proposed activities will be observed and described by DOD affiliated observers. Such observers have the potential to underreport or report with bias the impact of activities. The proposal does not provide for independent assessment of the impact of proposed military activities.	Whenever possible, the Navy will continue to work with local partners in Guam and the CNMI to engage in collaborative research efforts. This collaboration is limited, however, by safety and liability concerns, restricting access by third parties to live-fire ranges. Because FDM is an active range, it is not feasible to allow non-military personnel, including CNMI resource management agency representatives, on the island or within the restricted area of 3 NM due to safety and special explosive ordnance disposal certification requirements. The Navy provides survey information to CNMI resource management agencies as it becomes available and coordinates the best method for providing access to that data. In addition, pursuant to 40 CFR 1502.6, the Navy will make available any underlying documents to the public upon request. Documents would be provided without charge to the extent practicable as some references require purchased access to the source sites. For Navy-funded and managed studies, the Navy will continue to communicate and coordinate with the CNMI government on future collaboration and information sharing.
CNMI DLNR-08	Subsurface activities, including sonar use, and ordnance detonation on or near seamounts will have significant impacts on marine habitats and animal populations, including cetaceans, fish, and marine invertebrates.	The Navy is aware of the mapped seamounts in the Study Area. Mitigation measures associated with the use of sonar and explosives are presented in Section 5.3 (At-Sea Procedural Mitigation to be Implemented) and implemented as appropriate wherever the military trains and tests, including in areas where seamounts may be present. Mitigation areas for sea floor resources are presented in Section 5.4.1 (Mitigation Areas for Seafloor Resources). Chapter 5 (Mitigation) presents details of all mitigation measures, including listing the resource protection focus.
CNMI DLNR-09	There is limited knowledge of population structure of marine mammal and their spatial/habitat use for the CNMI and are used by MITT. We strongly suggest additional research be conducted to	The Navy has funded numerous marine mammal and sea turtle surveys in the Study Area, including in the CNMI. Additional surveys are ongoing, and the Navy plans to continue supporting marine species surveys in the future

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	better inform future assessments. The raw data should be made available to resource agencies immediately, followed by actively sharing any products/papers produced. If security clearances or guidelines are needed the military should collaborate with CNMI to ensure this occurs.	(often conducted by NOAA personnel). The Navy's marine species monitoring program website, www.navymarinespeciesmonitoring.us, is available to the public and provides post-survey monitoring reports with tables listing species sighted during the respective surveys. As per CEQ regulations, the Navy uses a number of sources of best available science and data in this Supplemental EIS/OEIS, including external references (noted in tables in each section of this Supplemental EIS/OEIS), technical documents (available on the MITT project website), and ongoing consultation processes with other agencies (NMFS and USFWS). Data is drawn and managed from multiple sources/points, including from the public during the NEPA process. Data are available in tables in this Supplemental EIS/OEIS and technical reports on the MITT project website. Best available peer-reviewed science/data can come from sources such as academia, consultations with other resource agencies, industry, and the public. For Navy-funded and managed studies, the Navy will continue to communicate and coordinate with the CNMI government on future collaboration and information sharing.
CNMI DLNR-10	The proposed activities will increase debris and entanglement issues; we recommend beach and ocean clean-up effort be conducted and the collection of materials post-activities. For example, all products and materials from parachute insertions should be collected during or just after the activity.	The Navy strives to recover materials used in training and testing, including parachutes, to the maximum extent practicable. Parachutes used as part of insertion activities are recovered by trainees following insertion. Some items are not intended to be recovered, cannot practicably and safely be recovered, and would therefore remain in the marine environment (see Table 3.0-18). The vast majority of this material would sink and is expected to remain in place on the seafloor, and therefore would not migrate to the nearshore habitat areas. This Supplemental EIS/OEIS includes an analysis of military expended material, including parachutes as part of the stressor analysis within this Supplemental EIS/OEIS. The Navy supports coastal cleanup efforts in the Tinian Military Lease Area to protect sea turtle nesting habitat.

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CNMI DLNR-11	We are concerned about the increase in higher explosive rate bins, which have greater environmental impacts and do not believe the increase in bins E8-10 are off-set by the lower occurrence of bins EI 1-12 (Table 2.4.3.2) All detonations (underwater or subsurface) have the potential to harm marine species and habitat. Thus, we are concerned by the increased occurrence proposed within MITT alternates, particularly Alternative 2.	As part of the 2015 MITT Final EIS/OEIS and 2015 MMPA Letter of Authorization, NMFS authorized the Navy to use impulsive sources (i.e., explosives). Similar to non-impulsive sources, the Navy sorted explosive sources into bins based on the net explosive weight of the explosive. After analyzing the level of explosive activities conducted during Phase II, the Navy identified that some explosive sources were incorrectly classed into bins with greater net explosive weights than actually is present in the munition. The Draft Supplemental EIS/OEIS analysis specifically looked at the potential impacts from the use of explosives, considering each bin and the number and location of activities associated with each bin (see Section 2.4.3.2, Explosives Use). Figures 2.4-2 and Figure 2.4-3 present a comparison of the proposed annual explosives use for this Supplemental EIS/OEIS and the 2015 MITT Final EIS/OEIS. As stated in Section 5.5.2.2.1 (Methods for Analyzing Impacts from Explosives) of the Draft Supplemental EIS/OEIS, the derivation of the explosive injury criteria is provided in the technical report titled Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III). This report was provided as supporting documentation to the Draft Supplemental EIS/OEIS.
CNMI DLNR-12	The use of unmanned vehicles for training offers an excellent opportunity to collect research data while training personnel. We strongly recommend working with researchers from government and state agencies as well as university professors to design scientifically rigorous studies, collect data in a meaningful way, and share raw data. Again, if security clearances or guidelines are needed, the military should collaborate to ensure this occurs.	The use of unmanned vehicles to satisfy training readiness requirements and collaboration is not feasible. The request for data sharing is addressed above.
CNMI DLNR-13	Behavioral changes in marine species are looked at as a negligible effect within the EIS, which is inappropriate. Behavioral changes are energetically costly, and can change access to food resources, predation rates and cause added stress in an already stressed environment; thus, behavioral changes can cause population effect and should be viewed as significant.	The Navy analyzed the potential for marine species to be affected by proposed testing and training activities, including the potential for behavioral responses. The analysis and consultation with NMFS indicated that temporally and spatially isolated explosions do not rise to the level of "harassment" under the MMPA for military readiness activities. The Navy

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		has been monitoring detonations since the 1990s and has not observed the types of reactions noted in the comment. TTS and all other higher order impacts are assessed for all training and testing events that involve the use of explosives or explosive ordnance. All Navy monitoring projects, reports and publications are available on the marine species monitoring webpage www.navymarinespeciesmonitoring.us. The Navy will continue to submit the appropriate reports on incidents involving ESA-listed species to NMFS immediately or as soon as operational security considerations allow. Reports will be made if the Navy observes the following that could be attributable to Navy activities: (1) a vessel strike of a marine mammal or sea turtle during training or testing; (2) a stranded, injured, or dead marine mammal or sea turtle during training or testing; or (3) an injured or dead marine mammal, sea turtle, or ESA-listed fish species during post-explosive event monitoring. Behavioral responses by marine mammals and sea turtles are predicted by the Navy's acoustic effects model. Research cited in this Supplemental EIS/OEIS and in the 2015 MITT Final EIS/OEIS indicates that behavioral responses by marine mammals exposed to underwater sound vary from no response to an immediate change in behavior (e.g., change in swimming direction). Behavioral changes are temporary and not necessarily repeated. Unlike noise associated with commercial shipping, for example, sound sources used by the military do not continuously produce sound. Given the range of possible responses and variability in the type and severity of behavioral responses observed in marine mammals, potential long-term or population level impacts are speculative. The Navy has addressed recent research on possible long-term effects in Section 3.4.2.1.1.7 (Long-Term Consequences) in this Supplemental EIS/OEIS and in Section 3.4.3.1.3 (Long-Term Consequences to the Individual and the Population) in the 2015 MITT Final EIS/OEIS. The Navy funds research on marine mammal responses to underwater sound, including sonar (e.g., Goldbogen et al. 2013), and has funded marine

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		mammal surveys in the MITT Study Area (e.g., Fulling et al. 2011). For additional discussion on the potential effects of stressors on marine mammals, refer to Sections 3.4.1.7 (General Threats), 3.4.2.1.1.3 (Physiological Stress), and 3.4.2.1.1.5 (Behavioral Reactions).
CNMI DLNR-14	New endangered species have been listed within the CNMI since the 2015 MITT. Have impacts to these species been assessed?	The Navy has reviewed and incorporated the best available science on endangered species, including newly listed species, in this Supplemental EIS/OEIS (Sections 3.4, Marine Mammals; 3.5, Sea Turtles; 3.6, Marine Birds; 3.8, Marine Invertebrates; and 3.9, Fishes).
CNMI DLNR-15	It is unclear when/if Alternative 2 activities would be implemented and why the additional munitions use is needed.	The Navy updated the Final Supplemental EIS/OEIS to reflect Alternative 2 as the Preferred Alternative. Alternative 2 allows for the greatest flexibility for the Navy to maintain readiness when considering potential changes in the national security environment, fluctuations in training and deployment schedules, and anticipated in-theater demands. Alternative 2 was used to inform the MMP and ESA consultations; however, the final decision on an alternative will be completed within the ROD. The alternatives carried forward were developed to meet the Navy's purpose and need and to ensure it can fulfill its obligation under Title 10 of the U.S. Code. See Section 2.4 (Action Alternatives Development) for more detailed information on the development of alternatives.
	DSEIS did not consider a "no change in current training levels" alternative. This is a major issue with this EIS. It offers a "no training" alternative, but even this involves a substantial change from current practices, and any reasonable person is going to understand that the military needs to conduct some level of training to maintain readiness. A "no change from current" alternative should have been presented; instead they only offered no training (which we know is a non-starter) vs. two increase in training alternatives.	In previous environmental impact analyses for at-sea training and testing activities in the MIRC, a "no change in current training and testing levels," or "the status quo," was presented as the No Action Alternative. However, as per guidance from NMFS to support their regulatory process, this Supplemental EIS/OEIS presents the No Action Alternative as a scenario where no authorizations or permits are issued and the Navy's training and testing activities do not take place. However, Section 2.4.1 (Alternatives Eliminated from Further Consideration) in the Final Supplemental EIS/OEIS has been expanded to include a Continuing Action Alternative. This alternative includes no change to the training and testing activities as approved in the 2015 MITT Final EIS/OEIS and consultation with NMFS under the MMPA. The Navy determined this alternative did not meet the purpose of and need for the Proposed Action or its obligation under Title

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		10 of the U.S. Code, and therefore was not carried forward for detailed analysis. In the Final Supplemental EIS/OEIS, the Navy presents information on proposed training and testing activities as compared to current ongoing (baseline) activities. Please see Section 2.3 (Proposed Activities) and Tables 2.5-1 and 2.5-2 for more detail about proposed changes in training and testing activities compared to current levels.
CNMI DLNR-16	Figures 2.4-2 and 2.4-3 illustrate the current and proposed annual use of underwater explosives. However, the DSEIS does not provide a similar comparison for the use of explosives in the air. This oversight needs to be addressed.	Tables 2.5-1 and 2.5-2 in Chapter 2 (Description of Proposed Action and Alternatives) present the current and proposed training and testing activities. The tables present the difference in the number of events and ordnance per year included in Alternative 1 and 2 of this Supplemental EIS/OEIS and the 2015 MITT Final EIS/OEIS. Explosives that are detonated 10 m above the surface of the water are not considered for modeling because the explosion does not result in underwater noise where marine mammals are present. Given marine mammals do not spend considerable time in air, there is no need to consider in-air detonations in the modeling (NAEMO), and a comparison similar to Figures 2.4-2 and 2.4-3 is not available.
CNMI DLNR-17	**Marine Mammals.** Numerous species of marine mammals (26+ spp., 5 Endangered) utilize the nearshore and offshore waters of the CNMI. Although most activities will be performed in excess of 12 run off shore, there are some concerns about the impact of acoustic activities and submarine explosives on local populations. These include: • The DSEIS has good descriptions of existing threats to species, but they should be used as a baseline for the assessment of added stress of Navy activities, not as permission or an excuse to conduct current activities or a justification that the additional impacts of these activities will have no significant effects.	Discussion of existing threats on marine mammals, for example Section 3.4.1.7 (General Threats), as well as threats to other marine species are a component of the affected environment and are described to put the proposed Navy training and testing activities in context. The Navy acknowledges in this Supplemental EIS/OEIS that the proposed training and testing activities have the potential to affect marine species. The Navy's acoustic effects model predicts impacts from acoustic stressors (e.g., sonar) on marine mammals and sea turtles. While stressors from Navy activities would contribute to other natural and anthropogenic stressors encountered regularly by marine species in the affected environment (e.g., commercial vessel traffic, fisheries, natural fluctuations in prey availability), their impact would be minimal in comparison. For

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	• In general, the DSEIS documents that increased activity in an area negatively affect marine mammals. Whether it is based on explosives, noise, sonar, or the vessel itself does not matter as the net effect is the same. Marine mammals demonstrated stronger responses in areas of lower traffic like the MITT area (Bejder et al. 2006). These impacts should be properly documented and mitigated. Mitigation measures might include changes in timing of activities to avoid seasonal presence of species, or creation of additional areas where activities are reduce/restricted due to high wildlife densities.	example, Navy vessel traffic is much lower than commercial and recreational vessel traffic entering and leaving Guam. The Navy developed two geographic mitigation areas off of Saipan and a third off of Guam (see Appendix I, Geographic Mitigation Assessment) as areas where the use of explosives is prohibited and the use of sonar requires additional reporting. The Navy developed these mitigation areas to further avoid or reduce potential impacts on marine mammals and sea turtles from explosives.
CNMI DLNR-17	• Genetic studies should be funded to conduct stock assessments within the MITT area to further assess, monitor, and mitigate impacts.	The Navy provides funding for marine mammal and sea turtles surveys in the Study Area. The results of these surveys become available either through government reports or scientific publications. The National Marine Fisheries Service is frequently involved in Navy-funded surveys, has access to these results, and is the organization responsible for conducting marine mammal stock assessments.
CNMI DLNR-18	• What is the area of impacts modeling (0-12nm or for whole EEZ)? It appears the whole EEZ is not being assessed, just l 2nm, and if that is the case, the EIS needs to assess direct, indirect, and cumulative effects throughout the whole nearly 1,000,000 nm range.	Modeling areas are not limited to 12 NM from shore and include areas throughout the U.S. EEZ as well as beyond the EEZ.
CNMI DLNR-19	• The DSEIS states activities present a low risk of entanglement however a drifting parachute would pose a significant risk to marine mammals, which may ingest or feed in proximity to the object and become entangled. Subsurface sink rates are unknown. The larger un-weighted parachutes are of particularly concern for covering bottom substrate, sea turtles, and marine mammals.	As described in Section 2.3.3 (Standard Operating Procedures) of this Supplemental EIS/OEIS, during activities that involve recoverable targets, such as aerial drones, the military recovers the target and any associated decelerators/parachutes to the maximum extent practical consistent with personnel and equipment safety. This standard operating procedure benefits biological resources, including marine mammals, sea turtles, seafloor resources, by reducing the potential for physical disturbance and strike, entanglement, or ingestion of applicable targets and any associated decelerators/parachutes. Section 3.4 (Marine Mammals) of this Supplemental EIS/OEIS includes analysis of entanglement stressors to marine mammals.

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CNMI DLNR-20	• With all of the surveys conducted, why are there not better density and distribution maps? More information should be collected on these surveys.	Spatially explicit density estimates require a substantial amount of sighting data collected from systematic surveys. While there have been numerous non-systematic small boat surveys around the islands, the 2007 comprehensive systematic marine mammal and sea turtle survey of waters off Guam and the Commonwealth of the Northern Mariana Islands has been the only survey to date having sighting rates or numbers that were high enough to calculate densities for marine mammals in the area. In addition to visual survey data, a habitat model based on acoustic data collected during the 2007 survey was developed for sperm whales, and that has provided spatially explicit density predictions for this species. The Navy will continue to fund marine mammal surveys in the Marianas, and future surveys and research may identify key information of biological importance to further inform density and distribution maps. Based on the analysis presented in this Supplemental EIS/OEIS and using the best available data, surveys or additional research are not required in order for the Navy to comply with NEPA.
CNMI DLNR-21	• Use of sonar, underwater explosives, and other acoustic devices will have an adverse impact on whales and dolphins, especially residential Culver's beaked whales which have shown mortality, injury, and evasion in response to Navy acoustic activities. Robust distribution studies should be conducted to identify areas where activities can be conducted that will not impact feeding, breeding, and migratory routes.	Information about the quantitative analysis is described in detail in the 2018 technical report *Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing*. The Navy's acoustic and explosive effects analysis looks at multiple factors such as marine mammal abundance across the study area in each season, the levels of sound that may cause certain effects, and the Navy's proposed time and space use of noise-producing activities. As discussed in this Supplemental Draft EIS/OEIS in Sections 3.4.2.1 (Acoustic Stressors) and 3.4.2.2 (Explosive Stressors), a few instances of take per year are not enough to cause long-term consequences for individuals. Regarding additional studies on the distribution of marine species, the Navy is fully engaged with NMFS through an adaptive management program that allows the Navy and NMFS to reevaluate impacts on marine resources using new scientific findings and to focus research funding where it is most needed. The results from Navy-funded research are

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		posted annually and are available on the Navy's public website www.navymarinespeciesmonitoring.us. The Navy will also continue to communicate and coordinate with the CNMI government on future collaboration and information sharing as has been occurring. As presented in Appendix I (Acoustics and Explosives Primer) of the 2015 Final MITT EIS/OEIS, the Navy has already used Navy-funded monitoring results to identify areas that can be avoided to avoid or reduce impacts on marine species, such as breeding humpback whales, and will integrate new and emergent data as appropriate in the future.
CNMI DLNR-22	• Despite numerous examples of harassment given in the DSEIS, it states that it is not possible to ascertain the true significance of the majority of the observed reactions (3.4-97-98). Regardless of whether the experimental design mimics Navy activities, studies show "harassment" and "take" with sonar sound and vessels. Therefore, there is no basis to say impacts are no significant. • The DSEIS notes numerous examples of know sonar effects but discounts or minimizes known responses. There are also contradictions within the report; for example in one area states "no significant behavioural responses" despite the previous section clearly stating that "sonar use during exercises involving the U.S. Navy has been identified as a contributing cause or factor in five specific mass stranding events: Greece in 1996; the Bahamas in March 2000; Madeira Island, Portugal in 2000; the Canary Islands in 2002, and Spain in 2006 (Cox et al., 2006; Fernandez, 2006; U.S. Department of the Navy, 2017c)" (3.4-86).	As discussed in Section 3.4.2.1.2.1 (Methods for Analyzing Impacts from Sonar and Other Transducers), although it was not possible to ascertain the true significance of the majority of the observed reactions in the research used to derive the behavioral response functions, the Navy assumed that most reactions that lasted for the duration of the sound exposure or longer were significant. Potential impacts on marine mammals from sonar sources, which are part of the Proposed Action, are analyzed in Section 3.4.2.1 (Acoustic Stressors). The behavioral response functions were used in the analysis of impacts in this Supplemental EIS/OEIS to estimate the number of significant behavioral responses due to exposure to sonar sounds. It is not clear if all of these estimated responses would rise to the level of take under military readiness; however, the Navy applies for Level B take under MMPA for all of these estimated behavioral impacts. The statement "no significant behavioral responses" is in reference only to observations made "during monitoring of actual training exercises." While exact causes of strandings are uncertain, scientists have identified potential contributing factors for strandings including age, illness, or disease; ingestion of marine debris/plastics; contaminant load; and manmade sources. A small number of strandings have been associated with the use of U.S. Navy sonar; none of these have occurred in the Study Area. Information on strandings associated with Navy training and testing

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		activities is provided in the 2017 technical report, "Marine Mammal Strandings Associated with United States Navy Sonar Activities." NMFS, as the regulator, maintains the authoritative National Stranding Database. The Center for Naval Analysis (CNA) recently conducted a statistical study of correlation of beaked whale strandings around the Mariana Islands with the use of U.S. Navy sonar, finding that insufficient evidence of a correlation exists. The CNA study used the complete record of all U.S. Navy sonar use between 2007 and 2019, including major training events, joint exercises, and unit level training/testing. The analysis also included the complete beaked whale stranding record for the Mariana Islands through 2019. Following the methods in Simonis et al. (2020), the CNA analysis found insufficient evidence of a correlation between sonar use and beaked whale strandings when considering the complete sonar use record. The CNA finding is in contrast to the finding in Simonis et al. (2020), which depicted a significant correlation between beaked whale strandings and Navy sonar use. However, the Simonis et al. (2020) result relied on substantially incomplete or inaccurate assumptions about U.S. Navy sonar use around the Mariana Islands. CNA also conducted statistical analyses specific to each island where beaked whale strandings have been observed in the Mariana Islands, similarly finding insufficient evidence of a correlation to sonar use. Additional information on the findings of the CNA analysis are presented in Section 3.4.2.1.1.6 (Stranding) in Chapter 3.4 (Marine Mammals). As described in Section 5.1.2.2.1 (Marine Species Research and Monitoring Programs), for this Final Supplemental EIS/OEIS, the Navy agreed to several additional research and monitoring initiatives designed to help advance the understanding of beaked whales and strandings in the MITT Study Area. The Navy will co-fund the Pacific Marine Assessment Program for Protected Species (PACMAPPS) Mariana Islands survey in spring-summer 2021 and future studies starting in 2022 to help document beaked whale occurrence, abundance, and distribution in the Mariana Islands. The Navy will also fund additional stranding response and

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		necropsy analyses for the Pacific Islands region, and research on a framework to improve statistical stranding analysis. Collaboratively with NMFS, the Navy will fund and organize an expert panel to provide recommendations on scientific data gaps and uncertainties for further protective measure consideration to minimize potential impacts of Navy training and testing activities on beaked whales in the Mariana Islands.
CNMI DLNR-22	• Please clarify what "potentially significant behavioural responses" means in Table 3.4. How is the assessed?	Based on the context of the comment, we assume the commenter is referring to Table 3.4-10. In this context, potentially significant means that the behavioral response from an individual marine mammal can vary from avoidance of the sound source to halting a biologically significant behavior such as feeding.
CNMI DLNR-23	• Please clarify figures 3.4-11 through 62 as they are not well explained and they do not indicate the number of "takes" which would be helpful. Also Figures 3.4-13, 17, 23, 24, etc. have panels representing more than 100%. Updates should ensure figures used are clear and that totals are properly calculated to further support assessment and impact mitigation.	The estimated number of impacts were included on the lower bar plot. Some figures had activity types or regions that added up to greater than 100 percent due to rounding errors. Updates to enhance readability were included in this Supplemental EIS/OEIS.
CNMI DLNR-24	• The only marine mammal species, Kogia whales, to experience permanent threshold shifts are the same species that have longer dive durations than the 30-minute wait period proposed as mitigation if a whale is spotted. In areas with pygmy and dwarf sperm whales, mitigation times should meet or exceed the average dive time for these sensitive species.	The Navy determined that a 30-min. wait period is the maximum practical wait time to implement during activities involving vessels and aircraft that are not typically fuel constrained. This allows the activities to continue meeting their intended objectives for the reasons described in Section 5.2.4.2 (Factors Affecting Practicality) of this Supplemental EIS/OEIS.
CNMI DLNR-25	**Sea Turtles.** • Chapter 3.0.1.22 mentions that the effects on sea turtles were assessed by fish experts. This data/information should be reviewed by sea turtle experts.	The text cited from Section 3.0.1.2 (Navy's Quantitative Analysis to Determine Impacts on Sea Turtles and Marine Mammals) is a typo and has been corrected. The data/information has been reviewed by sea turtle subject matter experts.
CNMI DLNR-26	• We are concerned about the increase in small joint coordinated ASW and increases in insertion/extraction activities as increased use of beach and nearshore waters have a high likelihood of impacting sea turtles. Increased beach use is a concern for nesting sea turtles. As was discussed in the prior	The Navy is not proposing to change land-based activities, except at FDM. There would be no increase in the use of beaches under the Proposed Action. Small joint coordinated ASW in Table 2.5-1 was not previously called out in the 2015 MITT Final EIS/OEIS, because components of the exercise were covered under several unit-level activities. However, the training activity is now listed individually in this Supplemental EIS/OEIS.

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	MITT comments from CNMI, compaction of sandy beaches should be avoided to protect turtle nesting habitats. • We oppose any use of vehicles on the beach as it negatively affects sea turtles. If vehicle use on beaches is deemed necessary, then nightly surveys for nesting sea turtles should be conducted year-round to identify and mark nests. These nests should be marked with GPS and monitored with a buffer placed around them, and should be avoided until after hatching.	Table 2.5-1 of the MITT Final Supplemental EIS/OEIS has been updated to reflect that there would be no increase in amphibious assault training. The Navy is implementing conservation measures in the USFWS Pacific Islands Fish and Wildlife Office's 2015 Biological Opinion.
CNMI DLNR-27	• We are concerned about the level of nearshore, beach, and littoral explosions as these impact sea turtles and sea turtle habitat. Studies have shown that sea turtles use nearshore waters for foraging and reproduction making them vulnerable to disturbance in this area. • How many near shore explosives will be used? This area has higher densities of sea turtles increasing the risk of injury and mortalities as well as increasing habitat damage.	The Navy does not conduct nor is proposing to conduct nearshore, beach, and littoral explosions in the CNMI.
CNMI DLNR-28	• Peak Pressure and SEL Based Ranges to TTS and PTS for Sea Turtles Exposed to Explosives often exceed observable distances. Mitigation measures should be re-assessed.	The mitigation zones for explosives extend beyond the average ranges to mortality, PTS, and TTS for sea turtles for the largest bin used in each activity. As described throughout Chapter 5 (Mitigation), the Navy's mitigation zones developed for this Supplemental EIS/OEIS are based on the largest areas within which it is practical for the Navy to implement mitigation during training and testing within the Study Area. Increasing the mitigation zone sizes would be impractical for the reasons described for each mitigation category (see Chapter 5, Mitigation).
CNMI DLNR-29	• The DSEIS, assuming only land strikes of ordnance, ignores the potential impact of aberrant ordnance on pelagic sea turtles around Farallon de Medinilla. Green (threatened), hawksbill (endangered), loggerhead (endangered), olive Ridley (threatened), and leatherback sea turtles (endangered) utilize nearshore habitats and reef sites as a refuge from predators and for grazing and reproduction. The sparse available habitat for such activities across the CNMI underscores the ecological significance of each island unit. Although the DSEIS indicates a	The Navy recognizes that sea turtles, particularly green sea turtles, use the surrounding shelf habitats of FDM for resting and foraging. Further, the Navy's Supplemental EIS/OEIS does consider errant targeting within impact areas on FDM. It should be noted that mitigation measures in Section 5.5.1 (Farallon de Medinilla) of this Supplemental EIS/OEIS specific to targeting restrictions are expected to reduce the potential for errant munitions to impact sea turtles. The Navy is consulting with NMFS for ESA-listed species and will implement conservation measures.

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	lower abundance of sea turtles around Farallon de Medinilla relative to other islands, this does not preclude Farallon de Medinilla's importance as critical habitat, nor establish that impacts to this habitat range would be less than significant.	
CNMI DLNR-30	• The DSEIS states a low risk of entanglement however a drifting parachute would pose a significant risk to sea turtles, which may ingest or feed in proximity to the object and become entangled. Subsurface sink rates are unknown. The larger un-weighted parachutes are of particularly concern for covering bottom substrate, sea turtles, and marine mammals.	The Navy acknowledges the risk for sea turtles to become entangled, particularly while at the surface. The potential for a sea turtle to encounter an expended decelerator/parachute at the surface or in the water column is extremely low, and is even less probable at the seafloor, given the general improbability of a sea turtle being near the deployed decelerator/parachute, as well as the general behavior of sea turtles. As described in Section 2.3.3 (Standard Operating Procedures) of this Supplemental EIS/OEIS, during activities that involve recoverable targets (e.g., aerial drones), the military recovers the target and any associated decelerators/parachutes to the maximum extent practical consistent with personnel and equipment safety.
CNMI DLNR-31	• Active low frequency acoustic sources such as the active sonar used by anti-submarine warfare sonars associated with the Littoral Combat Ship, the impact of non-explosive munitions, large vessel ship-radiated noise, and explosive devices emanating frequencies in the range of 300-400 Hz would impact the hearing of sea turtles. If their hearing is compromised, then their ability to navigate and detect predators (the latter is probably the more salient function of hearing in sea turtles) would be negatively affected. This is a significant impact that should be addressed, and mitigation should be proposed.	As described throughout Chapter 5 (Mitigation), the Navy will implement mitigation measures to avoid or reduce potential impacts from active sonar, explosives, and physical disturbance and strike stressors (e.g., vessel movement, non-explosive practice munitions) on sea turtles. For example, procedural mitigation measures for sonar and explosives include a power down or shut down (i.e., power off) of applicable active sonar sources and ceasing detonations when a sea turtle is observed in a mitigation zone. The mitigation zones for active sonar extend beyond the ranges to PTS and TTS for sea turtles. The mitigation zones for explosives extend beyond the average ranges to PTS, and beyond or into a portion of the average ranges to TTS for sea turtles. Therefore, mitigation will help avoid or reduce the potential for exposure to these effects for sea turtles. The Navy is consulting with NMFS as required by section 7(a)(2) of the ESA regarding active sonar, explosives, and physical disturbance and strike stressors on sea turtles. Analyses of potential impacts on sea turtles from

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		all relevant stressors were included in the Navy's biological assessment and are included in the Final Supplemental EIS/OEIS.
CNMI DLNR-32	• Activities such as ship movement, munitions use, and the use of active low frequency acoustical devices in areas where marine downwelling gathers and aligns buoyant material (including dispersed food resources in surface waters) would affect sea turtles that congregate at these convergences in their pelagic stage. These areas should be avoided.	While marine downwelling events can loosely combine materials floating on the surface in convergence zones including planktonic prey, these events are often short-lived in both time and space and would not consistently combine sea turtle prey or be in locations where sea turtles typically occur. Most military training and testing activities using munitions and sonar and other transducers occur at least 3 NM and often farther then 12 NM from shore (with the exception of activities at FDM) reducing the potential for sea turtles to be present where military training and testing activities occur. As noted above, the occurrence in space and time of oceanographic convergence zones is difficult to predict, and no particular area, even an area with somewhat persistent downwelling, could be considered biologically important for a particular behavior (e.g., foraging), as described in Appendix I (Geographic Mitigation Areas).
CNMI DLNR-33	• Proposed monitoring and surveillance of sea turtle nesting activity (including nest locations) is insufficient to identify fresh nests and body pits. Daily monitoring before and constant monitoring during military exercises and beach use are required to adequately reduce impact of amphibious training activities. Monitoring by an independent (i.e. not employed or contracted by the Department of Defense) party specially trained in sea turtle nest location is necessary to provide objective and non-biased assessments of the effect of military activities on sea turtle nesting success and behavior.	The Navy analyzed land-based activities on Guam, Saipan, Tinian, and Rota in the 2015 MITT Final EIS/OEIS; the Navy did not reanalyze land-based activities in this Supplemental EIS/OEIS because no changes are proposed to those land-based activities. The Navy is continuing to implement the standard operating procedures and mitigation/conservation measures included in the 2015 MITT Final EIS/OEIS and the USFWS Pacific Islands Fish and Wildlife Office's 2015 Biological Opinion.
CNMI DLNR-33	**Sediment and water quality/habitat impacts.** • In Table ES.6-1it states "Qualitative observations of nearshore waters of Farallon de Medinilla during multi-year dive surveys included observations of generally good water quality. There was little evidence of military impacts on benthic sediments and substrates observed during the dive surveys, and, where noted, impacts were localized and shown to recover during subsequent dive surveys". Are these observations from an	In 2017, the Navy funded additional surveys in the nearshore areas of FDM. Surveys were conducted by Space and Naval Warfare Systems Center Pacific, Scientific Diving Services. The results are available at: https://apps.dtic.mil/dtic/tr/fulltext/u2/1069450.pdf. The 2017 survey found little evidence that training has affected coral communities at FDM. Only three relatively new ordnance items were observed, but no blast pits, craters, or significant areas of coral breakage were observed. The ordnance observed during the 2017 survey was almost exclusively old and

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	independent scientific study? What were the baselines? Please provide raw data to DLNR.	encrusted in marine life, and was not having any discernable impact on surrounding communities. The Navy updated the MITT Final Supplemental EIS/OEIS to include the results of the 2017 survey as presented in Carilli et al (2018). The report information has been added to Section 3.1 (Sediments and Water Quality) and Section 3.8 (Marine Invertebrates). Specific text on impacts on Farallon de Medinilla is available in Section 3.1.3.1.5.3 (Farallon de Medinilla Specific Impacts) in the 2015 MITT Final EIS/OEIS, and Section 3.1 (Sediments and Water Quality) and Section 3.8 (Marine Invertebrates) of this Supplemental EIS/OEIS. This Supplemental EIS/OEIS and 2015 MITT Final EIS/OEIS also include information from surveys conducted prior to 2017. Surveys performed by Naval Facilities Engineering Command and the Navy's Expeditionary Warfare Center's Scientific Diving Services between 1997 and 2012 (Smith and Marx, 2016) documented direct ordnance impacts on the submerged physical environment, which were clearly attributable to training activities and detected in dive surveys conducted in 2007, 2008, 2010, and 2012. Indirect impacts, such as ordnance that skipped or eroded off the island and rock and ordnance fragments going off the island, were detected every year. However, natural phenomena such as typhoons, tropical storms, large wave events, tsunamis/micro-tsunamis and earthquakes are the primary disturbances, which shape and modify FDM's physical environment between the intertidal zone and depths of 30 m.
CNMI DLNR-34	• The increased level of bombing and disturbance of soil on Farallon de Medinilla poses a significant risk to surrounding corals and other sessile invertebrates. The DSEIS focuses on the in-water impacts of explosives and potential contamination from ordnance, which will have local and short-term negative impacts. Increased bombing will significantly disrupt soil and increase sedimentary load on surrounding reefs. Long-term cumulative effects should be meaningfully assessed and addressed.	FDM will continue to be operated in accordance with the terms and conditions specified in the 2015 Biological Opinion (U.S. Fish and Wildlife Service, 2015). The impact assessment for nearshore waters surrounding FDM does consider long-term negative impacts. The Navy, based on multi-year dive surveys conducted since 1999, with the most recent dive survey available from 2017, agrees that nearshore impacts can occur from errant ordnance targeted at FDM; however, these impacts are short-term and localized, with no evidence of coral reef impacts from sedimentation. The Navy is consulting with NMFS on the impact of training activities on ESA-

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		listed corals at FDM and will implement terms and conditions of the NMFS BO.
CNMI DLNR-35	• With increased sediment loading into near-shore waters, water and substrate quality will decrease. Without proper flushing, sediments will accumulate and be re- suspended with every storm or increased wave and wind activity. Suspended sediments affect light attenuation, effectively decreasing the amount of sunlight needed by photosynthesizing organisms such as corals and algae.	See response CNMI DLNR-34 (response to Anthony T. Benavente, Secretary CNMI Department of Lands and Natural Resources), regarding multi-year surveys conducted around FDM and survey findings regarding sediments, water quality and corals.
CNMI DLNR-36	• Aberrant ordnance around Farallon de Medinilla will decimate surrounding corals and cause mortality of sea turtles, marine mammals, and fish, and it will damage critical fish habitat. Existing stressors only compounds the significance of these effects. How will these impacts be meaningfully mitigated?	The Navy agrees that impacts may occur from errant ordnance on sea turtles, marine mammals, fish, and important fish habitat. However, the evidence suggests, based on multi-year dive surveys conducted since 1999, with the most recent dive survey available from 2017, that impacts on habitat are short term and localized, with no evidence of coral reef impacts from sedimentation, and direct impacts on individuals are unlikely. The Navy is consulting with NMFS, and any updated measures previously included in the 2015 MITT Final EIS have been included in the=is Supplemental Final EIS/OEIS.
CNMI DLNR-37	• The statement: "The impact of vessels and in-water devices on marine habitats would remain inconsequential because (1) vessel and in-water activities that could come into contact with marine substrates would be located in previously disturbed areas (i.e., nearshore shallow waters), (2) military expended materials could be colonized by benthic organisms, and (3) seafloor devices would be used in previously disturbed areas and therefore would not be expected to affect marine substrates" (ES-9) is inaccurate as expended materials may be toxic and contain heavy metals, and there is cumulative damage by disrupting bottom substrates.	Both this Supplemental EIS/OEIS and the 2015 MITT Final EIS/OEIS include an analysis of potential impacts from metals and contaminants as a result of military training and testing activities on marine resources. This analysis is presented in Section 3.1.2.2 (Metals), Section 3.4.2.7 (Secondary Stressors), Section 3.5.2.7 (Secondary Stressors), Section 3.7.2.3 (Secondary Stressors), Section 3.8.2.7 (Secondary Stressors), and Section 3.9.2.7 (Secondary Stressors). Based on the analysis presented in this Supplemental EIS/OEIS and the 2015 MITT Final EIS/OEIS, the Navy concluded that all levels of metals, chemicals, and other byproducts would be either below detectable levels or at levels below existing standards, regulations, and guidelines.
CNMI DLNR-38	• The number of mooring/anchoring stations should be minimized to the maximum number of vessels that use the area; this will minimize the damage to bottom substrate (e.g. coral) by anchors and anchor chains. We suggest installing a	As described in Section 5.4.1 (Mitigation Areas for Seafloor Resources), the Navy implements mitigation to avoid or reduce potential impacts on seafloor resources, including shallow-water coral reefs, live hard bottom, artificial reefs, and shipwrecks. Precision anchoring activities are

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	minimum number of mooring locations instead of setting anchors in different location. The military must also work with DLNR to obtain the proper permits to conduct these activities within the 3 nm boundary.	conducted in designated locations near ports over unconsolidated sediments that are lacking vegetation, which minimizes the potential for new areas or sensitive seafloor resources, such as seagrass beds, to experience disturbance.
CNMI DLNR-39	• We are concerned about the increased damage to seagrass beds as it affects in-water abundance of sea turtles. Seagrass re-growth may take up to 10 years. Thus, these areas should be mapped and all activities should be avoided in seagrass beds, just as hard substrates (coral) should be mapped and avoided.	This Supplemental EIS/OEIS describes actions that disturb benthic habitats occurring in designated/discrete areas (e.g., designated Apra Harbor underwater detonation sites). Overall as described in Section 3.7 (Marine Vegetation) of this Supplemental EIS/OEIS, the Proposed Action is not expected to result in detectable changes to seagrass growth, survival, or propagation, and is not expected to result in population-level impacts. The Navy's standard operating procedures will benefit seagrass in the Study Area by minimizing potential disturbances in areas with seagrass. For example, precision anchoring activities are conducted in designated locations near ports over unconsolidated sediments that are lacking vegetation, which minimizes the potential for seagrass to experience disturbance. Large amphibious vehicle beach landings and departures are scheduled at high tide, and vehicles stay fully on cushion or hover when over shallow reefs to avoid corals, hard bottom, and other substrate that could potentially damage equipment, as described in Section 5.1.8 (Amphibious Assault and Amphibious Raid Procedures) of the 2015 MITT Final EIS/OEIS.
CNMI DLNR-40	• The DSEIS states there is a low risk of entanglement however it does not address the affects a drifting parachute would pose to coral and bottom substrate. These effects need to be addressed and mitigated.	This Supplemental EIS/OEIS and the 2015 MITT Final EIS/OEIS considered the potential for entanglement of coral heads and colonies by military expended materials. Both the section 7 ESA consultations in 2015 and reinitiated in 2017 between the Navy and NMFS concluded that entanglement of corals is a remote possibility, and if it occurred, would damage corals. The likelihood of entanglement is sufficiently low for NMFS to conclude that entanglement risk for ESA-listed corals is discountable (unlikely to occur). As described in Section 2.3.3 (Standard Operating Procedures) of this Supplemental EIS/OEIS, during activities that involve recoverable targets (e.g., aerial drones), the military recovers the target and any associated decelerators/parachutes to the maximum extent practical consistent with personnel and equipment safety. This standard

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		operating procedure benefits biological resources (e.g., seafloor resources) by reducing the potential for physical disturbance and strike, entanglement, or ingestion of applicable targets and any associated decelerators/parachutes.
CNMI DLNR-41	• Increased terrestrial bombing increases the risk of wildfires on the island, which would kill or destroy vital habitat for tree- and forest-nesting birds such as the Micronesian megapode and red-footed booby. Mitigation strategies should be in place to detect and extinguish wild fires to protect island wildlife. Denuded soils should be stabilized and revegetated, and no-strike areas should be replanted with native plants to further support viable habitat areas.	This Supplemental EIS/OEIS discusses targeting restrictions in both Section 3.6 (Marine Birds) and Section 3.10 (Terrestrial Species and Habitats) that are designed to limit the potential for wildland fires ignited by munitions use on FDM. Placement of firefighting infrastructure and assets on FDM is not practical. Rather, the Navy's targeting and munitions type restrictions limit the potential for wildland fires. Example munitions restrictions were also discussed in the Navy's 2015 Final EIS/OEIS. White phosphorous, live cluster weapons/scatterable munitions, fuel air explosives, incendiary and smoke devices, or bombs greater than 2,000 pounds are not authorized for use on FDM. Red phosphorous is used in spotting charges only, and is not a main constituent of any munitions used on FDM. It should be noted that high explosive ordnance is only authorized for Impact Area 2 and Impact Area 3. These locations are south of Impact Area 1 (inert ordnance only used here) and the northern Special Use Area. Radiant heat emitted from high explosives detonated within Impact Areas 2 and 3 are not expected to impact rookeries on cliffs or northern forests of the island.
CNMI DLNR-42	• Soft bottom substrate such as sea grass is important for sea turtles and fish. Continued disturbance of any habitat should be minimized in its effect.	This Supplemental EIS/OEIS describes actions that disturb benthic habitats occurring in designated/discrete areas (e.g., designated Apra Harbor underwater detonation sites) and activities that may occur in deeper water habitats spread out over the Study Area. Additionally, activities that have a greater potential to impact the seafloor, such as amphibious assaults, are conducted at high tide to limit such interactions. Precision anchoring activities are conducted in designated locations near ports over unconsolidated sediments that are lacking vegetation, which minimizes the potential for seagrass to experience disturbance.
CNMI DLNR-43	• The use of high explosives will result in the deposition of heavy metal on the surface of Farallon de Medinilla. Heavy metal residues will be adsorbed into soil, bioaccumulated in low trophic-level organisms (including microorganisms, plants, and	This Supplemental EIS/OEIS, as well as the 2015 MITT Final EIS/OEIS, include discussion of the fate and transport of specific chemicals with references to chemical properties of munitions and munitions constituents. In summary, the Navy's analysis concludes that no federal or

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	soil-dwelling animals), and ingested by ground-feeding birds such as the Micronesian megapode and white-throated ground dove. These significant impacts should be assessed, monitored, and mitigated. • Heavy metals will also be washed into the ocean in precipitation and erosion events and bioaccumulated in fish that are ingested by white-tailed tropicbirds, red-tailed tropicbirds, brown noddies, black noddies, red-footed boobies, brown boobies, masked boobies, sooty terns, and great frigate birds. These heavy metals are toxic in relatively small concentrations. These significant impacts should be assessed, monitored, and mitigated.	local guidelines would be exceeded because of the following reasons: (1) rapid and natural degradation of substances (e.g., munitions constituents and other chemicals), and (2) localized concentrations where impact would occur. These conclusions are based on evidence gathered on other military ranges in similar environments (e.g., Vieques), as well as legacy dump site studies conducted off the coast of Oahu. These studies are summarized in Section 3.1 (Sediments and Water Quality). The Navy continues to monitor general ecological conditions on FDM through the use of aerial images and routine surveys. The Navy has an Operational Range Clearance plan (2013) for FDM, which includes provisions for vegetation management and removal/disposal of materials that may present an explosive risk. Clearance of the range occurs every 2–4 years, depending on the type of ordnance targeted for removal or destruction.
CNMI DLNR-44	**Birds.** • We are concerned about the increase in larger explosives/missiles as shrapnel poses a threat to the surrounding wildlife and increased disturbance, such as flushing from nests, can increase predation rates even if the adult is away from the nest a short time. Airplane flyovers pose a similar risk. Without a control-treatment design, you cannot determine if F-16 flyovers have an effect. • The decline in masked and red-footed boobies cannot be determined as natural fluctuations in the population without new data and regularly schedule surveys to assess current trends. Thus, the use of this reasoning to support continued military activity is flawed and baseless. Observed impacts should be meaningfully addressed.	The Navy agrees that low altitude flyovers of FDM may illicit short-term responses exhibited by nesting and roosting seabirds. Further, the Navy recognizes the potential for follow-on effects, such as predation of nests and chicks from temporary flushing. Section 3.6 (Marine Birds) of this Supplemental EIS/OEIS includes a statistical analysis of 17 years of monthly and quarterly bird counts of the three booby species that nest on FDM. The results of this analysis were also included in Section 3.6.2.6 (Rookery Locations and Breeding Activities within the Mariana Islands Training and Testing Study Area) of the 2015 MITT Final EIS/OEIS. In the previous NEPA document, this statistical analysis was not yet published. In this Supplemental EIS/OEIS, the same information is included in the analysis, but the published article is now cited (see: Camp, R., C. Leopold, K. Brinck, and F. Juola. (2016). *Farallon de Medinilla Seabird and Tinian Moorhen Analyses*. Hilo, HI: Hawaii Cooperative Studies Unit University of Hawaii at Hilo). It should be noted that the three booby species are easily seen (and therefore counted) reducing uncertainty in the survey effort. The results of the statistical analysis do not show any significant changes in population trends for the three booby species. The Navy concluded that increased

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		numbers of activities on FDM would not adversely impact seabird populations because no new bombing areas would be used. In other words, the same restrictions listed and described in COMNAVMARINST 3500.4A would be carried forward under all alternatives.
CNMI DLNR-45	• Are the surveys going to continue? Are you using adaptive management to refine monitoring approaches? We encourage the use of independent researchers to conduct surveys. Ideally, you would have independent scientists collecting the data, but at minimum raw data should be shared with CNMI resource managers immediately, have proper vetting, and independent analysis needed.	The Navy is continuing surveys on FDM. Adaptive management is an important component to the Navy's stewardship of ranges, and the Navy would consider changes to FDM use if these suggestions were supported by data. As per CEQ regulations, the Navy uses a number of sources of best available science and data, including external references from academia, industry, and the public (noted in each section of the EIS/OEIS); technical documents (available on the MITT project website); and ongoing consultation processes with other agencies (NMFS and USFWS). The Navy strives to share technical information and data with the public and resource agencies. Technical reports are posted on the MITT project website at www.mitt-eis.com. For Navy-funded and managed marine research and monitoring studies, the public can access reports, documentation, data, and updates on current monitoring projects via the U.S. Navy Marine Species Monitoring Program website at www.navymarinespeciesmonitoring.us. The Navy will continue to communicate and coordinate with the CNMI government on future collaboration and information sharing.
CNMI DLNR-46	• When summarizing impacts to marine sea birds the DSEIS states that "[p]eriodic helicopter-based surveys of Farallon de Medinilla have occurred since 1998 (monthly up to 2009, and quarterly thereafter through September 2016) for marine birds nesting on the island. Because of a lack of commercial helicopter transit services, surveys have not been conducted since 2016" (ES-14). Commercial helicopter transit services are currently available on Saipan; however, this long-standing approach may not be the most appropriate way to conduct bird nesting surveys. Evidence suggests that acute, high decibel	The Navy appreciates the suggestion that UAV could be used as a platform for conducting bird surveys over FDM. The Navy is committed to exploring safe, cost-effective, and current best practices for conducting surveys.

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	sounds (65-85 dBA) impact sea birds (see A. L. Brown, Measuring the effect of aircraft noise on Sea birds, Environment International Vol. 16, pp 587-592, 1990). Conversely, the Ornithological Council Guidelines to the Use of Wild Birds in Research, 2018 Supplement notes that small unmanned aircraft may be used to effectively survey marine birds, marine mammals, and sea turtles and notes this approach has been incorporated into the Department of the Interior's Office of Aviation Services. Robust surveys that reflect best practices should be employed to monitor the extent of current activities and assess the potential for future significant negative impacts from proposed increases in live fire activities on land and at sea.	
CNMI DLNR-47	• A 22-60% increase in the amount of net explosive weight is not negligible. (3.6.2.4.3). It is unclear why this increase is needed and what mitigation is being proposed to reduce the significance of impacts to the environment and the animals that will be further affected.	Based on this comment, the Navy should point out a possible misinterpretation of the data presented in Table 3.6-3. The increases would not range from 22 to 60 percent over what was analyzed previously. The increases would range from 0.22 percent to 0.61 percent. Having stated this, the Navy recognizes that some ordnance will increase on FDM, however, the ordnance will be used within the same impact locations (targeting restrictions) and under the same munitions-type restrictions as included in the 2015 MITT Final EIS/OEIS (e.g., no ordnance over 2,000 lb.). Therefore, the Navy believes that existing restrictions and mitigation measures on FDM are sufficient to reduce impacts of military use on FDM to the maximum extent practical.
CNMI DLNR-48	• Even if debris "does not resemble prey items", there is ample evidence that marine birds may ingest it. Thus, all debris poses a risk. Studies also show some debris absorb toxins and heavy metals, and can be harmful to the tissues when ingested (Fukuoka et al., 2016; Teuten et al., 2007). Mitigation measures should include collecting debris at-sea and on land and reducing the amount of debris released into the environment as much as possible.	The Navy recognizes the risk of ingestion for birds of expended military materials, and has analyzed the risk in both the 2015 Final EIS/OEIS and in this Supplemental EIS/OEIS. Collecting debris on land does occur in accordance with the Navy's Operational Range Clearance Plan (2013) for FDM, which includes provisions for vegetation management and removal/disposal of materials that may present an explosive risk. Clearance of the range occurs every 2–4 years, depending on the type of ordnance targeted for removal or destruction. This action will remove some materials that may potentially be ingestible on land.

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CNMI DLNR-49	• Four Micronesian megapod deaths per year is a significant portion of the 10-42 individuals surveyed. Increased munitions and large caliber projectiles devices should require reinitiation of Section 7 consultations and require the Navy to consult DLNR regarding CNMI permits.	The Navy will not reinitiate section 7 ESA Consultation with the USFWS because, despite changes in ordnance use on FDM, the Navy will still meet the existing take provisions, and the terms and conditions in the USFWS Pacific Islands Fish and Wildlife Office's 2015 Biological Opinion will continue to be implemented. Mitigation measures described in this Supplemental EIS/OEIS (e.g., targeting restrictions, munitions-type restrictions) reduce potential impacts on Micronesian megapodes to the maximum extent practical.
CNMI DLNR-50	• Page 3.6-10: While Farallon de Medinilla activities may not put Great Frigatebird or Masked Booby at risk regionally, these are relatively rare in the CNMI and must be conserved here if they are to persist as part of our natural heritage. The argument "they're common somewhere else" should not be use.	Conclusions presented for the Great Frigatebird and the Masked Booby are in the context of Migratory Bird Treaty Act (MBTA), with specific language identified in 50 CFR Part 21 for determining populations and impacts on populations.
CNMI DLNR-51	• DSEIS cannot say there are no significant declines in bird populations on Farallon de Medinilla as surveys are lacking and have not been done since 2016.	The Navy is using the best available science to support the conclusions that there are no significant declines. This Supplemental EIS/OEIS has been updated with the published citation (published since the release of the Navy's 2015 MITT Final EIS/OEIS). When surveys resume, and if the additional data from those surveys warrant a revision of conclusions in future analyses previously made in the 2015 Final EIS/OEIS and in this Supplemental EIS/OEIS, the Navy will do so in accordance with 50 CFR Part 21, as well as Sikes Act provisions that require updates to natural resource inventories on lands covered in the most recent Joint Region Marianas Integrated Natural Resources Management Plan.
CNMI DLNR-52	• Section 5.5: The DSEIS does not consider seasonal restrictions as a terrestrial mitigation measure. Any reduction in activities, even if not a complete ban, during breeding season can have tremendous mitigation value. On page 5-63, it says that seasonal or timing restrictions would be impractical, but offer no explanation or justification as to why.	The Navy will not implement seasonal restrictions on FDM because of the impairment of readiness training levels. Coupled with weather restrictions, seasonal restrictions would limit the ability to maintain military readiness. The Navy, however, has engaged with resource and regulatory agencies in the ESA context (e.g., section 7 ESA consultations between the Navy and USFWS), Sikes Act context (e.g., working with CNMI DLNR and other local resource agencies in the development of the JRM INRMP). The Navy is continuing to implement the standard operating procedures and mitigation measures included in the Navy's 2015 Final MITT EIS/OEIS and

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		the USFWS Pacific Islands Fish and Wildlife Office's 2015 Biological Opinion.
CNMI DLNR-53	**Fish.** The DSEIS states that most activities will be in deeper waters and therefore will have a low risk to fish. This is likely accurate in deeper, offshore waters (>25 nm). The DSEIS assessment is speculative regarding impacts to fish <25 nm from Farallon de Medinilla and Tinian. • Increased bombing of Farallon de Medinilla will impact local reef and bottom fish species that inhabit the surrounding shallow and deep-water reefs. Direct impact of reef sites by aberrant ordnance will mortally wound fish in proximity to detonation and be a significant stressor outward for hundreds of meters. • Increased bombing on Farallon de Medinilla will impact five pomacentrid species of fish, and the Napoleon wrasse (Cheilinus undulatus), that have been proposed for listing under the Endangered Species Act. Increased use of 2000 pound bombs on Farallon de Medinilla increases the potential for impact on surrounding reef fish. • Increased bombing activity will impact the genetic continuity of reef fish populations in the Mariana Archipelago. Bombs reaching the nearshore will kill reef fish, remove multiple year classes, and homogenize coral reef structure. These significant impacts should be assessed, monitored, and mitigated. • A decrease in the functional diversity of the reef surrounding Farallon de Medinilla will decrease grazing by herbivorous fish would likely increase algal production and outcompeting of corals. These significant impacts should be assessed, monitored, and mitigated. • No information (past or current) on reef fish populations or densities from Farallon de Medinilla, including reef fish habitat,	The Navy shares your concerns regarding the well-being of biological resources around Farallon de Medinilla (FDM). Section 3.8 (Marine Invertebrates) and Section 3.9 (Fishes) conclude impacts from land activities on FDM are not expected to result in significant impacts on corals and fishes, respectively. Although aberrant ordnances are possible, they would be infrequent and would not result in population-level impacts, changes in functional diversity, or changes to the genetic continuity of fishes in the surrounding areas. As stated in Section 3.9.1.3 (Endangered Species Act Species) of this Supplemental EIS/OEIS, the scalloped hammerhead shark (*Sphyrna lewini*), oceanic whitetip shark (*Carcharhinus longimanus*), and giant manta ray (*Manta birostris*) are the only ESA-listed fish species in the Study Area, and the Navy will consult with the National Marine Fisheries Service under section 7 for ESA-listed fish species. There are currently no fish species in the Study Area that are proposed for listing under the ESA. While there are proposed increases in the use of some smaller-sized munitions on FDM, the Navy is not proposing an increase in bombing activity. The total amount of explosive munitions used on FDM would continue to be governed by the 2015 Biological Opinion. As discussed in Sections 3.8 (Marine Invertebrates) and 3.9 (Fishes) of this Supplemental EIS/OEIS, recent surveys conducted by the Navy (Carilli et al., 2018) at FDM found that coral fauna are healthy and robust and the nearshore physical environment and basic habitat types at FDM remained unchanged. The Navy updated the MITT Final Supplemental EIS/OEIS to include the results of the 2017 survey as presented in Carilli et al. (2018). The report information has been added to Section 3.1 (Sediments and Water Quality) and Section 3.8 (Marine Invertebrates). Specific text on impacts on Farallon de Medinilla is available in Section 3.1.3.1.5.3 (Farallon

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	are available to allow for an assessment of probable impacts from aberrant ordnance within the nearshore (<3 nm) waters of Farallon de Medinilla. Additional data should be collected and shared with CNMI to support meaningful assessment of impacts and discussion of appropriate mitigation measures.	de Medinilla Specific Impacts) in the 2015 MITT Final EIS/OEIS, and Section 3.1 (Sediments and Water Quality) and Section 3.8 (Marine Invertebrates) of this Supplemental EIS/OEIS. In the absence of information, the Navy uses the best available science and data in this Supplemental EIS/OEIS to assess potential impacts. Although aberrant ordnances are possible, they would be infrequent and would not result in population-level impacts, changes in functional diversity, or changes to the genetic continuity of fishes in the surrounding areas. For Navy-funded and managed studies, the Navy will continue to communicate and coordinate with the CNMI government on future collaboration and information sharing.
CNMI DLNR-54	**Marine invasive species.** Increased shipping activity and associated fouling and ballast-water organisms has the potential will introduce marine organisms to nearshore habitats and pelagic waters. Once introduced, marine species are nearly impossible to eradicate, and the consequences of introductions are impossible to predict. In fact, in 2012 invasive barnacles were reported surrounding FDM and we lack current surveys to assess the damage. Additional concerns regarding invasive threats from ballast water and increased ship traffic should also be assessed and addressed.	The U.S. Navy recognizes the importance of biosecurity, ecological integrity, and resiliency of island ecosystems to the potential introduction of invasive species to the Mariana Islands associated with military training and testing. The Navy has a number of policies in place to prevent, interdict, and control invasive species introductions in both terrestrial and marine environments. Specific federal and Navy policies for marine invasive species can be found at: Public Law 104-332, National Invasive Species Act of 1996; Executive Order 13112 (Invasive Species) and amended by Executive Order 13751 (Safeguarding the Nation from the Impacts of Invasive Species; and OPNAVINST 5090.1E Chapter 35-3.19. (Ship and Ballast Water), 5090.1E Chapter 35-3.1 (Environmentally Sound Ships), and 5090.1E Chapter 12-3.9 (Invasive Species). As part of the INRMP, the Navy will implement marine management recommendations identified in the biosecurity plan for Micronesia and Hawaii.
CNMI DLNR-55	**Data and mitigation measures.** We recommend that the following items be provided by DOD to enable the Commonwealth to independently and objectively predict, monitor, and evaluate the impact of military activities proposed in this EIS.	As per CEQ regulations, the Navy uses a number of sources of best available science and data in this Supplemental EIS/OEIS, including external references (noted in each section of this Supplemental EIS/OEIS), technical documents (available on the MITT project website), and ongoing consultation processes with other agencies (NMFS and USFWS). Data is drawn and managed from multiple sources/points, including from the

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	• Provide a summary of the number of species on this list that have been impacted (both Type A and type B "take") by DOD training activities in the region in the last 20 years.	public during the NEPA process. Best available peer-reviewed science/data can come from sources such as academia, consultations with other resource agencies, industry, and the public. For Navy-funded and managed studies, the Navy will continue to communicate and coordinate with the CNMI government on future collaboration and information sharing. The Navy conducts marine species monitoring at Navy ranges. Monitoring reports and a number of other supporting documents can be found at www.navymarinespeciesmonitoring.us.
CNMI DLNR-56	• Provide funds for CNMI or an independent third-party contractor to perform ecosystem inventories and abundance estimates for wildlife on Farallon de Medinilla (including surrounding waters and the coral reef west of the island). • Involve DFW staff in the planning of surveys and pre- and post-survey scientific review. • Provide funds for CNMI to employ a Biologist, who is dedicated to reviewing DOD documents such as subsequent EISs, monitoring impact of military activities, and liaising with DOD, CNMI political officials, and third parties about conservation issues of mutual interest. • Provide data on all surveys performed around Farallon de Medinilla for marine invertebrates, reef fishes, marine mammals and sea turtles. Provide access to Farallon de Medinilla' s waters for DFW to perform independent surveys of fish, invertebrates and wildlife. • Fund a study that would satellite tag species of marine mammals (especially Culver's beaked whale) and sea turtles to measure movement and behavioral response of animals to military activities. • Funding should be provided for independent research into the movement and at-sea habitat use for green sea turtle (Chelonia mydas), hawksbill sea turtle (Eretmochelys imbricatata), loggerhead sea turtle (Caretta caretta), olive Ridley sea turtle	The Navy does not routinely allow independent, third-party access to live-fire ranges due to safety concerns. Because FDM is an active range, it is extremely difficult to allow non-military personnel on the island or within the restricted area of 3 NM due to safety and special explosive ordnance disposal certification requirements. As per CEQ regulations, the Navy uses a number of sources of best available science and data, including external references from academia, industry, and the public (noted in each section of EIS/OEIS); technical documents (available on the MITT project website); and ongoing consultation processes with other agencies (NMFS and USFWS). The Navy strives to share technical information and data with the public and resource agencies. Technical reports are posted on the MITT project website at www.mitt-eis.com. For Navy-funded and managed marine research and monitoring studies, the public can access reports, documentation, data, and updates on current monitoring projects via the U.S. Navy Marine Species Monitoring Program website at www.navymarinespeciesmonitoring.us. The Navy will continue to communicate and coordinate with the CNMI government on future collaboration and information sharing. Research funding is allocated via the Integrated Comprehensive Monitoring Program (U.S. Department of the Navy, 2010, 2013a), which provides the overarching framework for coordination of the Navy's marine

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	(Lepidochelys olivacea), and leatherback sea turtle (Dermochelys coriacea).	species research and monitoring efforts and serves as a planning tool to focus Navy monitoring priorities pursuant to ESA and MMPA requirements. The purpose of the Integrated Comprehensive Monitoring Program is to coordinate monitoring efforts across all regions and to allocate the most appropriate level and type of monitoring effort for each range complex based on a set of standardized objectives, regional expertise, and resource availability. Although the Integrated Comprehensive Monitoring Program does not identify specific field work or individual projects, it is designed to provide a flexible, scalable, and adaptable framework using adaptive management and strategic planning processes that periodically assess progress and reevaluate objectives. The adaptive management is anticipated to continue between the Navy, NMFS, and the Marine Mammal Commission through technical review meetings and ongoing discussions. The Navy is unable to directly provide funds as requested; however, the Navy will continue to work with local partners in Guam and the CNMI to engage in collaborative research efforts. Many of these activities are part of the larger collaborative effort with NOAA Fisheries, Guam Division of Aquatic and Wildlife Resources, CNMI Department of Lands and Natural Resources, Naval Base Guam, and the U.S. Pacific Fleet Environmental Readiness Office. The most recent collaborative research effort was sea turtle tagging in the Mariana Islands Range Complex (Martin, S. L., A. R. Gaos, and T. T. Jones. [2019]). In addition, the U.S. Department of Defense Office of Economic Adjustment helps local communities adapt to Department of Defense program changes, expansions and cutbacks, as well as incompatibilities between military operations and local development. The Office of Economic Adjustment is the appropriate agency to contact regarding funding inquiries.

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CNMI DLNR-56	• Studies should be conducted to identify density 'hotspot', ideally in real-time, so that Navy activities can avoid these areas. Some advances have been made for in Dynamic Ocean Management that the Navy should consider implementing for mitigation purposes.	As described in Appendix I (Geographic Mitigation Assessment), the Navy used the best available science, such as recently published monitoring studies and survey data on the occurrence, movement patterns, and distribution of marine mammals in the Mariana Islands to develop mitigation areas to avoid or reduce potential impacts on marine mammals and sea turtles in key areas of biological or ecological importance (see Appendix I, Geographic Mitigation Assessment). Based on the analysis presented in Appendix I, additional mitigation areas do not meet the requirements for biological importance for a particular species or practicality of implementation such that the Navy would be able to achieve mission requirements. The Navy is aware of advances being made in dynamic ocean management (Becker et al., 2016; Maxwell et al., 2015). The ability to use near real-time oceanographic data (e.g., sea surface temperature) to predict the presence of marine species in real time is a promising management tool; however, the method is not yet well established as a proven predictor of marine mammal occurrence. The Navy uses the same or similar marine mammal survey data in their density estimates that have been used in the development of dynamic ocean management models. Refer to the Navy's Marine Species Density Technical Report to see how the Navy derived densities for marine mammals and sea turtles in the MITT Study Area (U.S. Department of the Navy, 2018). Becker, E. A., K. A. Forney, P. C. Fiedler, J. Barlow, S. J. Chivers, C. A. Edwards, A. M. Moore, and J. V. Redfern. (2016). Moving Towards Dynamic Ocean Management: How Well Do Modeled Ocean Products Predict Species Distributions? Remote Sensing, 8(2), 149. Maxwell, S. M., Hazen, E. L., Lewison, R. L., Dunn, D. C., Bailey, H., Bograd, S. J., ... & Benson, S. (2015). Dynamic ocean management: Defining and

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		conceptualizing real-time management of the ocean. Marine Policy, 58, 42-50. U.S. Department of the Navy. (2018). U.S. Navy Marine Species Density Database Phase III for the Mariana Islands Training and Testing Study Area (Naval Facilities Engineering Command Pacific Technical Report). Pearl Harbor, HI: Naval Facilities Engineering Command Pacific.
CNMI DLNR-57	• In the absence of robust data regarding marine mammals and endangered sea turtle distribution, the Navy proposes two geographic mitigation areas at the Marpi Reef and Chalan Kanoa Reef. It would be prudent to continue marine mammal and turtle monitoring activities in partnership with the CNMI to develop BIAs or other appropriate management measures.	Through its marine species research and monitoring programs, the Navy is one of the nation's largest sponsors of scientific research on and monitoring of marine species. The Navy will continue to conduct monitoring projects to meet the objectives of its Integrated Comprehensive Monitoring Program and may partner with the CNMI, as requested, if appropriate.
CNMI DLNR-58	• Ensure that current and future Commonwealth laws and regulations governing the use of designated CNMI Conservation Areas be respected. Ensure that training plans are revised if boundaries of legally designated Conservation Areas change, or if new Conservation Areas are established, and that training activities are coordinated with CNMI in advance with opportunities for state agencies to monitor areas before and after exercises at minimum.	The Navy respects Commonwealth laws and regulations governing the use of legally designated Conservation Areas. These areas are documented in Table 6.1-2 and Figures 6.1-1 and 6.1-2 of the 2015 MITT Final EIS/OEIS. The Navy does not train in areas near legally designated Conservation Areas. If boundaries of existing Conservation Areas change, or if new Conservation Areas are established, the Navy would notify the CNMI of planned training activities.
CNMI DLNR-59	• Improve communication and collaboration with CNMI-DLNR on research and monitoring activities related to DOD training described in the MITT. Improvements should include collaborative projects, funding for independent research and monitoring from CNMI-DLNR, regular data and information sharing, and consultation prior to training activities that are likely to impact CNMI's natural resources.	The Navy is not able to directly provide funds as requested; however, the Navy will continue to work with local partners in the CNMI to engage in collaborative research efforts. For Navy-funded and managed studies, the Navy will continue to communicate and coordinate with the CNMI government on future collaboration and information sharing.
CNMI DLNR-60	• Provide funds for CNMI to sample, monitor, and research the effects of the release, environmental persistence, and bioaccumulation of explosive and toxic residues left by propellant and ordnance use on and in the waters surrounding Farallon de Medinilla.	The Navy is unable to directly provide funds as requested; however, the Navy will continue to work with local partners in the CNMI to engage in collaborative research efforts. See above response CNMI DLNR-56 (to Anthony T. Benavente, Secretary

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		CNMI Department of Lands and Natural Resources), regarding funding and access to FDM or waters surrounding FDM.
CNMI DLNR-61	• Provide alternatives and actions to mitigate sub-lethal effects.	The Navy will implement procedural mitigation measures to avoid or reduce potential impacts from the Proposed Action on marine mammals wherever and whenever applicable acoustic, explosive, and physical disturbance and strike stressors are used in the Study Area. The Navy's mitigation measures will help avoid or reduce a range of potential impact levels, including sub-lethal effects such as PTS, TTS, and behavioral impacts.
CNMI DLNR-62	• Mitigation measures involving Navy Divers should include observation/mitigation for all ESA species (see Table 5.3-11: Procedural Mitigation for Explosive Mine Neutralization Activities Involving Navy Divers as example).	The Navy worked cooperatively with NMFS during the ESA consultation process to increase mitigation for ESA-listed species during Explosive Mine Neutralization Activities Involving Navy Divers, as suggested by the commenter. Mitigation measures and monitoring requirements for endangered species are presented in Chapter 5 (Mitigation) of the Final Supplemental EIS/OEIS. Any additional measures required by the ESA Biological Opinion will be reflected in the Record of Decision.
CNMI DLNR-63	• The Navy is basing its decision not to consider Minke whale mitigation area on the fact that there is limited data available regarding their range in the Marianas. "In addition to Norris et al. (2017) noting the requirement for more detailed analyses of the current data, these results were collected from only a single season (January to April 2007), so it remains unknown if the minke whale detections were associated with static features such as water depth and bathymetry slope or were associated with dynamic ocean conditions present during that particular survey. Given the temporally dynamic redistributions of marine mammals in response to both seasonal variation and longer-term climate change affecting ocean conditions (Becker et al., 2017; Forney et al., 2015; Ramp et al., 2015; Risch et al., 2014; Silber et al., 2017), and that species such as minke whales migrate from low-productivity tropical waters in the summer (Jefferson et al., 2015; Perrin & Brownell, 2009), it is possible that minke whales may not have a fixed distribution within the	The best available science suggests that the mitigation areas proposed by the Navy are particularly important to one or more species of marine mammals or sea turtles for a biologically important life process (e.g., foraging, migration, reproduction). Based on the analysis presented in this Supplemental EIS/OEIS and using the best available data, surveys or additional research are not required for the Navy to comply with NEPA. The Navy conducts extensive monitoring and data collection programs as part of their compliance with the MMPA and ESA, including in the waters around the Mariana Islands. In 2007 the Navy funded the first large-scale marine mammal survey in the offshore waters of the Mariana archipelago. This was followed by the Navy and National Marine Fisheries Service establishing a marine mammal monitoring program in the Mariana Islands and in 2014 establishing a sea turtle tagging program in the Mariana Islands. The Navy's Marine Species Monitoring Program website provides access to reports, documentation, data, and updates on current monitoring projects. Information on current monitoring projects, technical

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	MITT Study Area" (1-33). Marine mammal and sea turtle surveys be conducted that address both spatial and temporal use of the area to better mitigate the Navy's activities The CNMI Department of Land & Natural Resources Division of Fish & Wildlife appreciates the opportunity to review and to provide comment on the EIS on the Marianas Islands Training Testing Activities, United States Department of the Navy. We hope that you will give considerable and favorable attention to our comments, and we ask for an open and ongoing exchange of information and a vigorous discussion of your future plans and their implications for our Commonwealth.	reports, conference presentations and data are available at www.navymarinespeciesmonitoring.us. In addition, while outside the current scope of this Supplemental EIS/OEIS, the military satisfies Sikes Act obligations through the development and implementation of the Joint Region Marianas INRMP. The 2019 Joint Region Marianas INRMP includes monitoring programs throughout the Mariana Islands. The CNMI Department of Lands and Natural Resources, Division of Fish and Wildlife is a signatory and participating member to the 2019 Joint Region Marianas INRMP that details natural resource management and monitoring programs. The Navy will continue to improve coordination and collaboration with the CNMI as part of the INRMP project development and implementation. The programs mentioned above help ensure current environmental conditions are monitored regularly. Any new information or data from the Navy's monitoring programs and INRMP will be incorporated into the Final Supplemental EIS/OEIS as appropriate.
Rita Chong-Dela Cruz, CNMI Historic Preservation Office (CNMI HPO)		
CNMI HPO-01	Staff of the CNMI Division of Historic Preservation (HPO) have reviewed the 2019 Mariana Islands Training and Testing (MITT) Draft Supplemental Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS). Per this review, CNMI HPO has several comments regarding the identification of cultural resources outlined in the Draft Supplemental EIS/OEIS. While some of these comments have been discussed with NAVFAC personnel directly, CNMI HPO feels it is important for these comments to be placed on the record at this time. CNMI HPO further recognizes that activities such as the identification of additional cultural resources may be worked out through the ongoing Section I06 consultation related to the renegotiation of the 2009 Programmatic Agreement that fulfills National Historic Preservation Act requirements for MITT activities. It should also be noted that CNMI HPO is satisfied	Consultation regarding the identification of historic properties, including traditional cultural properties, and the effects of the undertaking on the historic properties within the Area of Potential Effect has been conducted and solidified in the 2009 MIRC Programmatic Agreement (PA). FDM was included in the consultation. All cultural resources reports have been shared with and reviewed by the appropriate stakeholders. The need for FDM cultural surveys, both terrestrial and submerged, is part of ongoing Section 106 consultation and will be addressed as appropriate in any new Programmatic Agreement. The Navy is required to complete independent statutory obligations under both NEPA and NHPA. Thus, the Navy has prepared this Supplemental EIS/OEIS and continued compliance with NHPA under the Section 106 process.

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	with the mitigation strategy of avoiding the areas of known submerged cultural resources and the additional mitigations negotiated through the programmatic agreement. Our comments, therefore, relate primarily to the identification and documentation of cultural resources, as a comprehensive knowledge of cultural resources with accurate geospatial data is necessary for the proposed mitigation to be effective. With this in mind, our comments are as follows: **1) Terrestrial cultural resources on Farallon de Medinilla (FDM) have not been adequately identified** It is stated in section 3.11.1.2.1 of the 2019 MITT Draft Supplemental EIS/OEIS (Page 3.11-1) that "no additional ... land-based archaeological sites, or isolated-non-modern artifacts have been identified around or on Farallon de Medinilla." It is further stated that, because no additional resources have been identified, the information pertaining to the cultural resources of FDM in the 2015 MITT Final EIS/OEIS remains valid. It is stated in section 3.11.2.2.1 in the 2015 MITT Final EIS/OBIS (Page 3.11-15) that a preliminary archaeological field survey of FDM was conducted in 1996, which did not locate cultural resources on FDM. A similar statement is made in Paragraph 5 of page 3.11-6 of the 2019 Draft Supplemental EIS/OEIS, which states that, based on the 1996 survey, "there are no known cultural resources on FDM." It is the opinion of CNMI HPO that the 1996 archaeological survey conducted by David Welch did not provide sufficient coverage of FDM to confidently assess the presence or absence of cultural resources on FDM. It is therefore impossible at this time to adequately assess the potential impacts of MITT activities to cultural resources on FDM.	

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	This opinion is supported by the report of the 1996 survey. It is stated on Page 6 of that report that the planned survey strategy for FDM included three phases: a preliminary reconnaissance survey, an intensive survey, and a sample survey of selected areas. Only the first of these three proposed phases was completed. It is stated on Page 7 of the report that vegetation in some areas was so dense that it "precluded a careful check" of the area, and that the survey was cut short by an incoming typhoon. In the conclusion on Page 8 it is stated that > While the preliminary reconnaissance survey failed to tum up any evidence of prehistoric or early historic human activity on the island, the extent of the survey was far too limited to confirm that such evidence is not present or very unlikely to be present. The expected scarcity of any archaeological remains necessitates a more intensive survey to confirm their presence or absence and the past and potential future impacts of the military use of the island ... without this information, it is difficult to evaluate ... what impact military training on the island has had and may continue to have on the island's cultural resource base. It is then suggested that the additional phases of survey necessary to properly assess the presence of cultural resources on FDM and potential effects of military activity on those resources would take an additional two to three days of work. Given that Welch wrote in the report that the 1996 survey was in adequate to confirm the presence or absence of terrestrial cultural resources on FDM or to understand the impacts of military activity on potential cultural resources, it is misleading to imply, as is done in the 2015 MITT Final EIS/OBIS and in the 2019 MITT Draft Supplemental EIS/OBIS, that no cultural resources are present on	

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	FDM and that, therefore, MITT activities at FDM have no potential to affect cultural resources. Given also that Welch estimated only two to three additional days of survey would be required to adequately assess the presence or absence of cultural resources on FDM, it is the opinion of CNMI HPO that it would not be an undue burden to complete the full, three-phase program of archaeological survey on FDM as suggested in 1996. This would best be coordinated with other on-the-ground activities that regularly take place on FDM in order to mitigate the safety concerns associated with operations on FDM. **2) Submerged cultural resources in the waters around FDM have not been adequately identified** It is stated in section 3.11.1.2.1 of the 2019 MITT Draft Supplemental EIS/OEIS (Page 3.11-1) that "no additional submerged cultural resources ... have been identified around or on [FDM]." It is further stated that, because no additional resources have been identified, the information pertaining to the submerged cultural resources of FDM in the 2015 MITT Final EIS/OEIS remains valid. However, in section 3.11.2.2. l of the 2015 MITT Final EIS/OEIS (Page 3.11-15), the submerged cultural resources in the waters around FDM are not discussed. This is in direct contrast to the sections on Saipan, Tinian, and Rota, all of which include subsections on submerged cultural resources. Therefore, while the 2019 MITT Supplemental EIS/OEIS states that the information on submerged cultural resources presented in the 2015 MITT Final EIS/OEIS "is still valid and the most current," there is no indication in the 2015 MITT Final EIS/OEIS that any effort was made to ascertain if submerged cultural resources are present in the waters around FDM. The 2010 MIRC Final EIS/OEIS (also referred to as the	

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	2010 MITT Final EIS/OEIS) similarly indicates in its assessment of FDM on pages 3. 13-30 and 3.13-31 that only the terrestrial cultural resources of FDM have been assessed, making no reference to submerged cultural resources. It is further clear in reviewing "Submerged Cultural Resources Assessment of Micronesia" (Carrell et al. 1991) -the main source used to identify the submerged cultural resources of Saipan, Tinian, and Rota in the 2015 MITT Final EIS/OEIS -that no surveys for submerged cultural resources in the waters around FDM were conducted to support the production of that report. CNMI HPO is unaware of any additional surveys for submerged cultural resources around FDM that have been conducted since the 1991 assessment. It is, therefore, impossible at this time to assess the presence or absence of submerged cultural resources in the waters around FDM, as it is apparent no effort has ever been made to identify submerged cultural resources in those waters. It is, subsequently, impossible to determine what effect, if any, MITT activities at FDM may have on potential submerged cultural resources in those waters. If submerged cultural resources are present in the waters around FDM, however, activities there would have the potential to affect such resources, as it is stated on page 3.12-10 of the 2019 MITT Draft Supplemental EIS/OEIS that activities occurring at FDM "have the potential to affect coral reefs," in those same waters. CNMI HPO understands that the restriction of those waters within 3 nautical miles (NM) around FDM make survey for submerged cultural resources difficult. However, we note that in Paragraph 4 of page 4.3-260 of the 2019 MITT Supplemental EIS/OEIS it is stated in relation to marine mammals that "in-water surveys of marine resources within the 3NM danger zone surrounding FDM have been conducted for more than a decade." As it is clearly possible for	

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	underwater survey to be conducted within the 3NM danger zone, it is our opinion that it would not be an undue burden to conduct a survey to confirm the presence or absence of submerged cultural resources in those waters to allow the effects of MITT activities on any potential resources to be properly analyzed.	
CNMI HPO-02	**3) Some submerged cultural resources are identified from sources that do not provide geospatial data** In section 3.11.1.2.2 of the 2019 MITT Draft Supplemental EIS/OEIS (Page 3.11-1), it is stated that several previously unidentified submerged cultural resources have been identified in the nearshore waters off Unai Chulu and Unai Babui on Tinian since the publication of the 2015 MITT Final EIS/OEIS. However, the source cited for these resources does not provide geospatial data for these resources, only basic descriptions. As is stated repeatedly throughout the 2019 MITT Draft Supplemental EIS/OEIS, the primary mitigation for submerged cultural resources is to avoid the locations of known submerged cultural resources. Without precise data on the location of resources, this mitigation cannot be effective. It is not indicated in the 2019 MITT Draft Supplemental EIS/OEIS if any effort was made to obtain geospatial data for these resources from the authors of the source that is cited. If no such effort has been made, the authors should be contacted and the locations of these newly documented resources should be added to the appropriate Navy databases so that they may be avoided. CNMI HPO understands that these comments come at a late stage in the development of this document, which is an inopportune time to request for additional archaeological survey. We further understand that activities related to the identification and protection of historic properties are ongoing through Section 106 consultation, and we intend to pursue more comprehensive identification of historic properties through that process. However,	The Navy has updated Figure 3.11-1 to reflect new submerged cultural resources identified off Unai Chulu and Unai Babui on Tinian since the publishing of the 2015 MITT Final EIS/OEIS and included the figure in the Final Supplemental EIS/OEIS. The Navy has also updated Figure 5.4-2 in Chapter 5 (Mitigation) to reflect the new submerged cultural resources.

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	as we believe that comprehensive identification of cultural resources is necessary for the mitigation described in the EIS/OEIS to be effective, we feel it is important to raise these issues now. We would also like to note that CNMI HPO is happy to work with NAVFAC personnel to identify additional reports or other information about historic properties to better inform the analysis of MITT activities and ensure this important mission can continue to be carried out without damage to significant cultural resources. We intend to pursue this collaboration through the ongoing Section 106 consultation and under the terms of the programmatic agreement going forward.	
Senator Clynton E. Ridgell, Office of Senator Clynton E. Ridgell (OSR)		
OSR-01	Please include the following comments, questions, and concerns as part of the Public Comment Record for the Mariana Islands Training and Testing (MITT) Supplemental Environmental Impact Statement (SEIS)/Overseas Environmental Impact Statement (OEIS). • Why are rockets, missiles, and medium-caliber projectiles increasing in use (P. 3-28) from what was previously projected in the 2015 Mariana Islands Training and Testing EIS/OEIS? *Note that the use of rockets and medium projectiles are anticipated to have more than doubled in use.	The Navy has been conducting training and testing activities in the Study Area for decades and this supplement to the 2015 MITT Final EIS/OEIS supports the continuation of that training and testing. The activities analyzed in this Supplemental EIS/OEIS are largely a continuation of the ongoing training and testing activities that were analyzed in the 2015 MITT Final EIS/OEIS, 2010 MIRC EIS/OEIS, and 1999 Mariana EIS/OEIS. This Supplemental EIS/OEIS (1) includes the analysis of activities at sea and on Farallon de Medinilla (FDM) necessary to meet readiness requirements beyond 2020 and into the reasonably foreseeable future, (2) includes any changes to those activities previously analyzed, and (3) reflects the most up-to-date compilation of training and testing activities deemed necessary to accomplish military readiness requirements. The Navy predicts the activities it will be conducting years in the future to be analyzed for environmental and regulatory compliance. It is important to note that the Navy is then bound by the limits of its expected types and levels of activities. If a need arises that exceeds those predicted activities, the Navy would be required to conduct additional environmental analysis. Pursuant to 40 CFR section 1502.9(c), the Navy would prepare a supplement to the Final Supplemental EIS/OEIS if it makes substantial

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		changes in the Proposed Action that are relevant to environmental concerns (40 CFR section 1502.9(c)(1)(i)), or there are significant new circumstances or information relevant to environmental concerns and bearing on the Proposed Action or its impacts (40 CFR section 1502.9(c)(1)(ii)).
OSR-02	• The EIS says that unexploded ordinance is not part of military expended materials (P. 3.3-6), but the Executive Summary mentions marine mammals may encounter unexploded ordinance (P. ES-11). Why is there this inconsistency?	The inconsistencies noted in the Executive Summary and text within the Draft Supplemental EIS/OEIS have been revised in the Final Supplemental EIS/OEIS.
OSR-03	• Because there is not enough data on the conservation status of the dwarf and pygmy sperm whales, we would like to request for more data to be collected and more research to be done before these activities have the potential to permanently damage these species.	In this Supplemental EIS/OEIS, the Navy took a hard look at the potential impacts of the Proposed Action on marine mammals using the best available science. Based on the analysis presented in this Supplemental EIS/OEIS and using the best available data, surveys or additional research are not required to comply with NEPA. The Navy's quantitative analysis process for analyzing impacts from active sonar and explosives has been reviewed by independent scientists and approved by NMFS. The Navy also worked collaboratively with NMFS to develop mitigation measures using input from the military operators, the best available science, predicted activity impact footprints, and marine species monitoring and density data. The Navy has implemented and will continue to implement procedural mitigation measures designed to reduce or avoid impacts on sea turtles and marine mammals in the Study Area (see Chapter 5, Mitigation). At this time, these procedural mitigation measures represent the most practicable methods for protecting sea turtles and marine mammals while allowing the Navy to complete its training and testing mission.
OSR-04	• Is there an expected decrease in sonar activity which is causing the temporary and permanent shifts and damages to have decreased in marine mammals from the previous study? Please explain the anticipated decrease in permanent shifts and damages to marine mammals in contrast to the 2015 MITT EIS. Is there an expected decrease in sonar activity?	The overall use of sonar and other transducers for training and testing activities would be similar to what is currently conducted (see Table 2-3 and Figure 2-4 of the MITT Draft Supplemental EIS/OEIS for details). Depending on the species, densities may or may not have changed from Phase II to Phase III. The overall differences in estimated impacts are a combination of the following variables: an improved estimate of auditory

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		weighting in Phase III vs. Phase II; implementation of new behavioral response criteria in PIII based on additional behavioral response data, including recent data; and a generally lower proposed activity level for most sonar bins (see Table 2-3 which compares bin use in Phase II vs Phase III). Any or all of these factors combined could lead to changes (i.e., decreases) in impacts, such as permanent threshold shift, since the 2015 Final MITT EIS/OEIS (Phase II). Tables 2.5-1 and 2.5-1 in Chapter 2 of the Draft Supplemental EIS/OEIS compares the number of events from the 2015 MITT Final EIS/OEIS to the current draft for Alternatives 1 and 2. Overall, activities have increased, decreased, or stayed the same since Phase II.
OSR-05	• Earlier this year, Guam experienced a beaching of a beaked whale at the Naval Base, and beachings have happened often on Guam. The EIS states that research is not conclusive that beaching is caused by sonar, but a study done by Quiros, et al. (2019) https://royalsocietypublishing.org/doi/10.1098/rspb.2018.2533 shows the connection. What is being done to protect marine mammals from beaching?	The potential for sonar and explosives use during naval training and testing activities to potentially contribute to strandings is discussed in Sections 3.4.2.1.1.6 (Stranding) and 3.4.2.2.1.6 (Stranding), respectively. In addition, the technical report cited in the Draft and this Final Supplemental EIS/OEIS titled Marine Mammal Strandings Associated with U.S. Navy Sonar Activities (available at https://mitt-eis.com) summarizes (1) stranding events associated with U.S. Navy sonar activities and (2) strandings speculated but not linked to U.S. Navy sonar activities. This report also discusses other natural and anthropogenic factors that have been shown to contribute to strandings. The Navy's analysis of impacts on beaked whales took into account their greater sensitivity to disturbance relative to other marine mammals, as demonstrated by the data used to develop the behavioral response criteria for beaked whales [see the technical report titled *Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III)* available at https://mitt-eis.com]. This Final Supplemental EIS/OEIS further discusses the above Cuvier's beaked whale strandings relative to sonar use in the Study Area in Section 3.4.2.1.1.6 (Stranding) under Environmental Consequences due to Acoustic Stressors in the Marine Mammal section

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		(Section 3.4). This additional information does not change the conclusions of the analysis of potential impacts on Cuvier's beaked whales described in this Supplemental EIS/OEIS. As described in Section 5.1.2.2.1 (Marine Species Research and Monitoring Programs), for this Final Supplemental EIS/OEIS, the Navy agreed to several additional research and monitoring initiatives designed to help advance the understanding of beaked whales and strandings in the MITT Study Area. The Navy will co-fund the Pacific Marine Assessment Program for Protected Species (PACMAPPS) Mariana Islands survey in spring-summer 2021 and future studies starting in 2022 to help document beaked whale occurrence, abundance, and distribution in the Mariana Islands. The Navy will also fund additional stranding response and necropsy analyses for the Pacific Islands region, and research on a framework to improve statistical stranding analysis. Collaboratively with NMFS, the Navy will fund and organize an expert panel to provide recommendations on scientific data gaps and uncertainties for further protective measure consideration to minimize potential impacts of Navy training and testing activities on beaked whales in the Mariana Islands.
OSR-06	• As an endangered species, there are very strict regulations for the protection of the Green Sea Turtle and the prevention of a permanent threshold shift as predicted to happen to the Green Sea Turtle. These threshold shifts can impact the animal's ability to find mates or other animals of the same species. Please explain what other measures the U.S. Navy will implement to comply with these regulations.	As described throughout Chapter 5 (Mitigation), the Navy will implement mitigation measures to avoid or reduce potential impacts from acoustic stressors and explosives on sea turtles. Procedural mitigation measures for sonar and explosives include a power down or shut down (i.e., power off) of applicable active sonar sources and ceasing detonations when a sea turtle is observed in a mitigation zone. The mitigation zones for active sonar extend beyond the ranges to PTS and TTS for sea turtles. The mitigation zones for explosives extend beyond the average ranges to PTS, and beyond or into a portion of the average ranges to TTS for sea turtles. Therefore, mitigation will help avoid or reduce the potential for exposure to these effects for sea turtles.

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		The Navy is consulting with NMFS as required by Section 7(a)(2) of the ESA regarding potential impacts on sea turtles. Analyses of potential impacts on sea turtles from all relevant stressors were included in the Navy's biological assessment and are included in the Final Supplemental EIS/OEIS.
OSR-07	• The prediction of injury from these projects is listed as zero for all species. How certain are these predictions, despite the risk factors mentioned? Should there be any deviation in methodology for an increase in activity, what is the next realistic prediction of injury that may result from these projects?	For all modeled species (sea turtles and marine mammals), no injuries are estimated by the quantitative analysis. Section 3.0.4.7 (Conceptual Framework for Assessing Effects from Acoustic and Explosive Activities) in the Draft Supplemental EIS/OEIS provides additional information on injury and the framework used to analyze this potential impact. The Navy's analysis incorporates conservative assumptions to account for uncertainty and therefore likely overestimates potential impacts. In this instance where the predicted impact is zero, the Navy has a high confidence that the quantitative analysis results are accurate because of the conservative analysis approach taken. For example, using source classification bins (as discussed in Section 3.0.4.1, Acoustic Stressors, of the Draft Supplemental EIS/OEIS) ensures a conservative approach to all impact estimates, as all sources within a given class are modeled as the most impactful source (highest source level, longest duty cycle [i.e., the proportion of time signals are emitted in a given period of time], or largest net explosive weight) within that bin. The Navy analyzed the maximum number of activities that would occur under the Proposed Action as Alternative 2. The analysis included an assessment of unanticipated emergent world events that would require increased readiness levels above those included in Alternative 1. Therefore, the finding of zero non-auditory injurious impacts on marine mammals and sea turtles does represent the best and only realistic prediction of injury for the maximum level of activities that would occur under the Proposed Action.
OSR-08	• The mitigation practices are generally educating the federal employees and watching training sites for the presence of species and stopping training if an animal is seen. How will the lookouts notify and how soon will training stop if a lookout sees an animal? What happens to animals that the lookouts do not	The Navy will implement mitigation measures to avoid or reduce potential impacts from acoustic, explosive, and physical disturbance and strike stressors during training and testing activities on marine mammals, sea turtles, and ESA-listed fish. Procedural mitigation requirements are detailed in Section 2.3.2.2 (Procedural Mitigation to be Implemented) of the Navy's Draft Supplemental EIS/OEIS. Procedural mitigation generally

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	see? How effective are these lookouts at seeing animals underwater?	involves (1) the use of one or more trained Lookouts to diligently observe for specific biological resources within a mitigation zone, (2) requirements for Lookouts to immediately communicate sightings of specific biological resources to the appropriate watch station for information dissemination, and (3) requirements for the watch station to implement mitigation until a pre-activity commencement or during-activity recommencement condition has been met. The Navy's analysis assumes that Lookouts will not be 100 percent effective at detecting all individual marine mammals and sea turtles within the mitigation zones for each activity due to the inherent limitations of observing marine species and because the likelihood of sighting individual animals is largely dependent on observation conditions (e.g., time of day, sea state, mitigation zone size, observation platform) and animal behavior (e.g., the amount of time an animal spends at the surface of the water). The Navy developed a new mitigation for the Proposed Action that requires additional platforms already participating in the activity to support observing the mitigation zone before, during, and after the activity while performing their regular duties. There are typically multiple platforms in the vicinity of activities that use explosives; therefore, when available, having additional personnel support observations of the mitigation zone will help increase the likelihood of detecting marine mammals and sea turtles prior to and during these activities. The quantitative analysis assumes that only animals sighted at the water surface would be protected by the applied mitigation; however, in practice, mitigation also protects all unobserved (below the surface) animals in the vicinity, including other species, when marine mammals or sea turtles are observed at the surface. The analysis, therefore, does not capture the protection afforded to all marine species that may be near or within the mitigation zone. Section 3.4 (Marine Mammals) and Section 3.5 (Sea Turtles) of this Supplemental EIS/OEIS thoroughly discuss the potential impacts of all Navy training and testing activities on marine species.

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OSR-09	In response to the U.S. Navy's recently disclosed plans to expand the Surface Danger Zone to Point A - 13° 34' 57" N; 144° 49' 53" E; Point B – 13° 35' 49" N; 144° 47' 59" E; Point C – 13° 34' 57" N; 144° 47'; Point D – 13° 34' 48" N; 144° 49' 50" E; datum: NAD-83, I hereby submit additional comments for discussion on both the January 2019 publication of the MITT EIS/OEIS as well as for the expansion of the Surface Danger Zone as listed below. • Given the lack of information available to us regarding the impacts of the proposed activity on the endangered species within the boundaries of the danger zone, further analysis is required to determine potential impacts to the green sea turtle, the hawksbill sea turtle, and scalloped hammerhead sharks. I urge the U.S. Navy to conduct research with appropriate agents of the government and of the public to relay the potential impacts of disturbance to the endangered species caused by the proposed activities. • Expansion of the Surface Danger Zone will prevent access to traditional fishing grounds. These are used for bottom fishing, trolling and spear fishing. This will have a direct impact on our fishing and diving community and respective industries among residents and visitors alike. • The MITT-FEIS states that no forest clearance will occur as a result of the Finegayan Small Arms Firing Range. Are there any proposals that would contradict what is stated in the MITT-FEIS with respect to forest clearance at this site? • The proposed Surface Danger Zone will affect the Haputo Ecological Reserve Area. I am opposed to the possibility and probability of any proposed activities that will negatively compromise the state of any of our natural reserves or sacred and historical sites due to pollution or contamination caused by military activity.	The Surface Danger Zone is not part of the MITT Supplemental EIS/OEIS Proposed Action, and therefore comments on the Surface Danger Zone are beyond the scope of the MITT Supplemental EIS/OEIS. The military is committed to continuing to work with the local community on issues that potentially affect the public, including access to fishing sites while ensuring public safety at all times. The military actively promotes compatible use of ocean areas by minimizing public access restrictions and limiting the extent and duration of necessary closures. The Navy does not propose a change to the ocean areas currently used by both the Navy and the public. Restrictions on accessing areas of co-use would continue to be infrequent and short-term, while other fishing sites in the Study Area would continue to be available to the public.

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	• Existing documents do not state clearly what construction activity will be required to expand the SDZ. Further clarification is needed to determine how much construction activity will be required for this proposal and any environmental impacts caused by construction activity. • The Federal Public Notice indicates that the proposed action does not have the potential to cause effects to historic properties listed on the National Register of Historic Places; however, the site in question is located exactly between two locally-registered historic sites: Hila'an Beach and Haputo Beach as listed on the Guam Historic Resources Division's Register Listing. The application also does not specify how often this range will be in use and how much access will be limited to these ancient and sacred historical sites that are regularly visited by the CHamoru people. I urge further consultation with the Guam Department of Parks and Recreation's Historic Resources Division for review and comment. • According to the 2015 EIS, there are two pre-contact CHamoru sites listed in the Naval Base Telecommunications; 21 pre-contact sites eligible; and one World War II site eligible for being added to historical site registries. What, if any, impact will the proposed military activities have on any one of these sites?	
OSR-10	• The MITT-FEIS mentions fishing aggregating devices are being used outside of the danger zone so as not to disturb the fishing industry on Guam. What types of fishing aggregating devices are being used, and do they disturb any other form of aquatic life?	Fishing aggregating devices are not under the jurisdiction of the Navy and are deployed by local agencies such as the Guam Department of Fish and Wildlife. Please contact your local fishing agency for information about fish aggregating devices.
OSR-11	• The MITT-FEIS states that the military training activities do not occur in intact limestone forest areas where species of partulids or native snails live. What entity has made this determination, and how can this be confirmed? Data should be provided regarding any and all species determined to exist in the proposed area and how their habitats will be impacted.	Training and testing activities within this Supplemental EIS/OEIS are proposed to occur at sea and on FDM. Tables 2.5-1 and 2.5-2 in Chapter 2 (Description of Proposed Action and Alternatives) present the current and proposed training and testing activities. The 2015 MITT Final EIS/OEIS analyzed land-based activities on Guam, Saipan, Tinian, and Rota; the Navy did not reanalyze land-based activities in this Supplemental EIS/OEIS

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	• According to the MITT-FEIS, the plant communities at Finegayan are limestone forests, coconut forests, and disturbed/weed community. Local coconut resources are dwindling due to the presence of invasive species. Does the firing range and its proposed surface danger zone further negatively impact the presence and propagation of our coconut trees or any other endemic or native plants and trees? • There is insufficient information in the MITT-EIS regarding flood hazards and floodplain values. Please consult with proper agents to make a further determination. • Erosion purported to be similar to that of normal wave actions during stormy conditions. Erosion due to natural occurrences can and should not be compared to erosion that is caused by human activity; furthermore, efforts to mitigate naturally-occurring erosion suggest that even natural erosion can have a lasting, damaging effect on the environment. I believe that the comparison of this man-made erosion to natural, environmental causes is not in accordance with scientific fact and should be further studied and evaluated. • Accretion of inorganic matter is inevitable with the pollution that will occur when munitions are fired over and into the ocean; furthermore, the amount of inorganic matter that will be polluting the area will lead to the accretion of organic matter in an abundance not conducive to the survival of the ecosystem. There is insufficient information in the • Danger zone extends over important fishing and diving areas and will have an effect on tourists and residents as recognized by the Joint Guam Program Office. How often will these activities restrict access, and what is the economic impact of this loss of recreational activities in the area? • There are already many areas that have been restricted by the U.S. government from landowners for recreational, personal, and/ or business use. Is private land and their usefulness being	because there are no changes proposed to those land-based activities. Land-based training will continue to be conducted in accordance with the terms and conditions specified in the 2015 Biological Opinion (U.S. Fish and Wildlife Service, 2015). The firing range and Surface Danger Zone is not part of the MITT Supplemental EIS/OEIS Proposed Action, and therefore comments on the Surface Danger Zone are beyond the scope of the MITT Supplemental EIS/OEIS.

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	considered for increased land acquisition for training purposes that primarily benefit the US military? • The MITT-FEIS lacks information on the impacts to affected property owners. A public hearing should be conducted with any/ all private property owners in attendance whose properties may be affected by the expansion of the danger zone. • Concerns regarding water supply are general to those of increased construction activities. There is already concern over the dwindling fresh water supply on island and its availability to residents. Does the expansion of the Surface Danger Zone involve increased construction activities that will have an adverse reaction to our water supply? • Existing documents do not provide a specific timeline for proposed activities and frequency of use of the area -this information is vital to the impediment on the local and visiting fishing and diving communities. I am also interested to know if any activity has already commenced in this area, and if so, I would like to know under what authority these activities may have been granted permission for use. Existing documents also do not explain the need for the SDZ to expand out to 2.36 nautical miles over the ocean. Is this the standard for small arms fire? Will there be weapons used at the firing range that have a farther range than the current weapons that are used there? What are the weapons that will be used at the Finegayan range? I remain cautious and concerned that the MITT EIS/OEIS documents which consist of almost 1,500 pages contains either insufficient information or information that is inconsistent with the 2015 MITT EIS as well as the findings produced by other sources, including local government officials.	

	Comment	Navy Response
Cristian "CJ" Cayanan, Guam Department of Agriculture's Division of Aquatic and Wildlife Resources (DAWR)		
DAWR-01	Green sea turtles in the Study Area have been uplisted to endangered as of 2016. See attached file. [The commenter's "attached file" was an excerpt from the Federal Register, of which the first page is shown below.]	The Central West Pacific DPS and the Central South Pacific DPS are both listed as endangered. The Central North Pacific DPS and East Indian-West Pacific DPS are listed as threatened. The Navy has added clarifications to the Final Supplemental to ensure that the listing status for DPS that may occur within the Study Area are clear to the reader (Section 3.5, Sea Turtles).
Senator Sabina Flores Perez, Office of Senator Sabina Flores Perez (OSP), 35th Guam Legislature		
OSP-01	I strongly urge that all Marianas Islands Testing and Training activities be halted for the multiple reasons outlined below: 1) The U.S. military has not sufficiently determined the cumulative effects of all undertakings since the military's presence began on Guam. a) Cumulative effects include past, present, and reasonably foreseeable future actions. The U.S. military has a long list of undertakings and activities before and after the U.S. Pacific Re-alignment Plan was initiated. With respect to the 2015 MITT, local regulatory agencies and other stakeholders have not been publicly informed of the impacts (2019 Guam EPA MITT SEIS comments). "**For marine mammals, sea turtles, and marine invertebrates Alternatives 1 or 2 would contribute to and increase cumulative impacts, but the relative contribution would be negligible compared to other non-Navy actions.** Cumulative effects on socioeconomic resources may have short-term impacts on accessibility to public services, fishing sites, and tourism resources, but they are not expected to have long-term negative impacts on these resources or the economy of Guam and the Commonwealth of the Northern Mariana Islands. No new information or	The Navy used the best available science and conducted a comprehensive review of past, present, and reasonably foreseeable actions to develop a robust analysis of cumulative impacts (Chapter 4, Cumulative Impacts). As required under NEPA, the level and scope of the analysis are commensurate with the potential impacts of the action as reflected in the resource-specific discussions in Chapter 3 (Affected Environment and Environmental Consequences). The Navy considered proposed and ongoing activities alongside with other activities in the region whose impacts are truly meaningful to the analysis. Furthermore, the entire Supplemental EIS/OEIS provides the cumulative impacts analysis, not just Chapter 4. Chapter 3 provides the current effects of past and present impacts and environmental conditions that represent the baseline of the environment as it is; Chapter 3 also discusses the consequences or potential future impacts from Navy activities. Chapter 4 discusses other reasonably foreseeable activities to the extent they are known and the incremental impact of the Navy's proposal when added to past, present, and future impacts. Considering that minimal or no impacts from training and testing are anticipated on multiple marine resources that directly or indirectly affect marine mammals, sea turtles, and marine invertebrates, the contribution from Navy training and testing activities to cumulative impacts on marine animals is expected to be negligible. In addition, the Navy is consulting with NMFS under the ESA for potential effects (including cumulative

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	circumstances are significant enough to warrant further cumulative impact review." (Draft EIS, Volume 1, 2019) • What is the basis of the section in bold above? • The information provided is inadequate, and fails to provide the public with crucial information necessary to make informed comments.	effects) on marine mammals, sea turtles, and coral and received a Biological Opinion. Mitigation measures and monitoring requirements specified in the Biological Opinion are presented in Chapter 5 (Mitigation).
OSP-02	b) Cumulative effects are the total effects, both direct and indirect, on a given resource, ecosystem, and human community of all actions. In the MITT SEIS, cumulative impacts of the following indirect effects have not been assessed. 3.7.2.3 Secondary Stressors "Stressors from Navy training and testing activities could pose secondary or indirect impacts on marine vegetation via habitat, sediment, or water quality. Potential impacts on marine vegetation exposed to secondary stressors could occur indirectly through sediments and water quality. Components of these stressors that could pose indirect impacts include (1) explosives and byproducts; (2) metals; (3) chemicals; and (4) other materials such as targets, chaff, and plastics." 3.4.2.1.1.6 Stranding "Sonar use during exercises involving the U.S. Navy has been identified as a contributing cause or factor in five specific mass stranding events: Greece in 1996; the Bahamas in March 2000; Madeira Island, Portugal in 2000; the Canary Islands in 2002, and	The general threats on marine mammals described in Section 3.4.1.7 (General Threats) all contribute to some degree to cumulative impacts on marine mammals. The magnitude of each contribution is dependent on multiple wide-ranging factors including, but not limited to, the species and its vulnerabilities, the species population or stock, the location of the population (e.g., nearshore vs. offshore or Atlantic vs. Pacific ocean), fishing co-occurrence, abundance of prey, health of predator populations, adaptability to habitat or climate changes. The purpose of the section is to make the reader aware of the various stressors or threats that marine mammals encounter worldwide and to put Navy training and testing activities and associated stressors in context.

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	Spain in 2006 (Cox et al., 2006; Fernandez, 2006; U.S. Department of the Navy, 2017c). These five mass strandings resulted in about 40 known cetacean deaths consisting mostly of beaked whales and with close linkages to mid- frequency active sonar activity. In these circumstances, exposure to non-impulsive acoustic energy was considered a possible indirect cause of death of the marine mammals (Cox et al., 2006). Strandings of other marine mammal species have not been as closely linked to sonar exposure, but rather, have typically been attributed to natural or other anthropogenic factors." 3.4.1.7 General Threats "Marine mammal populations can be influenced by various natural factors as well as human activities. There can be direct effects from disease, hunting, and whale watching, or indirect effects such as through reduced prey availability or lowered reproductive success of individuals. Research presented in Twiss and Reeves (1999) and National Marine Fisheries Service (2011a, 2011b, 2011c, 2011d) provides a general discussion of marine mammal conservation and the threats they face. As detailed in National Marine Fisheries Service (2011e), investigations of stranded marine mammals are undertaken to monitor threats to marine mammals (Simeone et al., 2015). Investigations into the cause of death for stranded animals can also provide indications of the general threats to marine mammals in a given location (Bradford & Forney, 2017; Carretta et al., 2017b;	

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	Helker et al., 2017). The causes for strandings include infectious disease, parasite infestation, climate change reducing prey availability and leading to starvation, pollution exposure, trauma (e.g., injuries from ship strikes or fishery entanglements), sound (human-generated or natural), harmful algal blooms and associated biotoxins, tectonic events such as underwater earthquakes, and ingestion of or interaction with marine debris (for more information see NMFS Marine Mammal Stranding Response Fact Sheet (National Marine Fisheries Service, 2016d). Since 1963, Guam Department of Agriculture Division of Aquatic and Wildlife Resources has conducted aerial surveys twice every month (weather permitting) of the coastal margin around Guam at a distance of approximately 200–300 meters (m) offshore of the outer reef margin (Martin et al., 2016). Therefore, the Navy assumes any animals stranded on Guam are likely to have been identified; see also Mobley (2007). For a general discussion of strandings and their causes as well as strandings in association with U.S. Navy activity, see the technical report titled Strandings Associated with U.S. Navy Activity (U.S. Department of the Navy, 2017c)." G.6.3 Long-Term Consequences to the Individual and Population "Long-term consequences of secondary stressors on an individual or population are often difficult to determine. Once a primary impact is identified, the severity of that impact helps to determine the	

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	temporal scale at which the secondary stressor can be measured. For most marine resources, the abundance of prey species near a detonation point would be diminished for a short period (weeks to months) before being repopulated by animals from adjacent waters. In some extreme cases, recovery of the habitat or prey resources could occur over a relatively long time- frame (months to years). It is important to note that indirect impacts often differ among resources, spatial, and temporal scales." • Cumulative impacts are not being considered. These effects must be assessed and shared with the public, so the community can have an opportunity to provide meaningful and informed input on the SEIS. An assessment of cumulative effects should include military-induced and natural or other anthropogenic factors.	
OSP-03	c) Cumulative effects need to be analyzed in terms of the resource, as environmental effects are often evaluated only from the perspective of the proposed action. Analyzing cumulative effects thus requires focusing on the resource, ecosystem, and human community and understanding how the resource is susceptible to effects.	See above responses OSP-01 and OSP-02 (to Senator Sabina Flores Perez) regarding cumulative effects.
OSP-04	d) Cumulative effects are rarely aligned with political and administrative boundaries. Cumulative effects of migratory animals, spawning events of fishes and other marine species, fishing practices need to be assessed from a transboundary and Mariana Island archipelago perspective. The cumulative effects on the distribution of nutrients via upwellings and major ocean currents, atmospheric	See above responses OSP-01 and OSP-02 (to Senator Sabina Flores Perez) regarding cumulative effects.

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	deposition and oceanic distribution of pollutants has not been determined.	
OSP-05	a) Significant adverse impacts may result from accumulation of similar effects, or the synergistic interaction of different effects. The following needs to be addressed: • Are the changes in the use of sonar in combination with increased use of explosives causing additive or synergistic effects? • Specifically, how is the military dealing with the use of midfrequency active sonar (MFAS) and the stranding's of Cuvier's Beaked Whales, which occur after MFAS use? • How is the current use of MFAS in training, impacting migratory or local populations of beaked whales?	Information about the quantitative analysis is described in detail in the 2018 technical report titled *Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing*. The Navy's acoustic and explosive effects analysis looks at multiple factors such as marine mammal abundance across the study area in each season, the levels of sound that may cause certain effects, and the Navy's proposed time and space use of noise producing activities. As discussed in Sections 3.4.2.1 (Acoustic Stressors) and 3.4.2.2 (Explosive Stressors), a few instances of takes per year do not constitute long-term consequences for individuals. Stranding of marine mammals due to proposed activities is very unlikely. The Center for Naval Analysis (CNA) recently conducted a statistical study of correlation of beaked whale strandings around the Mariana Islands with the use of U.S. Navy sonar, finding that insufficient evidence of a correlation exists. The CNA study used the complete record of all U.S. Navy sonar use between 2007 and 2019, including major training events, joint exercises, and unit level training/testing. The analysis also included the complete beaked whale stranding record for the Mariana Islands through 2019. Following the methods in Simonis et al. (2020), the CNA analysis found insufficient evidence of a correlation between sonar use and beaked whale strandings when considering the complete sonar use record. The CNA finding is in contrast to the finding in Simonis et al. (2020), which depicted a significant correlation between beaked whale strandings and Navy sonar use. However, the Simonis et al. (2020) result relied on substantially incomplete or inaccurate assumptions about U.S. Navy sonar use around the Mariana Islands. CNA also conducted statistical analyses specific to each island where beaked whale strandings have been observed in the Mariana Islands, similarly finding insufficient evidence of a correlation to sonar use. Additional information on the findings of the CNA

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		analysis are presented in Section 3.4.2.1.1.6 (Stranding) in Chapter 3.4 (Marine Mammals). Information about the quantitative analysis is described in detail in the 2018 technical report titled Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing. The Navy's acoustic and explosive effects analysis looks at multiple factors such as marine mammal abundance across the study area in each season, the levels of sound that may cause certain effects, and the Navy's proposed time and space use of noise producing activities. As discussed in Sections 3.4.2.1 (Acoustic Stressors) and 3.4.2.2 (Explosive Stressors), a few instances of takes per year do not constitute long-term consequences for individuals. Stranding of marine mammals due to proposed activities is very unlikely. The Navy is committed to protecting marine life by implementing mitigation measures when training or testing using active sonar or explosives; working with regulatory agencies; and furthering our understanding of marine mammals through research and monitoring. Section 3.4.2.1.1.6 (Stranding) further discusses the best available information about strandings of beaked whales in the Mariana Islands and the Navy's support of efforts to better understand the causes of marine mammal strandings. Section 3.0.1.1.1 (Marine Species Monitoring and Research Programs) provides an overview of U.S. Navy-supported research on marine species. These programs support coordinated science, technology, research, and development focused on understanding the effects of sound on marine mammals, including physiological, behavioral, ecological, and population-level impacts. Additional information on these programs and other ocean resources-oriented initiatives can be found at the Department of the Navy's Energy, Environment, and Climate Change website (https://navysustainability.dodlive.mil).

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		The Navy's analysis of impacts on beaked whales took into account their greater sensitivity to disturbance relative to other marine mammals, as demonstrated by the data used to develop the behavioral response criteria for beaked whales [see the technical report titled Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III) available at https://mitt-eis.com]. Impacts to beaked whales due to sonar are described in Section 3.4.2.1.2.3 (Impacts from Sonar and Other Transducers under the Action Alternatives). No long-term consequences to any beaked whale species are expected. As described in Section 5.1.2.2.1 (Marine Species Research and Monitoring Programs), for this Final Supplemental EIS/OEIS, the Navy agreed to several additional research and monitoring initiatives designed to help advance the understanding of beaked whales and strandings in the MITT Study Area. The Navy will co-fund the Pacific Marine Assessment Program for Protected Species (PACMAPPS) Mariana Islands survey in spring-summer 2021 and future studies starting in 2022 to help document beaked whale occurrence, abundance, and distribution in the Mariana Islands. The Navy will also fund additional stranding response and necropsy analyses for the Pacific Islands region, and research on a framework to improve statistical stranding analysis. Collaboratively with NMFS, the Navy will fund and organize an expert panel to provide recommendations on scientific data gaps and uncertainties for further protective measure consideration to minimize potential impacts of Navy training and testing activities on beaked whales in the Mariana Islands.
OSP-06	e) There may be adverse impacts that last beyond the life of the proposed action that causes the effects. The SEIS needs to study and incorporate these impacts, and share such information, so the public can provide informed input. f) There must be included analyses of the capacity of each affected resource, ecosystem, and human community to	See above responses OSP-01 and OSP-02 (Senator Sabina Flores Perez) regarding cumulative effects.

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	accommodate additional effects, based on the resource's own time and space parameters. The most effective approach to conducting a cumulative analysis focuses on what is needed to ensure long-term productivity and sustainability of the resource.	
OSP-07	2) Mitigations are not sufficient for current and proposed MITT activities. b) "Two factors are considered when quantifying the effectiveness of mitigation: (1) the extent to which the type of mitigation proposed for a sound-producing activity (e.g., gunnery exercise) allows for observation of the mitigation zone prior to and during the activity; and (2) the sightability of each species that may be present in the mitigation zone, which is determined by species-specific characteristics and the viewing platform." (SEIS 3.1.1.2.4.1) • What types of observations methods are used? • Is it sensitive enough to engage mitigation procedures?	The Navy would implement procedural mitigation measures to avoid or reduce potential impacts on marine species wherever and whenever applicable acoustic, explosive, and physical disturbance and strike stressors are used in the Study Area. Procedural mitigation measures generally involve (1) the use of one or more trained Lookouts to observe for specific biological resources within a mitigation zone, (2) requirements for Lookouts to immediately communicate sightings of specific biological resources to the appropriate watch station for information dissemination, and (3) requirements for the watch station to implement mitigation until a pre-activity commencement or during-activity recommencement condition has been met. Procedural mitigation measures primarily involve Lookouts observing for marine mammals and sea turtles. For some activities, Lookouts may also be required to observe for additional biological resources, such as ESA-listed fish species or jellyfish aggregations that can be an indicator of potential sea turtle presence. To consider the benefits of procedural mitigation measures on marine mammals and sea turtles within the MMPA and ESA impact estimates, the Navy conservatively factored mitigation effectiveness into its quantitative analysis process, as described in the technical report titled *Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing*.
OSP-08	c) The Biological Opinions submitted in 2015 should be reassessed to offer sufficient mitigation options considering the addition of high-energy laser use in the current supplemental EIS.	The Navy has used and analyzed the potential impacts of high-energy lasers in other Study Areas in the Atlantic and Pacific Oceans. It is highly improbable that the use of high-energy lasers would strike a marine mammal. As described in Section 3.4.2.3 (Energy Stressors), impacts on marine mammals from high-energy lasers are not expected to occur given

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	"The 2015 MITT Final EIS/OEIS covered the use of low-energy lasers in Section 3.0.5.2.2.3 (Lasers), but high-energy laser weapons were not part of the Proposed Action in the 2015 MITT Final EIS/OEIS. The use of high-energy lasers represents a new sub-stressor as part of an existing activity in this SEIS/OEIS. As discussed in this SEIS/OEIS, Section 3.0.4.3.2.2 (High-Energy Lasers), high-energy lasers are designed to disable surface targets, rendering them immobile. The primary concern is the potential for a marine mammal to be struck with the laser beam at or near the water's surface, where extended exposure could result in injury or death." (Draft EIS, Volume 2, 2019) • Are High-Energy Lasers a new technology used by the U.S. Military? • In which other training locations have High-Energy Lasers been used? • What impacts and concerns have resulted from the use of High-Energy Lasers? • What mitigation standards or procedures are offered for the use of High-Energy Lasers? • What current and future cumulative effects will the use of High-Energy Lasers have on marine, terrestrial, and atmospheric conditions of the archipelago, both in part and as a whole? Such effects should also include consideration of the use of High- Energy Lasers in conjunction with other technologically advanced weapon systems.	the short ranges involved in the activities involving high-energy lasers, the aim point being a surface target, the inherent precision of the weapon and its targeting system, the very limited depth to which energy can penetrate the water's surface, and the fact that marine mammals spend up to 90 percent of their time underwater. The Navy follows all standard operating procedures for safely operating high-energy lasers for public health and safety; however, due to the highly improbable chance for interactions with marine mammals, mitigation measures for this activity are not warranted. The Navy is consulting with NMFS under the ESA for potential effects on ESA listed species. Mitigation measures and monitoring requirements for endangered species are presented in Chapter 5 (Mitigation) of the Final Supplemental EIS/OEIS. Any additional measures required by the ESA Biological Opinion will be reflected in the Record of Decision.
OSP-09	d) Studying the effects of marine mammals and sea turtles in situ introduces impacts that influence the outcome of the studies. For instance, density determinations using intrusive technology such as sonar and other means could falsely lower density results. The SEIS should adjust its analyses to appropriately accommodate for this.	Active sonar is not used to conduct marine mammal surveys. The line transect surveys conducted by researchers are primarily visually based surveys (either by air or from a vessel) factoring in a correction for marine mammals that could not be seen because they were below the surface. In addition, some vessel-based marine mammal surveys use passive acoustic monitoring, which employs a hydrophone to listen for marine mammal

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		vocalizations. Using passive acoustic monitoring can detect the presence of a marine mammal when it is not at the surface, but no sound is emitted by the hydrophone. Density estimates require a substantial amount of sighting data collected from multiple systematic surveys. The results of surveys are reported in government reports and peer reviewed scientific publications to help validate their quality and accuracy and represent the best available scientific data for estimating densities.
OSP-10	3) Historic properties, including those on submerged lands and sunken ships, have not been fully identified and therefore effects have not been determined. Additionally, cumulative effects, as described on item #1, on historic properties, has not been determined. Current and proposed actions pertaining to multiple detonations, sonar, and other detailed and unlisted activities threaten the existence, and knowledge of the existence, of unidentified historic properties. The public deserves information about this potential destructive action, and should be afforded an opportunity to provide informed comment.	The Navy considered cultural resources within the Study Area and potential impacts on cultural resources associated with the proposed activities as documented in Section 3.11 (Cultural Resources) of the Draft Supplemental EIS/OEIS and the 2015 MITT Final EIS/OEIS. As described in Section 2.3.3 (Standard Operating Procedures), the Navy implements standard operating procedures that benefit cultural resources, such as conducting underwater detonation training only in designated locations away from popular dive sites, such as wrecks. Additionally, as described in Chapter 5 (Mitigation), the Navy implements mitigation within Seafloor Resource Mitigation Areas throughout the Study Area to avoid potential impacts on shipwrecks from explosive and physical disturbance and strike stressors.
OSP-11	4) Cumulative effects regarding public access to ancestral lands, traditional fishing grounds, native forests for the continued practice of traditional medicine, including lack of access due to marine preserves and military ecological preserves at Haputo and Orote peninsula, has not been determined. Given the absence of such information, the public has not been given an opportunity to provide informed input on a potentially destructive action.	Use of Haputo and Orote peninsula is not proposed in this Supplemental EIS/OEIS. Training and testing activities are proposed to occur at sea and on FDM within the Study Area. Tables 2.5-1 and 2.5-2 in Chapter 2 (Description of Proposed Action and Alternatives) present the current and proposed training and testing activities.
OSP-12	5) The fragmentation of the Programmatic Agreement process from the Record of Decision is a burden to the community. The process is confusing to a layperson, and has been inadequately explained to the public. Deadlines for document review and feedback are unreasonably short. It is disingenuous to claim to seek community involvement, but then burden the public with dense, lengthy technical documentation and a short comment period. The	The Navy is required to complete independent statutory obligations under both NEPA and NHPA. Thus, the Navy has prepared this Supplemental EIS/OEIS and is pursuing continued compliance with NHPA under the Section 106 process. The Navy recognizes the importance of public participation in the development of this Supplemental EIS/OEIS and exceeded requirements for providing public notification, project information, and the opportunity

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	feedback process should be extended further, considering the extreme length and significant impact of the MITT SEIS, and proper community outreach and education should be conducted to properly facilitate public input.	for the public to submit comments on the analysis. This Supplemental EIS/OEIS complies with NEPA, CEQ requirements, and Navy instructions for implementing NEPA. The MIRC Programmatic Agreement expired in December 2019. In anticipation of this, the Navy initiated a NHPA Section 106 consultation in January 2019 with an eye toward developing new updated Programmatic Agreements. The Navy has held five consultation meetings open to consulting and interested parties on Guam and eight throughout the CNMI. Additionally, site visits, and working group sessions with the SHPOs and the National Park Service have taken place. The Navy is required to comply with NHPA Section 106 to support its undertaking. A Programmatic Agreement is one of several methods of ensuring compliance under Section 106 but is most appropriate for undertakings that involve routine and redundant activities where a federal agency plans to resolve potential adverse effects to historic properties through avoidance, minimization, and/or mitigation. An interim Programmatic Agreement for Guam that follows the exact terms of the 2009 MIRC Programmatic Agreement has been executed and is intended to “bridge” the expiration of the current Programmatic Agreement with the execution of the new Programmatic Agreement being developed.With regard to the CNMI, Cultural Resources staff at JRM have already taken action to conduct NHPA Section 106 consultation on individual training events following the expiration of the 2009 MIRC Programmatic Agreement to ensure compliance as the Navy continues the consultation process. The Navy acknowledges that the information presented in this Supplemental EIS/OEIS is by necessity very complex; however, the Navy attempts to explain challenging concepts, methods, and the results of the analysis as clearly as possible and developed public informational materials for lay audiences. The Navy prepared project brochures, videos, a website, and posters, using layperson terms to enhance public

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		understanding of the information presented in this Supplemental EIS/OEIS. Based on the demographics of the CNMI, a project fact sheet was also translated into Chamorro. The informational materials, including the translated fact sheet, were made available at all four public meetings and on the project website www.mitt-eis.com. The Navy held four open house public meetings, one each on Tinian (Tinian Public Library, March 14, 2019), Rota (Mayor's Conference Hall, March 15, 2019), Saipan (Kanoa Resort, March 18, 2019), and Guam (University of Guam, March 19, 2019). The public meetings were an opportunity for the public to ask questions of Navy leadership, scientists, and other experts about the analysis documented in this Supplemental EIS/OEIS. The Navy encouraged the public to attend these meetings and broadly notified the public through the media, including paid newspaper advertisements and news releases, and direct mail, including letters, postcards, and emails. A voice recorder was provided for any member of the public who wanted to provide an oral comment in a language other than English. The Navy has received feedback from attendees that the open-house format is more conducive to promoting public understanding and constructive dialogue. Open house meetings allow a greater number of individuals to directly engage and interact with Navy team members and ask questions about this Supplemental EIS/OEIS, as well as provide comments on the document. When planning the dates and locations for public meetings, the Navy considered cultural and religious holidays whenever possible. To better accommodate stakeholders and the public, the Navy provided 75 days to review and comment on the Draft Supplemental EIS/OEIS, which is 30 days longer than the minimum required time for review. The Navy appreciates input received from local government agencies and communities on how it can improve public notification and outreach efforts.

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OSP-13	Author Manuscript attached to comment. HHS Public Access Author manuscript Otol Neurotol. Author manuscript; available in PMC 2017 September 01 Temporary and Permanent Noise-Induced Threshold Shifts: A Review of Basic and Clinical Observations	The Navy has reviewed and incorporated the best available science on the hearing sensitivity of marine species, which is more relevant to the analysis presented in this Supplemental EIS/OEIS than the submitted manuscript that reviewed basic and clinical observations on threshold shifts in humans.
Nathaniel Martin Guam Department of Agriculture/Fisheries (GDAF)		
GDAF-01	1) Have concerns about the closing of Fishing, recreation grounds - need to have notice (advanced), example W517, Communication has been made, but folks still not getting info in a timely manner, recommend using various resources to inform public, explore other types. 2) Need to keep Guam DOAg/Fisheries informed and given ample time to respond to Detonation activities in aquatic env., DOAg is required to document environmental impact during activities.	It is important to note that Galvez Bank and Santa Rosa Reef are not within W-517, and only a portion of White Tuna Banks is within W-517. The Navy does not restrict access to Galvez Bank or Santa Rosa Reef. Mariners near Galvez Bank or Santa Rosa Reef may be warned of their proximity to W-517 or asked not to enter W-517 as a precautionary measure. When certain activities are planned, the military publishes notices to mariners for public safety and to help water users plan accordingly to avoid temporarily restricted areas. As specified in Title 33 CFR Subpart 72.01, Notices to Mariners, the U.S. Coast Guard issues information to the public concerning maritime navigation. When notices to mariners are issued, the restriction is not necessarily for a full 24-hour period because many training activities last less than a full day. Additionally, nautical charts issued by the National Oceanic and Atmospheric Administration include these federally designated zones and areas. Operators of recreational and commercial vessels have a duty to abide by maritime regulations administered by the U.S. Coast Guard. The Navy will continue to communicate closures to the public and fishing community, including using Facebook. As discussed in Section 5.1.2.2 (Monitoring, Research, and Reporting Initiatives), the Navy developed its reporting requirements in conjunction with NMFS to be consistent with mission requirements and balance the usefulness of the information to be collected with the practicality of collecting it. The Navy's training and testing activity reports and incident reports are designed to verify implementation of mitigation; comply with current permits, authorizations, and consultation requirements; and improve future environmental analyses. The Navy reports to NMFS if mitigation was implemented during sinking exercises (e.g., number of times explosive detonations were delayed due to marine mammal

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		sightings). For major training exercises, the Navy's annual training and testing activity reports include information on each individual marine mammal sighting related to mitigation implementation. In the unlikely event that a vessel strike of a marine mammal should occur, the Navy would provide NMFS with relevant information pertaining to the incident, including but not limited to vessel speed. Additional reporting would be ineffective for the reasons detailed in Section 5.6.7 (Reporting Requirements). The Navy is obligated under the ESA and MMPA to provide information on any incidents involving ESA-listed species. Therefore, the Navy will continue to submit the appropriate reports to NMFS immediately, or as soon as operational security considerations allow, if it observes an incident that is or may be attributable to Navy activities, including (1) a vessel strike of a marine mammal or sea turtle during training or testing; (2) a stranded, injured, or dead marine mammal or sea turtle during training or testing; or (3) an injured or dead marine mammal, sea turtle, or ESA-listed fish species during post-explosive activity monitoring.
Tyrone J. Taitano, Acting Director, Guam Bureau of Statistics and Plans, Government of Guam (BSP Guam)		
BSP Guam-01	Pursuant to the Coastal Zone Management Act of 1972 (U.S. P.L. 92-583), as amended by U.S. P.L. 94-370, 15 CFR Part 930 (CZMA), federal activities that may have an effect on coastal uses or resources are subject to the federal consistency review process. The CZMA requires all proposed federal activities that could affect any land or water use in Guam, or any of Guam's natural resources to be submitted for review for consistency with the enforceable policies of Guam Coastal Management Program (GCMP) of the Bureau of Statistics and Plans (BSP). This letter is provided to you to assist in ensuring compliance with the federal consistency requirements of the CZMA for the proposed at-sea training and testing activities under the U.S. Navy: Press Release 19-012: Marianas Islands Training and Testing Draft SEIS/OEIS.	The Navy submitted a Consistency Determination (CD) to the Bureau of Statistics and Plans (BSP) in December 2019 addressing proposed military training and testing activities that may affect Guam's coastal zone and coastal uses. The consistency determination was prepared in accordance with Guam's Procedures Guide for Achieving Federal Consistency with the Guam Coastal Management Program (Bureau of Statistics and Plans May 2011). BSP's response to the Navy's CD (dated March 6, 2020) can be found in Appendix C (Agency Correspondence). The Navy is in discussions with BSP in order resolve any differences and reach an agreement regarding the Navy's compliance with Guam's Coastal Management Program to the maximum extent practicable. The outcome of these discussions will be included in the ROD.

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	Under the CZMA, the GCMP's purpose is to enhance and maintain the long-term productivity of the coastal environment while meeting the current and future needs of the residents of Guam and the United States. The GCMP is a networked agency program implementing Guam's policies to guide the use, protection, and development of land and ocean resources within Guam's coastal zone. Guam Executive Order 78-37 serves as the means of Coastal Management Program's inter- agency coordination with local authorities to carry out coastal zone management objectives and policies. The GCMP is responsible for conducting federal consistency reviews for federal agency activities, activities requiring a federal license or permit, federal assistance to local governments, and outer continental shelf exploration, development, and production activities. Under the CZMA, the entire island of Guam and all of its offshore islands and territorial waters constitute the coastal zone as specified in 15 CFR 930.l l (e), 16 U.S.C. 1453(1), and the Submerged Lands Act (43 U.S.C. 1301 et seq.). Therefore, any federal activity that may affect land or water use, and is conducted in Guam and/or its included islands and waters, is subject to federal consistency review by the GCMP and its networked agencies. Under this approach, consistency review of a federal action is coordinated by the GCMP, which serves as the lead coastal agency, pursuant to Section 306(d) (6) of the CZM. For any federal agency proposing to conduct a subject activity in Guam, the first phase of the review process is intended to be initiated by the federal agency/entity itself, per Subpart C of the CZMA. Under Subpart C, the federal agency is required to be aware that its activity is subject to review; and then it must begin the process by contacting the GCMP and submitting an application and	The Navy has engaged with the Guam Coastal Management Program throughout the development of this Supplemental EIS/OEIS, including meeting with staff during the scoping phase and notifying the program director when the Draft Supplemental EIS/OEIS was made available for public review and comment.

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	determination documents to the GCMP. The United States Army Corps of Engineers (USACE) is a "Federal agency" for the purposes of the CZMA (15 CFR § 930.l l (j)). Federal activities subject to review under Subpart C of the CZMA are any activities, use, or development projects which could foreseeably affect the coastal zone; its use, access, or natural resources, and which are performed by a federal agency, or are performed by a contractor who has been contracted to carry out work for a federal agency (15 CFR § 930.31). Whenever "a Federal agency makes a proposal for action initiating an activity or series of activities when coastal effects are reasonably foreseeable" the Federal agency must submit a federal consistency "determination" to BSP GCMP for review (15 CFR §§ 930.3 l (a) and 930.34(a)(l)). Specifically, any proposed rule or rule change that affects the use of a coastal zone is subject to federal consistency review under the CZMA. "'Federal agency activity' means any functions performed by or on behalf of a Federal agency in the exercise of its statutory responsibilities. The term 'Federal agency activity' includes a range of activities where a Federal agency makes a proposal for action initiating an activity or series of activities when coastal effects are reasonably foreseeable, e.g....a proposed rulemaking that alters uses of the coastal zone..." (15 CFR 930.3 l (a)). (Emphasis added). The GCMP understands that the supplement to the 2015 Final Mariana Islands Training and Testing Environmental Impact Statement (SEIS/OEIS) is currently undergoing Public Notice (See Federal Press Release, Permit File Number: 19-012 Issued February 04, 2019). The Proposed Action under the SEIS consist of conduct at-sea training and testing activities within the Study Area. These activities	

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	include the use of active sonar and explosives while employing marine species mitigation measures. The purpose of the Proposed Action, which remains the same as the 2015 MITT Final EIS/OEIS, is to maintain a ready force to ensure the military can accomplish its mission to maintain, train, and equip combat-ready forces. Federal agencies must submit one of the two types of "Determination" documents; either a "Consistency Determination" or a "Negative Determination" to the GCMP (15 CFR §§ 930.34 and 930.35). This submission is required even if the federal agency finds that the proposed federal activity would have no effect on Guam's coastal zone access, use, or resources; so long as the activity is a listed activity or is similar to activities for which consistency determinations have been prepared in the past. The CZMA requires notice to the public of the proposed activity. This public notice requirement is one of the core mandates of the CZMA. See 15 CFR §§ 930.2 and 930.42. It is intended to allow the residents of Guam to be aware of any federal activities which may affect their land and water access, use, or recreational activities in Guam. The public notice required under the CZMA is issued by the GCMP, and is distinct from the public notice requirement imposed on USACE pursuant to 33 CFR § 334.4(b). To date, the GCMP has not received a federal consistency application or any determination documents from The US Navy for the MITT. Currently, the GCMP has no record of any federal consistency coordination between the US Navy and the GCMP concerning this MITT proposal. Early coordination between the GCMP and any federal agency conducting a subject activity affecting Guam's coastal zone is one of the key requirements of the CZMA. Coordination between the federal agency and the GCMP should begin "at an early stage in the	

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	development of the proposed activity," (15 CFR § 930.36(a); and the application and determination documents should be submitted "at the earliest practicable time in the planning or reassessment of the activity," and "at least 90 days before final approval of the Federal agency activity" (15 CFR § 930.36(b)). The GCMP would like to invite the U S Navy to coordinate with the GCMP and submit a federal consistency application and determination documentation to the GCMP for the MITT proposal, in cooperation with the U.S. Navy. A federal consistency application and consistency documents must be submitted to the GCMP for review of this activity. "A consistency determination should be prepared following development of sufficient information to reasonably determine the consistency of the activity with the management program, but before the Federal agency reaches a significant point of decision-making in its review process, i.e., while the Federal agency has the ability to modify the activity" (15 CFR § 930.36(b)). Cognizant of the exemplary coordination and cooperation that the US Navy has continued to demonstrate. We would like to take this opportunity to thank you in advance for your collaboration and professionalism in supporting GCMP and our resource networked agencies in conducting our mandated federal consistency reviews for federal activities. I sincerely appreciate your assistance, and look forward to receiving the required federal consistency determination and supporting documents for review. Thank you for your cooperation and consideration. Si Yu'os Ma'ase'.	

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Miguel C. Bordallo, Guam Waterworks Authority (GWA)		
GWA-01	The Guam Waterworks Authority has reviewed the 2019 Draft Mariana Islands Training and Testing (MITT) Supplemental Environmental Impact Statement/Overseas Environmental Impact Statement. The GWA has undertaken review of the proposed planned military activity to ensure protection of the Northern Guam Lens Aquifer and wastewater discharge into Guam's waters. Land based training located on Guam was covered under the 2015 MITT Final EIS/OEIS under the existing Mariana Island Range Complex (MIRC). This Supplemental EIS/OEIS considers activities conducted at sea and on Farallon de Medinilla (FDM). This supplemental EIS/OEIS incorporated new models, information, data and science as required by the Council on Environmental Quality Regulations. However, there are no changes made to land based activities proposed on Guam. The proposed activities listed in this draft MITT Supplemental EIS/OEIS will not have an impact to the ability for GWA to provide safe drinking water to its customers and ensure that wastewater discharge is conducted in appropriate manner.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Guam Department of Agriculture (DoAg), John C. Borja, Acting Chief *General Comments*		
DoAg-01	As the local state agency mandated to monitor and protect Guam's biological resources, the Guam Department of Agriculture (DoAg) submits the following general comments to be addressed in the Final MITT Environmental Impact Statement and Record of Decision. In addition, attached to this letter, are specific comments from the MITT DEIS/OEIS in a comment matrix format. 1. First and foremost, Department of Navy (DoN) needs to provide a progressive, comprehensive plan for the recovery of native species on Military property in consultation and coordination with	While outside the current scope of this Supplemental EIS/OEIS, the military satisfies Sikes Act obligations through the development and implementation of the Joint Region Marianas Integrated Natural Resource Management Plan (INRMP). The purpose of the INRMP is not to measure impacts of military training and testing activities, but to utilize adaptive management to maintain long-term ecosystem health and minimize impacts on natural resources consistent with the operational requirements of the DoD's mission. The 2019 Joint Region Marianas INRMP includes monitoring programs throughout the Mariana Islands. The Guam Department of Agriculture, Division of Aquatic and Wildlife Resources

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	DoAg. Without the ability to reintroduce federally endangered species on DOD property the cumulative impacts of DOD actions are jeopardizing the DoAg's ability to recover Guam's native species on Refuge Overlay lands. Furthermore, DOD's failure to coordinate with DoAg as required by the Sikes Act of 1960 [16 U.S.C. et seq.; 74 stat. 1052], as amended, and recognize the DoAg's ability to assist DOD in meeting their Section 7 requirements under the Endangered Species Act of 1973 [16 U.S.C. 1531 et seq.: 87 Stat. 884], as amended, results in a waste of taxpayers' dollars. The DoAg further emphasizes the need to be consulted and notified in matters that may impact the natural resources of Guam. 2. Secondly, the Final EIS needs to outline how DON will address long-standing issues regarding timely access for the DoAg Division of Aquatic and Wildlife Resources (DAWR) staff to all DOD lands to monitor and manage Guam's natural resources. The DoAg-DAWR staff could complete monitoring of resources under annual federal funded grant objectives, without cost, or at a much lower cost to DoN that is currently being contracted and assist with meeting Sikes Act coordination obligations. The current access requirements for DoAg-DAWR staff are cumbersome and prevent timely coordination as opposed to those procedures for federal employees and contractors.	(Guam DAWR) is a signatory and participating member to the 2019 Joint Region Marianas INRMP, which details natural resource management and monitoring programs. The Navy will continue to improve coordination and collaboration with Guam DAWR as part of the INRMP project development and implementation.
DoAg-02	3. The Final MITT DEIS needs to address another long-standing issue that is DOD's failure to comply with local laws. The MITT activities and study area include the Piti Marine Preserve Area that extends to the 600-foot contour. Any take of non-pelagic fishes with in this area is a violation of Guam law.	The Navy's Piti Floating Mine Neutralization site is for floating (i.e., at the water surface) mine detonation training events and would not affect non-pelagic fish such as bottom-fish. As can be seen in NOAA nautical chart 81048 and Figure 2.2-1 in the MITT DEIS, water depth at this site is approximately 356 fathoms or 2,136 feet. Therefore, the Piti is outside of the Piti Marine Preserve Area.
DoAg-03	4. The Final MITT DEIS must mitigate the cumulative impacts to recreational fishing in the oceanic areas that will be impacted by the proposed action. Recreational fishing includes sustenance and small-scale commercial fishing. The NEPA documents for other	The Navy used the best available science and conducted a comprehensive review of past, present, and reasonably foreseeable actions to develop a robust analysis of cumulative impacts (Chapter 4, Cumulative Impacts). As required under NEPA, the level and scope of the analysis are

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	proposed military activities indicate the closure of important fishing areas such as Ritidian and Pati Point. The additional loss of key recreational fishing areas proposed in the Draft MITT EIA is unacceptable and irreplaceable.	commensurate with the potential impacts of the action as reflected in the resource-specific discussions in Chapter 3 (Affected Environment and Environmental Consequences). The Navy considered proposed and ongoing activities alongside with other activities in the region whose impacts are truly meaningful to the analysis. Furthermore, the entire Supplemental EIS/OEIS provides the cumulative impacts analysis, not just Chapter 4. Chapter 3 provides the current effects of past and present impacts and environmental conditions that represent the baseline of the environment as it is; Chapter 3 also discusses the consequences or potential future impacts from Navy activities. Chapter 4 discusses other reasonably foreseeable activities, including Department of Defense activities in the Marianas regions, to the extent they are known and the incremental impact of the Navy's proposal when added to past, present, and future impacts. The Navy used the best available data to analyze the potential effects of the Proposed Action on commercial and recreational fishing in Section 3.12 (Socioeconomic Resources and Environmental Justice). The Navy is not proposing a change to any restricted ocean areas currently used by the Navy since the 2010 MIRC Final EIS/OEIS (Section 2.1.1, MIRC Overview) and the 2015 MITT Final EIS/OEIS (Section 2.1.1, Mariana Islands Range Complex). In this Supplemental EIS/OEIS there are no new restrictions to public access of fishing areas and the Navy is not proposing to close any additional fishing areas. The Navy is committed to continuing to work with the local community on issues that potentially affect the public, including access to fishing sites.
DoAg-04	5. Other boaters, including divers and other recreational users, also frequent many areas within the MITT study area. There is no clear indication of how extensive closures will be - do events last for an hour, or a day, or a week? The Final EIS and ROD need to minimize closure of areas regularly used by recreational boaters and fishers and identify clearly the space and time of the closures.	The Navy is committed to continuing to work with the local community on issues that potentially affect the public, including access to fishing sites while ensuring public safety at all times. The military actively promotes compatible use of ocean areas by minimizing public access restrictions and limiting the extent and duration of necessary closures. To clarify information presented in the Draft Supplemental EIS/OEIS, range access would not always be restricted when a range is in use; therefore, no

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	6. When notices to mariners is sent out, DOD should insure that notices are sent out to all media source outlets, to inform the public of Surface-Danger -Zone activities as the actions are implemented. 7. Prior to training exercises, the DoN and USCG issue NOTMARs and NOTAMs to announce an exercise and to notify the public of potential hazards in the exercise area. DoN must ensure these notices are adequately distributed to the public and with a much larger area proposed in the MITT distribution must be assessed for adequacy.	change has been made to the document. Range access is dependent on the nature and type of activity being conducted. The Navy does not propose a change to the ocean areas currently used by both the Navy and the public. Restrictions on accessing areas of co-use would continue to be infrequent and short-term, while other fishing sites in the Study Area would continue to be available to the public. The Navy recognizes that limited or no access to productive fishing areas would impact fishers. While the analysis concludes that impacts could occur, the Navy does not anticipate significant impacts on commercial and recreational fishing in the Study Area, as described in both this Supplemental EIS/OEIS and the 2015 MITT Final EIS/OEIS, given the availability of other fishing areas in the CNMI. Various means are used to communicate information to the public about areas restricted to public or commercial activities and are described in Section 3.13 (Public Health and Safety). As specified in Title 33 CFR Subpart 72.01, Notices to Mariners, the U.S. Coast Guard issues information to the public concerning maritime navigation. When notices to mariners are issued, the restriction is not necessarily for a full 24-hour period because many training activities last less than a full day. Additionally, nautical charts issued by the National Oceanic and Atmospheric Administration include these federally designated zones and areas. Operators of recreational and commercial vessels have a duty to abide by maritime regulations administered by the U.S. Coast Guard. The Navy will continue to communicate closures to the public and fishing community, including using a public Facebook page.
DoAg-08	8. The ROD must clearly indicate how the Micronesia Biosecurity Plan will be implemented, including funding mechanisms, to prevent the spread of invasive alien species (IAS) throughout the region. For example, 100% inspection rates for brown tree-snake (BTS) at ports of exit from Guam and entry points to other regional areas are necessary to ensure BTS does not impact bird, bat and lizard populations on other	The U.S. Navy recognizes the importance of biosecurity, ecological integrity, and resiliency of island ecosystems to the potential introduction of invasive species to the Mariana Islands associated with military training and testing. The Navy has a number of policies in place to prevent, interdict, and control invasive species introductions in both terrestrial and marine environments. Specific federal and Navy policies for marine

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	islands. These populations are necessary for the recovery of Guam's native ecosystem. 9. Although there are currently BTS inspections of cargo and vessels from Guam, there is a potential for the system to be overwhelmed by the increase in tempo of activities. The MITT DEIS also needs to be mindful of other IAS that Guam could infect CNMI with that would be devastating to endangered wildlife and Its habitats, i.e., little fire ant and coconut rhinoceros beetle.	invasive species can be found at: Public Law 104-332, National Invasive Species Act of 1996; Executive Order 13112 (Invasive Species) and amended by Executive Order 13751 (Safeguarding the Nation from the Impacts of Invasive Species; and OPNAVINST 5090.1E Chapter 35-3.19. (Ship and Ballast Water), 5090.1E Chapter 35-3.1 (Environmentally Sound Ships), and 5090.1E Chapter 12-3.9 (Invasive Species). The Navy currently operates under the recommendations of the 2015 Regional Biosecurity Plan for Micronesia and Hawaii. The DoD-specific recommendations are part of the plan. Recommendations in the plan are currently being updated. As part of the INRMP, the Navy will implement marine management recommendations identified in the biosecurity plan for Micronesia and Hawaii.
DoAg-10	10. Consistent monitoring of behavior and distribution of Mariana fruit bat/island swiftlet/common moorhen/megapode (and other terrestrial species of regional concern) must be conducted prior to and after MITT related activities in-order-to evaluate the impact of activities, particularly on species of greatest conservation need. Appropriate measures must be incorporated to reduce impacts to terrestrial species, as well as measures to avoid impacting species that aggregate when feeding in open water ocean. Impacts to aggregations of individuals in the expanded areas of MITT activities may impact species on a population level.	The Navy is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities. Both this Supplemental EIS/OEIS and the 2015 MITT Final EIS/OEIS Section 3.6 (Birds) address potential impacts on seabirds that nest and visit FDM. Section 3.10 (Terrestrial Species and Habitats) addresses wildlife and plant communities and ESA-listed species known to occur on the island (Micronesian megapodes and Mariana fruit bats). In addition, the 2019 Integrated Natural Resources Management Plan (INRMP) includes additional information on biological resources on FDM and nearshore waters surrounding waters of the island. In 2015, the Navy and USFWS completed consultation for potential impacts of military training activities on FDM. The 2015 Biological Opinion determined that these activities would adversely affect ESA-listed species on FDM, and included non-discretionary measures to reduce the effect of take resulting from training activities. Activities analyzed in the Navy's Supplemental EIS/OEIS do not warrant reinitiation of Section 7(a)(2) consultation with USFWS, and the measures agreed to between the Navy and USFWS in 2015 are carried forward in this Supplemental EIS/OEIS.

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DoAg-11	11. The assessment of potential effects to marine animals and habitat from underwater detonations needs more clarification and analysis. Habitat mapping needs to be more detailed, the Cetacean species that utilize the area proposed for the MITT need to be identified, as well as the impacts such activity will have on these species. The analysis also needs to include the impacts to sea turtles. The presence of ESA-listed sperm whales is well documented within three to five miles offshore in the Agat area. Effects to this species and the mitigation for these actions are not addressed in the MITT DEIS. The increased boat activity greatly increases the potential for boat strike of sperm whales. Navy lookouts undergo extensive training in order to qualify as a watch stander. It seems the use of these watch standers been how successful & should be measured.	Recognizing the importance of the Mariana Islands to marine mammals, the Navy has proposed three geographic mitigation areas in this Supplemental EIS/OEIS. Appendix I (Geographic Mitigation Assessment) includes information about areas considered and evaluated to be potential mitigation areas. Each area was assessed based on two criteria: (1) is the area a key area of biological importance for one or more marine mammal species or sea turtle species for an important life process, and (2) would the mitigation result in an avoidance or reduction of impacts. In addition, implementation of the area as a mitigation area must be practical and allow the Navy to carry out its mission requirements. The Navy used the best available scientific data on vulnerable or sensitive species, such as humpback whales, to identify the three proposed geographic mitigation areas that met the two criteria. Updates to the appendix have been made in this Supplemental EIS/OEIS based on the Navy's ESA and MMPA consultations with NMFS. In addition, the Navy developed its reporting requirements in conjunction with NMFS as discussed in Section 5.1.2.2 (Monitoring, Research, and Reporting Initiatives). Section 3.4.1.31.2 (Geographic Range and Distribution) of the Supplemental EIS/OEIS provides details on sperm whale sitings. Section 5.3.4.1 (Vessel Movement) of the Supplemental EIS/OEIS provides procedural measures to avoid or reduce the potential for vessel strikes of marine mammals and sea turtles. It is important to note that, within the Study Area, the Navy has sponsored several monitoring projects to better understand marine mammal and sea turtle distribution and habitat use, and to assess the presence of corals and ESA-listed species at FDM. Additional information is available on the U.S. Navy Marine Species Monitoring Program website (https://www.navymarinespeciesmonitoring.us/). The Navy will also continue to support marine mammal surveys in waters surrounding Guam and the CNMI to better quantify the abundance and distribution of marine

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		mammals and to increase scientific understanding of marine mammal behavior in the Study Area. Future monitoring efforts would be coordinated with NMFS. In the Draft Supplemental EIS/OEIS, the Navy took a hard look at the potential impacts of the Proposed Action on marine mammals and sea turtles using the best available science. The Navy's quantitative analysis process for analyzing impacts from active sonar and explosives has been reviewed by external scientists and approved by NMFS. The Navy also worked collaboratively with NMFS to develop mitigation measures using input from military operators, the best available science, predicted activity impact footprints, and marine species monitoring and density data.
DoAg-12	10. DoAg is concerned about the impact of landing craft exercises on the dolphins that reside in Agat Bay. The DoN contended unavoidable impacts. The Navy recognizes the common occurrence of spinner dolphins within Agat Bay and has developed mitigation measures in consultation with NMFS under provisions of the MMPA. Beachmasters are shore-based observers with binoculars whose sole purpose is to ensure safety of craft including avoidance of marine and terrestrial animals. Beachmasters were to work with environmental monitors and the natural resource managers. These measures have been utilized - how successful have they been and how has that success been measured?	The Navy has not conducted any type of approved beach landings in Agat Bay. However, there are Navy activities that are conducted in the water and have been analyzed in this Supplemental EIS/OEIS. Section 5.4.2 (Mitigation Areas for Marine Mammals and Sea Turtles) addresses spinner dolphins and the Agat Bay Nearshore Mitigation Area.
DoAg-13	11. The MITT DEIS must address impacts to the existing community of resource users and the need to mitigate economic impacts by avoiding near shore populations and their habitats. The training activities themselves present additional challenges that may alter the landscape far beyond the closure period. The potential loss of marine life, whether through injury, mortality or simply scaring them out of the area, presents significant economic issues for tour operators who rely on a healthy population of marine animals for their tours. The underwater detonations, for example, could lead to the relocation of Agat Bay's resident dolphin pod, disrupting the	The Navy understands that fishing and tourism is an important socioeconomic and cultural resource for the people of the CNMI and will continue to work with the fishing community. The Final Supplemental EIS/OEIS has been updated to include tourism and transit activities within the Study Area. The Navy is not proposing a change to the ocean areas currently used by both the Navy and the public in this Supplemental EIS/OEIS. Restrictions on accessing areas of co-use would continue to be relatively infrequent

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	dolphin-watch boats and other tours. The Navy recognizes the common occurrence of spinner dolphins within Agat Bay and has developed mitigation measures in consultation with NMFS under provisions of the MMPA, however more effort needs to be made to minimize impacts through avoidance and relocation of activities to areas of less impact.	and short term, while other fishing and tourism sites in the Study Area would continue to be available to the public. The analysis indicates there are no mortalities expected and there have been none from Navy activities having been conducted in the past. As discussed in the EIS/OEIS, there are no impacts that would impact populations of marine mammals and therefore no impacts to tour operators who rely on a healthy population of marine animals for their tours. With regard to the nearshore areas of Agat Bay, explosives are not used in shallow water areas where spinners have historically been viewed by whale watch vessels.
DoAg-14	12. It is probable that sea turtles would be affected by landing-craft training activities. The Navy agreed that landing craft training activities could potentially affect sea turtles within the MIRC. The Navy consulted with NMFS and USFWS Pacific Islands Field Office under provisions of Section 7 of the ESA to avoid, minimize and offset potential impacts associated with MIRC training on sea turtle nesting activity and activity in near shore and open ocean marine environments. How have these activities impacted sea turtles? What measures would be used to protect sea turtles in MITT. The use of LCACs and other equipment on sandy beaches can negatively impact sea turtle nesting and hatching success. Consultation with the local resource agency in addition to the Navy surveys can help avoid possible interactions.	The Navy is not proposing to change land-based activities, except at FDM. There would be no increase in the use of beaches under the Proposed Action. Table 2.5-1 of the MITT Final Supplemental EIS/OEIS has been updated to reflect that there would be no increase in amphibious assault training. The Navy is implementing conservation measures as required in the USFWS Pacific Islands Fish and Wildlife Office's 2015 Biological Opinion.
DoAg-15	13. The Final MITT DEIS must clarify impacts and identify necessary mitigation for fish mortality associated with soft bottom detonation operations in Apra Harbor. How have these activities in the MIRC impacted soft bottom habitat for species of ecological as well as fishery resource importance? Fish mortality associated with training activities within the MIRC are discussed in EIS, Section 3.9 (Fish and Essential Fish Habitat) but no mitigation is proposed to address this issue.	The Navy does not monitor for fish kills during underwater detonations; however, the Guam EPA is notified of all activities and is welcome to observe events.

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DoAg-16	DoAg requests more effort made to either find alternatives that will cause fewer impacts, or to provide environmental and compensatory mitigation to offset impacts to the open ocean and near shore marine environments and the species that inhabit them. The Final MITT DEIS should include (similar to the MIRC) a Range Monitoring Plan, reporting requirements, adaptive management, etc. Components of the monitoring and mitigation plans should be in cooperation with NMFS, USFWS and DoAg-DAWR. Monitoring and mitigation will be used both as: I) a planning tool to focus Navy monitoring priorities (pursuant to ESA/MMPA requirements) across Navy Range Complexes and Exercises; and 2) an adaptive management tool, through the consolidation and analysis of the Navy's monitoring and watch stander (lookout) data, as well as new information from other Navy programs (e.g., research and development), and newly published non-Navy information. Thank you for the opportunity and consideration of DoAg's comments on the Draft EIS. We look forward to reviewing a more complete analysis of impacts in the final EIS that clearly identifies and addresses the potential impacts associated with the MITT activities and includes viable options for avoidance and mitigation.	Based on the analysis presented in this Supplemental EIS/OEIS and use of best available data, additional monitoring or tagging is not required in order for the Navy to comply with NEPA. However, it is important to note that, within the Study Area, the Navy has sponsored several monitoring projects to better understand marine mammal and sea turtle distribution and habitat use. Additional information is available on the U.S. Navy Marine Species Monitoring Program website (https://www.navymarinespeciesmonitoring.us/). The Navy will also continue to support marine mammal surveys in waters surrounding Guam and the CNMI to better quantify the abundance and distribution of marine mammals and to increase scientific understanding of marine mammal behavior in the Study Area. Future monitoring efforts would be coordinated with NMFS. In the Draft Supplemental EIS/OEIS, the Navy took a hard look at the potential impacts of the Proposed Action on marine mammals and sea turtles using the best available science. The Navy's quantitative analysis process for analyzing impacts from active sonar and explosives has been reviewed by external scientists and approved by NMFS. The Navy also worked collaboratively with NMFS to develop mitigation measures using input from military operators, the best available science, predicted activity impact footprints, and marine species monitoring and density data. The NMFS Pacific Islands Regional Office and Science Center coordinates responses to marine mammal strandings through the National Marine Mammal Health and Stranding Response Program. The Navy does not anticipate that any marine mammal strandings would result from Navy activities in the Study Area. Since the inception of current monitoring protocols over a decade ago, no marine mammals have been reported distressed or injured in association with Navy training and testing activities. The Center for Naval Analysis (CNA) recently conducted a statistical study of correlation of beaked whale strandings around the Mariana Islands with the use of U.S. Navy sonar, finding that insufficient

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		evidence of a correlation exists. The CNA study used the complete record of all U.S. Navy sonar use between 2007 and 2019, including major training events, joint exercises, and unit level training/testing. The analysis also included the complete beaked whale stranding record for the Mariana Islands through 2019. Following the methods in Simonis et al. (2020), the CNA analysis found insufficient evidence of a correlation between sonar use and beaked whale strandings when considering the complete sonar use record. The CNA finding is in contrast to the finding in Simonis et al. (2020), which depicted a significant correlation between beaked whale strandings and Navy sonar use. However, the Simonis et al. (2020) result relied on substantially incomplete or inaccurate assumptions about U.S. Navy sonar use around the Mariana Islands. CNA also conducted statistical analyses specific to each island where beaked whale strandings have been observed in the Mariana Islands, similarly finding insufficient evidence of a correlation to sonar use. Additional information on the findings of the CNA analysis are presented in Section 3.4.2.1.1.6 (Stranding) in Chapter 3.4 (Marine Mammals). As described in Section 5.1.2.2.1 (Marine Species Research and Monitoring Programs), for this Final Supplemental EIS/OEIS, the Navy agreed to several additional research and monitoring initiatives designed to help advance the understanding of beaked whales and strandings in the MITT Study Area. The Navy will co-fund the Pacific Marine Assessment Program for Protected Species (PACMAPPS) Mariana Islands survey in spring-summer 2021 and future studies starting in 2022 to help document beaked whale occurrence, abundance, and distribution in the Mariana Islands. The Navy will also fund additional stranding response and necropsy analyses for the Pacific Islands region, and research on a framework to improve statistical stranding analysis. Collaboratively with NMFS, the Navy will fund and organize an expert panel to provide recommendations on scientific data gaps and uncertainties for further

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		protective measure consideration to minimize potential impacts of Navy training and testing activities on beaked whales in the Mariana Islands. Although the Integrated Comprehensive Monitoring Program does not identify specific field work or individual projects, it is designed to provide a flexible, scalable, and adaptable framework using adaptive management and strategic planning processes that periodically assess progress and reevaluate objectives. The adaptive management is anticipated to continue between the Navy, NMFS, and the Marine Mammal Commission through technical review meetings and ongoing discussions.
Guam Department of Agriculture (DoAg), John C. Borja, Acting Chief *Specific Comments*		
DoAg-01	**ES 6.1 Cumulative Impacts (ES-22)** There are many dangers for the survival for marine mammals and sea turtles. Because of the negligence and disregard to marine habitats, sea life continues to be in danger. The EIS should focus on how to minimize the impacts from the proposed activities rather be contempt that the activities proposed should be fine because others are already causing impacts to sea turtles and other sea life.	As described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practical, procedural and geographic mitigation measures during its training and testing activities to avoid or reduce potential impacts on marine life. This science-based analysis indicates, with implementation of the Navy's protective mitigation measures, there is not a significant impact on marine species.
DoAg-02	**ES 7.3 Cumulative Measures Considered but Eliminated (ES-23)** During the scheduled Public Scoping meetings, the DoN and their contractor preparing the MITT EIS fails to provide guidance to those in attendance on process of submitting a measurable, nor do they provide the evaluation process for comments being submitted.	Public Comment form Navy provided to attendees at the meetings included tips on providing substantive comments. Navy does not prevent the public from submitting mitigation measures they deem important for the Navy to consider. However, Navy would evaluate any recommended mitigation measures per the criteria outlined in Appendix I of the Draft and Final SEIS/OEIS.

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DoAg-03	**ES 7.4 Monitoring (ES-23)** DoN fails to recognize local environmental laws (many that are reflective to federal laws but site specific for the territory). DoN submits reports to NMFS, but fails to identify local agencies (GEPA, GDAWR, GCZMP).	The Navy consulted with NMFS under MMPA, ESA (for marine species) and Magnuson-Steven's Act (MSA), with USFWS under ESA (for terrestrial species), and with local agencies under CZMA and NHPA.As discussed in Section 5.1.2.2 (Monitoring, Research, and Reporting Initiatives), the Navy developed its reporting requirements in conjunction with NMFS to be consistent with mission requirements and balance the usefulness of the information to be collected with the practicality of collecting it. The Navy's training and testing activity reports and incident reports are designed to verify implementation of mitigation; comply with current permits, authorizations, and consultation requirements; and improve future environmental analyses. Navy's monitoring reports are available on the U.S. Navy Marine Species Monitoring Program website (https://www.navymarinespeciesmonitoring.us/). The Navy is obligated under the ESA and MMPA to provide information on any incidents involving ESA-listed species. Therefore, the Navy will continue to submit the appropriate reports to NMFS immediately, or as soon as operational security considerations allow, if it observes an incident that is or may be attributable to Navy activities, including (1) a vessel strike of a marine mammal or sea turtle during training or testing; (2) a stranded, injured, or dead marine mammal or sea turtle during training or testing; or (3) an injured or dead marine mammal, sea turtle, or ESA-listed fish species during post-explosive activity monitoring.

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DoAg-04	**ES 7.6.1 Consistency with Other Federal, State, and Local Plans, Policies and Regulations (ES-24)** GDAWR has been involved in the process at the Public Meeting held at Univ. of Guam. There has not been any other roundtable discussions or dialogue between DoN and GDAWR about marine protected species and critical habitats, that occurs within the scope of the proposed activity site. FEIS should be more specific and honest when describing consistency with statutory obligations.	While outside the current scope of this Supplemental EIS/OEIS, the military satisfies Sikes Act obligations through the development and implementation of the Joint Region Marianas Integrated Natural Resource Management Plan (INRMP). The purpose of the INRMP is not to measure impacts of military training and testing activities, but to utilize adaptive management to maintain long-term ecosystem health and minimize impacts on natural resources consistent with the operational requirements of the DoD's mission. Guam DAWR is a signatory and participating member to the 2019 Joint Region Marianas INRMP, which details natural resource management and monitoring programs. The Navy will continue to improve coordination and collaboration with Guam DAWR as part of the INRMP project development and implementation. Roundtable discussions or dialogue between the Navy and Guam DAWR about marine protected species and critical habitats within the Navy's training and testing areas in Guam could be conducted through the INRMP coordination.
DoAg-05	**Section 1.1 Introduction (p. 1.1 – 1.2)** As stated in the Exec. Summary the Navy will continue to consult with regulatory agencies. NMFS has been identified, but no inclusions with local regulatory agency.	The Navy consulted with NMFS under MMPA, ESA (for marine species) and MSA, with USFWS under ESA (for terrestrial species), and with local agencies under CZMA and NHPA
DoAg-06	**Section 1.1 Introduction (p. 1.1 – 1.2)** Several EIS and Supplemental EIS are mentioned in this Draft MITT EIS/OEIS. Yet, there is no acknowledgement in the document with the TOTAL IMPACT to the environment from the various activities mentioned. Guam and CNMI both are limited with natural resources. The continuous stress on these resources with military activities on-going in the islands will need to be monitored and mitigated.	The Navy conducted a comprehensive review of past, present, and reasonably foreseeable actions to develop a robust analysis of cumulative impacts (Chapter 4, Cumulative Impacts). As required under NEPA, the level and scope of the analysis are commensurate with the potential impacts of the action as reflected in the resource-specific discussions in Chapter 3 (Affected Environment and Environmental Consequences). The Navy considered proposed and ongoing activities alongside with other activities in the region whose impacts are truly meaningful to the analysis. Furthermore, the entire Supplemental EIS/OEIS provides the cumulative impacts analysis, not just Chapter 4. Chapter 3 provides the current effects of past and present impacts and environmental conditions that represent the baseline of the environment as it is; Chapter 3 also discusses the

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		consequences or potential future impacts from Navy activities. Chapter 4 discusses other reasonably foreseeable activities, including Department of Defense activities in the Marianas, to the extent they are known and the incremental impact of the Navy's proposal when added to past, present, and future impacts.
DoAg-07	**Section 1.2 The Navy's Environmental Compliance and At-sea Policy (p. 1-3)** Agreements usually require technical reports. Have any reports been submitted to NOAA? Have these reports shared with local regulatory agencies?	As discussed in Section 1.2 (The Navy's Environmental Compliance and At-Sea Policy), in 2005, the Navy and the National Oceanic and Atmospheric Administration reached an agreement on a coordinated programmatic strategy for assessing certain environmental effects of military readiness activities at sea. The Navy's At-Sea Policy is located at https://navysustainability.dodlive.mil/files/2010/04/At_Sea_Policy_Memo.pdf. In compliance with the MMPA Permit, Navy submits annual monitoring reports to NMFS. These reports are available on the U.S. Navy Marine Species Monitoring Program website (https://www.navymarinespeciesmonitoring.us/).
DoAg-08	**Section 2.3.2.2.3 (p. 2-1)** Draft MITT EIS/OEIS has mentioned mitigation measures for environmental and cultural resources. Yet, there is no mentioning thus far who they (the Navy) is consulting with regarding cultural resources in the document. Only NMFS has been identified as a consulting agency to the resources.	The MIRC Programmatic Agreement expired in December 2019. In anticipation of this, the Navy initiated a NHPA Section 106 consultation in January 2019 with an eye toward developing new updated Programmatic Agreements. The Navy has held five consultation meetings open to consulting and interested parties on Guam and eight throughout the CNMI. Additionally, site visits, and working group sessions with the SHPOs and the National Park Service have taken place. The Navy is required to comply with NHPA Section 106 to support its undertaking. A Programmatic Agreement is one of several methods of ensuring compliance under Section 106 but is most appropriate for undertakings that involve routine and redundant activities where a federal agency plans to resolve potential adverse effects to historic properties through avoidance, minimization, and/or mitigation.

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DoAg-09	**Table 2.5-1 & 2.5-2 Current and Proposed Training Activities (p. 2-26 to 2-43)** In relation to environmental and cultural resources, what are the outcomes of the on-going 2015 MITT EIS/OEIS activities? And, is there a report available for the local agencies and general public to read?	For marine mammals, the Navy's Marine Species Monitoring Program website provides access to reports, documentation, data, and updates on current monitoring projects. Information on current monitoring projects, technical reports, conference presentations, and data are available at www.navymarinespeciesmonitoring.us. Additional information is also available in Section 5.1.2.2 (Monitoring, Research, and Reporting Initiatives) of this Supplemental EIS/OEIS. While monitoring reports are internal Navy documents, MITT activities are subject to training constraints and Cultural Resources Managers have not reported any effects on historic properties.
DoAg-10	**Section 3.0.1 Overall approach to analysis (p. 3-1)** Has this been done? If so, what is the result of the study?	Yes, this has been done and the SEIS/OEIS assesses potential impacts based on the methods used and listed in 3.0.1. Therefore, the result of the study is the SEIS/OEIS.
DoAg-11	**Section 3.0.1 Overall approach to analysis (p. 3-1)** What changes in the activity was made from 2015 MITT to current proposal?	Refer to Chapter 2 (Description of the Proposed Action and Alternatives) specifically Tables 2.5-1 and 2.5-2. These tables include a color-coded legend that identify what activities have increased, decreased, or stayed the same in comparison to the 2015 activities.
DoAg-12	**Section 3.0.1 Overall approach to analysis (p. 3-1)** What studies have occurred during (or since) 2015 MITT to help identify new methods to analyze resources affected by stressors?	As part of the development of the SEIS/OEIS, existing information and data was reviewed and new federal and state regulations and standards relevant to resource-specific management or protection were identified. If there were any changes since the 2015 MITT Final EIS/OEIS it was noted and appropriate references were cited. The SEIS/OEIS includes a complete list of references cited.
DoAg-13	**Section 3.0.1.1.1 Marine species monitoring and research program (p. 3-2)** DoAg-DAWR has been monitoring marine mammals and sea turtles for several decades, this includes stranding events. No efforts were made by DoN to consult and/or collaborate with the state agency.	Navy's stranding data came from NMFS who is the authoritative source of stranding data. The Navy strives to share technical information and data with the public and resource agencies. Technical reports are posted on the MITT project website at www.mitt-eis.com. For Navy-funded and managed marine research and monitoring studies, reports, documentation, data, and updates on current monitoring projects can be accessed via the U.S. Navy Marine Species Monitoring Program website at

	Comment	Navy Response
		www.navymarinespeciesmonitoring.us. Please see the Navy's technical report on marine mammal strandings (Marine Mammal Strandings Associated with U.S. Navy Sonar Activities, 2017 – Available on the project website: https://mitt-eis.com/) for more information. In addition, Section 3.4.2.1.1.6 (Stranding) has been expanded to include additional information about strandings of beaked whales in the Mariana Islands and the Navy's support of efforts to better understand the causes of marine mammal strandings. The Navy regularly partners with federal and local agencies to ensure the best available data are used in impact analyses. For example, the Navy partners with local, state, and federal agencies, universities, research institutions, federal laboratories, and private researchers as part of its Marine Species Monitoring Program. Additionally, the U.S. Fish and Wildlife Service, NMFS, Guam Division of Aquatic and Wildlife Resources, and the CNMI Division of Fish and Wildlife are cooperating with the Navy on INRMP implementation.
DoAg-14	**Section 3.3.2.2.1 Impacts from Physical Disturbance and Strike Disturbance Under Alternative 1 (p. 3.3-5)** What test/study is being conducted to determine if this statement is true? Is the quantity of training exercises factored in for this statement?	This Supplemental EIS/OEIS includes an analysis of potential impacts on marine habitats from physical disturbance and strike stressors (Section 3.3.2.2.1, Impacts from Physical Disturbance and Strike Stressors Under Alternative 1; and Section 3.5.2.4.2, Impacts from Physical Disturbance and Strike Stressors Under Alternative 2 [Preferred Alternative]). The number of training exercises is considered as part of the analysis.
DoAg-15	**Section 3.4.1.7.6 Hunting (p. 3.4-11)** Irrelevant topic in this area. Whaling (whale hunting) occurs in other areas outside of the MIIT area.	Although whale hunting occurs outside of the MITT Study Area, some of the same species and populations of migrating marine mammals have been impacted by commercial whaling. Additional text has been added to the Final Supplemental EIS/OEIS to make this clear. Additionally, with the resumption of commercial whaling by Japan in 2019, this section has been expanded in the Final Supplemental EIS/OEIS to reflect that change occurring subsequent to the release of the Draft EIS/OEIS.

	Comment	Navy Response
DoAg-16	**Section 3.4.1.7.10 Marine Debris (p. 3.4-4)** There's no true saying where marine debris originates. Most marine debris (bottles, fishing gear, etc.) found near Guam's waters are written in a foreign language. Regardless, the debris left behind from the MITT exercises will need to be removed from MIIT area.	Marine debris discussed in Section 3.4.1.7.10 is provided as one of the general threats to marine mammal population. Military expended materials, such as marine markers and flares, chaff, unrecovered towed and stationary targets, sonobuoys, fiber-optic cables, and miscellaneous plastic and rubber components of other expended objects are expected to sink to the seafloor and become buried in sediments. Materials that sink and settle on the ocean bottom in very deep water make it impractical to recover. However, depending on the environmental conditions, including the availability of oxygen in sediments and water temperature at the seafloor, and the type of material (e.g., metal or plastic), expended material may degrade relatively quickly or persist in the environment indefinitely. Plastic and other persistent materials could incrementally contribute to marine “garbage patches” or other areas with accumulated debris but still have only minimal impact compared to other sources of debris. The Navy has standard operation procedures in place to reduce the amount of military expended materials, including recovering targets and associated parachutes to the maximum extent practical.
DoAg-17	**Section 3.4.1.7 General threats** Commercial industries, bycatch, other fisheries interactions, and hunting are irrelevant topics of discussions. None of these general threats occur on Mariana Islands waters. It is important that Navy's contractor engages collaboration with local resource agencies.	Commercial Industries discussed in Section 3.4.1.7.2 is provided as one of the general threats to marine mammal population. The Navy will continue to communicate and coordinate with the Guam government agencies on future collaboration and information sharing.
DoAg-18	**Section 3.4.2.1.1.5 Behavioral Reactions (p. 3.4-78)** Studies used for Behavioral Reactions to Vessels are from colder temperature waters compared to ocean water temperatures found in the MITT area. Sound in colder temperature waters move much more slowly as compared to warmer temperature waters. Navy should have conducted a study within the MITT areas to make a better, and acceptable determination.	For all stressors, including behavioral reactions to vessels, the Navy makes determinations based on the best available science. See Section¿3.4.2.1.1.5 (Behavioral Reactions)¿in the FSEIS/OEIS for the analysis of marine mammal behavioral reactions to vessel noise, including a summary of the best available science on this topic. The commenter asserts that sound travels much faster in warm water than in cold water where studies of marine mammal reactions to vessels have been conducted, and that the speed of sound could influence animal reactions. This is incorrect in that the speed of sound in seawater increases by less

	Comment	Navy Response
		than 10% between the poles and tropics. Research on vessel reactions cover a wide range of environmental conditions, and there is no evidence that the speed of sound affects how marine mammals react to vessels. See Appendix H (Acoustic and Explosive Concepts) for background information on how sound travels underwater.
DoAg-19	**Section 3.5.2 Environmental Consequences (p. 3.5-11)** Physical disturbance and strike could be potentially result in adverse effects on sea turtles from training and testing activities within the Study Area. Sea turtle mortality in Guam waters has resulted from vessel strikes.	This Supplemental EIS/OEIS includes an analysis of potential impacts on sea turtles from physical disturbance and strike stressors (Section 3.5.2.4.1, Impacts from Physical Disturbance and Strike Stressors Under Alternative 1; and Section 3.5.2.4.2, Impacts from Physical Disturbance and Strike Stressors Under Alternative 2 [Preferred Alternative]). The Navy is also consulting with NMFS under the ESA regarding the use of vessels and in-water devices, military expended materials, and seafloor devices. Although considered extremely rare, a ship strike of a sea turtle cannot be wholly discounted and would result in take, as defined under the ESA. Accordingly, the Navy has requested authorization pursuant with the ESA and has updated the Final Supplemental EIS/OEIS with measures to reduce the takes resulting from ship strikes. The Navy's analysis of other physical disturbances and strike stressors determined these activities would not adversely affect sea turtles.
DoAg-20	**Section 3.5.2.1.2.1 Accounting for Mitigation (p. 3.5-18)** How effective was sea turtle sightings during previous MITT exercises to trigger power down or shut down? How is this procedural mitigation used during night trainings? Is this information available in a report?	The Navy is committed to protecting marine life by employing mitigation measures when training or testing using active sonar or explosives; working with regulatory agencies; and furthering our understanding of marine mammals through research and monitoring. As part of their compliance with the MMPA and ESA the Navy conducts extensive monitoring and data collection. Within the Study Area, the Navy has sponsored several monitoring projects to better understand marine mammal and sea turtle distribution and habitat use, and to assess the presence of corals and ESA-listed species at FDM. The Navy's Marine Species Monitoring Program website provides access to reports, documentation, data, and updates on current monitoring projects. Information on current monitoring projects, technical reports, conference

	Comment	Navy Response
		presentations, and data are available at www.navymarinespeciesmonitoring.us. Additional information is also available in Section 5.1.2.2 (Monitoring, Research, and Reporting Initiatives) of this Supplemental EIS/OEIS.
DoAg-21	**Section 3.5.2.2.2.1 Accounting for Mitigation (p. 3.5-33)** Is the use of explosives only for daytime hours during the exercise? If explosive use is during night hours, how is sea turtles detected? What mitigation is taken?	As described in Section 5.2.1 (At-Sea Procedural Mitigation Development), after sunset and prior to sunrise, Lookouts and other Navy watch personnel employ night visual search techniques, which could include the use of night vision devices. However, for safety of personnel, the Navy generally does not schedule explosive activities to occur at night.
DoAg-22	**Section 3.6.1 Affected Environment (p. 3.6-1)** Migratory and resident seabirds are found in Apra Harbor, Piti and Agat (all within MITT Study Area on Guam).	Comment noted.
DoAg-23	**Section 3.6.1.3 Flight Altitudes (p. 3.6-2)** Examples used are irrelevant, as they should include species of more relevance with in the MITT study area. Not all seabirds behave similarly.	Based on the analysis presented in this Supplemental EIS/OEIS and using the best available data regarding flight altitudes for marine birds, additional data is not required in order for the Navy to comply with NEPA.
DoAg-24	**Section 3.6.1.6 General Threats (p. 3.5-5)** Little fire ant should also be addressed to prevent accidental introduction on FDM.	The little fire ant is addressed in the Micronesia and Hawaii Biosecurity Plan. Specific federal and Navy policies for marine invasive species can be found at: Public Law 104-332, National Invasive Species Act of 1996; Executive Order 13112 (Invasive Species) and amended by Executive Order 13751 (Safeguarding the Nation from the Impacts of Invasive Species; and OPNAVINST 5090.1E Chapter 35-3.19. (Ship and Ballast Water), 5090.1E Chapter 35-3.1 (Environmentally Sound Ships), and 5090.1E Chapter 12-3.9 (Invasive Species). As part of the INRMP, the Navy will implement marine management recommendations identified in the Micronesia and Hawaii Biosecurity Plan.

	Comment	Navy Response
DoAg-25	**Section 3.6.2 Population-level Impact Analysis (p. 3.6-10)** Mitigation for Navy should include funding for translocation of great frigatebirds from the 10,000 pairs in the Hawaiian Islands to the Mariana Islands to compensate the loss of individuals occurring on FDM from military exercises.	As stated in the Draft SEIS/OEIS language commented on, the effects of military activities on FDM would not represent a significant adverse impact on the population of the great frigatebird, therefore, mitigation is not warranted.
DoAg-26	**Section 3.6.2 Population-level Impact Analysis (p. 3.6-10)** Mitigation for Navy should include funding for translocation of masked booby from the 2,500 pairs in the Hawaiian Islands to the Mariana Islands to compensate the loss of individuals occurring on FDM from military exercises.	As stated in the Draft SEIS/OEIS language commented on, the effects of military activities on FDM would not represent a significant adverse impact on the population of the masked booby, therefore, mitigation is not warranted.
DoAg-27	**Section 3.6.2.1.3.1 Impacts from Aircraft Noise Stressors Under Alternative 1 (p. 3.6-14)** Visual stressors should also be addressed. During daytime exercises, marine birds (at rookery) will be exposed by visual stressors from aircrafts, resulting to disturbance.	An analysis for rookeries on Guam was included in the 2015 MITT Final EIS/OEIS for land-based training events and in-air training activities close to Guam's shoreline. Please see Table 3.6-5 (Known Rookery/Nesting Locations on Department of Defense Owned or Leased Lands within the Mariana Islands Training and Testing Study Area) and Figure 3.6-3 (Known Breeding Locations for Seabirds on Military Lands on Guam) in the 2015 MITT Final EIS/OEIS for a discussion of known rookery locations within DoD-owned lands on Guam. This information was added to the 2015 MITT Final EIS/OEIS in response to comments made from your agency on the Draft EIS/OEIS/ The Navy's analysis of rookeries was conducted in the context of the DoD's obligations under the Migratory Birds Treaty Act (MBTA). Under the MBTA regulations applicable to military readiness activities (50 C.F.R. Part 21), any stressors introduced during training and testing activities would not result in a significant adverse effect on migratory bird populations. While this determination is applicable to all seabirds and shorebirds that occur in the Study Area, the Navy carried out a focused analysis for seabirds known to breed within the Study Area, particularly for breeding seabirds on FDM. For the Navy's Supplemental EIS/OEIS, the Navy's analysis focused on rookeries on FDM because there was no change in land-based training activities or other activities that would impact rookery sites on Guam.

	Comment	Navy Response
DoAg-28	**Section 3.8.1.3 Endangered Species Act-Listed Species (p. 3.8-2)** Mitigation should include to avoid areas where the 3 listed coral species occurs in the Study Area.	Navy consulted with NMFS on ESA species. Mitigation from the ESA consultations will be implemented.
DoAg-29	**Section 3.8.3 Public Scoping Comments (p. 3.8-17)** Marianas Trench occurs in open ocean areas within the MITT Study Area. EIS should address cumulative impacts from military expended materials as marine debris to inverts found in the Mariana Trench.	The Navy used the best available science and conducted a comprehensive review of past, present, and reasonably foreseeable actions to develop a robust analysis of cumulative impacts (Chapter 4, Cumulative Impacts) within the entire MITT Study Area including potential impacts on marine invertebrates (refer to Section 4.4.8.3 [Impacts of Other Actions]).
DoAg-30	**Section 3.10.1.3.1 Micronesian megapode (p. 3.10-4)** Data used is outdated. There should have been an updated survey prior the drafting of the MITT EIS/OEIS. Status could change from 2013, as megapodes are opportunistic species. More so, since CNMI has been through numerous typhoon events in after 2013.	Both this Supplemental EIS/OEIS and the 2015 MITT Final EIS/OEIS Section 3.6 (Birds) address potential impacts on seabirds that nest and visit FDM. Section 3.10 (Terrestrial Species and Habitats) addresses wildlife and plant communities and ESA-listed species known to occur on the island (Micronesian megapodes and Mariana fruit bats). In addition, the 2019 Integrated Natural Resources Management Plan (INRMP) includes additional information on biological resources on FDM and nearshore waters surrounding waters of the island. In 2015, the Navy and USFWS completed consultation for potential impacts of military training activities on FDM. The 2015 Biological Opinion determined that these activities would adversely affect ESA-listed species on FDM, and included non-discretionary measures to reduce the effect of take resulting from training activities. Activities analyzed in the Navy's Supplemental EIS/OEIS do not warrant reinitiation of Section 7(a)(2) consultation with USFWS, and the measures agreed to between the Navy and USFWS in 2015 are carried forward in this Supplemental EIS/OEIS.

	Comment	Navy Response
DoAg-31	**Section 3.10.1.3.2 Mammals (p. 3.10-4)** The last surveys conducted in FDM occurred in 2007. Fruit bat monitoring in FDM is needed, as the species are opportunistic. Fruit bat in FDM may occur, especially after storm event passing through the Mariana Islands.	See Response to DoAg – 30. The Navy will continue to implement the terms and conditions of the 2015 MITT USFWS BO associated with monitoring and surveys of the Mariana Fruit bat.
DoAg-32	**Section 3.10.2.1.1 Impacts from Acoustic Stressors (p. 3.10-8)** MITT EIS/OEIS should also include impacts to visual stressors from fixed-winged aircrafts.	Please refer to the response for DoAg – 27.
DoAg-33	**Section 3.10.2.4 Secondary Stressors (p. 3.10-15)** In regards to potential introduction of invasive species, MITT EIS should address other invasive species such as the Little fire ant.	See response DoAg – 24 regarding the little fire ant.
DoAg-34	**Section 3.10.3.1.1.2 Alternative 1 – Acoustic Stressors – Terrestrial Species and Habitat (p. 3.10-53)** Fruitbats and megapodes in FDM will be impacted; mitigation is needed to address both species	Navy will continue to implement the terms and conditions of the 2015 MITT USFWS BO to minimize the impacts of military activities on the megapodes and Mariana fruit bats.
DoAg-35	**Section 3.9.2.2.1.1 Injury (p. 3.9-40)** Injury of fish is not limited to organ, hearing and buoyancy systems. Mortality has been observed after underwater detonations on Guam involving damage of hard integument, such as found on boxfish and cowfish.	Comment noted. Section 3.9.2.2.1.1 (Injury) has been updated to include additional information regarding potential effects related to in-water explosions.
DoAg-36	**Table 5.3-10 Procedural Mitigation Description (p. 5-43)** Hammerhead sharks need to be added to resources being protected. Sightings of hammerheads on Guam are most frequent in Apra Harbor and around the entrance. Both Agat and Piti detonation zones are within sighting areas.	As described in Section 5.3.3.8 (Explosive Mine Neutralization Activities Involving Navy Divers), the Navy worked cooperatively with NMFS to develop mitigation to avoid or reduce potential impacts on ESA-listed fish species, including scalloped hammerhead sharks and giant manta rays, during explosive mine neutralization activities involving Navy divers.

	Comment	Navy Response
DoAg-37	**Section 3.4.1.4 Habitat Use (p. 3.4-4)** Seasonal migration and breeding are important factors in the spatial and temporal distribution of marine mammals in the study area as well. These are documented by both local and federal resource agencies	Comment noted.
DoAg-38	**Section 3.4.1.7.3 Bycatch (p. 3.4-8)** Entanglement generally involves longline fishing or purse seining. Neither activity occurs within Guam's local or federal EEZs	Bycatch as discussed in Section 3.4.1.7.3 is provided as one of the general threats to marine mammal population.
DoAg-39	**Section 3.4.1.9.2 Bryde's whale geographic range and distribution (p. 3.4-17)** Bryde's whale have been seen 3 times in the months of July and August near Guam, and a dead individual washed up on Guam's west coast in August, 2014	Comment noted.
DoAg-40	**Section 3.4.1.17.5 Cuvier's Beaked whale species specific threats (p. 3.4-28)** Several strandings are not mentioned in the recap. This information is available from local and federal resource agencies.	Please see the Navy's technical report on marine mammal strandings (Marine Mammal Strandings Associated with U.S. Navy Sonar Activities, 2017 – Available on the project website: https://mitt-eis.com/) for more information. In addition, Section 3.4.2.1.1.6 (Stranding) has been expanded to include additional information about strandings of beaked whales in the Mariana Islands and the Navy's support of efforts to better understand the causes of marine mammal strandings.
DoAg-41	**Section 3.4.1.18.5 Dwarf Sperm whale species specific threats (p. 3.4-29)** Entanglement generally involves longline fishing or purse seining. Neither activity occurs within Guam's local or federal EEZs	Comment noted. Entanglement information is provided as one of the general species-specific threats to marine mammal population.
DoAg-42	**Section 3.4.5 ESA Determination (p. 3.4 – 259)** Sperm whales have been documented pupping off of the coast of Agat, and have been seen with young along the same coast in subsequent years.	Comment noted. Navy consulted with NMFS on the effects of the Proposed Action on ESA-listed marine mammals, which include sperm whales.

	Comment	Navy Response
DoAg-43	**Section 3.5.1.5 Sea Turtles (p. 3.5-5)** There have been 5 turtle deaths by vessel strike in Apra Harbor since 2011. Increased vessel traffic must be mentioned as a threat as well.	Both the Supplemental EIS/OEIS and the 2015 MITT FEIS/OEIS recognizes that vessel strike occurs in Apra Harbor. This Supplemental EIS/OEIS has been updated with more information from the Section 7 ESA consultation between the Navy and NMFS regarding potential strike risk resulting from Navy activities and in a cumulative context, for non-military (e.g., commercial, private) vessels transiting in and out of Apra Harbor. The vessel strikes mentioned in this comment (the 5 vessel strikes in Apra Harbor) are not likely attributable to Navy activities because no vessel strikes were reported by the Navy, and the majority of vessel traffic is comprised of civilian vessels. Because vessel strike by military vessels cannot be wholly discounted, the Navy and NMFS consultation on this stressor type and has included procedural mitigation to avoid or reduce the potential for vessel strike of sea turtles to occur in the MITT Study Area (see Section 5.3.4, Physical Disturbance and Strike Stressors.
DoAg-44	**Number of days per year affected by military (p. 3.12-18)** In 2016, around 140 days, in 2017, 120 days, in 2018, 82 days. An average of around 90 days per year since 2010	Comment noted. NOTMAR data has been updated in the FSEIS/OEIS.

Table K-2: Response to Comments from Federal Agencies

	Comment	Navy Response
U.S. Department of the Interior (DOI), Janet Whitlock, Regional Environmental Officer		
DOI-01	The Department of the Interior (Department) has reviewed the Draft Mariana Islands Training and Testing (MITT) Supplemental Environmental Impact Statement/Overseas Environmental Impact Statement (SEIS/OEIS). The Department offers the following comments for use in the development of the final SEIS/OEIS for this project. **General Comments** The distinctions among the 2015 MITT EIS, the 2010 Mariana Islands Range Complex (MIRC), and other Department of Defense trainings and activities planned for the area are not clear. The Department recommends that the final SEIS/OEIS include a summary of the types of activities proposed, where they would occur specifically, what documents cover each undertaking, and where to find those documents. This summary should also note the current status of each undertaking and their associated NEPA and NHPA documents.	The Navy has been conducting training and testing activities in the Mariana Islands Training and Testing (MITT) Environmental Impact Statement (EIS)/Overseas EIS (OEIS) Study Area (Study Area) for decades, and this Supplement to the 2015 MITT Final EIS/OEIS supports the continuation of that training and testing. The activities analyzed in this Supplemental EIS/OEIS are largely a continuation of the ongoing training and testing activities that were analyzed in the 2015 MITT Final EIS/OEIS, 2010 Mariana Islands Range Complex (MIRC) EIS/OEIS, and 1999 Mariana EIS/OEIS. This Supplemental EIS/OEIS (1) includes the analysis of activities at sea and on FDM necessary to meet readiness requirements beyond 2020 and into the reasonably foreseeable future, (2) includes any changes to those activities previously analyzed, and (3) reflects the most up-to-date compilation of training and testing activities deemed necessary to accomplish military readiness requirements. Table 2.5-1 and Table 2.5-2 of this Supplemental EIS/OEIS summarize the types of activities proposed. Locations of the proposed activities are included in the tables, and additional details are available in Appendix A (Training and Testing Activities Descriptions). As noted in Chapter 1 (Purpose and Need), the 2015 MITT Final EIS/OEIS analyzed training and testing activities conducted at existing MIRC land-based training areas located on Guam, Saipan, Tinian, and Rota. The Navy is not proposing any changes to those land-based activities; therefore, the Navy will continue to rely on the analysis presented in the 2015 MITT Final EIS/OEIS for these activities. The Navy will use the impact analysis documented in this Supplemental EIS/OEIS to comply with NEPA, support regulatory consultations, request a letter of authorization under the Marine Mammal Protection Act (MMPA), and request incidental take statements under the Endangered Species Act (ESA). Please refer

	Comment	Navy Response
		to Section 1.2 (The Navy's Environmental Compliance and At-Sea Policy) for further discussion and explanation. As part of the Section 106 Consultation process, the Navy is preparing tables that will detail the specific locations where activities included in this undertaking are planned to occur. The intent is to include these tables in the Guam and CNMI Programmatic Agreements currently under development.
DOI-02	The final SEIS/OEIS should also provide a clear explanation of the evolution from the MIRC (used in reference to both the original study area and the EIS) to the MITT (which expanded the study area but still references the original MIRC Study Area). We note that the official MITT- EIS.com website calls the 2010 MIRC EIS/OEIS the "2010 MITT EIS/OEIS" even though the official documents are titled MIRC, not MITT. This re-naming of documents is confusing, especially because the draft MITT SEIS was released at the same time as consultation is underway to update the 2009 Programmatic Agreement (PA) associated with the 2010 MIRC EIS, and subsequently the 2015 MITT EIS, on the basis that the activities proposed in 2015 were consistent with those evaluated in 2009. The new PA is being developed based on the 2015 MITT EIS and not the information in the draft SEIS/OEIS, because the draft SEIS/OEIS is only for at-sea activities. This distinction is not intuitive given that there are submerged resources in the at-sea training areas, which we note below in our comments on Chapter 3.11.	The Navy is currently in the third phase of implementing a programmatic approach for analyzing certain environmental effects of military training and testing activities both on land and at sea. The Phase I analysis is documented in the 2010 MIRC EIS/OEIS for the MIRC Study Area. The Navy has corrected the reference to the "2010 MITT EIS/OEIS" on the website. The Navy expanded the Study Area in the Phase II analysis to include established military land, air, and sea areas of the MIRC; in-water areas around the MIRC; and the transit corridor between the MIRC and the Navy's Hawaii Range Complex. The Study Area for Phase II was renamed as the MITT Study Area. The Study Area did not change in Phase III. The activities analyzed in this Supplemental EIS/OEIS are largely a continuation of the ongoing training and testing activities that were analyzed in the 2015 MITT Final EIS/OEIS, 2010 MIRC EIS/OEIS, and 1999 Mariana EIS/OEIS. Section 1.2 (The Navy's Environmental Compliance and At-Sea Policy) discusses the Navy's past environmental compliance. The MIRC Programmatic Agreement expired in December 2019. In anticipation of this, the Navy initiated a NHPA Section 106 consultation in January 2019 with an eye toward developing new updated Programmatic Agreements. The Navy has held five consultation meetings open to consulting and interested parties on Guam and eight throughout the CNMI. Additionally, site visits, and working group sessions with the SHPOs and the National Park Service have taken place. The Navy is required to comply with NHPA Section 106 to support its

	Comment	Navy Response
		undertaking. A Programmatic Agreement is one of several methods of ensuring compliance under Section 106 but is most appropriate for undertakings that involve routine and redundant activities where a federal agency plans to resolve potential adverse effects to historic properties through avoidance, minimization, and/or mitigation.
DOI-03	The draft SEIS/OEIS refers to the 2015 MITT EIS, noting that terrestrial impacts, except on Farallon de Medinilla Island (FDM), are addressed in the 2015 Final EIS and would not change. Therefore, the draft SEIS/OEIS is to cover changes in at-sea activities and recent knowledge since 2015 related to impacted resources. The information and comments provided by the Department of the Interior covers the known status of resources as well as the sources of impacts from training. We have limited our comments to select chapters most relevant to our responsibilities in the Mariana Islands. Below, the Department offers additional sources of information that should be considered and referenced in the Final SEIS/OEIS and note them in the appropriate chapter comments.	The Navy is formally consulting with NMFS concerning potential impacts of proposed training and testing activities on marine mammals protected under the MMPA, and on ESA-listed species known to occur in the Study Area. The Navy has updated the Final Supplemental EIS/OEIS based on section 7 consultation and MMPA rule-making process and will incorporate all reasonable and prudent measures and terms and conditions set forth in the Biological Opinion into the Record of Decision.
DOI-04	**Summary of NPS Resources Relevant to the MITT DSEIS** The Agat and Asan Units of War in the Pacific National Historical Park on Guam cover more than 1,000 acres of submerged land that comprises more than half of the total area of the parks combined seven units. Coral reefs and their associated habitats and highly diverse marine species are a major feature of the park. Deeper waters traversed by coastal and pelagic species are also found in the Agat and Asan units of the Park. Common to the NPS managed waters both in Agat and in Asan are resident populations of spinner dolphins Stenella longirostris. Other marine mammal species of the Odontocetes (toothed whales and dolphins) and Mysticetes (baleen whales) pass through park waters. Two species listed	Summary of NPS resources relevant to the MITT Supplemental EIS/OEIS noted.

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	pursuant to the Endangered Species Act, the green sea turtle (Chelonia mydas) and hawksbill sea turtle (Eretmochelys imbricata), as well as hammerhead sharks (Sphyrna lewini), manta rays (Manta birostris) and threatened coral species including Acropora globiceps also occur in the park. The giant humphead wrasse (Cheilinus undulatus) is frequently seen in the park and more rarely the large bumphead parrotfish (Bulbometapon muricatum), which are both considered "species of concern" by the National Marine Fisheries Service. These areas of the park are utilized each day by scores of recreational SCUBA divers and snorkelers and multiple dolphin watching tourist vessels. The American Memorial Park in Garapan, Saipan, does not extend into coastal waters beyond the mean high tide mark. However, it provides access to visitors and residents to heavily used marine recreational areas and has recorded nesting of green sea turtles.	
DOI-05	**Chapter 3.4 Marine Mammals** The DSEIS provides excellent information on marine mammals in the MITT Study Area. However, much is unknown about training impacts on each species, as evidenced by the many new scientific studies on these mammals producing new information every year. The DSEIS application of knowledge about other dolphin species in other Pacific areas to evaluating impacts on the dolphins in the MITT area may not be appropriate. We recommend that you conduct research and documentation of the residency of populations of spinner dolphins (Stenella longirostris) on Guam and impacts of the training to them. These populations may particularly be impacted by the mine explosion training in areas at Agat and Asan. We recommend that you provide better information on the impacts of the explosions on these	The Draft Supplemental EIS/OEIS included detailed information on spinner dolphins in Section 3.4.1.32 (Spinner Dolphin [*Stenella longirostris*]). The Navy's analysis of impacts on spinner dolphins considered the potential impacts of training on spinner dolphins in Section 3.4.2 (Environmental Consequences) and Section 3.4.4 (Summary of Potential Impacts on Marine Mammals). Based on the analysis presented in this Supplemental EIS/OEIS and using the best available data, surveys or additional research are not required in order for the Navy to comply with NEPA. No mortalities of any marine mammals are predicted. Activities using underwater explosives, including mine countermeasure activities at the Agat Bay and Apra Harbor sites, were modeled to estimate impacts on marine mammals from explosives. The Agat Bay Mine Neutralization Site is located in deep water far offshore of Agat Bay and not in the nearshore and shallow water locations where spinner dolphins frequently engage in resting behavior. Mitigation measures specifically for mine countermeasure activities are presented in Chapter 5 (Mitigation), Section

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	populations and before implementing that training at those sites. We recognize and support that an area frequented by the Agat spinner dolphins is identified as a mitigation area (mostly in NPS managed waters) because of their presence (see Chapter 5).	5.3.3.7 (Explosive Mine Countermeasure and Neutralization Activities). Asan is not identified as an underwater detonation area. The Navy is consulting with NMFS under the MMPA and ESA for potential effects on protected species. Mitigation measures specified in the Final Rule and Biological Opinion will be reflected in the Record of Decision.
DOI-06	We question the assessment of training impacts, especially of active sonar to beaked whales. We believe the strandings of beaked whales linked to active sonar, noted on page 3.4-86, particularly in the Canary Islands, has led to termination of active sonar use in training there. Although the numbers of beaked whale strandings, included ones in our Agat Unit, have been low in the MITT area, they often appear to be associated with Navy training exercises. It seems logical that even if many beaked whales were injured or killed due to active sonar training in the large MITT Study Area, only a very small percentage would strand on reefs in the Study Area. The following reference is informative and should be reviewed and noted in the Final SEIS: Faerber, M.M. and R.W. Baird. 2010. Does a lack of observed beaked whale strandings in military exercise areas mean no impacts have occurred? A comparison of strandings and detection probabilities in the Canary and main Hawaiian Islands. Marine Mammal Science 26(3):602-613. The permanent threshold shifts (PTS) which damage hearing are noted to apply to pygmy sperm whales and dwarf sperm whales (Kogia spp.) found in the MITT Study Area. We are concerned that this may also affect the beaked whales that are also deep divers. Page 3.4-129 notes that beaked whales are impacted by sound up to 50 kilometers away and that they avoid sound sources by 10 kilometers (page 3.4-132). For the final SEIS/OEIS, the Department recommends that the impact assessments consider whether they would be so	Cuvier's beaked whale strandings in the Study Area are summarized in Section 3.4.1.17.5 (Species-specific Threats) in the background information on Cuvier's beaked whales. The Navy's analysis of impacts on beaked whales took into account their greater sensitivity to disturbance relative to other marine mammals, as demonstrated by the data used to develop the behavioral response criteria for beaked whales (see the technical report titled Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III) available at https://mitt-eis.com). In addition, nitrogen decompression—commonly known as "the bends"—is discussed in this Supplemental EIS/OEIS in Section 3.4.2.1.1.1 (Marine Mammals - Injury - Nitrogen Decompression). This section discusses the background of potential impacts on marine mammals—and specifically beaked whales—from acoustic stressors, such as sonar, and outlines the literature currently available with regards to this potential impact. This Final Supplemental EIS/OEIS includes additional information on Cuvier's beaked whale strandings relative to sonar use in the Study Area in Section 3.4.2.1.1.6 (Stranding) under Environmental Consequences due to Acoustic Stressors in the Marine Mammal section (Section 3.4). This additional information does not change the conclusions of the analysis of potential impacts on Cuvier's beaked whales described in the Final Supplemental EIS/OEIS. The issue of Navy sonar causing mortality to beaked whales is complex for a species known to be susceptible to behavioral reactions to any anthropogenic sound including, for example, commercial shipping vessels. With the Pacific Islands Fisheries Science Center (PIFSC) and Guam Division of Aquatic and Wildlife Resources (DAWR) data, the Navy conducted an independent review of the beaked whale strandings between August 2007 and December 2019. During that 13-year time period there were nine beaked whale stranding events, the

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	startled by explosions or active sonar causing them to rush from great depths to the surface at dangerous speed causing injury from gas expansion in their blood and whether repeated impacts causing temporary threshold shifts (TTS) could lead to PTS.	majority of which were identified as Cuvier's beaked whales. There were 7 years across the 13-year period in which no beaked whale strandings occurred and 2 years in which two strandings occurred within a given year. From 2007 to 2019, 18 of 23 (or 78 percent) of multi-national Navy events using sonar in the MITT Study Area did not co-occur with any beaked whale strandings. 56% (5 of 9) of the beaked whale strandings occurred without any Navy sonar use prior, therefore, some factors other than Navy sonar may be influencing these strandings. It should also be noted that the PIFSC conducted necropsies on three of the beaked whales that stranded after sonar use (two in March 2011 and one in March 2015). The results did not show evidence of gas bubble disease (gas emboli and fat emboli were not observed), which can occur during a rapid ascent to the surface and has been suggested as a response by beaked whales to sonar. Based on the above information, the Navy does not predict that any beaked whales would be injured under this Proposed Action. The Center for Naval Analysis (CNA) also recently conducted a statistical study of correlation of beaked whale strandings around the Mariana Islands with the use of U.S. Navy sonar, finding that insufficient evidence of a correlation exists. The CNA study used the complete record of all U.S. Navy sonar use between 2007 and 2019, including major training events, joint exercises, and unit level training/testing. The analysis also included the complete beaked whale stranding record for the Mariana Islands through 2019. Following the methods in Simonis et al. (2020), the CNA analysis found insufficient evidence of a correlation between sonar use and beaked whale strandings when considering the complete sonar use record. The CNA finding is in contrast to the finding in Simonis et al. (2020), which depicted a significant correlation between beaked whale strandings and Navy sonar use. However, the Simonis et al. (2020) result relied on substantially incomplete or inaccurate assumptions about U.S. Navy sonar use around the Mariana Islands. CNA also conducted statistical analyses specific to each island where beaked whale strandings have been observed in the Mariana Islands, similarly finding insufficient evidence of a correlation to sonar

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		use. Additional information on the findings of the CNA analysis are presented in Section 3.4.2.1.1.6 (Stranding) in Chapter 3.4 (Marine Mammals). As described in Section 5.1.2.2.1 (Marine Species Research and Monitoring Programs), for this Final Supplemental EIS/OEIS, the Navy agreed to several additional research and monitoring initiatives designed to help advance the understanding of beaked whales and strandings in the MITT Study Area. The Navy will co-fund the Pacific Marine Assessment Program for Protected Species (PACMAPPS) Mariana Islands survey in spring-summer 2021 and future studies starting in 2022 to help document beaked whale occurrence, abundance, and distribution in the Mariana Islands. The Navy will also fund additional stranding response and necropsy analyses for the Pacific Islands region, and research on a framework to improve statistical stranding analysis. Collaboratively with NMFS, the Navy will fund and organize an expert panel to provide recommendations on scientific data gaps and uncertainties for further protective measure consideration to minimize potential impacts of Navy training and testing activities on beaked whales in the Mariana Islands. Given its proximity to eastern Asia, Navy vessels equipped with sonar have likely been transiting and at times conducting individual and group training events with sonar in the MITT Study Area since modern hull-mounted active sonars became standard on Navy surface ships in the mid-1960s. Furthermore, the greater number of Navy ships and subsequent improvements to passive acoustic detection technology meant that it is likely that there was more active sonar use from the 1960s through the late 1980s than what is currently proposed in the current Supplemental EIS/OEIS. The Navy has reviewed Faerber and Baird (2010) as part of past projects, including in a comment on the 2015 MITT Final EIS/OEIS, and concluded that their study is highly speculative, relying on a geographic comparison between Hawaii and the Canary Islands rather than actual stranding data to suggest that sonar is impacting beaked whales in the Hawaiian Islands. The paper is not relevant to the MITT Study Area. For a more comprehensive

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		analysis of beaked whale strandings associated with Navy sonar, the Navy recommends reviewing Filadelfo et al. (2009). Filadelfo, R., J. Mintz, E. Michlovich, A. D'Amico, P.L. Tyack, and D.R. Ketten. 2009. Correlating Military Sonar Use with Beaked Whale Mass Strandings: What Do the Historic Data Show? Aquatic Mammals 35(4):435-444. The quantitative analysis of impacts, fully described in the report titled *Quantitative Analysis for Estimating Acoustic and Explosive Impacts to Marine Mammals and Sea Turtles* (U.S. Department of the Navy, 2018a), available at www.mitt-eis.com, predicts that no beaked whales are likely to suffer PTS as a result of the Proposed Action. As described in Section 3.4.2.1.1.2 (Hearing Loss), the definition of TTS precludes PTS.
DOI-07	**Chapter 3.11 Cultural Resources** There is considerable literature available on submerged cultural resources in addition to the few references listed in this section. As noted earlier, submerged resources located in the MITT Study Area are at risk during at-sea activities. Because the draft SEIS clearly states that avoidance is the primary mitigation measure, the list of reference documents and maps of the sites should be comprehensive and updated to ensure that Navy decisions are based on all available information. We are also aware that a NOAA research vessel Okeanos Explorer located submerged wrecks of USAAF B-29s from World War II off Tinian North Field and provided live video of the wrecks on public internet in 2016. Documentation exists of numerous Japanese and American aircraft down in the waters offshore of the Mariana Islands, in such locations as Agat Bay of Guam, especially in June and July 1944 during World War II.	In the 2015 MITT Final EIS/OEIS, the Navy considered Carrell, Toni, ed. *Micronesia Submerged Cultural Resources Assessment*. National Park Service. Santa Fe, 1991. The Final Supplemental EIS/OEIS has been updated to include the recommended citations: Carrell, Toni, ed. *Maritime History and Archaeology of the Commonwealth of the Northern Mariana Islands*. Commonwealth of the Northern Mariana Islands. Saipan, 2009. The citation, Lotz, Dave. Patrol Area 14. Xlibris. Bloomington, 2018, was reviewed and is not applicable to this Supplemental EIS/OEIS analysis. While the latitude and longitude of submarine location at the time of the sinkings are included in the report, the actual location of the ship sunk is not documented or available.

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	At a minimum, the following documents should be reviewed, considered, and referenced in the Final SEIS: Carrell, Toni, ed. *Micronesia Submerged Cultural Resources Assessment.* National Park Service. Santa Fe, 1991. Carrell, Toni, ed. *Maritime History and Archaeology of the Commonwealth of the Northern Mariana Islands*. Commonwealth of the Northern Mariana Islands. Saipan, 2009. Lotz, Dave. *Patrol Area 14.* Xlibris. Bloomington, 2018. Appendix 2 lists the Japanese ships sunk by U.S Navy submarines in the waters of the Mariana Islands with the locations of the sinkings.	
DOI-08	**Chapter 4. Cumulative Impacts** Table 4.2-1 does not provide a comprehensive listing of past, present, and reasonably foreseeable actions. For example, known similar actions, such as increases in ocean liner tourism and evaluated as cumulative impacts. The final SEIS/OEIS should include updated and expanded information so that a thorough cumulative impact analysis can be conducted. Also, it is not clear why "Wastewater System for Saipan" is located in Guam (page 4-16). The Department recommends that this be corrected in the final SEIS/OEIS.	In accordance with CEQ guidance, the cumulative impacts analysis focused on impacts that are truly meaningful in the context of impacts associated with the Navy's Proposed Action. This was accomplished by reviewing the direct and indirect impacts on each resource that would occur under each alternative. Key factors considered were the current status and sensitivity of the resource and the intensity, duration, and spatial extent of the impacts of each potential stressor. In general, long-term and widespread impacts were considered more likely to contribute to cumulative impacts than short-term and localized impacts. Impacts on a resource considered to be negligible were not considered further in the analysis. The level of analysis for each resource was commensurate with the intensity of the impacts identified in Chapter 3 (Affected Environment and Environmental Consequences). The Navy analyzed maritime traffic in Section 4.4.4.3.3 (Maritime Traffic and Vessel Strikes) and updated Table 4.2-1 in Chapter 4 (Cumulative Impacts) to include Maritime Traffic, which is inclusive of ocean liners and is evaluated in the cumulative effects analysis. The location of the wastewater system for Saipan has been corrected in the Final Supplemental EIS/OEIS.

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DOI-08	**Chapter 5. Mitigation** It is not clear if mitigation is proposed for damages to resources caused by the training activities. A possible mitigation action by the Navy would be to restrict fishing and development impacts in the Navy side of Sasa Bay, where the Guam Government marine protected area covers the east side of the bay and stops at Navy waters at the west half of the bay. It seems that this critical pupping ground for threatened hammerhead sharks, nursery area for many fishes, largest mangrove forest, and largest mud flat area in the Mariana Islands should be recognized and conserved by the Navy, as it is by the Government of Guam.	The Navy understands the concern about the military's use of Sasa Bay. At this time, Sasa Bay is not proposed as a mitigation area in this Supplemental EIS/OEIS, and the military is not prohibited from conducting testing and training activities in or near Sasa Bay. Restricting fishing or development impacts is not within the jurisdiction of the Navy. As described in Section 2.3.3.2 (Sea Space and Airspace Deconfliction), the Navy minimizes conflicts within areas used for commercial and recreational fishing, subsistence use, and tourism. For example, during applicable seasons around the islands of Guam and the CNMI, the Navy works collaboratively with local communities to deconflict sea space used for fishing to the maximum extent practicable, such as avoiding known fishery infrastructures (e.g., fish aggregating devices) and high-use fishing areas.
DOI-09	The mitigation area proposed in this draft SEIS/OEIS in Agat Bay, because of the resident spinner dolphins, might not be adequately large. Habitat needed by these dolphins should be assessed and the mitigation area re-designed to include this. Also a mitigation nearshore area in leeward Guam from Piti to Tanguisson may be needed as well for another population of this species. On page 5-11, please define what is meant by saying mitigation zones do not apply to "deminimus" explosions. Does this imply small explosions such as 2.5 pounds of explosives versus 20 pounds or more can be allowed in the dolphin mitigation areas?	The size and dimensions of the Agat Bay Nearshore Mitigation Area were based on observations of spinner dolphins showing resting behavior in Agat Bay from 2010 through 2013, as described in Section I.3.3 (Proposed Geographic Mitigation Area—Agat Bay Nearshore) and is being coordinated with NMFS. "*De minimis*" explosives refer to explosives with a net explosives weight of 0.1 pound or less. Quantitative modeling in multiple locations has validated that these sources have a very small zone of influence (see Section 3.0.4.2.1.1, Explosions in Water). Regardless, no explosives, even *de minimis* charges, are expected to be used in the Agat Bay Nearshore Mitigation Area.
DOI-10	The use of lookouts to detect marine mammals and turtles is not effective enough to protect the animals from sonar and explosives harm. The likelihood of detecting especially deep diving and difficult to see smaller cetaceans is low and decreases with wave activity and darkness, even though training is conducted in rough seas and after dark. As noted earlier, beaked whales react to sounds up to 50 kilometers away, impacts likely would be beyond surface observers' sight. Falcone et al. (2017) (Page 3.4-280 reference) showed that beaked whales react to hull-mounted and helicopter	The Navy's analysis does indicate, and the Navy does not expect, that Lookouts would be 100 percent effective at detecting all species of marine mammals for every activity because of the inherent limitations of observing marine species. Using shipboard Lookouts as a means to detect marine species in the vicinity of a vessel has been an additional and effective means to avoid or reduce impacts to marine mammals from Navy training and testing for over a decade. The likelihood of sighting individual animals is largely dependent on observation conditions, such as time of day, sea state, mitigation zone size, or observation platform location. In addition to Lookouts, the Navy also employs other at-sea

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	deployed mid-frequency active sonar (MFAS), even 100 kilometers away.	mitigation measures, such as monitoring for marine mammals acoustically when possible, establishing mitigation zones for marine species, implementing geographic mitigation measures, and navigating safely. The Navy used the best available science to develop the behavioral response functions in consultation with NMFS. The Navy's current beaked whale behavioral risk function (BRF) acknowledges and incorporates the increased sensitivity observed in beaked whales during both behavioral response studies and during actual Navy training and testing events. The article cited in the comment (Falcone, 2017) was not available at the time the behavioral response functions were developed. The new information and data presented in the article were thoroughly reviewed when they became available and further considered in discussions following presentation in October 2017 at a scientific conference. The Navy will incorporate these findings into the Navy's future behavioral response functions as appropriate. However, the Navy's current beaked whale BRF covers the responses observed in the new article since the beaked whale risk function is more sensitive than the other risk functions at lower received levels. Thus far, no new information has been published or otherwise conveyed that would fundamentally change the assessment of impacts or conclusions of this Supplemental EIS/OEIS.
DOI-11	It is our understanding that Navy sonar operators are able to detect submerged cetaceans and even determine their species. We recommend that training operations include a protocol to use such sonar lookouts to prevent damage to marine mammals during training.	As described in Section 5.2.1 (At-Sea Procedural Mitigation Development), the Navy's passive acoustic devices (e.g., remote acoustic sensors, expendable sonobuoys, passive acoustic sensors on submarines) can complement visual observations for marine mammals when passive acoustic assets are already participating in an activity. The passive acoustic devices can detect vocalizing marine mammals within the frequency bands already being monitored by Navy personnel. Marine mammal detections from passive acoustic devices can alert Lookouts to possible marine mammal presence in the vicinity. Lookouts can use the information from passive acoustic detections to assist their visual observations of the mitigation zone. Based on the number and type of passive acoustic devices that are typically used, passive acoustic detections do not

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		provide range or bearing to a detected animal in order to determine its location or confirm its presence in a mitigation zone. Therefore, it is not practical for the Navy to implement mitigation in response to passive acoustic detections alone (i.e., without a visual sighting of an animal within the mitigation zone). Additional information about passive acoustic devices is provided in Section 5.6.3 (Active and Passive Acoustic Monitoring Devices).
DOI-12	We suggest that a comparison be provided in the final SEIS/OEIS of mitigation and limits of similar specific military training activities applied in Hawaii and California to the proposal for the MITT Study Area. If activities and species "take" limits are more restrictive in those other training areas than they are in the MITT Study Area, please consider more restrictions in the MITT Study Area.	The Navy's procedural mitigation measures are generally consistent with those implemented in other Navy at-sea training and testing study areas, including Atlantic Fleet Training and Testing and Hawaii-Southern California Training and Testing. There are specific requirements based on activity types and species occurrence in the MITT Study Area. The Navy develops mitigation areas independently for each Study Area based on each area's unique biology and the operational requirements for each Proposed Action; however, the mitigation area development, assessment criteria, and processes are consistent across Study Areas.
DOI-13	We recommend determination of a Biological Interest Area for marine mammals in the MITT Study Area, to better direct future mitigation.	The Navy worked collaboratively with NMFS to develop mitigation measures using input from the military operators, the best available science, predicted activity impact footprints, and marine species monitoring and density data. The Navy has implemented and will continue to implement procedural mitigation measures designed to reduce or avoid impacts on marine mammals in the Study Area (see Chapter 5, Mitigation). At this time, these procedural mitigation measures represent the most practicable methods for protecting marine mammals while allowing the Navy to complete its training and testing mission. Appendix I (Geographic Mitigation Assessment) includes information about areas considered and evaluated to be potential mitigation areas. Each area was assessed based on two criteria: (1) if the area is a key area of biological importance for one or more marine mammal species or sea turtle species for an important life process, and (2) if the mitigation would result in an avoidance or reduction of impacts. In addition, implementation of a mitigation area must be practical and allow the Navy to carry out its mission requirements. The Navy

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		used the best available scientific data on vulnerable or sensitive species, such as humpback whales, to identify the three geographic mitigation areas that met the two criteria. Updates to the appendix have been made in the Final Supplemental EIS/OEIS based on the Navy's ESA and MMPA consultations with NMFS. The Navy determined that implementing mitigation beyond what is described in Section 5.3 (At-Sea Procedural Mitigation to be Implemented) and Section 5.4 (At-Sea Mitigation Areas to be Implemented) would be impractical due to implications for safety, sustainability, and mission requirements for the reasons described in Appendix I (Geographic Mitigation Assessment) and Chapter 5 (Mitigation). NMFS described their process for designating an area as a biologically important area (BIA) for a marine mammal species in Fergusson et al. (2015). Ferguson, M. C., C. Curtice, J. Harrison, and S. M. Van Parijs. (2015). Biologically important areas for cetaceans within U.S. waters – Overview and rationale. Aquatic Mammals (Special Issue), 41(1), 2–16.
DOI-14	**Appendix A: Training and Testing Activities Descriptions** • Page A-70, for mine neutralization, E4 explosive bins are listed for use in "Mariana littorals". For the final SEIS/OEIS, please clarify whether E4 explosive bins – as well as the limpet mine explosions on page A-69 - will be used in places frequented by the spinner dolphins in Agat Bay and Asan Bay.	To clarify, explosives are not proposed for use in the nearshore waters of Agat Bay or in Asan Bay where spinner dolphins may engage in resting behavior. The sections referenced are correct, and there is a difference between the nearshore and shallow water location where spinner dolphins frequently engage in resting behavior, and the long-established Agat Bay Mine Neutralization Site located in deep water far offshore of Agat Bay. Additionally, the reference to nearshore littorals in the context of submarine activities (wherein waters less than 600 ft. are considered "shallow") also refers to deeper waters than those serving as resting places for spinner dolphins. All the activities mentioned in the comment were appropriately described in the document and analyzed based on where they have been and are proposed in the future, as well as where spinner dolphins, engaged in resting behavior, are known to occur.
DOI-15	• Page A-80, for mine neutralization EOD, E5 and E6 explosive bins are listed for Bays/Estuaries at Agat Bay, Piti, and Apra Harbor. The final SEIS/OEIS should clarify	NMFS has not determined that there are any small and resident populations of spinner dolphins in the Mariana Islands (as they have in Hawaii, for example). The process NMFS uses to identify a resident population and the geographic

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	whether this will also impact resident dolphin habitat areas.	area used by the resident population is described in Ferguson et al. (2015). As described in Section 3.4.2.1.2.3 (Impacts from Sonar and Other Transducers Under the Action Alternatives), the monitoring results predict few minor to moderate TTS or behavioral reactions to spinner dolphins. An individual dolphin experiencing this level of impact over the course of a year is unlikely to experience significant effects or long-term consequences. In addition to procedural mitigation, the Navy will not use surface ship hull-mounted MF1 mid-frequency active sonar or explosives during training and testing in the Agat Bay Nearshore Mitigation Area, where spinner dolphins have been observed resting. Long-term consequences for the species or habitat therefore would not be expected.
DOI-16	• Page A-82, for submarine mine exercise, high frequency sonar is proposed at "nearshore littorals." The final SEIS/OEIS should clarify that this activity should not be done in Guam spinner dolphin areas.	In the context of submarine training activities, shallow waters are those less than 600 ft. Therefore, this activity would not take place in Guam spinner dolphin resting areas.
DOI-17	• Page A-86, for underwater demolition qualification and certification, up to 20 pound explosive charges are listed for Agat Bay and 10 pound charges at Piti and Apra Harbor. The Agat and Piti sites may be frequented by the resident spinner dolphins and dolphin tour boats and fishermen. Larger explosions there would not be appropriate. This should be analyzed and addressed in the final SEIS/OEIS.	The Agat Bay Mine Neutralization Site is far offshore and is not the resting habitat of spinner dolphins that may enter the Agat Bay nearshore area; therefore, there would not be a potential for overlap of explosive activities at the Agat Bay Mine Neutralization Site with spinner dolphin resting or tour boat operations. The Apra Harbor and Piti sites have been used for demolition qualification and certification training for decades without incident. As presented in Chapter 5 (Mitigation), procedural mitigation measures will help avoid or reduce potential impacts on marine mammals, including spinner dolphins, during activities that use explosives. In addition, the Navy developed mitigation areas to further avoid potential impacts from explosives on spinner dolphins in important resting areas, as described in Appendix I (Geographic Mitigation Assessment).
DOI-18	**Appendix I: Geographic Mitigation Assessment** As more information is discovered on areas and seasons critical to marine mammals and other protected organisms,	Marine Protected Areas in the Commonwealth of the Northern Mariana Islands and the Guam Marine Preserves are presented in Figures 6.1-1 and 6.1-2 of the 2015 Final MITT EIS/OEIS. Table 6.1-2 (Marine Protected Areas within the

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	and on sites of submerged historical resources such as World War II wrecks, we recommend that mitigation areas and limits on damaging training actions be applied by the Navy during training exercises before another SEIS is needed. We support and are pleased to see the innovation of the Marpi Reef Mitigation Area in recognition of the recently documented humpback whale breeding area. For the final SEIS/OEIS, please show on maps and describe the designated Marine Protected Areas in the Commonwealth of the Northern Mariana Islands and the Guam Marine Preserves as not available for impacts of MITT activities. Likewise, federally designated areas on Guam that include the two Navy Ecological Preserves and the War in the Pacific National Historical Park are not available for damaging MITT activities. Those areas should not be offered as mitigation for MITT activities, as those protections already exist, but they should be recognized as areas to exclude from training. Although training may be allowed in the Marianas Trench Marine National Monument, its location should be provided for reference. Future scientific studies of Monument resources may lead to need for specific mitigation sites there. Thank you for the opportunity to participate in this review. The National Park Service is pleased to continue working with the Department of Navy to ensure the protection and preservation of resources in the areas proposed for training and testing.	Mariana Islands Training and Testing Study Area) describes the different Marine Protected Areas, regulations applicable to the Navy, anticipated training and testing activities, and potential impacts. The Navy has no plans to train or conduct tests at the War in the Pacific National Historical Park on Guam. Information on mitigation areas is included in Section 5.4 (At-Sea Mitigation Areas to be Implemented) and Appendix I (Geographic Mitigation Assessment). As described in Appendix I (Geographic Mitigation Assessment), the Navy developed new mitigation for the Final Supplemental EIS/OEIS to include a restriction on the number of hours of surface ship hull-mounted MF1 mid-frequency active sonar used from December 1 to April 30 within the Marpi Reef Mitigation Area and Chalan Kanoa Reef Mitigation Area. The use of in-water explosives is also prohibited in these mitigation areas. The Navy is fully engaged with NMFS through an adaptive management program that allows the Navy and NMFS to reevaluate impacts on marine resources using new scientific findings.
United States Fish and Wildlife Service (USFWS)/Marianas Trench Marine National Monument, Pamela Repp, Acting Superintendent		
USFWS-01	Thank you for allowing us the opportunity to comment on the 2019 Draft Mariana Islands Training and Testing (MITT) Supplemental Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS). Please find our	Thank you for your comments. The Navy uses the best available science when analyzing impacts and developing conclusions. While some recent surveys (2015 and 2016) have discovered new

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	comments below. **General Comment** There was no mention made of the hydrothermal vents or the hydrothermal vent communities in the EIS/OEIS. Details should be provided on the location of these areas, their unique geological and chemical processes, and the marine life associated with these features, as well as the expected impacts of military operations and training on these unique features and biological communities. **Environmental Effects, Marine Habitats** The EIS/OEIS should recognize the unique nature of the hydrothermal vent community and the impacts that military operations can have on the unique marine habitat surrounding these vents. Use of explosives, vessels and in-water devices, military expended materials and seafloor devices associated with training and testing activities could have a significant impact on this unique marine habitat that is found only in this region.**.S. Fish and Wildlife Service (FWS) Resources of Concern Relevant to the MITT DSEIS**he Marianas Trench Marine National Monument (the Monument) contains approximately 95,216 square miles of submerged lands and waters. The Monument includes three parts: the Islands Unit, the Mariana Arch of Fire National Wildlife Refuge (NWR), and the Mariana Trench National Wildlife Refuge. The Monument contains a unique hydrothermal vent system that supports a community of organisms that live in extremely hot and highly acidic waters, and rely on chemosynthesis instead of photosynthesis to survive. Within the Monument are threatened and endangered marine mammals, a high abundance of reef fish, over 300 species of corals, and threatened green and	deep-sea vents in the Marianas Trench, very limited information exists regarding the biota and geological features of the vents. As stated in Section 3.8.2.4 (Physical Disturbance and Strike Stressors) of this Supplemental EIS/OEIS, most marine invertebrate populations, including hydrothermal vent communities, extend across wide areas containing hundreds or thousands of discrete patches of suitable habitat. Such widespread populations are difficult to evaluate in terms of Navy training and testing activities that occur intermittently and in relatively small patches in the Study Area. In addition, there would be no bottom detonations, no vessel impacts, and no in-water devices on vents. Therefore, based on the best available science, the Navy believes that it is unlikely that training and testing activities would have an impact on vent communities because of the wide dispersion of activities throughout the Study Area.

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	hawksbill sea turtles. Unlike other reefs across the Pacific, the northernmost Mariana reefs provide unique volcanic habitats that support marine biological communities requiring basalt. Maug Crater represents one of only a handful of places on Earth where photosynthetic and chemosynthetic communities of life are known to come together. These reefs and waters are among the most biologically diverse in the Western Pacific and include the greatest diversity of seamount and hydrothermal vent life yet discovered. The Monument also includes numerous geological formations and chemical processes that are of scientific interest, and likely many that have yet to be discovered. The largest active mud volcanoes on Earth are located in the Arch of Fire NWR. The Champagne vent, located at the Eifuku submarine volcano, produces almost pure liquid carbon dioxide, one of only two known sites in the world. The world's only known pool of liquid sulfur is located at the Daikoku submarine volcano. The only other known location of molten sulfur is on Io, one of Jupiter's moons	
USFWS-02	The statement "military expended materials could be colonized by benthic organisms" needs to be clarified and supported. Surveys of deep-sea regions have shown that military expended materials can last a long time with little colonization by benthic organisms. The discovery of a World War II B-29 Super fortress in the Monument is one example of how military hardware can survive in the deep ocean for decades. Further, explanation is needed to detail the impacts of expended material in the deep-sea environment, the length of time they survive in deep ocean environments, the settlement rates of benthic organisms on various materials, and the impact they have on deep-sea marine habitats and species.	The statement "military expended materials could be colonized by benthic organisms" is not in this Supplemental EIS/OEIS. Information in Section 3.8.3.3 (Physical Disturbance and Strike Stressors) in the 2015 Final MITT EIS/OEIS states that benthic invertebrates (such as crabs, clams, and polychaete worms) within the disturbed area (i.e., nearshore) could be displaced, injured, or killed during amphibious operations. Benthic invertebrates inhabiting these areas are adapted to a highly variable environment and are expected to rapidly recolonize disturbed areas by immigration and larval recruitment. The Navy used the best available data to analyze potential impacts from training and testing activities on marine resources. As described in Section 3.8 (Marine Habitats), Section 3.8.2 (Environmental Consequences), as well as in the 2015 MITT Final EIS/OEIS, there is no evidence that Navy training and testing activities would have a significant

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	Environmental Effects, Marine Invertebrates The EIS/OEIS should recognize the unique nature of the hydrothermal vent community and the impacts that military operations can have on the rare invertebrate life surrounding the vents. Use of explosives, vessels and in- water devices, military expended materials and seafloor devices, associated with training and testing activities could have a significant impact on these species as they are unique populations and subpopulations found only in this region.	impact on benthic species in the deep-sea environment. Section 3.8.3.3.2.2 (Military Expended Materials Other than Ordnance) of the 2015 MITT Final EIS/OEIS analyzed a "worst case" scenario for impacts associated with potential strike to benthic invertebrates from a ship hulk landing on the seafloor. The analysis concluded that, as the vessel hulk settles on the seafloor, all marine invertebrates within the footprint of the hulk would be impacted by strike or burial, and invertebrates a short distance beyond the footprint of the hulk would be disturbed. However, habitat-forming invertebrates such as deep sea corals are likely absent where sinking exercises are planned because this activity occurs in depths greater than the range of corals and most other habitat-forming invertebrates (approximately 10,000 ft. [3,048 m]) and typically over soft bottom habitat where these species do not occur. It is likely that the largest expended materials, such as ship hulks, would persist in deep sea environments for decades. Since many of these deep-sea habitats are comprised of soft bottom, the added structure from the expended material would provide habitat for many colonizing invertebrates and fishes.
USFWS-03	Figure 2.1-1: Mariana Islands Training and Testing Study Area should be amended to include the Marianas Trench Marine National Monument.	The Marianas Trench Marine National Monument (MTMNM) has been added on to Figure 2.1-1 in the Final Supplemental EIS/OEIS.
USFWS-04	**Marine Debris** Military expended materials including explosives, seafloor devices, cables, wires, and decelerators/parachutes can cause damage to benthic marine life and can harm geological features such as vents and mud volcanoes. The impact of this debris on deep-sea communities, especially those associated with hydrothermal vents, is currently unknown and therefore should be avoided.	See above response USFWS-03 regarding impacts from military expended materials.
USFWS-05	**Summary** Given the purposes for which the Monument was established, the Service recommends that military training	The training and testing activities within the MITT Study Area are not expected to have significant effects on resources designated for special protection under the MTMNM designation. However, when operations do occur in this area,

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	activities avoid significant impacts to habitat and marine life in the Monument. This area is a key area of biological importance to multiple species of deep-sea marine life, including hydrothermal vent associated organisms. Limiting activities in this area, especially activities that result in benthic military debris, will avoid affecting these communities and the unique benthic processes to which they are dependent. Thank you for the opportunity to comment on the EIS/OEIS.	mitigation measures followed during military activities and exercises within the Monument ensure that the activities are consistent "so far as is reasonable and practicable" with the Proclamation.
National Park Service (NPS), David Lotz, Cultural Resource Manager		
NPS-01	Please provide our office three printed copies of the complete DEIS.	A copy of the Draft Supplemental EIS/OEIS were delivered to the National Park Service following receipt of the request.
Environmental Protection Agency (EPA), Connell Dunning, Acting Manager, Environmental Review Section Connell Dunning, Acting Manager Environmental Review Section		
EPA-01	The U.S. Environmental Protection Agency (EPA) has reviewed the subject Draft Supplemental Environmental Impact Statement (DEIS) pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508), and our NEPA review authority under Section 309 of the Clean Air Act. EPA provided comments on the 2015 Mariana Islands Training and Testing (MITT) Final Environmental Impact Statement on June 18, 2015. We noted the large increase in explosive munitions proposed for use on Farallon de Medinilla (FDM), which had the potential to greatly increase erosion and sedimentation impacts to the surrounding coral reefs[1]. This supplement to the 2015 MITT Final EIS considers ongoing and future activities conducted at sea and on FDM, incorporating new information and updated training and testing requirements for these locations.	Information noted.

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	The actions proposed in this draft Supplemental EIS (DSEIS) would result in a further increase, beyond increases already proposed in the 2015 MITT Final EIS, of munitions use at FDM. The DSEIS states that proposed increases in munition use include increases of Naval Surface Fire Support Exercise Land- based Targets from 1,000 to 4,200 annually; an increase in Missile Exercises from 85 explosive missiles to 115; and increases of explosive grenades/mortars for Direct Action from 600 to 1,000. The DSEIS states that ordnance increases on FDM would be less than 1 percent over the 2015 levels analyzed, and that there is no appreciable change on the impact conclusions presented in the 2015 MITT Final EIS, which concluded coral fauna around FDM was healthy and robust.	
EPA-02	*Clarify most recent dive survey* In our comments on the 2015 MITT Final EIS, we commented on using observations of existing coral health as a predicter of future impacts from the large increase in munitions proposed, and noted that the 2012 dive survey, which identified a coral barnacle infestation, concluded that such an infestation could indicate the corals are "highly impacted by other stressors". We also recommended the Navy commit to annual dive surveys to continue to monitor the marine resources around FDM. We note that the most recent dive survey, conducted at FDM in September and October 2017, no longer detected the coral barnacle infestation identified in 2012 but showed corals around FDM undergoing a severe bleaching event. The DSEIS does not indicate whether the higher levels of munitions, approved in the July 2015 MITT Record of Decision, were immediately put into effect in subsequent training years. Therefore, it is not known whether the most recent dive surveys were performed after the large increases in munitions. *Recommendation:* EPA recommends	The Final Supplemental EIS/OEIS includes the most up-to-date dive survey information. As discussed in Section 3.8 (Marine Invertebrates), recent surveys conducted by the Navy (Smith and Marx, 2016) at FDM found that coral fauna are healthy and robust, and the nearshore physical environment and basic habitat types at FDM remained unchanged. These conclusions are based on (1) a limited amount of physical damage, (2) very low levels of partial mortality and disease (less than 1 percent of all species observed), (3) absence of excessive mucus production, (4) good coral recruitment, and (5) complete recovery by 2012 from the 2007 bleaching event. Smith and Marx (2016) also concluded that the health, abundance, and biomass of fishes, corals, and other marine resources at FDM are comparable to or superior to those in similar habitats at other locations within the Mariana Archipelago. In addition, the Navy funded additional reef surveys in the nearshore areas of FDM in 2017. The results are available at https://apps.dtic.mil/dtic/tr/fulltext/u2/1069450.pdf. The 2017 survey found little evidence that training has affected coral reef communities at FDM. Only three relatively recent ordnance items were observed, but no blast pits, craters, or significant areas of coral breakage were observed. The ordnance observed during the 2017 survey was almost exclusively old, encrusted in marine

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	that the FSEIS confirm whether or not the most recent dive surveys (September and October 2017) are reflective of the increases in munitions proposed in the 2015 MITT Final EIS.	life, and was not having any discernable impact on surrounding communities. The 2017 survey is reflective of ongoing training activities at FDM as approved under the 2015 MITT Final EIS/OEIS.
EPA-03	*Increase frequency of dive surveys to monitor coral health* While the survey associates the elevated water temperatures (heat stress) in the Marianas archipelago with bleaching events, the DSEIS acknowledges that the proposed action would also impact corals and other marine invertebrates (p. 3.8-16). It states that erosion as a result of training activities at FDM may contribute to deposition of soils into the nearshore areas of FDM, causing increased turbidity. Evidence of training-related erosion, such as ordnance skipping or eroding off of FDM, and rock and ordnance fragments blasted off of the island, were detected in every dive survey year (Vol l, p. 3.1-4). The resulting turbidity can impact corals and invertebrate communities on hard-bottom areas by reducing the amount of light that reaches these organisms and by clogging siphons for filter-feeding organisms. Reef-building corals are sensitive to water clarity because they host symbiotic algae that require sunlight to live (Vol 2, p. 3.8-15-16). The DSEIS also notes that sedimentation, pollutants, or other stressors have been associated with bleaching of corals, with several studies suggesting a direct link between declining water quality from increased runoff and sedimentation and coral reef health and bleaching (Vol 2, p. 8). The DSEIS concludes, however, that the sedimentation that may result from military use of FDM is not sufficient to adversely impact water quality and coral communities (Vol 2, p. 3.8-17). This conclusion is not supported in the DSEIS and appears to be based on a summary of dive surveys from 1997 through 2012 (as discussed in Smith and Marx, 2016). Further, since the 2017 dive survey documented severe coral bleaching, it is possible that the incremental increases in	The 2019 Joint Region Marianas Integrated Natural Resources Management Plan (INRMP) includes monitoring programs throughout the Mariana Islands. The 2019 Joint Region Marianas INRMP details natural resource management and monitoring programs, including projects for ESA-listed corals, that either improve the understanding of these species in the wild or are designed to protect species and their habitat without infringing on the Department of Defense's (DoD's) military mission. Programs specific to coral and Farallon de Medinilla (FDM) (subject to annual funding availability) include Marine Habitat Mapping (benthic habitat mapping) [Naval Base Guam, Andersen Air Force Base, Farallon de Medinilla]. • Fish, Coral, and Marine Surveys (visual surveys) [Farallon de Medinilla]. • Assess ESA-Listed Scleractinian Corals (visual surveys and condition assessment for ESA-corals) [Farallon de Medinilla]. Coral reef habitat surveys occur around FDM once every five years, per the terms and conditions of the 2017 NMFS BO. The Navy is consulting with NMFS for potential effects of the Proposed Action on ESA-listed corals and will implement terms and conditions of the new BO as they relate to coral reef habitat surveys around FDM. The Navy shall, no less than once every five years, survey coral reef habitat around FDM within 30 m of water depth. These surveys shall be structured to confirm presence or absence and abundance of ESA-listed corals and to assess general trends in coral reef species composition, percent coral coverage, and condition (e.g., disease, predators, extent of breakage).

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	erosion and sedimentation from increased military training contributes to the multiple stressors on corals. *Recommendations:* EPA continues to recommend monitoring/dive surveys more frequently than every 5 years to monitor the health of the resources possibly affected by the proposed project and to advance the science regarding the effects of multiple stressors on coral resources. Robust monitoring data is needed to help capture changes, such as bleaching and recovery/mortality episodes and changes in species composition and to provide data to support whether the protective measures identified are sufficient. As the DSEIS indicates, "coral reef surveys provide an indication if the waters surrounding FDM (designated Class A) are degrading in quality, as evidenced by coral health" (Vol I, p. 3.1-3).	
EPA-04	*Clarify how sediment and water quality impacts are assessed* The DSEIS states that explosives and explosives byproducts, metals, chemicals, and other materials expended during training and testing described in this SEIS would not exceed regulatory thresholds and guidelines established for measuring impacts on sediment and water quality; however, these thresholds and guidelines are not identified in the DSEIS. *Recommendations* In the FSEIS, identify the specific regulatory thresholds and guidelines used to assess impacts to sediment and water quality. Effective October 22, 2018, EPA no longer includes ratings in our comment letters. Information about this change and EPA's continued roles and responsibilities in the review of federal actions can be found on our website at: https://www.epa.gov/nepa/epa-review-process-under-section-309-clean-air-act.	Regulatory thresholds referred to in Section 3.1 (Sediments and Water Quality) of the Draft Supplemental EIS/OEIS have been added to the Final Supplemental EIS/OEIS. Since the Draft Supplemental EIS/OEIS, the Navy has updated Section 3.1 (Sediments and Water Quality) to include detailed water quality standards and classifications for both Guam and CNMI. Guam's water quality standards and classifications are sourced from Title 22 Division II Chapter 5 Section 102 of the Guam Administrative Code. CNMI's water quality standards and classifications are sourced from Chapter 65-130 Part 200 of the Northern Mariana Islands Administrative Code. Please see the newly added section in the Final Supplemental EIS/OEIS, Section 3.1.1.1.1 (Water Quality Criteria and Screening Levels in Waters Surrounding Guam and the Commonwealth of the Northern Mariana Islands). Given a lack of recent sediment and water quality data for the Study Area (with the exception of nearshore sediments and waters surrounding FDM assessed by Smith and Marx, 2016 and Carilli et al., 2018a, 2018b), qualitative observations from other equally or more heavily used military ordnance sites in Hawaii; Vieques, Puerto Rico; and the Potomac River, Maryland, are used as a proxy to

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	EPA appreciates the opportunity to review this DEIS. When the FEIS is released for public review, please send one electronic copy to the address above (mail code: ENF-4-2).	assess potential impacts on sediments and water quality in the Study Area. Information on impacts on sediments and water quality from munitions at two additional sites, one in Hawaii and one in the Potomac River, Maryland, where military munitions have resided for decades, have been added to the section. Information from the National Coastal Condition Assessment report (IV), which evaluated waters and sediments around Guam based on data from 2003 to 2006, was also cited for background information.
Marine Mammal Commission (MMC)		
MMC-01	The DSEIS addresses the impacts on marine mammals from conducting training and testing activities in the MITT study area and is associated with the letter of authorization (LOA) application that the Navy submitted to the National Marine Fisheries Service (NMFS). The Navy previously analyzed the various impacts, first under the Tactical Training Theater Assessment and Planning DEISs (TAP I) and second under Phase II DEISs. Background The Navy's MITT study area in the Pacific Ocean encompasses the waters around Guam and the Commonwealth of the Northern Mariana Islands, throughout the Mariana Islands Range Complex (MIRC), and in the transit corridor between MIRC and the Hawaii Range Complex. The proposed activities would involve the use of low-, mid-, high- and very high-frequency active sonar, weapons systems, explosive and non-explosive practice munitions and ordnance, high-explosive underwater detonations, expended materials, vibratory and impact hammers, airguns, electromagnetic devices, high-energy lasers, vessels, underwater vehicles, and aircraft. Under the No Action Alternative, the Navy would not conduct training or testing activities. Alternative 1, the Preferred Alternative, includes a representative number of training and	The proposed activities in the Study Area do not include vibratory hammers, impact hammers or airguns.

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	testing activities, and Alternative 2 includes the maximum number of training and testing activities. In addition to some time-area closures, mitigation measures would include visual monitoring to implement delay and shut-down procedures.	
MMC-02	Density estimates The Commission had recommended in previous letters regarding Navy Phase II activities that the Navy incorporate more refined data in its extrapolated density estimates, including for cetaceans in regions or seasons that have not been surveyed or for which data are scant. For Phase III activities in the Atlantic Fleet Training and Testing (AFTT) study area and Hawaii-Southern California Training and Testing (HSTT) study area, the Navy used more refined density estimation methods for cetaceans and accounted for uncertainty in those densities and the group size estimates4 that seeded its animat modeling. Department of the Navy (2018a) indicated that uncertainty in group size estimates for MITT was based on either Poisson or lognormal distributions but remained silent on whether uncertainty was incorporated in the density estimate and what, if any, distribution was used. Rather Department of the Navy (2018a) merely noted that a compound Poisson-gamma distribution was used for incorporating uncertainty in density estimates for AFTT and a lognormal distribution was used for densities associated with HSTT. The Commission assumes that the Navy did not incorporate uncertainty in the density estimates for MITT as otherwise it would have been specified in Department of the Navy (2018a). Since much of the MITT density data are based on survey data from either the Hawaiian Islands or Equatorial Pacific Ocean and the remaining data that originated from MITT are	Regarding the marine mammal density data, the comment characterizes "the remaining data" used in the analysis as being less than ideal because it was, "…collected during surveys that were conducted in a Beaufort sea state (BSS) of 4 or higher …" citing to Fulling et al. (2010). It is not correct that the remaining data are only from the survey reported on in Fulling et al. (2010); note citations to Norris et al. (2017) and Yack et al. (2016). In addition to density data, other data sources were also considered in evaluating any seasonal patterns and local distribution of marine mammals observed in the Study Area, such as (Deakos et al., 2016; HDR, 2011, 2012; HDR EOC, 2012; Hill et al., 2016a; Hill et al., 2016b; Hill et al., 2017a; Hill et al., 2017b; Hill et al., 2018a; Hill et al., 2018b; Hill et al., 2018c; Klinck et al., 2015; Klinck et al., 2016; Ligon et al., 2011; Martin et al., 2016; Mobley, 2007; Norris et al., 2015; Norris et al., 2017; Oleson, 2017; Oleson & Hill, 2010; Oleson et al., 2015; Tetra Tech Inc., 2014; Uyeyama, 2014). Uncertainty was incorporated into the density estimates used for modeling. The commenter is referred to the technical report titled "*Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing*" (U.S. Department of the Navy, 2018) for clarification on the use of uncertainty in density estimates. See specifically Section 4.2 titled "Marine Species Distribution Builder," page 4-6, where details are provided on how statistical uncertainty surrounding density estimates was incorporated into the modeling for the Study Area as has been done for all other recent Navy/NMFS analyses of training and testing at sea.

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	less than ideal because they were collected during surveys that were conducted in a Beaufort sea state (BSS) of 4 or higher[5] (Fulling et al. 2010), it would have been prudent for the Navy to incorporate uncertainty in all of its density estimates. Department of the Navy (2018b) included coefficients of variation (CVs) for the various datasets; those could have been used to inform the relevant standard deviations and underlying distributions. The Commission recommends that the Navy clarify whether and how it incorporated uncertainty in its density estimates for its animat modeling specific to MITT and if uncertainty was not incorporated, re-estimate the numbers of marine mammal takes based on the uncertainty inherent in the density estimates provided in Department of the Navy (2018b).	
MMC-03	Criteria and thresholds *Thresholds in general*—As stated in letters related to "NMFS's Technical guidance for assessing the effects of anthropogenic sound on marine mammal hearing: Underwater acoustic thresholds for onset of permanent and temporary threshold shifts" (PTS and TTS, respectively; NMFS 2016), the Commission supports the weighting functions and associated thresholds as stipulated in Finneran (2016), which are the same as those used for Navy Phase III activities (Department of the Navy 2017). Although several more recent studies provide additional information on behavioral audiograms (Branstetter et al. 2017, Kastelein et al. 2017b) and TTS (Kastelein et al. 2017a, 2017c), only Branstetter et al. (2017) was discussed within the DSEIS. The Commission appreciates that developing weighting functions and associated thresholds is an extensive process and that the Navy cannot amend them with each new published dataset. However, the	The Navy and NMFS thoroughly reviewed new information available since the development of the Phase III weighting functions and determined that no new research would fundamentally change the assessment of impacts or conclusions. As noted by the commenter, Branstetter et al. (2017) was discussed in the DSEIS/OEIS. Specifically, Section 3.4.1.6 (Hearing and Vocalization) of the DSEIS/OEIS stated, "The mid-frequency cetacean composite audiogram is consistent with recently published behavioral audiograms of killer whales (Branstetter et al (2017))." Additionally, this FEIS/OEIS affirms that the harbor porpoise hearing and threshold shift studies conducted by Kastelein et al., cited in the Commission's comment, are consistent with the criteria used to assess auditory impacts to high-frequency cetaceans. This information can be found in Section 3.4.1.6 (Hearing and Vocalization) and Section 3.4.2.1.1.2 (Hearing Loss). New research will be quantitatively incorporated into future auditory criteria, as appropriate.

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	Navy should discuss within the final SEIS, whether those newer data corroborate the current weighting functions and associated thresholds.	
MMC-04	*Behavior thresholds for non-impulsive sources*— To further define its behavior thresholds for non- impulsive sources, the Navy developed multiple Bayesian biphasic dose response functions (Bayesian BRFs) for Phase III activities. The Bayesian BRFs were a generalization of the monophasic functions previously developed and applied to behavioral response data (see Department of the Navy 2017 for specifics). The biphasic portions of the functions are intended to describe both level- and context-based responses as proposed in Ellison et al. (2011). At higher amplitudes, a level-based response relates the received sound level to the probability of a behavioral response; whereas, at lower amplitudes, sound can cue the presence, proximity, and approach of a sound source and stimulate a context-based response based on factors other than received sound level. The Bayesian BRFs are reasonable and a much-needed improvement on the two dose response functions (BRFs) that the Navy had used both for TAP I and Phase II activities. The Commission is concerned, however, that following the development of the BRFs, the Navy then implemented various cut-off distances beyond which it considered the potential for significant behavioral responses to be unlikely (Table C.4 in Department of the Navy 2017). The Navy indicated it was likely that the context of the exposure is more important than the amplitude at large distances (Department of the Navy 2017)—that is, the context-based response dominates the level-based response. The Commission agrees but contends that, although the distance between the animal and the sound source is an important	The consideration of proximity (cut-off distances) was part of the criteria developed in consultation with NMFS and was applied within the Navy's acoustic effects model. Cut-off distances were used to better reflect the take potential for military readiness activities as defined in the MMPA. As stated in Draft Supplemental EIS/OEIS Section 3.4.2.1.2.1 (Methods for Analyzing Impacts from Sonar and Other Transducers), the derivation of the behavioral response functions and associated cut-off distances is provided in the technical report titled *Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III)*. Briefly, much of the data used to derive the behavioral response functions was from nearby scaled sources, thereby potentially confounding results since it is difficult to tell whether the focal marine mammal is reacting to the sound level or the proximity of the source and/or vessel amongst other potentially confounding contextual factors that are unlike actual Navy events for which the behavioral risk function (BRF's) are being derived. To account for these non-applicable contextual factors, all available data on marine mammal reactions to actual Navy activities and sound sources (or other large-scale activities such as seismic surveys when information on proximity to sonar sources is not available for a given species group, e.g., harbor porpoises) were reviewed to find the farthest distance to which significant behavioral reactions were observed. These distances were rounded up to the nearest 5 or 10 km interval, and for moderate to large scale activities using multiple or louder sonar sources, these distances were greatly increased --- doubled in most cases. The Navy's BRF's applied within these distances is currently the best-known method for providing the public and regulators with a more realistic estimate (but still conservative where some uncertainties exist) of impacts and potential takes. The Commission specifically refers to the research on blue whales exposed to sonar in Goldbogen et al. (2013). It should be noted that all of the blue whale responses described by Goldbogen et al. (2013) occurred within 2 km of the

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	contextual factor, such factors have already been included in the Bayesian BRFs. Including additional cut-off distances contradicts the data underlying those functions and negates the intent of the functions themselves. In addition, the cut-off distances were based on scant acoustic data from a single species each for beaked whales and mysticetes and tag data from Risso's dolphins. Interestingly, Risso's dolphins tens of kilometers from the source exhibited similar responses to those that were within hundreds of meters of the source (Southall et al. 2014). That is, the dolphins did not exhibit any clear, overt behavioral response to either the real mid-frequency (MF) source or the scaled MF source at either distance, and the scaled MF source had to be shut down from full power when the dolphins entered the 200-m shut-down zone. The Commission remains unconvinced of the appropriateness of the cut-off distances. Moreover, depending on the activity and species, the cut-off distances could effectively eliminate a large portion of the estimated numbers of takes. For sonar bin MF1 (the most powerful mid-frequency active sonars), the estimated numbers of takes would be reduced to zero for odontocetes beginning where the probability of response is 40 percent and for beaked whales where the probability of response is 45 percent (Table 3.4-12 in the DSEIS). For mysticetes, takes would be eliminated for MF1 sources at a received level of 154 dB re 1 µPa equating to a probability of response of 17 percent. While that percentage may seem inconsequential, the received level is in fact greater than the level at which actual context-based behavioral responses were observed for feeding blue whales (see Figure 3 in Goldbogen et al. 2013). The Navy attempted to assuage the Commission's concerns in	sound source, well short of the 10 km cut-off that is conservatively applied in the mysticete behavioral criteria. Additionally, the Commission refers to observations of Risso's dolphins during the Behavioral Response Studies in Southern California. In the 2013 study, the researchers observed no clearly evident changes in behavior of Risso's dolphins exposed to actual or simulated Navy sonar at various distances. These observations suggest that the cut-off distances may be very conservative for some species.

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	its response to comments regarding the AFTT DEIS by asserting that the use of the Bayesian BRFs in conjunction with the cut-off distances is currently the best-known method for providing the public and regulators with a more realistic (but still conservative where some uncertainties exist) estimate of impacts and potential takes. Use of the cut-off distances is neither conservative nor realistic and effectively discounts the underlying data, including Goldbogen et al. (2013), upon which the BRFs are based. For all these reasons, the Commission recommends that the Navy refrain from using cut-off distances in conjunction with the Bayesian BRFs and re- estimate the numbers of marine mammal takes based solely on the Bayesian BRFs. Use of cut-off distances could be perceived as an attempt to reduce the numbers of takes, which is discussed in a subsequent section of this letter.	
MMC-05	Behavior threshold for explosives—The Navy assumed a behavior threshold 5 dB lower than the TTS thresholds for each functional hearing group for explosives. That value was derived from observed onset behavioral responses of captive bottlenose dolphins during non-impulsive TTS testing (Schlundt et al. 2000). The justification for the threshold itself is questionable, but more concerning is that the Navy continues to believe that marine mammals do not exhibit behavioral responses to single detonations (Department of the Navy 2017). The Navy has asserted that the most likely behavioral response would be a brief alerting or orienting response and significant behavioral reactions would not be expected to occur if no further detonations followed. Although there are no data to substantiate that assertion, the Navy notes that the same reasoning was used in previous ship shock trial final rules in 1998, 2001, and 2008. Without such data, there is no reason to continue to ascribe validity to assumptions made 10 to 20 years ago. Larger single	As stated in Supplemental EIS/OEIS Section 3.4.2.2.2.1 (Methods for Analyzing Impacts from Explosives), the derivation of the explosive injury criteria is provided in the technical report titled *Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III)*. This report was provided as supporting documentation to this Supplemental EIS/OEIS. Marine mammals may be exposed to isolated impulses in their natural environment (e.g., lightning). There is no evidence to support the assertion that animals have significant behavioral responses (rising to the level of "harassment" under the MMPA definition for military readiness activities) to temporally and spatially isolated explosions, regardless of charge size. Still, the analysis conservatively assumes that any modeled instance of temporally or spatially separated detonations occurring in a single 24-hour period would result in harassment under the MMPA for military readiness activities. Further, the criteria do not preclude the consideration of animals being behaviorally disturbed during single explosions if they are exposed above the TTS threshold, which is only 5 dB higher than the behavioral harassment threshold. The range to effect for TTS would be correlated to the size of the explosive.

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	detonations (such as explosive torpedo testing) would be expected to elicit 'significant behavioral responses'. The Navy provided no evidence that an animal would exhibit a significant behavioral response to two 5-lb charges detonated within a few minutes of each other but would not exhibit a similar response for a single detonation of 50 lbs., let alone detonations of more than 500 lbs. In response to the Commission's comments on the AFTT and HSTT DEISs, the Navy indicated that there is no evidence to support that animals have significant behavioral reactions to temporally and spatially isolated explosions and that they had been monitoring detonations since the 1990s and have not observed those types of reactions. The Commission is unaware of the Navy having personnel on station to monitor marine mammal responses during large single detonations due to human safety concerns. For some activities (i.e., missiles launched from a ship), the target area isn't cleared prior to the exercise and personnel are 28 to 139 km from the target site. In other instances (i.e., missiles launched and bombs dropped from aircraft), the lookout is tasked primarily with clearing the mitigation zone and realistically only observes for animals in the central portion of that zone immediately prior to the activity commencing. Lookouts are not responsible for documenting an animal's behavioral response to the activity, they are responsible for minimizing serious injuries and mortalities to any observed animal. Additionally, the Commission is unaware of the Navy conducting post-activity monitoring to document injuries or mortalities, let alone behavioral responses, for the majority of these types of activities. The Commission continues to believe the Navy has not provided adequate justification for ignoring the possibility that single underwater detonations can cause a	The Navy has been monitoring detonations since the 1990s and has not observed these types of reactions. To clarify, this monitoring has occurred under the monitoring plans developed specifically for shock trials, the detonations with the largest net explosive weight conducted by the Navy (no shock trials are proposed in this Study Area). Temporary threshold shifts (TTS) and all other higher-order impacts are assessed for all training and testing activities that involve the use of explosives or explosive ordnance. All Navy monitoring projects, reports, and publications are available on the Marine Species Monitoring website (https://www.navymarinespeciesmonitoring.us/). The Navy proposes to continue to conduct post-detonation monitoring where practical to implement, as described in Chapter 5 (Mitigation). To provide information on incidents involving ESA-listed species, the Navy will continue to submit the appropriate reports to NMFS immediately, or as soon as operational security considerations allow, if it observes an incident that is or may be attributable to Navy activities, including (1) a vessel strike of a marine mammal or sea turtle during training or testing, (2) a stranded, injured, or dead marine mammal or sea turtle during training or testing, or (3) an injured or dead marine mammal, sea turtle, or ESA-listed fish species during post-explosive activity monitoring.

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	behavioral response and therefore again recommends that the Navy estimate and ultimately request authorization for behavior takes of marine mammals during all explosive activities, including those that involve single detonations.	
MMC-06	*Mortality and injury thresholds for explosives*—The Commission notes that the constants and exponents associated with the impulse metrics for both onset mortality and onset slight lung injury have been amended from those used in TAP I and Phase II activities. The Navy did not explain why the constants and exponents have changed while the underlying data remain the same. The modifications yield smaller zones in some instances and larger zones in other instances. These results are counterintuitive since the Navy presumably amended the impulse metrics to account for lung compression with depth, thus the zones would be expected to be smaller rather than larger the deeper the animal dives. The Commission provided similar comments in its letters regarding both the AFTT and HSTT DEISs. However, the Navy did not provide in either final EIS an explanation regarding the constants and exponents nor did it specify the assumptions made. The Navy merely directed the Commission to Department of the Navy (2017)—the document from which the Commission's comments originated. Therefore, the Commission again recommends that the Navy in its final SEIS (1) explain why the constants and exponents for onset mortality and onset slight lung injury thresholds for Phase III have been amended, (2) ensure that the modified equations are correct, and (3) specify any additional assumptions that were made.	The Navy is aware that MMC previously expressed concern on this topic. The Navy reiterates that the derivation of the explosive injury equations is provided in the technical report titled *Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III)*. Detailed technical information can be more adequately addressed in depth within a technical report in lieu of the SEIS. This technical report is incorporated into the analysis conducted in the EIS, as stated in Section 3.4.2.2.2.1 (Methods for Analyzing Impacts from Explosives). This technical report is publicly available and easily accessible at www.mitt-eis.com. The rationale for updating the constants and exponents is explained in detail in the technical report, along with any additional assumptions that were made at the time of the criteria update. The constants C and K are defined in the following sections in the technical report, Section 2.2 (Weighting Functions and Exposure Functions), and the steps to deriving the weighting and exposure functions are described in Section 2.3 (Methodology to Derive Function Parameters). These updated equations were reviewed by several subject matter experts and found to be correct.
MMC-07	More importantly, the Navy used the onset mortality and onset slight lung injury criteria to determine only the range to	The Navy used the range to one percent risk of mortality and injury (referred to as "onset" in this Supplemental EIS/OEIS) to inform the development of

	Comment	Navy Response
	effects, while it used the 50 percent mortality and 50 percent slight lung injury criteria to estimate the numbers of marine mammal takes. That approach is inconsistent with the manner in which the Navy estimated the numbers of takes for PTS, TTS, and behavior for explosive activities. All of those takes have been and continue to be based on onset, not 50-percent values. Although the effectiveness of the Navy's mitigation measures has yet to be determined, the circumstances of the deaths of multiple common dolphins during one of the Navy's underwater detonation events in March 2011 (Danil and St. Leger 2011) indicate that the Navy's mitigation measures are not fully effective, especially for explosive activities. It would be more prudent for the Navy to estimate injuries and mortalities based on onset rather than a 50-percent incidence of occurrence. The Navy did indicate that it is reasonable to assume for its impact analysis—thus its take estimation process—that extensive lung hemorrhage is a level of injury that would result in mortality for a wild animal (Department of the Navy 2017). Thus, it is unclear why the Navy did not follow through with that premise. What is clear is that the 50-percent rather than onset criteria underestimate both predicted mortalities and injuries. The Navy's response in the AFTT and HSTT final EISs that overpredicting impacts by using onset values would not afford extra protection to any animal is irrelevant from an impact analysis basis. The intent of an impact analysis is to describe and estimate impacts (i.e., takes) from the proposed activities accurately. There is no logical reason for basing the estimated impacts on onset of PTS, TTS, and behavioral response for sublethal effects; while for lethal and injurious	mitigation zones for explosives. In all cases, the mitigation zones for explosives extend beyond the range to one percent risk of non-auditory injury, even for a small animal (representative mass = 5 kg). In this Supplemental EIS/OEIS, the Navy clarified that the "onset" non-auditory injury and mortality criteria are actually one percent risk criteria. The Navy concurs that the intent of an impact analysis is to describe and estimate impacts from proposed activities accurately. Therefore, similar to other physiological criteria (PTS and TTS), the mean dose (i.e., 50%) at which an outcome was observed in experimental data was used to establish the non-auditory injury thresholds. The terminology in the EIS has been revised to address this misunderstanding of the threshold since the AFTT and HSTT Draft EISs. The Navy, in coordination with NMFS, has determined that the mean dose is a reasonable representation of these potential effects. Ranges to effect based on one percent risk criteria were examined to ensure that explosive mitigation zones would encompass the range to any potential mortality or non-auditory injury, affording actual protection against these effects. Contrary to the comment, the Navy used extensive lung hemorrhage as indicative of mortality. Extensive lung hemorrhage is assumed to result in mortality, and the explosive mortality criteria are based on extensive lung injury data [See the technical report titled *Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III)* available at www.mitt-eis.com.

	Comment	Navy Response
	effects, the impacts are based on a 50-percent criterion. Potential mortalities and injuries should be fully accounted for rather than be erroneously discounted in any impact analysis. The Commission recommends that the Navy use onset mortality, onset slight lung injury, and onset GI tract injury thresholds to estimate both the numbers of marine mammal takes and the respective ranges to effect.	
MMC-08	Mitigation measures Mitigation effectiveness—The Navy's proposed mitigation zones are similar to the zones32 previously used during Phase II activities and are intended, based on the Phase III DSEIS, to avoid the potential for marine mammals to be exposed to levels of sound that could result in injury (i.e., PTS). However, the Phase III proposed mitigation zones would not protect various functional hearing groups from PTS. For example, the mitigation zone for an explosive sonobuoy is 549 m but the mean PTS zones range from 2,076–2,364 m for HF34. Similarly, the mitigation zone for an explosive torpedo is 1,920 m but the mean PTS zones range from 5,051–8,388 m for HF35. The appropriateness of such zones is further complicated by platforms firing munitions (e.g., for missiles and rockets) at targets that are 28 to 139 km away from the firing platform. An aircraft would clear the target area well before it positions itself at the launch location and launches the missile or rocket. Ships, on the other hand, do not clear the target area before launching the missile or rocket. In either case, marine mammals could be present in the target area at the time of the launch unbeknownst to the Navy. In addition, the Navy indicated in the DSEIS that lookouts would not be 100 percent effective at detecting all species of marine mammals for every activity because of the inherent	The Navy's Phase III mitigation zones are designed to avoid or reduce potential impacts on marine mammals to the maximum extent practicable. The mitigation zones for active sonar and weapons firing noise extend beyond the average ranges to PTS for all marine mammal hearing groups. The explosive mitigation zones extend beyond the ranges to mortality for all marine mammals, and beyond or into a portion of the average ranges to PTS for marine mammals, depending on the activity and hearing group. The mitigation zones for some explosives also extend beyond or into a portion of the average ranges to TTS for marine mammals. Therefore, depending on the species, mitigation would help avoid or reduce mortality and all or a portion of the potential for exposure to non-auditory injury, PTS, and higher levels of TTS. Per Section 5.3.3 (Explosive Stressors), any additional increases in explosive mitigation zone size (beyond what is depicted for each explosive activity) or observation requirements would be impractical to implement due to implications for safety, sustainability, and mission requirements. Implementing mitigation measures during activities that involve vessels firing missiles and rockets would be impractical for the reasons described in Section 5.3.3.4 (Explosive Missiles and Rockets). The Lookout effectiveness study mentioned by the commenter is still ongoing. This type of study, has never been conducted, is extremely complex to ensure data validity, requires a substantial amount of data to conduct meaningful statistical analysis, and the Navy is committed to completing it. As noted by the commenter, there has not been enough data collected to conduct a sufficient

	Comment	Navy Response
	limitations of observing marine species and because the likelihood of sighting individual animals is largely dependent on observation conditions (e.g., time of day, sea state, mitigation zone size, observation platform). The Commission agrees and has made repeated recommendations to the Navy regarding the effectiveness of visual monitoring. Since 2010, the Navy has been collaborating with researchers at the University of St. Andrews to study Navy lookout effectiveness. The Navy does not appear to have mentioned that study in its DSEIS for Phase III. For its Phase II DEISs, the Navy noted that the data that had been collected could not be analyzed in a statistically significant manner. The Commission understands that point but continues to consider the basic information provided by the studies to be useful. In one instance, the marine mammal observers (MMOs) sighted at least three marine mammals at distances of less than 914 m (i.e., within the mitigation zone for mid-frequency active sonar for cetaceans), which were not sighted by Navy lookouts (Department of the Navy 2012). In other instances, MMOs sighted a group of approximately three dolphins at a distance of 732 m (Department of the Navy 2014a), a group of approximately 20 dolphins at a distance of 759 m (Department of the Navy 2014c), a group of approximately 9 pilot whales at a distance of 383 m (Department of the Navy 2014b), and a small unidentified marine mammal at 733 m (Department of the Navy 2014b)—none of which were documented as having been sighted by the Navy lookouts. Further, MMOs have reported marine mammal sightings not observed by Navy lookouts to the Officer of the Deck, presumably to implement mitigation measures (Department of the Navy 2010). Neither the details regarding those reports	analysis; therefore, drawing conclusions on an incomplete data set is not scientifically valid.

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	nor the raw sightings data were provided to confirm this. More recent data have confirmed the earlier observed trends. Department of the Navy (2016) noted that 10 of the 13 marine mammal sightings occurred at or within 1 km of the vessel, and Navy lookouts only detected 4 of 13 total sightings. The Commission understands that any data that have been collected since then would still not be sufficient to allow a meaningful statistical analysis. The Commission recognizes that the study will be very informative once completed but believes that in the interim, the preliminary data provide a basis for taking a precautionary approach. Accordingly, the Commission continues to believe that rather than simply reducing the size of the zones it plans to monitor, the Navy should supplement its visual monitoring efforts with other monitoring measures. The Navy proposed to supplement visual monitoring with passive acoustic monitoring during three explosive activity types but not during the other explosive activities or during low-, mid- and high-frequency active sonar activities.	
MMC-09	The Navy uses visual, passive acoustic, and active acoustic monitoring (via HF/M3) during SURTASS LFA sonar activities to augment its mitigation efforts over large areas. The Navy indicated in its Phase III DSEIS that it is not able to use HF/M3 during training and testing activities due to impacts on speed and maneuverability that can affect safety and mission requirements due to costs associated with designing, building, installing, maintaining, and manning the equipment. The Navy also stated that it did not have sufficient resources to construct and maintain additional passive acoustic	The Navy employs passive acoustic monitoring when practical to do so (i.e., when assets that have passive acoustic monitoring capabilities are already participating in the activity). As discussed in Section 5.6.3 (Active and Passive Acoustic Monitoring Devices), there are significant manpower and logistical constraints that make constructing and maintaining additional passive acoustic monitoring systems or platforms for each training and testing activity impractical. The Navy's existing passive acoustic monitoring devices (e.g., sonobuoys) are designed, maintained, and allocated to specific training units or testing programs for specific mission-essential purposes. Reallocating these assets to different training unit or testing programs for the purpose of monitoring for marine mammals would prevent the Navy from using its

	Comment	Navy Response
	monitoring systems or platforms for each training and testing activity. The Commission again points out that sonobuoys, which are deployed and used during many of the Navy's activities, could be deployed and used without having to construct or maintain additional systems. For example, sonobuoys could be deployed with the target prior to an activity to better determine whether the target area is clear and remains clear until the munition is launched. The Navy went on to indicate that passive acoustic detections would not provide range or bearing to detected animals and therefore cannot be used to determine an animal's location or confirm its presence in a mitigation zone. The Commission does not agree with that supposition. In the DSEIS, the Navy indicated that it had capabilities to monitor instrumented ranges in real time or through data recorded by hydrophones at the Southern California Offshore Range, the Pacific Missile Range Facility (PMRF) off Kauai, and the Atlantic Undersea Test and Evaluation Center in the Bahamas. The Commission also understands that the Navy is quite adept at detecting, classifying, and localizing individual marine mammals on those ranges. For example, Helble et al. (2015) were able to track multiple animals on PMRF hydrophones in real time, including humpback whales, a species that can be problematic to localize. Several animals were localized simultaneously with a localization error rate of 2 percent or less. Similar methods can be used for other species. Baird et al. (2015) also indicated that the PMRF hydrophones allow the PAM analyst to isolate animal vocalizations on the range, confirm species classification, and localize groups of animals in real time. Multiple detectors can be used for sperm whales, delphinids, beaked whales, and baleen whales.	equipment for its intended mission-essential purpose. Diverting platforms that have integrated passive acoustic monitoring capabilities would impact their ability to meet mission requirements and reduce the service life of those systems. Furthermore, adding a passive acoustic monitoring capability to additional explosive activities (either by adding a passive acoustic monitoring device to a platform already participating in the activity, or by adding an additional platform to the activity) for mitigation is not practical. For example, all platforms participating in an explosive bombing exercise (e.g. firing aircraft, safety aircraft) must focus on situational awareness of the activity area and continuous coordination between multiple training components for safety and mission success. Therefore, it is impractical for participating platforms to divert their attention to non-mission essential tasks, such as deploying sonobuoys and monitoring for acoustic detections during the activity (e.g., setting up a computer station). The Navy does not have available manpower or resources to allocate additional aircraft for the purpose of deploying, monitoring, and retrieving passive acoustic monitoring equipment during a bombing exercise. As stated in Section 5.6.3 (Active and Passive Acoustic Monitoring Devices), to develop an estimated position for an individual marine mammal, the animal's vocalizations must be detected on at least three hydrophones. As stated in Section 5.2.1 (At-Sea Procedural Mitigation Development), "Based on the number and type of passive acoustic devices that are typically used, passive acoustic detections do not provide range or bearing to a detected animal in order to determine its location or confirm its presence in a mitigation zone." This sentence was taken out of context and implied the Navy indicated passive acoustic detections do not provide range or bearing to marine mammals in general. The Navy reemphasizes that the passive acoustic monitoring devices typically used during its training and testing activities do not provide range or bearing to marine mammals, based on the number (e.g., one or two) and type of assets used. The Study Area does not currently contain an instrumented range. As discussed in Section 5.6.3 (Active and Passive Acoustic Monitoring), although the Navy is continuing to improve its capabilities to use range instrumentation to aid in the

	Comment	Navy Response
	Similar to Helble et al. (2015), Baird et al. (2015) indicated that localization algorithms could determine an animal's position. In the case of bottlenose dolphins, localized positions were within approximately 100 m of the vocalizing animal. Similar localizations have been used to direct researchers to groups of vocalizing odontocetes to deploy satellite-linked tags (Baird et al. 2014). Moreover, the Navy itself has indicated the success of using sonobuoys to detect bottlenose dolphins in real-time during mine exercises. Although the Navy indicated that it was continuing to improve its capabilities for using range instrumentation to aid in the passive acoustic detection of marine mammals, it also stated that it didn't have the capability or resources to monitor instrumented ranges in real time for the purpose of mitigation. That capability clearly exists. While available resources could be a limiting factor, the Commission notes that personnel who monitor the hydrophones and sonobuoys on the operational side do have the ability to monitor for marine mammals as well. Department of the Navy (2013) confirmed that ability exists—four independent sightings were made not by the Navy lookouts but by the passive acoustic technicians. Similarly, Department of the Navy (2014c) reported that echolocation clicks of short-finned pilot whales were reported by the sonar technician to the bridge prior to mitigation being implemented. The Commission has supported the use of the instrumented ranges, operational hydrophones and active acoustic sources, and sonobuoys to fulfill mitigation implementation for quite some time and contends that localizing certain species (or genera) provides more effective mitigation than localizing none at all.	passive acoustic detection of marine mammals, at this time it would not be effective or practical for the Navy to monitor instrumented ranges for real-time mitigation or to construct additional instrumented ranges as a tool to aid in the implementation of mitigation.

	Comment	Navy Response
	Given that the effectiveness of Navy lookouts conducting visual monitoring has yet to be determined, the Commission believes that passive or active acoustic monitoring should be used to supplement visual monitoring, especially for activities that could injure or kill marine mammals. Therefore, the Commission again recommends that the Navy to passive and active acoustic monitoring, whenever practicable, to supplement visual monitoring during the implementation of its mitigation measures for all activities that could cause injury or mortality beyond those explosive activities for which passive acoustic monitoring already was proposed—at the very least, sonobuoys expended and active sources and hydrophones used during an activity should be monitored for marine mammals.	
MMC-10	Pre- and post-activity monitoring—Based on the limitations noted for implementing mitigation measures during explosive activities, the Commission believes additional pre- and post-activity monitoring should be required. Although the Navy likely could not provide additional assets to clear an area prior to an activity, the existing assets (primarily for aircraft) could conduct additional flyovers of the mitigation zone before expending any ordnance. Therefore, the Commission recommends that the Navy conduct additional pre-activity overflights, barring any safety issues (e.g., low fuel), before conducting any activities involving detonations.	As described in Section 5.3.3 (Explosive Stressors), the Navy developed a new mitigation measure for the Proposed Action requiring additional platforms already participating in explosive activities to support observations of the mitigation zone before, during, and after the activity while performing their regular duties. There are typically multiple platforms in the vicinity of activities that use explosives, such as safety aircraft. When available, having additional personnel support observations of the mitigation zone will help increase the likelihood of detecting biological resources.
MMC-11	In addition, NMFS would require the Navy to conduct post-activity monitoring for certain, but not all, activities involving underwater detonations. Specifically, post-activity monitoring would not be required after activities involving medium- and large-caliber projectiles, missiles and rockets, or bombs. Based on the uncertain effectiveness of the Navy's proposed mitigation measures, the Commission believes it would be prudent to require post-activity monitoring for these	As described in Section 5.3.3 (Explosive Stressors), the Navy developed a new mitigation measure for the Proposed Action requiring the Lookout to observe the mitigation zone after completion of explosive activities. In accordance with the 2015 MITT Final EIS/OEIS consultation requirements, the Navy currently conducts post-activity observations for some, but not all explosive activities. When developing mitigation measures for this Supplemental EIS/OEIS, the Navy determined it could expand the requirement to other explosive activities for enhanced consistency and to help determine if any resources were injured

	Comment	Navy Response
	activities as well. That monitoring could occur immediately after the activity, with additional surveys by activity aircraft as previously specified or by vessels or when personnel retrieve the targets. The Commission recommends that the Navy conduct post-activity monitoring for activities involving medium- and large-caliber projectiles, missiles, rockets, and bombs.	during explosive events, when practical. If additional platforms are supporting an explosive activity (e.g., providing range clearance), those assets will assist in the post-event visual observation of the area where detonations occurred. The Navy will continue to follow the incident reporting procedures outlined in Section 5.1.2.2.3 (Incident Reports) if an incident is detected at any time during the event, including during the post-activity observations.
MMC-12	Pile-driving activities For pile-driving activities, the Navy accumulated the energy for both impact and vibratory pile driving based on 1 minute and 6 minutes of activities, respectively, rather than accumulating the energy over the entire day of activities—the latter is standard practice for all pile-driving activities, including those the Navy conducts (e.g., 83 Fed. Reg. 9366 and 10689). The Navy assumed that animals would avoid higher sound levels because (1) most marine mammals should be able to easily move away from the expanding range to effects for both TTS/PTS within 60 seconds and (2) most animals should avoid the zone altogether if they are outside of the immediate area upon startup. Those assumptions do not comport with actual monitoring data. For many pile-driving activities involving both impact and vibratory pile driving, including those that the Navy has conducted, marine mammals routinely are observed approaching and occurring within the PTS zone. Although the animals are able to avoid the zone, they do not. Therefore, the Commission recommends that the Navy (1) accumulate the energy for the entire day of proposed activities to determine the ranges to PTS and TTS for impact and vibratory pile-driving activities, (2) reassess the appropriateness of the proposed mitigation zones, and (3) re-estimate the numbers of takes accordingly.	Impact or vibratory pile driving would not occur during training and testing activities in the Study Area for the proposed alternatives, and is therefore not analyzed in this Supplemental EIS/OEIS.

	Comment	Navy Response
MMC-13	Level A harassment and mortality takes The Navy used various post-model analyses to estimate the numbers of marine mammal takes during acoustic and explosive activities that are similar to methods used in its Phase II DEISs. Those analyses effectively reduced the model-estimated numbers of Level A harassment (i.e., PTS) and mortality takes. The analyses were based on (1) animal avoidance, (2) mitigation effectiveness, and (3) cut-off distances. The Commission has discussed the first two aspects at length in letters regarding Phase II activities. That information is not repeated herein but should be reviewed in conjunction with this letter (see the Commission's 15 September 2014 letter). The Commission has a few additional comments on those analyses. For avoidance, the Navy assumed that animals present beyond the range to onset PTS for the first three to four pings would avoid any additional exposures at levels that could cause PTS (Department of the Navy 2018a). That equated to approximately 5 percent of the total pings or 5 percent of the overall time active; therefore, 95 percent of marine mammals predicted to experience PTS due to sonar and other transducers were instead assumed to experience TTS (Department of the Navy 2018a).	As stated in Section 3.4.2.1.2.1 (Methods for Analyzing Impacts from Sonar and Other Transducers), the consideration of marine mammals avoiding the area immediately around the sound source is provided in the technical report titled *Quantitative Analysis for Estimating Acoustic and Explosive Impacts to Marine Mammals and Sea Turtles*. This report was provided as supporting documentation to the Draft Supplemental EIS/OEIS. As the commenter correctly articulates: "For avoidance, the Navy assumed that animals present beyond the range to onset PTS for the first three to four pings are assumed to avoid any additional exposures at levels that could cause PTS. That equated to approximately 5 percent of the total pings or 5 percent of the overall time active; therefore, 95 percent of marine mammals predicted to experience PTS due to sonar and other transducers were instead assumed to experience TTS." As discussed in the Quantitative Analysis for Estimating Acoustic and Explosive Impacts to Marine Mammals and Sea Turtles, animats in the Navy's acoustic effects model do not move horizontally or 'react' to sound in any way, necessitating the additional step of considering animal avoidance of close-in PTS zones. This approach is fully supported by the best available science. Based on a growing body of behavioral response research, animals do in fact avoid the immediate area around sound sources to a distance of a few hundred meters or more depending upon the species. Avoidance to this distance greatly reduces the likelihood of impacts on hearing, such as TTS and PTS. Specifically, the ranges to PTS for most marine mammal groups are within a few tens of meters and the ranges for the most sensitive group, the HF cetaceans, average about 200 m, to a maximum of 270 m in limited cases; however, high-frequency cetaceans such as harbor porpoises, have been observed reacting to anthropogenic sound at greater distances than other species and are likely to avoid their zones to hearing impacts (TTS and PTS) as well. Querying the dosimeters of the animats would not produce useful information since animats do not move in the horizontal and are not programmed to 'react' to sound or any other stimulus.
MMC-14	The Navy should have been able to query the dosimeters of the animats to verify whether its 5-percent assumption was	Details of this analysis are provided in the technical report titled *Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical*

	Comment	Navy Response
	valid, but on its face that assumption has no scientific basis. Given that sound sources are moving, it may not be until later in an exercise that the animal is close enough to experience PTS and it is those few close pings that contribute to the potential to experience PTS. Since both sources and animals are moving during an exercise, whether an animal is initially beyond the PTS zone has no bearing on whether it will later come within close range. Behavioral response studies (BRS) have shown this as well. For example, Southall et al. (2014) indicated that Risso's dolphins and California sea lions approached the 200-m shut-down zone when a source was operating at full power, resulting in having to shut down the source. Both instances occurred well after the first three or four pings. Department of the Navy (2010b and 2012) also noted multiple instances in which dolphins were observed 27 to 460 m from a vessel emitting mid- frequency active sonar, some instances were apparently numerous hours after the source was active. Those dolphins did not receive only the first three or four pings emitted, nor did they avoid the source. Avoidance aside, Navy vessels may move faster than the speed animals are capable of moving to evacuate the area. Thus, the animals would be exposed to pings after the first three or four as well. Regarding mitigation effectiveness, the Commission notes that the specific mitigation effectiveness scores for the various activities were provided for Phase II but not for Phase III activities. For Phase III, the Navy included more detail regarding how the scores were determined (including species sightability, observation area extent, visibility factors, and whether sound sources were under positive control) but did	*Approach for Phase III Training and Testing*. As stated in Section 3.4.2.1.2.1 (Methods for Analyzing Impacts from Sonar and Other Transducers) and Section 3.4.2.2.2.1 (Methods for Analyzing Impacts from Explosives) of the technical report, the consideration of marine mammal avoidance and mitigation effectiveness is integral to the Navy's overall analysis of impacts from sonar and explosive sources. The quantitative analysis assumes a conservative slow animal travel speed when accounting for avoidance. The quantitative analysis also accounts for a portion of animats being exposed to sound exposure levels that could result in PTS at any time during an event using sonar. Many sonar sources are not used omni-directionally, which would affect the exposure level at different angles and depths relative to the sound source, and thus potential physiological and behavioral responses. As discussed in the 2017 technical report titled *Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing*, the Navy's acoustic effects model does not consider procedural mitigation measures (e.g., power-down or shut-down of active sonar or pausing explosive activities when marine mammals or sea turtles are observed in a specified mitigation zone around a sound source or detonation location), which necessitates consideration of these factors in the Navy's overall acoustic analysis. Determination of mitigation effectiveness is extremely conservative. The Navy has fully described its analytical process in the above technical report. The Navy refined the Phase III analysis by considering mitigation effectiveness at the scenario level, rather than at the activity level as in Phase II. Many scenario details are classified, thus the level of detail requested by the Commission cannot be provided in an unclassified document. The Commission is wrong to accuse the Navy of "zeroing out" estimated mortality. No mortality nor non-auditory injury takes of any marine mammal species were estimated by the Navy Acoustic Effects Model; therefore, the Navy did not assess the potential for mitigation to avoid a portion of model-predicted mortalities under this Proposed Action. If the model had estimated any mortality take, the Navy would have followed the process described in the technical report to realistically assess the potential for mitigation to avoid a portion of impacts.

	Comment	Navy Response
	not specify what the actual scores were for those four factors or the mitigation scores as a whole. The Navy also apparently did not include model-estimated numbers of takes. The lack of information makes it difficult for the Commission and the public to assess the appropriateness of the mitigation scores or their effect on the overall numbers of marine mammal takes. And, although the Navy did not reduce the numbers of injury (slight lung and GI tract) and PTS takes for explosive activities as it had for Phase II analyses, it still assumed its model- estimated mortality takes would not occur, zeroed out those takes, and enumerated them as injury takes. Since the Navy has yet to determine the effectiveness of its mitigation measures, it is premature to include any related assumptions to reduce the numbers of marine mammal takes. The concerns with the cut-off distances, which reduced the numbers of takes, were articulated in a previous section of this letter and it seems apparent that the post-analyses as a whole would underestimate the various numbers of takes. Therefore, the Commission again recommends that the Navy (1) specify the total numbers of model-estimated Level A harassment (PTS) and mortality takes rather than reduce the estimated numbers of takes based on the Navy's post-model analyses and (2) include the model-estimated Level A harassment and mortality takes in its LOA application to inform NMFS's negligible impact determination analyses. Most, if not all, of the Commission's recommendations would apply to the Navy's LOA application as well and should be considered as such. Please contact me if you have questions concerning the Commission's recommendations or rationale.	Not considering animal avoidance and mitigation effectiveness would lead to a great overestimate of injurious impacts. NMFS has concurred with the analytical approach used. The results of the quantitative analysis represent the best estimate of the maximum number of instances that marine mammals may be impacted under this Proposed Action.

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Table K-3: Response to Comments from Non-Governmental Organizations

	Comment	Navy Response
Northern Marianas Descent Corporation (NMDC), John Oliver Gonzales		
NMDC-01	The Northern Marianas Descent Corporation (NMDC) indisputably objects to the U.S. Navy's illegal and dishonest approach to its expansion of live- fire training and testing facilities in and around the Marianas archipelago through use of subterfuge. The Navy's tactics include: 1. Breaking its monumental live-fire project into smaller, more innocuous appearing projects of limited geographic scope. 2. Ignoring and refusing to consider any and all alternatives that allow them to meet their objectives elsewhere besides the Marianas. 3. Ignoring the cumulative impacts of its multiple and obviously inter- related live-fire projects. These projects include: a. Military Training in the Marianas (1999) b. Intelligence, Surveillance, and Reconnaissance and Strike (ISR/Strike) (2006) c. Mariana Islands Range Complex (MIRC) (2010) d. Mariana Islands Testing and Training (MITT) (2015) e. Marines Relocation to Guam (2015) f. CNMI Joint Military Training (CJMT) (Begun 2015) g. Divert Activities and Exercises (2016) h. Ritidian Live-Fire Training Range Complex (LFTRC) (2018) i. Supplemental Mariana Islands Testing and Training (MITT) – 2019	The Navy is not proposing any geographic expansion of the training and testing area in this Supplemental Environmental Impact Statement (EIS)/Overseas Environmental Impact Statement (OEIS). Proposed activities are similar to those conducted in the Study Area for decades. The Navy has been conducting training and testing activities in the Mariana Islands Training and Testing (MITT) EIS/OEIS Study Area (Study Area) for decades and this supplement to the 2015 MITT Final EIS/OEIS supports the continuation of that training and testing. The activities analyzed in this Supplemental EIS/OEIS are largely a continuation of the ongoing training and testing activities that were analyzed in the 2015 MITT Final EIS/OEIS, 2010 MIRC Final EIS/OEIS, 1999 Military Training in the Marianas Final EIS, and other environmental compliance documents. Section 1.2 (The Navy's Environmental Compliance and At-Sea Policy) discusses the Navy's past environmental compliance. This Supplemental EIS/OEIS (1) includes the analysis of activities at sea and on Farallon de Medinilla (FDM) necessary to meet readiness requirements beyond 2020 and into the reasonably foreseeable future, (2) includes any changes to those activities previously analyzed, and (3) reflects the most up-to-date compilation of training and testing activities deemed necessary to accomplish military readiness requirements. The proposed Live-Fire Training Range Complex is not part of this Proposed Action. The military is committed to protecting the terrestrial and marine environment during training and testing activities, and the Department of Defense (DoD) strives to reduce or minimize potential impacts as much as possible. The alternatives carried forward for analysis were developed to meet the Navy's purpose and need and to ensure it can fulfill its obligation under Title 10 of the U.S. Code. See Section 2.4 (Action Alternatives Development) for more detailed information on the development of alternatives and rationale on why alternative training and testing locations are not feasible. Ongoing training and testing activities within the Study Area are not dependent on other DoD activities that are outside the scope of the 2015 MITT Final EIS/OEIS or this Supplemental EIS/OEIS. For example, proposed and ongoing MITT training and

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		testing activities within the Study Area would proceed regardless of whether other proposed actions are taken, such as the CNMI Joint Military Training EIS/OEIS. Different projects have vastly different scopes, timetables, and action proponents. According to Council on Environmental Quality (CEQ) regulations, training and testing activities in the Study Area may logically be viewed in isolation because they have independent utility, as they are ongoing activities. In addition, courts have upheld federal agencies' decisions to organize and plan their actions in a reasonable or rational manner. Cumulative impacts of these independent actions are analyzed in this Supplemental EIS/OEIS. The Navy used the best available science and conducted a comprehensive review of past, present, and reasonably foreseeable actions to develop a robust analysis of cumulative impacts (Chapter 4, Cumulative Impacts). As required under the National Environmental Policy Act (NEPA), the level and scope of the analysis are commensurate with the potential impacts of the action as reflected in the resource-specific discussions in Chapter 3 (Affected Environment and Environmental Consequences). The Navy considered proposed and ongoing activities alongside with other activities in the region whose impacts are truly meaningful to the analysis. Furthermore, the entire Supplemental EIS/OEIS provides the cumulative impacts analysis, not just Chapter 4. Chapter 3 (Affected Environment and Environmental Consequences) provides the current effects of past and present impacts and environmental conditions that represent the baseline of the environment as it is; Chapter 3 also discusses the consequences or potential future impacts from Navy activities. Therefore, the current aggregate impacts of past and present actions are reflected in the baseline information as presented in Chapter 3 and used in the cumulative effect analysis. Chapter 4 discusses other reasonably foreseeable activities to the extent they are known and the incremental impact of the Navy's proposal when added to past, present, and future impacts.
NMDC-02	4. Creating massive and highly technical Environmental Impact Statements that are beyond the reasonable comprehension of the public that the Navy is obligated to inform of the impacts of their project. In this case nearly 1,500 pages, all in college	The Navy recognizes the complexity of the information presented within this Supplemental EIS/OEIS. This Supplemental EIS/OEIS contains a rigorous scientific analysis of the potential impacts of the Navy's proposal, and thoroughly explains the scientific methodology, analysis methods, and findings. The Navy attempts to

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	level English, were presented to a community where English is a second or third language to the majority of adults.	explain challenging concepts, methods, and the results of the analysis as clearly as possible and developed public informational materials for lay audiences. The Navy prepared project brochures, videos, a website, and posters using layperson terms to enhance public understanding of the information presented in this Supplemental EIS/OEIS. A project fact sheet was also translated into Chamorro. The informational materials, including the translated fact sheet, were made available at all four public meetings and on the project website (www.mitt-eis.com).
NMDC-03	5. Failing to provide reasonably adequate time for public scrutiny of the EIS.	To better accommodate stakeholders and the public, the Navy provided 75 days to review and comment on the Draft Supplemental EIS/OEIS. The comment period for the Draft Supplemental EIS/OEIS was from February 1, 2019 to April 17, 2019, which is 30 days longer than the minimum required time for review (40 CFR section 6.203(c)(3)(v)).
NMDC-04	6. Failing to provide the public with informational meetings that encourage open discussion. In this case public meetings provided almost no information and were staffed by very few personnel who had limited knowledge of the EIS except in their tiny area of involvement. It is clear that the Navy is actively evading its responsibility to follow the letter and the intent of the National Environmental Policy Act. Each of the above listed tactics renders the Navy's DSEIS/OEIS incomplete and inadequate. Because of this failure to comply with NEPA, the DSEIS/OEIS and related informing activities must be redone in a prudent manner that corrects the above deficiencies.	The Navy held four open house public meetings, one each on Tinian (March 14, 2019), Rota (March 15, 2019), Saipan (March 18, 2019), and Guam (March 19, 2019). The public meetings were an ideal opportunity for the public to ask questions of Navy team members (and specific subject matter experts on Saipan and Guam) about the analysis documented in the Draft Supplemental EIS/OEIS. The Navy encouraged the public to attend these meetings and broadly notified the public through the media, including paid newspaper advertisements and news releases, and direct mail, including letters, postcards, and emails.
NMDC-05	MARINE NOISE The DSEIS/OEIS does not take into consideration the cumulative impacts of its active sonar use and testing in light of current high levels of marine noise caused by other activities in the ocean, particularly sonar or acoustic sensing used for oil exploration. The Navy is required to consider not	The Navy analyzed cumulative impacts on marine mammals through the regulatory processes for the Marine Mammal Protection Act (MMPA) and Endangered Species Act (ESA), administered by the National Marine Fisheries Service (NMFS). Compliance with these regulatory requirements help ensure the Navy's Proposed Action would not have a measurable effect on marine mammals. The cumulative impact analysis is described in Section 4.4.4.5 (Cumulative Impacts

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	only the impact on marine life of the noise it creates, but must consider the cumulative impacts of all ocean noise that it contributes to. Man-caused noise levels in the ocean today are at historic high and there is ample scientific evidence that this source of ocean noise is disruptive and detrimental to marine mammals.	on Marine Mammals). Section 4.4.4.3.5 (Ocean Noise) considers the cumulative impact of all ocean noise in this Supplemental EIS/OEIS cumulative effects analysis.
NMDC-06	IRREVERSIBLE DESTRUCTION OF RESOURCES The Navy intends to continue its high-level bombing of Farallon de Medinilla (FDM) despite the fact that the island is already irreversibly damaged. In fact, after already increasing the rate of bombing by 300%, the Navy now proposes to increase the rate of bombing with its highest destructive bombs. FDM is public land, owned collectively by the people of Northern Marianas Descent. It is our nearest northern island and it sits on the largest thriving coral reef in Micronesia. Unequivocally, this is an immensely valuable natural and cultural resource to the people of the NMI for sustainable food sustenance and traditional cultural and environmental conservation management practices. Continued bombing of FDM and testing and training activities in the surrounding waters and the coral reef must be stopped as the land resource and the fisheries resource are not only being denied to the people of the NMI today, but are in danger of becoming irreversibly and irretrievably lost permanently for all time. The island was never leased to be destroyed. The Navy has simply taken it upon itself to define what is acceptable use of the island under the lease. The owners of the island, as well as the CNMI government, have a right to object to the Navy's self-serving interpretation that the lease that cost them a mere $20,000 entitles them a free reign to destroy the island. Assuredly, the DSEIS/OEIS must describe the impact of past, present, and future MITT training on FDM and the surrounding	The Navy is committed to protecting the terrestrial and marine environment while conducting necessary training and testing. The Navy continues to monitor general ecological conditions on FDM through the use of aerial images and routine surveys. The Navy has relocated targets and relocated impact area boundaries away from island edges and cliffs to reduce erosion. The Navy has also implemented an Operational Range Clearance Plan at FDM, which includes provisions for vegetation management and removal/disposal of materials that may present an explosive risk. Clearance of the range occurs every 2–4 years, depending on the type of ordnance to be removed. Management procedures are in place for FDM that limit the amount of annual ordnance expenditure by explosive weight and location (based on the current U.S. Fish and Wildlife Service Biological Opinion), and restrict the amount of high explosive ordnance used in the southern impact area; these procedures will continue to be followed. The Navy regularly monitors island resources to responsibly manage potential effects.] Qualitative observations of nearshore waters of FDM during multi-year dive surveys included indicators of good water quality. There was little evidence of military impacts on benthic sediments and substrates observed during the dive surveys, and, where noted, impacts were localized and shown to recover during subsequent dive surveys. In 2017, the Navy funded additional coral reef surveys in the nearshore areas of FDM. Surveys were conducted by Space and Naval Warfare Systems Center Pacific, Scientific Diving Services. The results were approved for public release in September 2018 and are available at: https://apps.dtic.mil/dtic/tr/fulltext/u2/1069450.pdf. The 2017 survey found little

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	coral reef, and must project the condition of the island in relation to its becoming an irreversibly and irretrievably lost valuable resource. The island must be returned in the condition in which it was given to the Department of Defense. If it cannot be restored to that condition already, then bombing must end. If it still can be restored to that condition, then the DSEIS/OEIS must project when it will be necessary to cease destructive use of the island so that it can be restored and returned in as original, good condition.	evidence that training has affected coral communities at FDM. Only three relatively fresh ordnance items were observed, but no blast pits, craters, or significant areas of coral breakage were observed. The ordnance observed during the 2017 survey was almost exclusively old and encrusted in marine life, and was not having any discernable impact on surrounding communities. The Navy updated the MITT Final Supplemental EIS/OEIS to include the results of the 2017 survey as presented in Carilli et al (2018). The report information has been added to Section 3.1 (Sediments and Water Quality) and Section 3.8 (Marine Invertebrates). Specific text on impacts on FDM are available in Section 3.1.3.1.5.3 (Farallon de Medinilla Specific Impacts) in the 2015 MITT Final EIS/OEIS, and Section 3.1 (Sediments and Water Quality) and Section 3.8 (Marine Invertebrates) of this Supplemental EIS/OEIS. This Supplemental EIS/OEIS and 2015 MITT Final EIS/OEIS also includes information from surveys conducted prior to 2017. At the conclusion of its use as a military range, FDM would be cleared of unexploded ordnance to the greatest extent practicable in accordance with Article 9(b) of the 1983 Lease Agreement and all applicable U.S. laws and regulations.
NMDC-07	RESTRICTIONS ON SEA TRAVEL AND FISHING Any continuation or expansion of the MITT activities that limits the right of the people of the Marianas to freedom of movement between their islands or access to the marine resources for cultural practices and available food source supply that the indigenous *Chamoru* and *Refaluwaasch* community has relied on for over 4,000 years is unacceptable. The DSEIS/OEIS is blatantly vague about the restrictions that the Navy's plans will put on public interisland travel. The DSEIS/OEIS must state who, what, when, where, and why travel will be restricted. The NMI is actively involved in resettling its northern islands. The DSEIS/OEIS must state how the project will impact this. The NMI community has long valued and used the fishing grounds around FDM. The DSEIS/OEIS must state how the project will impact this. The	**Restrictions on Sea Travel and Fishing** The Navy is not proposing any geographic expansion of the training and testing area in this Supplemental EIS/OEIS as the proposed activities are similar to those conducted in the Study Area for decades. Nor is the Navy proposing any new activities or restrictions which would interfere with interisland travel. However, waters around FDM within 3 NM from shore would continue to be permanently closed for safety reasons due to the potential presence of unexploded ordnance. Waters around FDM within 12 NM from shore would be closed for safety reasons as necessary when the range is in use. The Navy regards the safety of fishermen and other boaters as a top priority. The Navy would not restrict the freedom of movement between islands. Various means are used to communicate information to the public about areas restricted to public or commercial activities and are described in Section 3.13 (Public Health and Safety). As specified in Title 33 C.F.R. Subpart 72.01, Notices to Mariners, the U.S. Coast Guard issues information to the public concerning maritime navigation.

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	CNMI community is actively re-establishing its ancient maritime tradition and promoting canoe culture as a means to improve health, strengthen cultural identity, and attract tourists to our islands. We intend to put hundreds of traditional canoes on our seas and to travel again between our islands. The DSEIS/OEIS must state how the project will impact this.	Additionally, nautical charts issued by the National Oceanic and Atmospheric Administration include these federally designated zones and areas. Operators of recreational and commercial vessels have a duty to abide by maritime regulations administered by the U.S. Coast Guard. The Navy will continue to use new and innovative methods to communicate closures to the public and fishing community, including Facebook and WhatsApp.
CNMI Women's Summit and Association Joint Working Group (SAJWG), Retta Sue Hamilton		
SAJWG-01	The people of the Mariana Islands have been confronted by ever-expanding and compounding plans presented by the US military — including the Marine Relocation to Guam, the Mariana Islands Range Complex (MIRC), the Mariana Islands Training and Testing (MITT) Study Area, the Divert Activities and Exercises, and the CNMI Joint Military Training (CJMT) — all of which are interconnected projects that involve the irreparable damage of the land, sea, air, and biological systems of the Marianas archipelago. Military activities conducted in the Marianas threaten to harm the local population by increasing the likelihood of illnesses caused by exposure to contaminants and civilian injuries and deaths caused by botched Military training exercises (both of which occurred during military training range exercises on the Puerto Rican island of Vieques), and therefore degradation of the land, water and air by any pollutants, including all physical, chemical and biologic agents should not be allowed. Military training and testing in the Marianas also poses a dire threat to our sustainable economic development by jeopardizing the health of the local workforce and degrading the natural beauty of the Marianas (including the many historic sites and structures around the islands and in the surrounding seas) which constitutes an essential element	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities. The Navy's environmental stewardship programs contribute both to the success of the military mission and the preservation of the environment for future generations. Ongoing military training and testing activities within the Study Area are not dependent on other DoD activities that are outside the scope of the 2015 MITT Final EIS/OEIS or this Supplemental EIS/OEIS. For example, proposed and ongoing training and testing activities within the Study Area would proceed regardless of whether other proposed actions are taken, such as the CNMI Joint Military Training EIS/OEIS. Different projects have vastly different scopes, timetables, and action proponents. According to Council on Environmental Quality (CEQ) regulations, training and testing activities in the Study Area may logically be viewed in isolation because they have independent utility, as they are ongoing activities. In addition, courts have upheld federal agencies' decisions to organize and plan their actions in a reasonable or rational manner. Cumulative impacts of these independent actions are analyzed in this Supplemental EIS/OEIS. The safety of the public and military personnel is of utmost importance to the military. The Navy employs precautions when planning and conducting training and testing activities, such as ensuring impact areas and targets are unpopulated prior to potentially dangerous activities; canceling or delaying activities if public or personnel safety is a concern; notifying the public of the location, date, and time of potentially dangerous activities; implementing temporary access restrictions to

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	attracting tourists to our islands. The degradation of the natural environment, human health and local economy of the Marianas threatens to trigger a mass emigration from our homeland, thus constituting an existential threat to our sense of cultural identity. Following the above line of logic, it can be concluded that any damage to the natural environment of the Marianas archipelago constitutes violence enacted upon the indigenous Chamorro and Refaluwasch (Carolinian) peoples and the degradation of their cultures — for the natural environment, the indigenous peoples who dwell upon and protect the natural environment, and the cultures of those peoples constitute one indivisible whole. In resisting this violence, we stand in solidarity with all islander and indigenous peoples fighting against the needless destruction of their physical persons, homelands, and cultures by the US military. The people of the CNMI, Guam, and indigenous and islander peoples across the globe, pledge to vigorously oppose any US military plans which threaten to degrade the natural environment, human health, indigenous culture, economic development and political empowerment of the people of the CNMI and Guam.	training and testing areas; and conducting thorough environmental and safety reviews for all test systems before tests are conducted on range sites. The Navy used the best available science and conducted a comprehensive review of past, present, and reasonably foreseeable actions to develop a robust analysis of cumulative impacts (Chapter 4, Cumulative Impacts). As required under NEPA, the level and scope of the analysis are commensurate with the potential impacts of the action as reflected in the resource-specific discussions in Chapter 3 (Affected Environment and Environmental Consequences). The Navy considered proposed and ongoing activities alongside other activities in the region whose impacts are truly meaningful to the analysis, as noted in the Council on Environmental Quality (CEQ) publication Considering Cumulative Effects Under the National Environmental Policy Act. Furthermore, the entire Supplemental EIS/OEIS provides the cumulative impacts analysis, not just Chapter 4. Chapter 3 provides the current effects of past and present impacts and environmental conditions that represent baseline environmental conditions; Chapter 3 also discusses the consequences or potential future impacts from Navy activities. Chapter 4 discusses other reasonably foreseeable activities to the extent they are known and the incremental impact of the Navy's proposal when added to past, present, and future impacts. Both this Supplemental EIS/OEIS and the 2015 MITT Final EIS/OEIS include an analysis of potential impacts from metals and contaminants as a result of military training and testing activities on marine resources. This analysis is presented in Section 3.1.2.2 (Metals), Section 3.4.2.7 (Secondary Stressors), Section 3.5.2.7 (Secondary Stressors), Section 3.7.2.3 (Secondary Stressors), Section 3.8.2.7 (Secondary Stressors), and Section 3.9.2.7 (Secondary Stressors). Based on the analysis presented in this Supplemental EIS/OEIS and the 2015 MITT Final EIS/OEIS, the Navy concluded that all levels of metals, chemicals, and other byproducts would be either below detectable levels or at levels below existing standards, regulations, and guidelines. This Supplemental EIS/OEIS, as well as the 2015 MITT Final EIS/OEIS, include discussion of the fate and transport of specific chemicals with references to

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		chemical properties of munitions and munitions constituents. In summary, the Navy's analysis concludes that no federal or local guidelines would be exceeded because of the following reasons: (1) rapid and natural degradation of substances (e.g., munitions constituents and other chemicals), and (2) localized concentrations where impact would occur. These conclusions are based on evidence gathered on other military ranges in similar environments (e.g., Vieques), as well as legacy dump site studies conducted off the coast of Oahu. These studies are summarized in Section 3.1 (Sediments and Water Quality).
Micronesia Climate Change Alliance (MCCA), Michelle Voacolo		
MCCA-01	To Whom it May Concern, I am writing you this letter today as a climate change advocate, an environmentalist, a business owner and a resident of Guam. My organization, Micronesia Climate Change Alliance, seeks to raise awareness on climate related issues through outreach and education. Guam, like many pacific islands, is at risk for the worst effects of climate change due to our size and location. Although Guam's carbon footprint cannot even compare to that of China or the U.S., we still need to mitigate our emissions as much as possible. It is also important for us to become more resilient in the face of our changing climate and dangerous storms to come. At the ongoing rate of the Military's actions against our environment, it is concerning that the residents of Guam will suffer because of this. Most recently, beached whales have been showing up on Navy shores. While the military denies active use of sonar testing in the involvement of beached whales, extensive research proves otherwise. In January 2019, a small beaked whale was euthanized after becoming stranded on a reef for the second time. While the military continuously states that they look at all environmental, cultural, historical, natural and marine life	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities. While exact causes of strandings are uncertain, scientists have identified potential contributing factors for strandings including age, illness, or disease; ingestion of marine debris/plastics; contaminant load; and manmade sources. A small number of strandings have been associated with the use of U.S. Navy sonar; none of these have occurred in the Study Area. The Navy is committed to protecting marine life by implementing mitigation measures when training or testing using active sonar or explosives; working with regulatory agencies; and furthering our understanding of marine mammals through research and monitoring. Please see the Navy's technical report on marine mammal strandings (Marine Mammal Strandings Associated with U.S. Navy Sonar Activities, 2017 – Available on the project website: https://mitt-eis.com/) for more information. The Center for Naval Analysis (CNA) recently conducted a statistical study of correlation of beaked whale strandings around the Mariana Islands with the use of U.S. Navy sonar, finding that insufficient evidence of a correlation exists. The CNA study used the complete record of all U.S. Navy sonar use between 2007 and 2019, including major training events, joint exercises, and unit level training/testing. The analysis also included the complete beaked whale stranding record for the Mariana Islands through 2019. Following the methods in Simonis et al. (2020), the CNA analysis found insufficient evidence of a correlation between sonar use and beaked whale strandings when considering the complete sonar use record. The

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	resources, history would prove otherwise. It is well known and documented that the military has caused severe damage on Guam. The brown tree snakes that came here on a US Naval Cargo ships after World War two caused 10 species of forest birds, 2 native mammals and 6 species of lizards to go extinct. Military dumping and nuclear testing contaminated the Pacific with PCBs and radiation. In 2007, a U.S. Navy Nuclear submarine leaked trace amounts of radioactivity in our waters, poisoning the fish and further damaging our reefs.	CNA finding is in contrast to the finding in Simonis et al. (2020), which depicted a significant correlation between beaked whale strandings and Navy sonar use. However, the Simonis et al. (2020) result relied on substantially incomplete or inaccurate assumptions about U.S. Navy sonar use around the Mariana Islands. CNA also conducted statistical analyses specific to each island where beaked whale strandings have been observed in the Mariana Islands, similarly finding insufficient evidence of a correlation to sonar use. Additional information on the findings of the CNA analysis are presented in Section 3.4.2.1.1.6 (Stranding) in Chapter 3.4 (Marine Mammals). Section 3.4.2.1.1.6 (Stranding) has been expanded to include additional information about strandings of beaked whales in the Mariana Islands and the Navy's support of efforts to better understand the causes of marine mammal strandings.
MCCA-02	Another major concern is climate change. Ocean acidification, sea level rise and warming waters are all a result of man-made climate change. Heat in the oceans acts as fuel, causing ocean-based storms to become more destructive. We witnessed Typhoon Yutu make catastrophic landfall in the Marianas only last year. Saipan and Tinian are still trying to recover from this. It was reported recently that the world's oceans have been absorbing far more excess heat in recent decades than scientists had predicted. Earth's oceans have absorbed 93% of the excess heat from greenhouse gas emissions. The warming of our oceans leads to deoxygenation, and sea level rise resulting from the expanding seas as they heat up and increase the melting of sea ice. This already has multiple effects on marine life, such as loss of breeding grounds for marine mammals, seabirds and fisheries. In 1911, earth's atmosphere had 300 parts per million of carbon dioxide. Today, we hover around 410 parts per million, planetary conditions that are unknown to any human beings before us and uncharted territory for our survival.	Section 3.2 (Air Quality) of this Supplemental EIS/OEIS addresses regional emissions, existing air quality, hazardous pollutants, and greenhouse gases. Chapter 4 (Cumulative impacts), Section 4.4.2 (Air Quality) addresses greenhouse gases and climate change from a cumulative perspective. The analysis indicates there would be a minor increase in greenhouse gas emissions from the Proposed Action, but the increase is not expected to significantly affect the global climate. Additionally, the Secretary of the Navy has established energy goals that aim to reduce the overall impact the department has on climate change. These activities would more than offset the small increase in greenhouse gas emissions that would result from the implementation of Alternative 1 or 2.

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MCCA-03	In sections 2.4.2.1 under the No Action Alternative in the draft supplemental EIS/OEIS it states: "Cessation of proposed Navy at-sea training and testing activities would mean that the Navy would not meet its statutory requirements and would be unable to properly defend itself and the United States from enemy forces, unable to successfully detect enemy submarines, and unable to effectively use its weapons systems or defensive countermeasures due to a lack of training of forces and testing of systems that replicate the conditions to which Naval forces must operate while executing the range of military operations required to further national security objectives. Navy personnel would essentially not obtain the unique skills or be prepared to safely and effectively use sensors, weapons, and technologies in realistic scenarios required to accomplish the overall mission." In short, this section states that the military has the ability to not take action but phrases it in such a way that makes it seem like this is their only option. "Sole reliance on simulation would deny service members the ability to develop battle-ready required proficiency in the employment of active sonar during military operations" (Section 2.4.1.4, Simulated Training and Testing Only). Similarly, sonar and explosive uses deny the residents of Guam and our Marine life the ability to become resistant against climate change, ocean acidification, rising seas and warming waters. These only make us, our seas, our coral, our marine life, more vulnerable to the devastating effects of climate change. Active sonar and explosive testing may benefit the Military's ability to train and defend, but it weakens Guam's ability to fight back against natural disasters that are increasing because of climate change.	The U.S. military must train personnel and test new technologies to defend the United States, its territories, and its interests. Realistic training and testing are crucial for military readiness, personnel safety, and national defense. The Mariana Islands offer realistic environments, with sufficient sea and airspace for safety and mission success. Proposed training and testing activities are needed to achieve and maintain military readiness within the Study Area. Alternatives carried forward were developed to meet the Navy's purpose and need and to ensure it can fulfill its obligation under Title 10 of the U.S. Code. See Section 2.4 (Action Alternatives Development) for more detailed information on the development of alternatives and rationale on why alternative training and testing locations were deemed not feasible. Section 3.2 (Air Quality) of this Supplemental EIS/OEIS addresses regional emissions, existing air quality, hazardous pollutants, and greenhouse gases. In addition, Chapter 4 (Cumulative impacts), Section 4.4.2 (Air Quality) addresses greenhouse gases and climate change from a cumulative perspective. The analysis indicates there would be a minor increase in greenhouse gas emissions from the Proposed Action, but the increase is not expected to significantly affect the global climate. Additionally, the Secretary of the Navy has established energy goals that aim to reduce the overall impact the department has on climate change. These activities would more than offset the small increase in greenhouse gas emissions that would result from the implementation of Alternative 1 or 2.

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MCCA-04	Marine life has declined 49% on average from 1970-2012. Since 2008, 25.3 million people have been newly displaced due to natural disasters. While climate change will never be that one thing that causes a war, a government to fail or driver of migration, it is a factor that makes all other factors increasingly difficult. Climate change is a threat multiplier, which means that it exacerbates underlying issues already within susceptible communities. Guam is a vulnerable place because of its location and size. Increased military testing compromises our land, our waters and our capacity to work on mitigation and adaptation efforts in the face of climate change. How can we work on restoring our reefs, our marine life with active testing? How can we become more climate conscious when our Military is polluting our land and waters? How can we demand change when our military denies the ability to do testing in other ways? How can we grow stronger when our military fights to gain control of sacred Chamorro land? How can the people here prosper and grow when the military takes all of the opportunities away?	The analysis indicates there would be a minor increase in greenhouse gas emissions from the Proposed Action, but the increase is not expected to significantly affect the global climate. Additionally, the Secretary of the Navy has established energy goals that aim to reduce the overall impact the department has on climate change. These activities would more than offset the small increase in greenhouse gas emissions that would result from the implementation of Alternative 1 or 2.
MCCA-05	The MITT Final EIS/OEIS states the various mitigation efforts the military plans on taking during testing. But, how can we ensure that these efforts will be followed through given our long history with the military? How can we ensure the safety of our reefs, marine life and water? Is there any guarantee that this testing will not cause long-term damage? There are several paragraphs in the EIS/OEIS that state there will be no long-term damage but forgive me if I am not so easily trusting of the military considering their long and toxic legacy. Some of the most polluted places in the world are left behind from the US military. There needs to be specific data that ensures, guarantees and promises no long-term damage. There needs to be complete transparency. Citizens of Guam need to be engaged in this and we need to be made aware of every single step the military makes. Our livelihoods are at stake and we	As described in Chapter 5 (Mitigation) of this Supplemental EIS/OEIS, the Navy implements procedural and geographic mitigation measures during its training and testing activities to avoid or reduce potential impacts on biological and cultural resources. The Navy strictly adheres to its mitigation requirements, as required under the law. As discussed in Section 5.1.2.2 (Monitoring, Research, and Reporting Initiatives), the Navy developed reporting requirements in cooperation with NMFS during the MMPA and ESA consultation and permitting processes. The Navy's training and testing activity reports and incident reports are designed to verify implementation of mitigation; comply with current permits, authorizations, and consultation requirements; and improve future environmental analyses. For example, the Navy reports to NMFS if mitigation was implemented during sinking exercises (e.g., number of times explosive detonations were delayed due to marine mammal sightings). For major training exercises, the Navy's annual training and testing activity reports include information on each individual marine mammal sighting related to mitigation implementation.

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	cannot afford military testing and training on our already compromised lands and oceans. ***The wars you are preparing for are the same wars you are contributing to.*** We will start having wars over food, water and resources if we do not act. There will be no need for training when the seas rise, and our waters are poisoned. **There will be no need for a military on a dead planet.**	
Prutehi Litekyan: Save Ritidian (PLSR), Monaeka Flores		
PLSR-01	Prutehi Litekyan: Save Ritidian (PLSR) is a direct-action group dedicated to the protection of natural and cultural resources in the areas identified for DOD live-fire training on Guam. We oppose the continued destruction and desecration of our sacred land and ocean by U.S. Military training and testing activities in the Marianas and in the broader Pacific region. Prutehi Litekyan: Save Ritidian vehemently opposes the continued destruction caused by the Navy's training and testing activities that include the use of active sonar and explosives in the Mariana Islands Range Complex (MIRC) and the Mariana Islands Training and Testing (MITT) study area. We oppose the use of active sonar and explosives in and the continued occupation of 984,601 square nautical miles of the entire ocean across and beyond the Mariana Islands, which is larger than the states of Washington, Oregon, California, Idaho, Nevada, Arizona, Montana and New Mexico combined. We oppose the serious threats to our marine archaeological sites and our ocean ecosystem. We are deeply concerned about the consequences such actions will have on the significant resources our great ocean and land provide us in the Mariåna Islands. These actions have a devastating impact	Training and testing activities proposed in this Supplemental EIS/OEIS would occur at sea and on FDM, and do not include the live-fire training on Guam. Tables 2.5-1 and 2.5-2 in Chapter 2 (Description of Proposed Action and Alternatives) present current and proposed training and testing activities. The Navy analyzed land-based activities on Guam, Saipan, Tinian, and Rota in the 2015 MITT Final EIS/OEIS; the Navy did not reanalyze land-based activities because there are no changes proposed to those activities. This Supplemental EIS/OEIS fully complies with NEPA. The Navy conducted extensive studies and analysis, and using the best available science, exceeds the required hard look at impacts on environmental resources. All of the potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS.

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	on indigenous culture and lifeways, increase our dependence on imported foods sources, and erode our resilience. Our community has been made aware of serious risks associated with this training through the review of the MITT Draft Supplemental Environmental Impact Statement (SEIS) and analysis made public by local officials.	
PLSR-02	We oppose the continued taking of marine mammals and rare and endangered species as a result of military training and testing activities. The MITT draft SEIS lacks current research on the impacts of sonar, vessel interactions, and explosives detonation in the water on marine mammals. The Guam Department of Agriculture has noted that recent information on strandings, sightings, whales sighted giving birth were not included in the draft SEIS for the MITT. The Agat offshore mine detonation area is a well-documented site with photographic evidence of sperm whales birthing, which is listed both as an endangered species and marine mammal. At least five sea turtles were killed by vessel strike in the last seven years in inner Apra Harbor, which is closed to all activity except military vessel activities. There have also been reports of the military encroaching on important fishing grounds outside of the test sites and closing off public access.	The Navy reviewed the best available scientific data and information on marine mammals at the time the Draft Supplemental EIS/OEIS was completed and incorporated relevant information into the analysis of impacts on marine mammals in this Supplemental EIS/OEIS. Peer-reviewed scientific publications are considered to be the most reliable and accurate sources of data and information and were used throughout this Supplemental EIS/OEIS to support the analysis and conclusions. Well respected and historically vetted government reports (e.g., marine mammals stock assessment reports) were also used to support the analysis. Any newly published data and information relevant to the analysis of potential impacts on marine mammals that has become available since the Draft Supplemental EIS/OEIS was completed was incorporated into the Final Supplemental EIS/OEIS. In addition, Section 3.4.2.1.1.6 (Stranding) has been expanded to include additional information about strandings of beaked whales in the Mariana Islands and the Navy's support of efforts to better understand the causes of marine mammal strandings. Two photographs that are Associated Press File photos depict this calf; mention of those photos has been added to the Final Supplemental EIS/OEIS. To reiterate, that single known occurrence of a newborn calf approximately 19 years ago does not indicate the area to be an established and routinely used sperm whale calving and nursery habitat. While it is possible that several species of marine mammals could occur at the Agat Bay Mine Neutralization Site, the Navy's procedural mitigation involving observing for marine mammals and sea turtles prior to conducting activities using explosives at the site reduces the likelihood of impacts on marine mammals, as described in Chapter 5 (Mitigation) and Appendix I (Geographic Mitigation Assessment).
PLSR-03	We oppose the continued destruction of our coral reefs and continued contamination of our waters and marine life. The	Section 3.8 (Marine Invertebrates) includes an analysis of potential impacts on coral reefs off Guam and FDM from the Proposed Action. In addition, the Navy is

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	Guam Coastal Management Program has posed concerns about potential contamination from the breakdown from military expended material, as well as the potential for contamination to spread through ocean ecosystem and food chain. Additionally, the program also discussed the potential damage to hard bottom substrate, which as a site for coral polyp settlement.	consulting with NMFS regarding Essential Fish Habitat, which includes corals and coral reefs. Smith and Marx (2016) concluded that the health, abundance, and biomass of fishes, corals, and other marine resources at FDM are comparable to or superior to those in similar habitats at other locations within the Mariana Archipelago. The Navy funded additional reef surveys in the nearshore areas of FDM in 2017. The results are approved for public release, and available at: https://apps.dtic.mil/dtic/tr/fulltext/u2/1069450.pdf. The 2017 survey found little evidence that training has affected coral reef communities at FDM. Only three relatively fresh ordnance items were observed, but no blast pits, craters, or significant areas of coral breakage were observed. The ordnance observed during the 2017 survey was almost exclusively old, encrusted in marine life, and was not having any discernable impact on surrounding communities. Based on the most recent NOAA coral reef condition report, coral reefs off Guam are moderately impacted, and overall conditions are fair. Guam's reefs are struggling from threats such as pollution, overfishing, and climate change.
PLSR-04	We oppose the increase in underwater mine charges. The Guam Environmental Protection Agency has reported that neither the 2015 MITT nor the 2019 Supplemental MITT have a discussion on the rational for an increase from a 10 lbs. underwater mine charge to the new standard of a 20 lbs. charge for the listed mine detonation activities.	The proposed training and testing activities in this Supplemental EIS/OEIS are needed to achieve and maintain military readiness within the Study Area. This Supplemental EIS/OEIS furthers the Navy and other military services' execution of their roles and responsibilities under 10 U.S.C. section 8062. Certain mine neutralization measures require the use of larger charges to ensure the efficacy of the technique and procedures trained to. While occurrence of this event will be infrequent, the capability to conduct this type of event was included in the 2015 MITT Final EIS/OEIS and is reanalyzed in this supplement.
PLSR-05	We oppose the lack of transparency. The military has not been diligent in providing reports of species taking, surveys, and other impacts to the public. EPA officials have also stated that reports have not been provided to document the impacts of all activities.	The Navy is obligated under the ESA and MMPA to provide information on any incidents involving ESA-listed species, the Navy will continue to submit the appropriate reports to NMFS immediately, or as soon as operational security considerations allow, if it observes an incident that is or may be attributable to Navy activities, including: (1) a vessel strike of a marine mammal or sea turtle during training or testing, (2) a stranded, injured, or dead marine mammal or sea turtle during training or testing, or (3) an injured or dead marine mammal, sea turtle, or ESA-listed fish species during post-explosive activity monitoring. The

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		Navy's Marine Species Monitoring Program website provides access to reports, documentation, data, and updates on current monitoring projects. Information on current monitoring projects, technical reports, conference presentations and data are available at: https://www.navymarinespeciesmonitoring.us/. Additionally, the U.S. Fish and Wildlife Service, NMFS, Guam Division of Aquatic and Wildlife Resources, and the CNMI Division of Fish and Wildlife are cooperating with the Navy on INRMP implementation with other federal and local agencies. The Navy will continue to improve coordination and collaboration with the CNMI as part of the INRMP project development and implementation.
PLSR-06	We oppose continued destruction to our ancestral sites and cultural resources. The Guam State Historic Preservation Officer has expressed concerns that the list of cultural resources referenced in the SEIS does not fully incorporate all the cultural resources that may be impacted.	The Navy has reviewed and incorporated the best available science on cultural resources, including underwater cultural heritage and maritime archeology that are listed or eligible for listing under the National Historic Preservation Act (NHPA). The Navy is required to complete independent statutory obligations under both NEPA and NHPA. Thus, the Navy has prepared this Supplemental EIS/OEIS and will continue Section 106 consultation under the NHPA with the Guam Historic Preservation Officer until a Programmatic Agreement can be reached
PLSR-07	Guam, the Marianas Islands, the larger Micronesian region, and the broader Pacific have all had a long history of destruction and contamination from U.S. military activities. On a regular basis, we are flooded with more news of contamination and devastating loss of cultural and natural resources. The U.S. military has historically proven and continues to prove that they are not good stewards of the land and sea. In this process, we are reminded that we do not have a "seat at the table". Prutehi Litekyan: Save Ritidian opposes the continued injustice against our ocean, lands, and people.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities. Potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practicable, procedural and geographic mitigation measures during its training and testing activities to reduce potential impacts on biological and cultural resources. Ritidian is not part of the Proposed Action.
Natural Resources Defense Council (NRDC)		
NRDC-01	On behalf of the Natural Resources Defense Council and Center for Biological Diversity, and our millions of members, activists, and constituents, we submit these comments on the Navy's Draft Supplemental Environmental Impact	Comment introduction noted. This Supplemental EIS/OEIS fully complies with NEPA, includes extensive studies and analysis, and, using the best available science, exceeds the required hard look

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	Statement/Offshore Environmental Impact Statement ("Draft SEIS") for the Mariana Islands Training and Testing ("MITT") Study Area. 84 Fed. Reg. 677 (Jan. 31, 2019). I. LEGAL FRAMEWORK The National Environmental Policy Act of 1969 ("NEPA") "declares a broad national commitment to protecting and promoting environmental quality." Robertson v. Methow Valley Citizens Council, 490 U.S. 332, 348 (1989). NEPA establishes a national policy to "encourage productive and enjoyable harmony between man and his environment" and "promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man." 42 U.S.C. § 4321. To achieve its broad goals, NEPA mandates that "to the fullest extent possible" the "policies, regulations, and public laws of the United States shall be interpreted and administered in accordance with [it]." 42 U.S.C. § 4332. Central to NEPA is its requirement that, before any federal action that "may significantly degrade some human environmental factor" can be undertaken, agencies must prepare an EIS. Steamboaters v. F.E.R.C., 759 F.2d 1382, 1392 (9th Cir. 1985) (emphasis in original). The requirement to prepare an EIS "serves NEPA's action-forcing purpose in two important respects." Robertson, 490 U.S. at 349. First, "the agency, in reaching its decision, will have available, and will carefully consider, detailed information concerning significant environmental impacts," and second, "the relevant information will be made available to the larger audience that may also play a role in both the decision-making process and the implementation of that decision." Id. (emphasis added). As the Supreme Court explained: "NEPA's instruction that all federal agencies comply with the impact statement	at impacts on the human and natural environment. The Navy is committed to protecting the environment while training and conducting testing. A comprehensive analysis of potential effects on environmental resources from Navy training and testing activities is presented in Chapter 3 (Affected Environment and Environmental Consequences) of the Draft Supplemental EIS/OEIS. While some impacts would occur from training and testing activities, the analysis concludes that impacts would be minimal and would not have a significant impact on the environment. As described in Chapter 5 (Mitigation), the Navy implements mitigation measures during its training and testing activities to avoid or reduce potential impacts on biological or cultural resources.

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	requirement… 'to the fullest extent possible' [cit. omit.] is neither accidental nor hyperbolic. Rather the phrase is a deliberate command that the duty NEPA imposes upon the agencies to consider environmental factors not be shunted aside in the bureaucratic shuffle." Flint Ridge Development Co. v. Scenic Rivers Ass'n, 426 U.S. 776, 787 (1976). The fundamental purpose of an EIS is to force the decision-maker to take a "hard look" at a particular action—at the agency's need for it, at the environmental consequences it will have, and at more environmentally benign alternatives that may substitute for it—before the decision to proceed is made. 40 C.F.R. §§ 1500.1(b), 1502.1; Baltimore Gas & Electric v. NRDC, 462 U.S. 87, 97 (1983). This "hard look" requires agencies to obtain high quality information and accurate scientific analysis. 40 C.F.R. § 1500.1(b). "General statements about possible effects and some risk do not constitute a hard look absent a justification regarding why more definitive information could not be provided." Klamath-Siskiyou Wilderness Center v. Bureau of Land Management, 387 F.3d 989, 994 (9th Cir. 2004) (quoting Neighbors of Cuddy Mountain v. United States Forest Service, 137 F.3d 1372, 1380 (9th Cir. 1998)). The law is clear that the EIS must be a pre-decisional, objective, rigorous, and neutral document, not a work of advocacy to justify an outcome that has been foreordained. To comply with NEPA, an EIS must inter alia include a "full and fair discussion" of direct and indirect environmental impacts (40 C.F.R. § 1502.1), consider the cumulative effects of reasonably foreseeable activities in combination with the proposed action (id. § 1508.7), analyze all reasonable alternatives that would avoid or minimize the action's adverse impacts (id. § 1502.1), address measures to mitigate those	

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	adverse effects (id. § 1502.14(f)), and assess possible conflicts with other federal, regional, state, and local authorities (id. § 1502.16(c)).	
NRDC-02	II. ALTERNATIVES ANALYSIS AND MITIGATION MEASURES At bottom, an EIS must "inform decision-makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment." 40 C.F.R. § 1502.1. This requirement has been described in regulation as "the heart of the environmental impact statement." Id. § 1502.14. The courts describe the alternatives requirement equally emphatically, citing it early on as the "linchpin" of the EIS. Monroe County Conservation Council v. Volpe, 472 F.2d 693 (2d Cir. 1972). The agencies must therefore "[r]igorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated." Id. § 1502.14(a). Consideration of alternatives is required by (and must conform to the independent terms of) both sections 102(2)(C) and 102(2)(E) of NEPA. In addition, agencies must discuss measures designed to mitigate their action's impact on the environment. See 42 C.F.R. § 1502.14(f). (A) Information Essential to an Analysis of Reasonable Alternatives Under NEPA, agencies are required to obtain information that is "essential to a reasoned choice among alternatives," provided that the overall costs of obtaining it are not exorbitant (40 C.F.R.§ 1502.22(a)); if the information cannot be obtained, then agencies must proceed with their evaluation using "theoretical approaches or research methods generally accepted in the scientific community" (id. at § 1502.22(b)(1)).	In the fall of 2016, the Navy entered a cooperative agreement to provide contributory funding for NMFS' large scale visual and passive acoustic surveys. This effort is titled the Pacific Marine Assessment Program for Protected Species (PacMAPPS) (https://swfsc.noaa.gov/PacMAPPS/). The PacMAPPS partnership includes Bureau of Ocean Energy Management (BOEM), NOAA Fisheries (Alaska, Northwest, Pacific Islands, and Southwest Fisheries Science Centers), U.S. Navy, and the U.S. Fish and Wildlife Service (USFWS). Data collected during PacMAPPS primarily includes line-transect (visual sightings), passive-acoustic, and photographic data and skin and blubber biopsy samples for cetaceans, strip transect (visual sightings) data for seabirds, physical and biological oceanographic data, and data on mid-trophic fishes and invertebrates (e.g., active acoustics, net sampling). The data will potentially be used to generate population abundance estimates for the surveyed areas, abundance trend estimates, delineate stock structure (i.e., based on photo ID data and genetic analysis of the biopsy samples), augment large-whale photo-identification catalogs (which ultimately contribute to knowledge about stock structure and large scale movement patterns), and provide time series information on seabird community composition, distribution, and abundance indices. Most of these cetacean metrics inform various elements (e.g., stock structure and abundance estimates) of stock assessment reports (SARs) that are required under the Marine Mammal Protection Act. To date, the Navy has already contributed to two completed surveys and one 2020 pending survey in the Pacific. Technologies that will be employed during PacMAPPS efforts include standardized line transect visual surveys, passive acoustic towed arrays, and deployment of multiple Drifting Acoustic Spar Buoy Recorders (DASBR) which have shown promise in detecting beaked whales (Griffiths and Barlow 2015, 2016). Under the PacMAPPs program, NMFS' first large scale survey ever in the Mariana Island EEZ is currently scheduled for summer 2021 and will have significant Navy funding to support. This PacMAPP survey will address almost all of the

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	The data gaps for many marine mammal stocks within the MITT Study Area pose challenges to the development of meaningful alternatives. Without better information on marine mammal population structure, distribution, and important habitat, it is not possible to evaluate what formula of alternative will avoid or minimize adverse impacts for many species. In this case, the Navy must actively work to address the limiting data gaps, particularly for beaked whales. As the Navy is aware, and as further discussed in Section III.A of these comments, beaked whales are highly sensitive to disturbance from naval training and testing activities to the point where serious injury and mortality may occur. Indeed, the best available evidence indicates that such impacts are occurring in the MITT Study Area—a result that is not surprising given the relative naivete of beaked whales in the regions to Navy activities and the ramp-up of those activities over the past several cycles. There remain significant data gaps for beaked whales across the Navy's ranges, which are only amplified in regions that are generally data-depauperate, such as the MITT Study Area. The only systematic large-scale survey for marine mammals undertaken in the MITT Study Area was the Mariana Islands Sea Turtle and Cetacean Survey ("MISTCS") conducted during January-April in 2007 in waters around Guam and the Northern Mariana Islands. While several smaller scale surveys have taken place since that time, there remains a critical need to carry out a new large- scale systematic survey targeted specifically at beaked whales, in order to update and improve density estimates for these species as well as to identify important habitat areas for time-area protections and other alternatives. Any new systematic survey should integrate new methods and tools for detecting beaked whales and	commenter's statements and will be repeated at five-year intervals. The Navy also continues to refine the development of underwater gliders with passive acoustic sensors and is currently testing the latest generation of these gliders in Southern California from 2019 through 2020. The Navy has already conducted two previous underwater surveys with early generation gliders for cetaceans including beaked whales in the Mariana Islands area in 2014 and 2015. Under future monitoring considerations with NMFS, Navy is considering a number of technologies for additional beaked whale work in the Study Area (ex., gliders, bottom-deployed passive acoustic sensors). Opportunistic satellite tagging of beaked whales in the Study Area is likely not feasible given the large spatial extent area, the cryptic nature of beaked whales, sensitivity of beaked whales to close approaches by research boats, and high sea states in the region which could make offshore small boat tagging efforts problematic. Although records of marine mammal strandings exist as far back as 1878 in Guam, reporting of marine mammal strandings across the Mariana Islands has likely only become consistent in recent years, similar to other regions, whereas sonar use has occurred in the area around the Mariana Islands for decades. It is unlikely that beaked whales in the Study Area are naïve to sonar. While exact causes of strandings are uncertain, scientists have identified potential contributing factors for strandings, including age, illness, or disease; ingestion of marine debris/plastics; contaminant load; and manmade sources. A small number of strandings have been associated with the use of U.S. Navy sonar; none of these have occurred in the Study Area. Information on strandings associated with Navy training and testing activities is provided in the 2017 technical report, "Marine Mammal Strandings Associated with United States Navy Sonar Activities." Sonar use occurred prior to four of nine beaked whale strandings in the Mariana Islands. NMFS was able to necropsy two of the beaked whales after stranding, one from the 2011 Saipan stranding and one from a 2015 Guam stranding. Upon examination, the dead stranded beaked whales did not exhibit most of the diagnostic features described by Bernaldo de Quiros et al. (Bernaldo de Quirós et al., 2019), suggesting that these strandings are unlikely to be associated with sonar exposure. Section 3.4.2.1.1.6 (Stranding) has been expanded to include additional information about strandings of beaked whales in the Mariana Islands and the

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	understanding their habitat use, including systematic vessel-based surveys, passive acoustic monitoring, telemetry, and unmanned vehicles. Additionally, and as discussed in greater detail at section II.C.2, the Navy should expand its existing Behavioral Response Study on beaked whales to assess the reactivity of these species to modified sonar signals, given the demonstrated potential of ostensibly practicable signal modifications to reduce the extent and severity of behavioral response in at least some cetaceans. We strongly believe that focusing on these research questions would be among the most effective uses of the Navy's research resources for the MITT Study Area at this time. Indeed, such a focus is necessary to "a reasoned choice among alternatives" (40 C.F.R. § 1502.22(a)). Such alternatives include establishing Geographic Mitigation Areas in beaked whale habitat, particularly in areas with relatively high densities or associated with range-limited populations; concentrating training and testing activities in habitat of lesser importance to beaked whales; and, conditional on additional research, modifying the sonar signal to reduce the extent and severity of behavioral response in these species.	Navy's support of efforts to better understand the causes of marine mammal strandings. As described in Section 5.1.2.2.1 (Marine Species Research and Monitoring Programs), for this Final Supplemental EIS/OEIS, the Navy agreed to several additional research and monitoring initiatives designed to help advance the understanding of beaked whales and strandings in the MITT Study Area. The Navy will co-fund the Pacific Marine Assessment Program for Protected Species (PACMAPPS) Mariana Islands survey in spring-summer 2021 and future studies starting in 2022 to help document beaked whale occurrence, abundance, and distribution in the Mariana Islands. The Navy will also fund additional stranding response and necropsy analyses for the Pacific Islands region, and research on a framework to improve statistical stranding analysis. Collaboratively with NMFS, the Navy will fund and organize an expert panel to provide recommendations on scientific data gaps and uncertainties for further protective measure consideration to minimize potential impacts of Navy training and testing activities on beaked whales in the Mariana Islands. Please see the response to NRDC-20 in regard to research with modified sonar signals.
NRDC-02	(B) Time-Area Management Spatial restrictions designed to protect important habitat are one of the most effective available means to reduce the potential impacts of noise and disturbance on marine mammals, including mid-frequency sonar and noise resulting from other naval activities. The Navy proposes to implement three Geographic Mitigation Areas based on criteria related to biological effectiveness and operational practicability, described as Marpi Reef, Chalan Kanoa Reef, and Agat Bay Nearshore (DEIS at Appendix I). Three other potential mitigation areas were considered but it was concluded that they not meet the Navy's criteria because, based on the	The Navy considered using bathymetry to define the Marpi Reef Mitigation Area when initially evaluating potential mitigation areas, but instead relied on confirmed sightings of humpback whales to define the area. After reviewing the cited reference presenting detailed bathymetry of the reef (or bank) coupled with the brief nature of marine mammal sightings, the Navy has reevaluated how the Marpi Reef Mitigation Area is bounded and has redefined the area based on the extent of the 400 m isobath. Given most sightings of humpback whales were in waters less than 200 m in depth, this provides an additional buffer between most sighting locations and the boundary for the area. Humpback whale sightings at the southern extent of the reef help to identify the reef as an area of potential biological importance, but do not define the reef. Seafloor areas extending beyond the reef are not necessarily areas of potential biological importance (i.e., whales may have been transiting to or from the reef when sighted). Scientist from the

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	available data, the areas are not key areas of biological importance to any marine mammal or sea turtle species: North Guam Offshore Area, Ritidian Point Offshore Area, and Tumon Bay Offshore Area (DEIS at Appendix I-4). To effectively protect marine mammals, the Navy's mitigation areas must be properly sited, and the management objectives for each must be based on the best available science and be precautionary in nature. Below, we evaluate each of the three proposed areas and highlight gaps, where they exist, in their geographic coverage and mitigation requirements. We subsequently highlight additional areas of geographic importance for marine mammals for which Geographic Mitigation Areas should be considered. (1) Evaluation of proposed Geographic Mitigation Areas a. Marpi Reef Geographic Mitigation Area The Marpi Reef Geographic Mitigation Area is intended to provide year-round protection for marine mammals from in-water explosives and a seasonal (December-April) reporting requirement for MF1 surface-ship hull-mounted mid-frequency active sonar used in this area, due to aggregations of breeding humpback whales occurring at this time. Other species afforded protection by the prohibition on explosives include spinner dolphins, bottlenose dolphins, short- finned pilot whales, and false killer whales, all of which have been documented at Marpi Reef (DEIS at Appendix I-5). The boundaries of the proposed Marpi Reef Geographic Mitigation Area are defined by a simple polygon encompassing recorded sightings of humpback whales at the reef during a broad-area line-transect survey in 2007 and during non-	NMFS's Pacific Islands Fisheries Science Center, who have conducted numerous humpback whale surveys in Hawaii and Mariana Islands, stated that the majority of humpback whale breeding activity (mother-calf pairs, competitive behavior) happens in water depths of 200 m or less, with more mother-calf pairs in water depths 50 m or less. In addition, during a review of the Marpi Reef sightings and bathymetry, the Navy found that the mitigation graphics in Appendix I (Geographic Mitigation Assessment) had errors where bathymetric lines plotted were incorrectly shifted. This issue was fixed using a more accurate small-scale bathymetric dataset. Revised figures for the Final Supplemental EIS/OEIS show that all humpback whale sightings near Marpi Reef where suspected reproductive behaviors were observed (mother-calf pairs, competitive behavior) were shallower than the 200 m isobath. Therefore, the Navy revised this area so the 400 m isobath is used to define the Marpi Reef Mitigation Area. The Navy does not see a need to extend the area beyond the 400 m isobath based on sightings or to add a buffer to encompass areas beyond the reef given the biologically important activities that typically occur in water depths < 200 m. Using the 400 m isobath offers some degree of built-in buffer when considering humpback whale biology. As described in Appendix I (Geographic Mitigation Assessment), the Navy developed new mitigation for the Final Supplemental EIS/OEIS to include a restriction on the number of hours of surface ship hull-mounted MF1 mid-frequency active sonar used from December 1 to April 30 within the Marpi Reef Mitigation Area and Chalan Kanoa Reef Mitigation Area.

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	systematic small-boat surveys occurring from 2010 through 2018 (DEIS at Appendix I-5). However, defining the Geographic Mitigation Area based solely on survey sightings may overlook other important habitat in the immediate vicinity (described below) that shares the same characteristics and supports the same biological function. In addition, humpback whales, like all baleen whales, are particularly vulnerable to vessel collisions, which can cause serious injury and mortality. A recent study carried out in the 4- island region around Maui indicates that humpback whale calves are at relatively higher risk. Calves represented 25-39% of whales not seen until <300 m, which would constitute a "near- miss," even though they comprised only 7-9% of the population. Collision risk was found to correlate directly to vessel speed: Encounters with humpback whales dropped by 91.5% when vessels were traveling at 12.5 knots or less. As such, it is important that the Navy implement vessel speed regulations in this important breeding habitat. We therefore make the following recommendations with respect to this area: 1. *Extend the Marpi Reef Geographic Mitigation Area boundaries to the 400 m depth contour plus a buffer than encompasses humpback whale sightings data*. In defining the boundaries of the Marpi Reef Geographic Mitigation Area, we recommend that the Navy include the entirety of Marpi Reef as defined by the 400 m depth contour plus a buffer that encompasses the humpback whale sightings beyond this contour (i.e., the distance between the 400 m depth contour and the southernmost point of the current	

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	proposed Marpi Reef Geographic Mitigation Area [DEIS at Appendix I, Figure I-2]).	
NRDC-03	*2. Implement vessel speed restrictions from December through April.* Ship strikes and vessel noise pose a serious risk to humpback whales, particularly in calving and breeding areas. As such, the Navy should implement restrictions to limit vessel speed within the Marpi Reef Geographic Mitigation Area from December through April.	To avoid physical disturbance and strike from vessel movements, the Navy maneuvers to maintain a 500 yd. mitigation zone from whales and other marine mammals (except bow-riding dolphins). As further described in Section 5.3.4.1 (Vessel Movement), implementing mitigation to limit vessel speed restrictions in the Study Area would be incompatible with the practicality assessment criteria for safety, sustainability, and mission requirements. For example, Navy vessel operators need to train to proficiently operate vessels as they would during military missions and combat operations, including being able to react to changing tactical situations and evaluate system capabilities. Navy studies from other range complexes demonstrated that median speeds near coasts are already low, varying from 5 to 12 knots. Furthermore, given that there have been no vessel strikes involving humpback whales or other marine mammals and Navy vessels conducting training and testing activities in the Study Area, implementing vessel speed restrictions in the Marpi Reef Mitigation Area or other locations in the Study Area would not be an effective mitigation measure because it would not result in an avoidance or reduction of impacts.
NRDC-04	*3. Prohibit use of air-deployed mid-frequency active sonar year-round.* Dipping sonar has been shown to have disproportionate impacts on beaked whales and may impact other species in a similar manner, due to the unpredictability of the signal. The Marpi Reef Geographic Mitigation Area should include a year-round prohibition on air-deployed mid- frequency active sonar.	It should be pointed out that the commenter's recommendation is based on new Navy-funded behavioral response research specific to beaked whales. There are still important limitations to these data that are still under investigation such as proximity to source and other factors. Furthermore, the research was focused exclusively on beaked whales. Behavioral responses of beaked whales from dipping and other sonars cannot be universally applied to other marine mammal species. For example, Navy-funded behavioral response studies of blue whales to simulated surface ship sonar has demonstrated there are distinct individual variations as well as strong behavioral state considerations that influence any response or lack of response. With regards to beaked whales, water depths in the Marpi Reef Mitigation Area are not suitable habitat for beaked whales. There is no evidence to suggest that prohibiting the use of mid-frequency dipping sonar in the Marpi Reef Mitigation Area would have any benefit whatsoever to beaked whales.

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NRDC-05	*4. Prohibit use of low-frequency active sonar from December through April* Baleen whales are vulnerable to the impacts of low-frequency active sonar, particularly in calving areas where low-amplitude communication calls between mothers and calves can be easily masked. Low-frequency sonar within the Cautionary Area should be prohibited from December through April.	Low-frequency sonar use under the MITT Proposed Action has been significantly scaled down from previous authorization. The Navy is only seeking authorization for 11 hours or less per year of low-frequency sonar use in the Study Area, with most of these systems used further offshore. Furthermore, the most used source at approximately 10 hours (LF5) has source levels <180 dB. Only one hour of LF4 with source levels >180 dB and <200 dB is proposed. Based on historical sonar use in the Study Area, it is highly unlikely that the few planned low-frequency sonar hours would occur in the Marpi Reef Mitigation Area from December through April. Therefore, a prohibition would have very limited or no potential benefit to humpback whales and other marine mammals in the area and would unnecessarily impose a restriction on training and testing in the Study Area.
NRDC-06	b. Chalan Kanoa Reef Geographic Mitigation Area The Chalan Kanoa Reef is intended to provide year-round protection for marine mammals from in-water explosives and a seasonal (December-April) reporting requirement for MF1 surface- ship hull-mounted mid-frequency active sonar used in this area is required due to aggregations of breeding humpback whales. Other species afforded protection by the prohibition on explosives include spinner dolphins, bottlenose dolphins, short-finned pilot whales, false killer whales, rough-toothed dolphins, and pygmy killer whales, all of which have been documented at Chalan Konoa Reef (DEIS at Appendix I-16-I-17). The boundaries of the proposed Chalan Kanoa Reef Geographic Mitigation Area are defined by a simple polygon encompassing exposed fringing reef, reef flats exposed at low tide, nearshore shallow waters (less than 20 meters in depth), and a portion of Saipan Harbor (DEIS at Appendix I-13). The relative concentration of total marine mammal sightings and tag detections as observed and documented between 2007 and 2018, which include seasonal (February-March) humpback	As with the Marpi Reef Mitigation Area, the Navy considered using bathymetry to define the Chalan Kanoa Reef Mitigation Area, but instead relied on confirmed sightings of marine mammals and sea turtles to define the area. Using the recommendation in the comment and after reviewing the cited reference presenting bathymetry of the reef and surrounding areas, coupled with the ephemeral nature of marine mammal sightings, the Navy has reevaluated how the Chalan Kanoa Reef Mitigation Area is defined and has redefined the spatial extent of the area based on the 400 m isobath. Humpback whale sightings seaward of the forereef helped to identify the seaward extent of the area of potential biological importance. Sightings of humpback whales, other cetacean, and sea turtles along the fore reef and closer to shore than the offshore humpback sightings suggested that these areas may be of greater importance to multiple species, including humpbacks, than the areas farther from shore. Deeper areas beyond the reef are not necessarily areas of potential biological importance (i.e., humpbacks in these areas may have been transiting to or from the shallower areas closer to the reef when sighted). In addition, during a review of the Chalan Kanoa Reef sightings and bathymetry, the Navy found that the mitigation graphics in Appendix I (Geographic Mitigation Assessment) had errors where bathymetric lines plotted were incorrectly shifted. This issue was fixed on using a more accurate small-scale bathymetric dataset. Revised figures for the Final Supplemental EIS/OEIS show that most humpback whale sightings near Chalan Kanoa Reef where suspected reproductive behaviors were observed (mother-calf pairs, competitive behavior)

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	whale sightings documented during non-systematic small-boat surveys occurring from 2015 through March 2018. Id. As with Marpi Reef, defining the Geographic Mitigation Area based solely on survey sightings may overlook other important habitat in the immediate vicinity that shares the same characteristics and biological function. In addition, vessel speed restrictions and a prohibition on low-frequency sonar should be observed during the humpback whale breeding season. Given the observed presence of particularly noise-sensitive species at Chalan Kanoa Reef (e.g., false killer whales), the Navy should also impose a year-round prohibition on air-deployed mid-frequency active sonar within the Geographic Mitigation Area. We therefore make the following recommendations with respect to this area: *1. Extend the Chalan Kanoa Reef Geographic Mitigation Area boundaries to encompass the entire reef as defined by the 200 m depth contour.* In defining the boundaries of the Chalan Kanoa Reef Geographic Mitigation Area, we recommend that the Navy include the entirety of Chalan Kanoa Reef as defined by the 200 m depth contour (i.e., the Mitigation Area should be extended to the west and south to encompass the entire reef habitat).	were shallower than the 200 m isobath. There were two mother-calf pair sightings outside of the 200 m isobath, but shallower than the 400 m isobath. Therefore, the Navy revised the Chalan Kanoa Reef boundaries to encompass the 400 m isobath on the northern, western, and parts of the southern boundaries, shown in Appendix I, Figure I-3, which encompasses most sightings. As described in Appendix I (Geographic Mitigation Assessment), the Navy developed new mitigation for the Final Supplemental EIS/OEIS to include a restriction on the number of hours of surface ship hull-mounted MF1 mid-frequency active sonar used from December 1 to April 30 within the Marpi Reef Mitigation Area and Chalan Kanoa Reef Mitigation Area.
NRDC-07	*2. Implement vessel speed restrictions from December through April.* Ship strikes and vessel noise pose a serious risk to humpback whales, particularly in calving and breeding areas. As such, the	Similar to the response for Marpi Reef, Navy vessel speeds in coastal zones are often already low. Given that there have been no vessel strikes involving Navy vessels conducting training and testing activities on marine mammals in the Study Area, implementing vessel speed restrictions in the area would further limit Navy

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	Navy should implement restrictions to limit vessel speed within the Chalan Kanoa Reef Geographic Mitigation Area from December through April.	training and testing activities with little or no benefit to marine mammals and sea turtles at the Chalan Kanoa Reef Mitigation Area.
NRDC-08	*3. Prohibit use of air-deployed mid-frequency active sonar year-round.* Dipping sonar has been shown to have disproportionate impacts on beaked whales and may impact other species in a similar manner. The Chalan Kanoa Reef Geographic Mitigation Area should include a year-round prohibition on air-deployed mid-frequency active sonar.	Beaked whales have not been sighted at Chalan Kanoa Reef and there is no indication that the shallow, nearshore reef area is an area of particular biological importance to beaked whales, which are found in much deeper waters. Therefore, there is no evidence to suggest that prohibiting the use of mid-frequency dipping sonar in the Chalan Kanoa Reef Mitigation Area would have any particular benefit to beaked whales.
NRDC-09	*4. Prohibit use of low-frequency active sonar from December through April.* Baleen whales are vulnerable to the impacts of low-frequency active sonar, particularly in calving areas. Low-frequency sonar within the Cautionary Area should therefore be prohibited within the Geographic Mitigation Area from December through April.	Low-frequency sonar use under the MITT Proposed Action has been significantly scaled down from previous authorization. The Navy is only seeking authorization for 11 hours or less per year of low-frequency sonar use in the Study Area, with most of these systems used further offshore. Furthermore, the most used source at approximately 10 hours (LF5) has source levels <180 dB. Only one hour of LF4 with source levels >180 dB and ≤200 dB is proposed. Based on historical sonar use in the Study Area, it is highly unlikely that the few planned low-frequency sonar hours would occur in the Chalan Kanoa Reef Mitigation Area from December through April. Therefore, a prohibition would have very limited or no potential benefit to humpback whales and other marine mammals in the area and would unnecessarily impose a restriction on training and testing in the Study Area.
NRDC-10	c. Agat Bay Nearshore Geographic Mitigation Area The Agat Bay Nearshore Geographic Mitigation Area is intended to provide year-round protection for spinner dolphins and sea turtles from in-water explosives and MF1 surface-ship hull-mounted mid-frequency active sonar (DEIS at Appendix I-26). The boundaries of the proposed Agat Bay Nearshore Geographic Mitigation Area are designed to encompass the	The current western boundary of the Agat Bay Nearshore Mitigation Area essentially follows the 100 m isobath except at the southern extent of the area. At its northern extent, the area includes deeper waters beyond the 100 m isobath to include an area with a cluster of sea turtle sightings. The greater number of sightings may indicate that the northern portion of the Agat Bay Nearshore Mitigation Area may be of greater importance than the southern portion due to some physical or biological features. The point of land at the southern end of the Agat Bay Nearshore Mitigation Area is a convenient physical feature for defining the area, and as with other sightings data, it is reasonable to assume that animals just outside of the boundary of the area may be transiting to (or from) the

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	shoreline between Tipalao, Dadi Beach, and Agat on the west coast of Guam, with a boundary across the bay enclosing an area of approximately 5 km2 in relatively shallow waters (less than 100 m) (DEIS at Appendix I-21). The boundaries are based on spinner dolphin sightings documented during small boat surveys from 2010 through 2014. Sea turtle sightings from 2010 through 2014 were also used. Id. In this case, we recommend the southern portion of the Geographic Mitigation Area be extended westwards to include the 100 m depth contour to encompass the aggregation of sightings and protect nearshore habitat for these species. We therefore make the following recommendation with respect to this area: *Extend the southern boundary of the Agat Bay Nearshore Geographic Mitigation Area boundaries seaward to the 100 m depth contour* In defining the boundaries of the Agat Bay Nearshore Geographic Mitigation Area, we recommend that the Navy extend the southern portion of the Mitigation Area westwards out to the 100 m depth contour (DEIS Appendix I at Figure I-4). This extension would encompass a cluster of sea turtle sightings and protect nearshore habitat that, based on sightings data, appear generally important for spinner dolphins and sea turtles. Id.	northern portion of the area and that areas beyond the boundary do not constitute areas of any particularly biological significance.
NRDC-11	(2) Additional habitat areas of importance within MITT Study Area The Navy should consider several additional habitat areas that are not discussed as potential Mitigation Areas in the Draft EIS.	Navy has cited Eldredge (2003), which included a short paragraph on sperm whales sited in the “Micronesian Area” between the years 1761 and 2001; Navy has considered all the information in that reference. The mention of a calf in the sentence, “Eight sperm whales were sighted June 15, 2001, including a young calf with a trailing umbilical cord (web site for Micronesian Divers Association)” is not sufficient to designate a sperm whale breeding and calving habitat off Agat Bay, which is not mentioned in the report. No information on the referenced website is

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	a. Sperm whale calving and nursery habitat offshore Agat Bay, Guam	provided in Eldredge (2003). Two photographs that are Associated Press File photos depict this calf; mention of those photos has been added to the Final Supplemental EIS/OEIS. To reiterate, a single known occurrence of a newborn calf approximately 19 years ago does not indicate the area to be an established and routinely used sperm whale calving and nursery habitat.
NRDC-12	In a 2012 survey, a single sperm whale was sighted close to the western coast of Guam. Additionally, Eldredge (2003) reported a sighting of a group of sperm whales including a newborn calf, made during June 2001 off the west coast of Guam.[15] Just over one-quarter of the sightings (26%) were in or on the periphery of Agat Bay, an area where the bathymetry drops to depths beyond 2000 m very quickly, and closer to shore than any other area around Guam, Rota or Saipan. The Navy should consider designating a Geographic Mitigation Area in the offshore area of Agat Bay encompassing the continental shelf break and slope and extending out to the 2000 m depth contour to protect this potentially important calving and nursing area for endangered sperm whales. b. Sperm whale breeding and calving habitat offshore Apra Harbor, Guam Sightings of several sperm whale calves and a large bull have been observed 2.5 km offshore of the mouth of Apra Harbor. The Navy should consider designating a Geographic Mitigation Area offshore Apra Harbor, encompassing the continental shelf break and slope and extending out to the 2000 m depth contour, to protect this potential breeding and calving habitat for endangered sperm whales.	U.S. Department of the Navy (2007) notes that the closest sighting off Apra Harbor was 2.5 km from the mouth of the harbor, a distance that extends approximately to the 1,000 m isobath off Apra Harbor. Sperm whales are a highly mobile species. Single or small numbers of visual sightings do not necessarily correspond to long term, repeated occupancy of small areas in the ocean. There are many areas in the Mariana Islands where the bathymetry drops to great depth very quickly in comparison to continental margins. Sperm whales are considered a deep-water species and sightings by the U.S. Department of the Navy (2007) are consistent with that. Depths where sperm whales were sighted ranged from 800 to 10,000 m and occurred throughout the Mariana Islands. There is no compelling scientific evidence to consider the area from the shelf break to 2,000 m off Apra Harbor as an area of particular biological importance for sperm whales.
NRDC-13	c. Spinner dolphin resting habitat at Bile Bay, Tumon Bay, and Double Reef, Guam	While spinner dolphins occur in other bays in the Study Area (Bile Bay, Tumon Bay and Double Reef in Guam; Cocos Island and lagoon in Guam; Rota Bank, and Tanapaq Lagoon in Saipan), the sighting data suggest that Agat Bay may be of

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	Spinner dolphin resting habitat in lagoons is well characterized[18] and has been identified in Bile Bay, Tumon Bay, and Double Reef located on the west side of Guam. Similar to the protections for the Agat Bay Nearshore Geographic Mitigation Area, the Navy should establish Geographic Mitigation Areas in these bays to protect important habitat for spinner dolphins.	particular biological importance for resting behavior. The criteria for establishing a geographic mitigation area included is that "The best available science suggests that the mitigation area is particularly important to one or more species of marine mammals or sea turtles for a biologically important life process (e.g., foraging, migration, reproduction)." While future surveys and research may identify an area other than Agat Bay as a key area of biological importance, the available data indicate that geographic mitigation at Agat Bay would have the most benefit.
NRDC-14	d. Breeding habitat for a possibly resident pygmy killer whale population and resting habitat for spinner dolphin at Cocos Island and Lagoon, Guam Eight pygmy whales were encountered west of Guam in 2013 and the same group with a new calf was encountered west of Cocos Island in 2014 indicating that this area comprises important breeding and calving habitat for a population of pygmy killer whales that exhibits site fidelity to the area. Cocos Lagoon (off Merizo) is also known as important resting habitat for spinner dolphins. In addition, Cocos Island and Lagoon may represent high-use areas for sea turtles. The Navy should consider protecting Cocos Lagoon and the continental shelf and slope waters west of Cocos Island seaward to the 2000 m depth contour as important habitat areas for multiple species.	The cited reference (Hill et al., 2014) indicates that the same 8 pygmy killer whales were sighted off Guam in 2013 and 2014, but it makes no mention of the area as a possible breeding or calving area for pygmy killer whales, nor does it suggest that the population is a resident or island associated population (pygmy killer whale were also seen off Saipan in 2011). In summary, the scientific data acquired to date are insufficient to identify any area off Guam as a key area of biological importance for a pygmy killer whale behavior. While future surveys and research may identify an area other than Agat Bay as a key area of biological importance, the available data indicate that geographic mitigation at Agat Bay would have the most benefit.
NRDC-15	e. Short-finned pilot whale core use areas, west of Guam and Rota The area of highest probability of use (ten percent) for eleven short-finned pilot whales satellite- tagged off Guam and Rota during the summers (June through August) of 2013, 2014, and 2016, were located off the west sides of Guam and Rota (see Figure 1). Short-finned pilot whales found off Guam and Rota are genetically different from short-pinned pilot whales found off Saipan and Tinian, indicating that these core areas represent important habitat for a genetically distinct group of	The analysis by Hill et al., (2018) makes a convincing case that all or part of the highest use area, as depicted in Figure 3 of their paper, may meet the Navy's criteria for being a key area of biological significance. However, the area is sufficiently large that it would be impractical to implement and would not meet the Navy's criteria as described in Section 5.2.4 (Practicality of Implementation) and Appendix I.2.3 (Assessing Practicality of Implementation). Because the area extends north from Apra Harbor along the entire west coast of Guam (and beyond), it would impact the Navy's ability to safely plan, schedule, and conduct training and testing activities from Guam.

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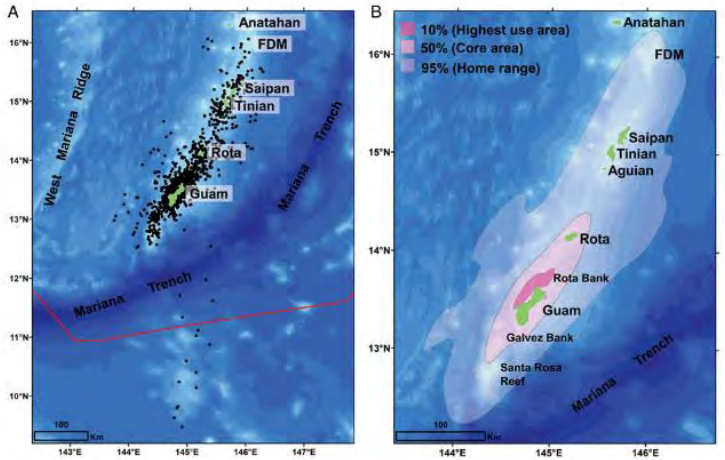
	short-finned pilot whales and two distinct social networks within that group (the Guam social network is separate from the Rota social network). The Navy should consider designating a Geographic Mitigation Area to protect the ten percent "highest use area" for short- finned pilot whales.  **Fig. 1.** Panel A: Two-daily satellite tag locations (n = 1,007) from 11 short-finned pilot whales satellite tagged off Guam and Rota during summer (June–August) 2013, 2014, 2016 (black dots). Panel B: the probability density contours (magenta 10%, pink 50%, violet 95%) estimated from kernel densities of the satellite tag locations. Red line denotes the Guam and Commonwealth of the Northern Mariana Islands exclusive economic zone boundary. All individuals were a part of the main social cluster. (Adapted from Hill et al. 2018).	

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NRDC-16	f. Persistent important habitat for spinner and bottlenose dolphins and potential feeding habitat for Bryde's whales, Rota Bank Spinner dolphins and bottlenose dolphins were consistently encountered within 500 m of the same location at Rota Bank over four years, and the area is considered an offshore area with higher relative abundance of spinner dolphins. Bottlenose dolphins have low genetic diversity relative to other populations and show evidence of nuclear introgression with Fraser's dolphin, indicating a hybridization event; bottlenose dolphins in the Marianas are therefore a small genetically isolated and genetically distinct population.[28] A Bryde's whale was also observed lunge-feeding at Rota Bank in 2015, indicating it may serve as a feeding area for this species. The Navy should designate a Geographic Mitigation Area to protect important habitat for multiple species of marine mammals at Rota Bank.	As discussed in Appendix I (Geographic Mitigation Assessment), the Navy considered six potential geographic mitigation areas based on multiple years of sighting and satellite tagging data. The data from the surveys were used to determine which, if any, of the areas could be particularly important to one or more species of marine mammals or sea turtles for a biologically important life process (e.g., foraging, migration, reproduction). While multiple marine mammal species occurred in all six areas, only three of the areas were proposed as mitigation areas, because there was clear evidence that the area supported a biologically important process (e.g., breeding behavior). There is insufficient evidence to identify Rota Bank as an important area for spinner dolphins. Spinner dolphins have also been sighted at multiple other locations exhibiting the same behavior, including resting behavior in Agat Bay where the Navy has developed a geographic mitigation area. The single sighting of a Bryde's whale feeding approximately five years ago does not indicate the presence of an established feeding area for the species.
NRDC-17	g. Important resting habitat for spinner dolphins, Tanapaq Lagoon, Saipan Spinner dolphin resting habitat is well characterized in Tanapaq Lagoon, Saipan. Similar to the Agat Bay Nearshore Geographic Mitigation Area, the Navy should establish a Geographic Mitigation Area to protect this important habitat for spinner dolphins.	As discussed in Appendix I (Geographic Mitigation Assessment), the Navy considered six potential geographic mitigation areas based on multiple years of sighting and satellite tagging data. The data from the surveys were used to determine which, if any, of the areas could be particularly important to one or more species of marine mammals including spinner dolphins. The survey data used did not identify other locations in the Study Area where spinner dolphins would benefit from establishing other mitigation areas.
NRDC-18	(3) Recommendations for Geographic Mitigation Assessment within the MITT Study Area In carrying out its Geographic Mitigation Assessment, we are concerned that the Navy makes unsupported assumptions that lead to the outright dismissal of potential Geographic Mitigation Areas located in data-poor areas that may otherwise be afforded further consideration.	See Appendix I (Geographic Mitigation Assessment) for a complete discussion of mitigation areas considered for the MITT Study Area.

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	The Ninth Circuit has soundly rejected an underprotective approach to data-poor areas, pursuant to the MMPA's mitigation provision. Specifically, the Court held, inter alia, that NMFS, in predicating its Offshore Biologically Important Areas (OBIAs) in such regions on habitat- specific data, had made a policy choice inconsistent with its duty to prescribe mitigation producing the "least practicable adverse impact" on marine mammals. NRDC v. Pritzker, 828 F.3d 1125, 1140 (9th Cir.). Protecting habitat, as the Court recognized, is "of paramount importance" under the MMPA. Id. at 1141 (citing the mitigation requirement's application to "species or stock and their habitat" and NMFS' duty to "pay[] particular attention to rookeries, mating grounds, and areas of similar significance"). To meet that law's "stringent standard" (id. at 1129), the agencies must follow a more precautionary approach that does not proceed "as if the 'no data' scenario were equivalent to… 'no biological importance'" (id. at 1140, quoting a NMFS White Paper identifying potentially important habitat, infra). See 40 C.F.R. § 1502.2(d). As such, the Navy and NMFS should consider the guidelines for capturing biologically important marine mammal habitat in data-poor areas that NMFS' subject-matter experts provided that were addressed by the Ninth Circuit, as those guidelines are relevant to the broader MITT Study Area, much of which is comprised of data-poor, offshore areas. These "White Paper" guidelines call for: (i) designation as OBIAs of all continental shelf waters and waters 100 km seaward of the continental slope as biologically important for marine mammals; (ii) establishment of OBIAs within 100 km of all islands and seamounts that rise within 500 m of the surface; and (iii) nomination as OBIAs of high-productivity regions that are not	

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	included in the continental shelf, continental slope, seamount, and island ecosystems above as biologically important. In addition, and consistent with the Court's decision in Pritzker, the Navy should adjust its approach to Geographic Mitigation Assessment as follows: *First,* the Navy must not dismiss the existence of persistent areas of primary productivity. In its discussion of the West Mariana Ridge, the DEIS states: "The Navy recognizes that biological productivity is often associated with bathymetric features like ocean ridges and seamounts; however, productivity in such areas is often highly dependent on changeable conditions, including weather patterns, wind intensity and direction, localized currents and eddies, and the presence of nutrients in the water column" (DEIS at Appendix I-27). To the contrary, bio- physical coupling leads to static bathymetric features promoting and retaining areas of elevated localized production, resulting in persistent biodiversity 'hotspots' in the open ocean. This mechanism is well supported in marine systems and has led in other contexts, including the development of Important Marine Mammal Areas (IMMAs), to static bathymetric features being considered as a strong basis for marine protected area and biologically important area establishment. *Second,* the Navy must not conflate the lack of survey effort with an absence of biologically important habitat. In relation to the West Mariana Ridge, which has received little targeted research effort, the DEIS states: "The available data do not indicate that the West Mariana Ridge or surrounding area is an area of key biological importance for marine mammals or other marine species, nor is it clear that limiting the use of sonar and explosives in the area would result in an avoidance	

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	or reduction of impacts. Therefore, the West Mariana Ridge area does not meet the Navy's criteria for effective geographic mitigation" (DEIS Appendix I at I-27, I-28). The DEIS continues: "Based on the distribution of marine mammals as known from visual surveys and satellite tag detections within the Study Area (Figure I-5), limiting Navy training and testing activities at the West Mariana Ridge and surrounding region to the 3,500 m isobath would not result in avoiding "high concentrations" of marine mammals" (DEIS Appendix I at I-27). Yet it is clear from Figure I-5 that the data the Navy is relying on to support this statement originate from studies carried out specifically in the vicinity of the Marianas Islands, far to the east; moreover, the target species of those studies are island-associates and would be unlikely to make regular commutes across the ~250 km to the Ridge, even if some individuals may do so. As such, the Navy cannot make any conclusions regarding the biological importance of the West Mariana Ridge based on these data alone. As discussed above, the bathymetric complexity of the Ridge provides strong support that it likely serves as an OBIA for multiple species. *Third,* the Navy overlooks evidence of island-associated small or resident populations, and relative risk to those populations. The DEIS states that "there are no indications from satellite tag data or photographic identification of marine mammals that there are any island-associated small or resident populations of marine mammals in the Mariana Islands" (DEIS at Appendix I-30). However, there is evidence that two demographically independent stocks of spinner dolphins may occur—one around Guam and the other from Rota northward. The Guam spinner dolphins resemble populations observed in Hawaii, exhibiting very close association with calm bays during the day. The Rota spinner dolphins are also found in nearshore	

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	waters, but in much more dynamic and turbid waters, and also on offshore shallow reefs. In addition, satellite telemetry data suggest bottlenose dolphins are associated with the islands and offshore reefs and seamounts, and that a connected population between Guam and islands north of Saipan exists. This population is likely to be relatively small given encounter rates and re-sight rates for individuals. Moreover, the DEIS includes a statement suggesting that cumulative exposure to training and testing activities do not negatively affect small and resident populations of marine mammals: "Additionally, research from areas, including Hawaii, where training and testing activities occur more often and involve more concentrated use of sonar and explosives, such as at the Pacific Missile Range Facility, has documented the presence of numerous small and resident populations of marine mammals and long-term residency of individuals (Baird et al., 2015). These marine mammals have co-existed for decades alongside areas of concentrated Navy training and testing activity" (DEIS at Appendix I-30). This is completely misleading. Resident populations are at relatively greater risk of cumulative exposure to noise and other disturbances. Relatively few marine mammal species occur in the Pacific Missile Range Facility as compared to other islands in the main Hawaiian archipelago, suggesting an incompatibility of repeated Navy activity with some species. Elsewhere in the archipelago, the Big Island stock of melon-headed whales was recently cited as a key example in a scientific study highlighting the potential harm to the population from naval sonar, given its residency to the area. The authors emphasize a general point of how "displacement can also be a significant source of harm (including injury or death), particularly for small, resident populations that may have 'nowhere to go' and for which the costs of leaving their habitat may be severe." For this and	

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	other reasons, NMFS has identified the presence of small, range-limited populations as a critical factor in defining Biologically Important Areas ("BIAs") and has endeavored to systematically identify BIAs off the U.S. mainland on that basis. These "severe" effects have been borne out within the Navy's AUTEC Operating Area. A comprehensive study of the population ecology of beaked whales in the Grand Bahama Canyon has demonstrated that the "Cul de Sac" region has high relative density of beaked whale species (Ziphius cavirostris and Mesoplodon spp.) compared to other portions of the Andros-AUTEC Operating Area ("OPAREA"). While the Cul de Sac is part of the OPAREA, it is an acoustically "quiet" region not currently used for tactical sonar exercises. To the north, the Cul de Sac is directly connected to the Tongue of the Ocean ("TOTO"), a deep-water basin that is home to the AUTEC hydrophone array and, as such, the site of regular mid-frequency active sonar training activities. The TOTO provides foraging habitat for Blainville's beaked whales and probably for other species as well; however, the density of beaked whales in the TOTO is estimated to be just over half that of the Cul de Sac (39.5 whales/1000 km2 compared to 73.4 whales/ 1000km2 for Mesoplodon spp.). Fewer immature animals and calves were observed in the TOTO, although the number of females was comparable between the two sites, adding to ongoing concern that the regular use of mid-frequency active sonar at AUTEC is driving the lower recruitment and overall densities of beaked whales in the TOTO. It is entirely remiss for the Navy to ignore evidence of small and resident populations within the MITT Study Area and afford them no additional protections.	
NRDC-19	(C) Other Measures	As described in Section 5.6.2 (Explosives) of the Navy's 2019 Draft Supplemental EIS/OEIS, when assessing and developing mitigation, the Navy considered reducing the number and size of explosives and limiting the locations and time of day of

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	NMFS should consider the following additional measures, whether as mitigation measures to prescribe or as research. (1) Avoidance of underwater detonations at night and in other low-visibility conditions At night and during periods of low-visibility, the Navy's ability to detect marine mammals within its safety zone declines significantly. Additionally, some endangered species engage in rest or shallow diving during the night, increasing their vulnerability to ship collision and to injury from explosives and ordnance. Many individual Navy exercises, tests, and maintenance activities last eight hours or fewer, making avoidance of nighttime activity practicable, at least in some cases. Yet the Navy does not require, nor, apparently, does it consider, avoidance of underwater detonations at night and/or during other low-visibility conditions.	explosive training and testing in the Study Area. The locations and timing of the training and testing activities that use explosives vary throughout the Study Area based on range scheduling, mission requirements, testing program requirements, and standard operating procedures for safety and mission success. Although activities using explosives typically occur during daytime for safety reasons, it is impractical for the Navy to prohibit every type of explosive activity at night or during low visibility conditions. Doing so would diminish activity realism, which would impede the ability for Navy Sailors to train and become proficient in using explosive weapons systems (which would result in a significant risk to personnel safety during military missions and combat operations), and would impede the Navy's ability to certify forces to deploy to meet national security tasking.
NRDC-20	(2) Research into sonar signal modifications NOAA's Ocean Noise Strategy puts an emphasis on source modification, along with habitat management, as an important means of reducing acoustic impacts on marine life.[47] In the case of naval activities, behavioral response studies on harbor porpoises and gray seals have yielded preliminary insights into how different characteristics of the sonar signal may differentially affect marine mammals in terms of impact. This research highlights ways in which the sonar signal might be modified to reduce the level of impact at the source. For example, research to date suggests that behavioral response to up-sweep and down-sweep signals vary, depending on the presence or absence of harmonics (i.e., side-bands). For 1 to 2 kHz sweeps with harmonics, harbor porpoises were observed to swim further away from the	NOAA's Ocean Noise Strategy Roadmap acknowledges that sound caused by sonar is an integral and necessary part of an associated sonar activity, and it does not propose sonar signal modification as a means of reducing acoustic impacts on marine life. Rather, the Roadmap suggests exploration of technologies for activities in which low-frequency, broadband sound is incidental to the activity (e.g., maritime traffic and pile driving). As described in the HSTT 2018 Final EIS/OEIS and MITT Final Supplemental EIS/OEIS, at this time, the science on the differences in potential impacts of up or down sweeps of the sonar signal (e.g., different behavioral reactions) is extremely limited and requires further development before a determination of potential mitigation effectiveness can be made. The studies cited by the commenter report the behavioral responses of a few captive harbor porpoises to varying signals. Although this very limited data set suggests up or down sweeps of the sonar signal may result in different reactions by harbor porpoises in certain circumstances, the author of those studies highlights the fact that different species respond to signals with varying characteristics in a number of ways. In fact, the same signals cited here were also played to harbor seals, and their responses were different than the harbor

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	sound source in response to the up-sweeps than to the down-sweeps; in the absence of harmonics, however, sweep type (up-sweep and down-sweep) caused no significant difference in the response. For simulated naval sonar sounds with fundamental frequencies in the 1 to 2 kHz range containing harmonics, using down-sweeps appears to affect harbor porpoise less than up- sweeps. A related study showed that for 1-2 kHz sweeps without harmonics, a 50% startle response rate occurred at maximum received levels (mRLs) of 133 dB re 1 µPa; for 1-2 kHz sweeps with strong harmonics at 99 dB re 1 µPa; and for 6-7 kHz sweeps without harmonics at 101 dB re 1 µPa. A follow-up study quantifying the behavioral effects of 25-kHz FM signals with high frequency side bands showed that harbor porpoise respiration rate, a probable indicator of stress-response, increased by ~39% compared to signals without side bands at an average received sound pressure level of 148 dB re 1 µPa. Based on these studies, mitigating active sonar impacts could be achieved by employing down- sweeps with harmonics or by reducing the level of side bands (or harmonics). In addition, results indicate that low-frequency (1-2 kHz) active naval sonar systems without harmonics can therefore operate at higher source levels than mid-frequency (6-7 kHz) active sonar systems without harmonics with similar startle effects on porpoises. To our knowledge, the Navy is not presently investigating signal modification as a potential mitigation measure. Given the tangible management implications of this research, however, and the potentially broad benefits to multiple species through modification at the signal source, we recommend that more research of this nature should be carried out in order to understand the extent to which these results can be generalized across species. In parallel, the feasibility of implementing signal modifications (such as those	porpoises. Furthermore, harmonics in a signal result from a high-intensity signal being detected in close proximity; they could be artificially removed for a captive study, but cannot be whitened in the open ocean. Active sonar signals are designed explicitly to provide optimum performance at detecting underwater objects (e.g., submarines) in a variety of acoustic environments. If future studies indicate that modifying active sonar signals could be an effective mitigation approach, then the Navy will investigate if and how the mitigation would affect the sonar's performance. As described throughout Chapter 5 (Mitigation), mitigation must meet the appropriate balance between being effective and practical to implement.

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	recommended above) into Navy operations should be explored. Other signal characteristics may also be of interest. For example, short rise times (i.e., rise times less than or equal to 15 ms) are correlated across mammalian species with startle response, raising concerns about sensitization. In a 2011 study, researchers demonstrated that sounds with short rise times elicited an acoustic startle response in captive grey seals, followed by "rapid and pronounced" sensitization, taking hold after about 3 playbacks, whereas sounds with longer rise times failed to induce a startle response and did not sensitize the animals. The startled seals then displayed sustained spatial avoidance, rapid flight responses, and "clear signs of fear conditioning," and, once sensitized, even avoided food that was proximate to the sound source. According to the authors, sounds with short rise times thus have "the potential to cause severe effects on long-term behavior, individual fitness and longevity of individuals in wild animal populations." In a follow-on study, high-frequency echosounders with short rise times were found to produce a strong behavioral response in the same species, leading the researchers to conclude that it could produce startle responses, and therefore potentially sensitization, as well. Here, too, we recommend further research and exploration of the feasibility of signal modification. While the Navy, in its recent EIS for Hawaii-Southern California training and testing, rejected modifying sonar sound sources as a mitigation measure, a decision summarily upheld by NMFS, it never explained why making the modifications implicated by the marine mammal behavioral studies discussed above would be impracticable. Indeed, some of	

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	those modifications, such as converting up-sweeps to down-sweeps, would not alter the system's spectral output in any way. We believe source modification requires greater validation across species and in more behavioral contexts before any decisions are made to alter signals—but given the preliminary data, and given the potential of this measure to reduce the instances and severity of behavioral harassment—particularly for beaked whales and small, resident populations around the Marinas archipelago—we urge the Navy to expedite that research.	
NRDC-21	(3) Thermal detection systems Because mitigation measures based on visual observation, such as safety zone maintenance, results in highly limited risk reduction for most species and under most conditions (e.g., Leaper et al. 2015; see Impacts section for further discussion), we view alternative detection measures as a significant area for development. Thermal detection offers a supplement to visual detection measures and has been demonstrated to outperform observers in number of detected whale blows and ship-whale encounters due to its ability to continuously monitor a 360° field of view during both daylight and nighttime hours. In addition, aerial-mounted infrared cameras have proven able to detect thermal 'trails' up to 300 m behind humpback whales, formed by the thermal mixing of the stratified water that persists for up to 2 minutes. The emerging development of automated whale blow detection systems for infrared video also indicate this technology can feasibly be used for real-time whale detection and mitigation. The Navy has correctly indicated the limitations inherent in thermal detection systems, including its lesser utility in warmer temperatures and foggy conditions, when whale blow	Analysis of the potential for thermal detection systems as a mitigation tool was presented in Section 5.6.4 (Thermal Detection Systems) of the Navy's 2019 Draft Supplemental EIS/OEIS. The Office of Naval Research Marine Mammals and Biology program funded a project (2013-2018) to test the thermal limits of infrared-based automatic whale detection technology. That project focused on capturing whale spouts at two different locations featuring subtropical and tropical water temperatures, optimizing detector/classifier performance on the collected data, and testing system performance by comparing system detections with concurrent visual observations. The Navy has also been investigating the use of thermal detection systems with automated marine mammal detection algorithms for future mitigation during training and testing, including on autonomous platforms. For example, the Defense Advanced Research Projects Agency funded six initial studies to test and evaluate infrared-based thermal detection technologies and algorithms to automatically detect marine mammals on an unmanned surface vehicle. Based on the outcome of these initial studies, follow-on efforts and testing are planned for 2018–2019. The Navy plans to continue researching thermal detection systems to determine their effectiveness and compatibility with Navy applications. If the technology matures to the state where thermal detection is determined to be an effective mitigation tool during training and testing, the Navy will assess the practicality of using the technology during training and testing events and retrofitting its observation platforms with thermal detection devices. The Navy will provide information to NMFS about the status and findings of Navy-funded thermal detection studies and any associated practicality

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	is less distinguishable from the ambient air; but such systems are effective in colder conditions as a supplement to visual monitoring. NMFS should consider requiring the Navy to employ thermal detection in optimal conditions, or, alternatively, require the establishment of a pilot program for thermal detection, with annual review under the adaptive management system. According to the DEIS, the Navy "plans to continue researching thermal detection technology to determine their effectiveness and compatibility with Navy applications." A pilot program would be consistent with that interest, while allowing for trial use as a monitoring measure.	assessments at the annual adaptive management meetings. Information about the Navy's adaptive management program is included in Section 5.1.2.2.1.1 (Adaptive Management).
NRDC-22	(4) Mitigation and research on Navy ship speeds The speed at which Navy vessels operate during testing and training exercises, and during general transit between exercises, has direct implications for the probability of mortality from a ship strike as well as for the size of the ship's acoustic footprint. A vessel speed of 15 knots is estimated to result in an 80% probability of mortality if a ship strike were to occur, and this probability approaches 100% at a speed of 20 knots or higher. Slowing ships below 10 knots can reduce collision rates by 90% and decrease the probability of serious injuries or death. The acoustic footprint of vessels also widens dramatically with speed; an increase from a ~7 km footprint at a speed of 10 knots to a ~14 km footprint at 12 knots was observed for commercial shipping vessels in waters off British Columbia. While the Navy has indicated a need to operate at higher speeds under certain circumstances, such as when an aircraft carrier must maintain a minimum wind speed relative to ground in order to launch and receive aircraft, there are other conditions when maintaining a 10-knot vessel speed is surely practicable.	As described in Section 5.6.7 (Reporting Requirements) of the Navy's 2019 Draft Supplemental EIS/OEIS, the Navy developed its reporting requirements in conjunction with NMFS to be consistent with mission requirements and balance the usefulness of the information to be collected with the practicality of collecting it. The Navy's training and testing activity reports and incident reports are designed to verify implementation of mitigation; comply with current permits, authorizations, and consultation requirements; and improve future environmental analyses. Additional reporting would be ineffective as mitigation because it would not result in modifications to training or testing activities or further avoidance or reductions of potential impacts. For example, additional reporting of vessel speed data would not result in modifications to vessel speeds (e.g., speed restrictions) or reduce the already low potential for vessel strikes of marine mammals for the reasons described in Section 5.3.4.1 (Vessel Movement). The speed of Navy vessels can fluctuate an unlimited number of times during training and testing events. Burdening operational Commanders, vessel operators, and event participations with requirements to complete additional administrative reporting would distract them from preparing a ready force and focusing on mission-essential tasks. Additional reporting requirements would draw event participants' attention away from the complex tactical tasks they are primarily obligated to perform, such as driving a warship or engaging in a gunnery event, which would adversely impact Navy personnel safety, public safety, and the effectiveness of training or testing.

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	Additionally, given that the speed of Navy ships during all aspects of their operations potentially impacts marine mammals, we recommend that the Navy collect and report data on ship speed as part of the EIS process. This will allow for objective evaluation of ship-strike risk, of harassment resulting from vessel activity, and of the potential benefit of additional speed-focused mitigation measures.	As described in Section 2.3.3 (Standard Operating Procedures) Navy vessels operate in accordance with the navigation rules established by the U.S. Coast Guard, which require that vessels proceed at a safe speed so that proper and effective action can be taken to avoid collision and be stopped within a distance appropriate to the prevailing circumstances and conditions. As described in Section 5.3.4.1 (Vessel Movement), any additional vessel speed restrictions would prevent vessel operators from gaining skill proficiency, would prevent the Navy from properly testing vessel capabilities, or would increase the time on station during training or testing activities as required to achieve skill proficiency or properly test vessel capabilities (which would significantly increase fuel consumption); therefore, the mitigation proposed by the comment would be impractical to implement. Finally, given the discussion of ship speeds is primarily focused on potential risk of strike to marine mammals, and that there have been no Navy ship strikes to date combined with existing Navy large whale avoidance mitigation and marine species awareness, the risk to marine mammals from Navy vessel transit at any speed is low.
NRDC-23	III. IMPACTS ANALYSIS Fundamental to satisfying NEPA's requirement of fair and objective review, agencies must ensure the "professional integrity, including scientific integrity," of the discussions and analyses that appear in environmental impact statements. 40 C.F.R. § 1502.24. To this end, they must make every attempt to obtain and disclose data necessary to their analysis. The simple assertion that "no information exists" will not suffice; unless the costs of obtaining the information are exorbitant, NEPA requires that it be obtained. See 40 C.F.R. § 1502.22(a). Agencies are further required to identify their methodologies, indicate when necessary information is incomplete or unavailable, acknowledge scientific disagreement and data gaps, and evaluate indeterminate adverse impacts based upon	The Navy reviewed the best available scientific data and information on marine mammals available at the time the Draft Supplemental EIS/OEIS was completed and incorporated relevant information into the analysis of impacts on marine mammals in this Supplemental EIS/OEIS. Peer-reviewed scientific publications are considered to be the most reliable and accurate sources of data and information and were used throughout this Supplemental EIS/OEIS to support the analysis and conclusions. Well respected and historically vetted government reports (e.g., marine mammals stock assessment reports) were also used to support the analysis. Any newly published data and information relevant to the analysis of potential impacts on marine mammals that has become available since the Draft Supplemental EIS/OEIS was completed and was incorporated into the Final Supplemental EIS/OEIS. The Navy has continued to fund basic research on marine mammals, including behavioral response studies specifically designed to determine the effects on marine mammals from the Navy's use of mid-frequency sonar and other

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	approaches or methods "generally accepted in the scientific community." 40 C.F.R. §§ 1502.22(2), (4), 1502.24. Such requirements become acutely important in cases where, as here, so much about an activity's impacts depend on newly emerging science. Finally, NEPA does not "permit agencies to falsify data or to ignore available information that undermines their environmental impact conclusions." Hoosier Environmental Council v. U.S. Department of Transportation, 2007 WL 4302642 *13 (S.D. Ind. Dec. 10, 2007). Thus, the Navy's review must be thorough and it must not "sweep[] negative evidence under the rug." National Audubon Society v. Department of the Navy, 422 F.3d 174, 194 (4th Cir. 2005). (A) Beaked Whales At least four species of beaked whale are found within the MITT Study Area: Cuvier's beaked whale, Blainville's beaked whale, Longman's beaked whale, and Ginkgo-toothed beaked whale. Beaked whales were acoustically detected in almost every month where there was recording effort off Saipan and Tinian (2010-2013). No beaked whale species is considered "threatened" or "endangered" under the Endangered Species Act, or "depleted" under the Marine Mammal Protection Act; however, U.S. stock assessments have only limited information on animals in offshore regions or remote naval use areas such as the MITT Study Area. While there is little information on beaked whale population structure in the MITT Study Area, new science shows differences in the echolocation signal frequency of Blainville's beaked whales between the Northern Marianas Islands and other locations in the Pacific, Western Atlantic, and Gulf of Mexico. The observed acoustic delineation between regions suggest population-level boundaries of Blainville's beaked	transducers. Relevant data needed for improving these analytical approaches for population level consequences resulting from disturbances will continue to be collected during projects funded by the Navy's marine species research programs. There is limited information about beaked whale populations in the Study Area. Navy funded projects have provided nearly the entirety of marine mammal science collected in the Marianas. In fact, prior to Navy funding of marine mammal science, there had not been any dedicated marine mammal surveys performed in the Mariana Islands. The commenter infers that spectral differences in Blainville's beaked whale echolocations correspond to spatially limited populations; however, the cited research does not make this claim. Baumann-Pickering et al. suggest reasons why Blainville's beaked whale echolocation may differ between regions, while acknowledging that information to investigate those hypotheses are limited. Also, while citing research that identifies populations with relatively small ranges (e.g., Baird et al. 2016), the commenter has misinterpreted other research showing year-round species presence as implying range limitation (e.g., Cummings et al. 2017). The Navy will continue to meet its mission requirements as it funds research investigating the potential effects of training and testing on marine species, as well as research that will better inform the understanding of species presence, including beaked whales, in the Study Area. The Navy has implemented an adaptive management plan in coordination with NMFS to periodically review recent science and evaluate its mitigation procedures. As described in Section 3.4.2.1.2.1 (Methods for Analyzing Impacts from Sonar and Other Transducers), a few minor to moderate TTS or behavioral reactions to an individual over the course of a year are unlikely to have any significant costs or long-term consequences for that individual. Considering these factors and the mitigation measures that would be implemented as described in Section 5.3.2.1 (Active Sonar) and Section 5.4.2 (Mitigation Areas for Marine Mammals and Sea Turtles), long-term consequences for the species or stocks are not expected.

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	whales, including a population specific to the Northern Marianas Islands. In other parts of the world, scientific studies now indicate that beaked whales show remarkable site fidelity. Range-limited beaked whale populations have been found on the shelf break approximately 50 km east of Cape Hatteras, as well as off Canada, in the Mediterranean, off Southern California, in the Bahamas, and around the Hawaiian Islands. A recent passive acoustic monitoring study similarly indicates that beaked whales reside in areas year-round. In a similar vein, range-limited sperm whale populations, another deep-diving species, have been found off Cape Hatteras, the Gulf of Mexico, and off Western Australia. Resident populations are at relatively greater risk of cumulative exposure to noise and other disturbances. The Cuvier's beaked whale population off Cape Hatteras was recently cited as a key example in a scientific study highlighting the greater potential harm to the population from seismic surveys, given its residency to the area. The authors emphasize that "displacement can also be a significant source of harm (including injury or death), particularly for small, resident populations that may have 'nowhere to go' and for which the costs of leaving their habitat may be severe." The study, which was led by NMFS biologists, emphasizes how "[f]ailure to consider effects of both noise exposure and displacement of Cuvier's beaked whales from their habitat in this region could lead to more severe biological consequences than 'Level B Harassment' (as defined under US law), because (1) not all animals that can be injured are likely to be detected, and (2) displacement out of their population range may adversely affect foraging rates, reproduction, or the health of Cuvier's beaked whales."	

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	Given this contextual data, it is conservative to assume that range-limited beaked whale populations inhabit the MITT Study Area and are regularly exposed to the Navy's training and testing activities.	
NRDC-25	The increase in the stranding incidence of beaked whales in recent years—six beaked whales stranded in Guam since 2007 compared to only a single stranding in the previous 35 years—is therefore of great concern. Moreover, the strandings appear to be correlated with Navy training and testing activities—four of the six recent strandings occurred within days of Navy operations. The observed correlation is hardly surprising, as numerous studies clearly representing the best available science, including post-stranding pathology, laboratory study of organ tissue, theoretical work on dive physiology, and expert reviews, provide support for behaviorally-mediated injury and mortality through maladaptive alteration of the dive pattern in response to Navy sonar exposure. Experiments on common bottlenose dolphin to test for nitrogen bubble formation after sudden repetitive dives have found no evidence of gas bubble formation. But beaked whales, which are adapted to perform long and deep dives, show saturation of nitrogen levels at the surface, making them particularly vulnerable. *For purposes of analysis, the Navy must assume that beaked whales are subject to both acute and chronic injury from gas-bubble formation under certain conditions of sonar exposure—and, indeed, have already suffered injury and death from training and testing activities in the MITT Study Area.*	Although records of marine mammal strandings exist as far back as 1878 in Guam, reporting of marine mammal strandings across the Mariana Islands has likely only become consistent in recent years, similar to other regions, whereas sonar use has occurred in the area around the Mariana Islands for decades. While exact causes of strandings are uncertain, scientists have identified potential contributing factors for strandings including age, illness, or disease; ingestion of marine debris/plastics; contaminant load; and manmade sources. A small number of strandings have been associated with the use of U.S. Navy sonar; none of these have occurred in the Study Area. The Navy is committed to protecting marine life by implementing mitigation measures when training or testing using active sonar or explosives; working with regulatory agencies; and furthering our understanding of marine mammals through research and monitoring. Information on strandings associated with Navy training and testing activities is provided in the Navy's technical report on marine mammal strandings (Marine Mammal Strandings Associated with U.S. Navy Sonar Activities, 2017 – Available on the project website: https://mitt-eis.com/) for more information. Sonar use occurred prior to four of nine beaked whale strandings in the Mariana Islands. NMFS was able to necropsy two of the beaked whales after stranding, one from the 2011 Saipan stranding and one from a 2015 Guam stranding. Upon examination, the dead stranded beaked whales did not exhibit most of the diagnostic features described by Bernaldo de Quiros et al. (Bernaldo de Quirós et al., 2019), suggesting that these strandings are unlikely to be associated with sonar exposure. The Center for Naval Analysis (CNA) recently conducted a statistical study of correlation of beaked whale strandings around the Mariana Islands with the use of U.S. Navy sonar, finding that insufficient evidence of a correlation exists. The CNA study used the complete record of all U.S. Navy sonar use between 2007 and 2019,

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		including major training events, joint exercises, and unit level training/testing. The analysis also included the complete beaked whale stranding record for the Mariana Islands through 2019. Following the methods in Simonis et al. (2020), the CNA analysis found insufficient evidence of a correlation between sonar use and beaked whale strandings when considering the complete sonar use record. The CNA finding is in contrast to the finding in Simonis et al. (2020), which depicted a significant correlation between beaked whale strandings and Navy sonar use. However, the Simonis et al. (2020) result relied on substantially incomplete or inaccurate assumptions about U.S. Navy sonar use around the Mariana Islands. CNA also conducted statistical analyses specific to each island where beaked whale strandings have been observed in the Mariana Islands, similarly finding insufficient evidence of a correlation to sonar use. Additional information on the findings of the CNA analysis are presented in Section 3.4.2.1.1.6 (Stranding) in Chapter 3.4 (Marine Mammals). Section 3.4.2.1.1.6 (Stranding) has been expanded to include additional information about strandings of beaked whales in the Mariana Islands and the Navy's support of efforts to better understand the causes of marine mammal strandings.
NRDC-26	In addition, new science shows that northern bottlenose whales (Hyperoodon ampullatus) not previously exposed to sonar exhibit sustained avoidance and cessation of feeding at low received levels; moreover, distance to the source was found not to significantly influence responses, indicating that whales did not perceive less risk from, or react less severely to, a relatively distant sound source (28 km). Populations of beaked whales in the MITT Study Area may be similarly naïve to sonar exposure and, as such, may be expected to react strongly even at considerable distances. This is all the more concerning in light of the fact that the Navy is currently operating without a permit for Level A take of beaked whales. NMFS may not conclude, under the Marine Mammal Protection Act, that an activity will have only a "negligible impact" on a particular species or stock if it has no	The reactions by bottlenose whales to sonar exposure described in Wensveen et al. (2019) occurred at received sound pressure levels and distances similar to reactions observed in other tagged beaked whales. The greater sensitivity of beaked whales to behavioral disturbance, both to lower sound pressure levels and at greater distances, is considered in the estimate of potential impacts to these species. Further information can be found in the Navy technical report titled *Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III)*, available at www.mitt-eis.com. There are records of beaked whales stranding in the Mariana Islands for approximately 150 years and there is no evidence that Navy activities in the Mariana Islands have resulted in the mortality to beaked whales found stranded in more recent times. With the PIFSC and DAWR data, the Navy conducted an independent review of the beaked whale strandings between August 2007 and December 2019. During that 13-year time period there were nine beaked whale stranding events, the majority of which were identified as Cuvier's beaked whales. There were 7 years across the 13-year period in which no beaked

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	information on which to do so, see 40 C.F.R. § 1502.25(a) at 1225, as is the case for beaked whales. As such, the Navy's present activities are being conducted illegally; and its failure to acknowledge the potential for serious injury and mortality in its DEIS, and in its February 2019 take application, is arbitrary and capricious and will result in further illegal action under the MMPA.	whale strandings occurred and 2 years in which two strandings occurred within a given year. From 2007 to 2019, 18 of 23 (or 78 percent) of multi-national Navy events using sonar in the MITT Study Area did not co-occur with any beaked whale strandings. 56% (5 of 9) of the beaked whale strandings occurred without any Navy sonar use prior, therefore, some factors other than Navy sonar may be influencing these strandings. It should also be noted that the PIFSC conducted necropsies on three of the beaked whales that stranded after sonar use (two in March 2011 and one in March 2015). The results did not show evidence of gas bubble disease (gas emboli and fat emboli were not observed), which can occur during a rapid ascent to the surface and has been suggested as a response by beaked whales to sonar. Based on the above information, the Navy does not predict that any beaked whales would be injured under this Proposed Action. The issue of Navy-only sonar exclusively causing mortality to beaked whale is complex for a species known to be susceptible to behavioral reactions to any anthropogenic sound, including commercial shipping transits. Other anthropogenic causes of beaked whale mortalities include plastic ingestion. Factoring in natural causes of mortality (e.g., disease, predation, foraging success), determining direct causal relationships is complex for any species of marine mammals, especially beaked whales. The Navy's MITT Supplemental EIS does a thorough job of qualitatively and quantitatively summarizing potential effects to all marine mammal species, including beaked whale, within the MITT Study Area. Criteria development, modeling improvements for assessing acoustic and explosive impacts, refinements to the science used for the impact assessment framework, and Navy-funded monitoring in the Marianas Islands have been advancing for over 10 years in consultation with the National Marine Fisheries Service (NMFS). The Navy stands by the MITT Supplemental EIS conclusions and associated NMFS take request under the Marine Mammal Protection Act.
NRDC-27	(B) Other Methodological Problems In our comments on the Navy's previous third-phase DEISs, particularly those prepared for Hawaii-Southern California and Atlantic Fleet training and testing activities ("HSTT" and "AFTT"	Information about the quantitative analysis process, including the consideration of mitigation effectiveness, is described in detail in the technical report titled *Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing*. It should be noted that even before consideration of mitigation effectiveness, there were no modeled

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	respectively), we identified a number of significant issues concerning the Navy's analysis of acoustic and other impacts on marine mammals. In most instances, the Navy has not modified its approach to address the issues we raised. We therefore note these issues again. (1) (1) Post-modeling analysis of Level A injury and mortality In estimating the number of instances of injury and mortality, the DEIS makes two post hoc adjustments, significantly reducing the totals based on presumed animal avoidance and mitigation effectiveness. These two reductions are arbitrary and non-conservative. By itself, the Navy's avoidance adjustment effectively reduces the number of estimated auditory injuries by 95%, on the assumption that marine mammals initially exposed to three or four sonar transmissions at levels below those expected to cause permanent injury would avoid injurious exposures. While it is certainly true that some marine mammals will flee the sound, there are no data to inform us how many would do so, let alone that 95% would move as expeditiously as the Navy presumes. Marine mammals may remain in important habitat, and the most vulnerable individuals may linger in an area, notwithstanding the risk of harm; marine mammals cannot necessarily predict where an exercise will travel; and Navy vessels engaged in certain activities may move more rapidly than a marine mammal that is attempting to evacuate. Avoidance adjustments were first used in 2012, for an environmental impact report prepared under the California Environmental Quality Act; in that case, the authors, to compensate for their non- conservative assumptions about avoidance, presumed that every instance of permanent	mortalities to any marine mammal or sea turtle species. The Navy assumes that Lookouts will not be 100% effective at detecting all individual marine mammals and sea turtles within the mitigation zones for each activity. This is due to the inherent limitations of observing marine species and because the likelihood of sighting individual animals is largely dependent on observation conditions (e.g., time of day, sea state, mitigation zone size, observation platform) and animal behavior (e.g., the amount of time an animal spends at the surface of the water). The Navy quantitatively assessed the effectiveness of its mitigation measures on a per-scenario basis for four factors: (1) species sightability, (2) a Lookout's ability to observe the range to permanent threshold shift (for sonar and other transducers) and range to mortality (for explosives), (3) the portion of time when mitigation could potentially be conducted during periods of reduced daytime visibility (to include inclement weather and high sea-state) and the portion of time when mitigation could potentially be conducted at night, and (4) the ability for sound sources to be positively controlled (e.g., powered down). The g(0) values used by the Navy for their mitigation effectiveness adjustments take into account the differences in sightability with sea state, and utilize averaged g(0) values for sea states of 1-4 and weighted as suggested by Barlow (2015). Using g(0) values is an appropriate and conservative approach (i.e., underestimates the protection afforded by the Navy's mitigation measures) for the reasons detailed in the technical report. For example, during line-transect surveys, there are typically two primary observers searching for animals. Each primary observer looks for marine species in the forward 90-degree quadrant on their side of the survey platform and scans the water from the vessel out to the limit of the available optics (i.e., the horizon). Because Navy Lookouts focus their observations on established mitigation zones, their area of observation is typically much smaller than that observed during line-transect surveys. The mitigation zone size and distance to the observation platform varies by Navy activity. For example, during hull-mounted mid-frequency active sonar activities, the mitigation zone extends 1,000 yd. from the ship hull. During the conduct of training and testing activities, there is typically at least one, if not numerous, support personnel involved in the activity (e.g., range support personnel aboard a torpedo retrieval boat or support aircraft). In addition to the Lookout posted for the purpose of mitigation, these

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	threshold shift would result in biological removal. The Navy should not adjust for avoidance here. The Navy's adjustment of injury and mortality numbers for "mitigation effectiveness" is also problematic. The DEIS starts with the species-specific g(0) factors applied in professional marine mammal abundance surveys, then multiplies them by a simple factor to reflect the relative effectiveness of its lookouts in routine operating conditions. Yet the Navy's sighting effectiveness is likely to be much poorer than that of experienced biologists dedicated exclusively to marine mammal detection, operating under conditions that maximize sightings. As one recent paper observed, for example, abundance survey rates declined significantly as sea states rose above Beaufort 1, and average Beaufort sea states in the MITT Study Area are notably high, as evidenced by marine mammal survey reports. Given this, and given that most Navy activities would be allowed to occur in all sea conditions and hours of day, it seems seldom that Navy visual surveys can approximate the sighting effectiveness of a large-vessel abundance survey. In any case, the public has no meaningful way to evaluate the Navy's adjustment further since the DEIS does not provide the scores used to generate the effectiveness factor, nor does it provide pre-adjustment take numbers. Notably, as the Marine Mammal Commission observes, an ongoing study on mitigation effectiveness, conducted by the Navy in partnership with the University of St. Andrews, has reported instances where Navy lookouts failed to site or report marine mammals spotted by Marine Mammal Observers within established mitigation zones. We urge the Navy to provide more transparency about its post hoc modeling adjustments (40 C.F.R. §§ 1502.9(a), 1503.1(a), 5	additional personnel observe for and disseminate marine species sighting information amongst the units participating in the activity whenever possible as they conduct their primary mission responsibilities. However, as a conservative approach to assigning mitigation effectiveness factors, the Navy elected to account only for the minimum number of required Lookouts used for each activity; therefore, the mitigation effectiveness factors may underestimate the likelihood that some marine mammals and sea turtles may be detected during activities that are supported by additional personnel who may also be observing the mitigation zone. The Navy has fully described its analytical process in the above technical report. The Navy refined the Phase III analysis by considering mitigation effectiveness at the scenario level, rather than at the activity level as in Phase II. Many scenario details are classified, thus the level of detail requested cannot be provided in an unclassified document. As discussed in *Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing*, animats in the Navy's acoustic effects model do not move horizontally or "react" to sound in any way, necessitating the additional step of considering animal avoidance of close-in PTS zones. This approach is fully supported by the best available science. Based on a growing body of behavioral response research, animals do in fact avoid the immediate area around sound sources to a distance of a few hundred meters or more depending upon the species. Avoidance to this distance greatly reduces the likelihood of impacts to hearing such as temporary and permanent threshold shift (TTS and PTS, respectively). Specifically, the ranges to PTS for most marine mammal groups are within a few tens of meters and the ranges for the most sensitive group, the HF cetaceans, average about 200 m, to a maximum of 270 m in limited cases; however, HF cetaceans such as harbor porpoises have been observed reacting to anthropogenic sound at greater distances than other species and are likely to avoid their zones to hearing impacts (TTS and PTS) as well. Not considering animal avoidance and mitigation effectiveness would lead to a great overestimate of injurious impacts. NMFS has concurred with the analytical approach used. The results of the quantitative analysis represent the best estimate

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	U.S.C. § 706(2)(D)) and, conservatively, to use unadjusted injury and mortality numbers in finalizing the EIS.	of the maximum number of instances that marine mammals may be impacted under this Proposed Action.
NRDC-28	(2) Behaviorally-mediated injury and mortality In the past, both the Navy and NMFS have discounted the leading explanation about the mechanism of sonar-related pathologies, maladaptive alteration of the dive pattern, as one of several controversial hypotheses. But this explanation has now been supported by numerous studies, including post-stranding pathology, laboratory study of organ tissue, and theoretical work on dive physiology, as well as by expert reviews, and is clearly best available science. Experiments on common bottlenose dolphin to test for nitrogen bubble formation after sudden repetitive dives have found no evidence of gas bubble formation.90 But beaked whales, which are adapted to perform long and deep dives, show saturation of nitrogen levels at the surface, making them particularly vulnerable. For purposes of analysis, the Navy should assume that beaked whales are subject to both acute and chronic injury from gas-bubble formation under certain conditions of sonar exposure. studies, including post-stranding pathology, laboratory study of organ tissue, and theoretical work on dive physiology, as well as by expert reviews, and is clearly best available science. Experiments on common bottlenose dolphin to test for nitrogen bubble formation after sudden repetitive dives have found no evidence of gas bubble formation. But beaked whales, which are adapted to perform long and deep dives, show saturation of nitrogen levels at the surface, making them particularly vulnerable. For purposes of analysis, the Navy should assume that beaked whales are subject to both acute and chronic injury from gas-bubble formation under certain conditions of sonar exposure. studies, including post- stranding pathology, laboratory study of organ tissue, and theoretical work on dive	Nitrogen decompression is discussed in the MITT Final EIS/OEIS in Section 3.4.2.1.1.1 (Marine Mammals - Injury - Nitrogen Decompression). This section discusses the background of potential impacts on marine mammals—and specifically beaked whales—from Acoustic stressors, such as sonar, and outlines the literature currently available with regards to this potential impact. This Final Supplemental EIS/OEIS includes additional information on Cuvier's beaked whale strandings relative to sonar use in the Study Area in Section 3.4.2.1.1.6 (Stranding) under Environmental Consequences due to Acoustic Stressors in the Marine Mammal section (Section 3.4). Based on the best available science summarized in this FEIS/OEIS, the Navy does not predict that any beaked whales would be injured due to behaviorally-mediated injury under this Proposed Action.

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	physiology, as well as by expert reviews, and is clearly best available science. Experiments on common bottlenose dolphin to test for nitrogen bubble formation after sudden repetitive dives have found no evidence of gas bubble formation. But beaked whales, which are adapted to perform long and deep dives, show saturation of nitrogen levels at the surface, making them particularly vulnerable. For purposes of analysis, the Navy should assume that beaked whales are subject to both acute and chronic injury from gas-bubble formation under certain conditions of sonar exposure.	
NRDC-29	(3) Thresholds and weighting systems for auditory impacts The criteria that SPAWAR has produced to estimate temporary and permanent threshold shift in marine mammals are erroneous and non-conservative. Wright (2015) has identified several statistical and numerical faults in the Navy's approach, such as pseudo-replication and inconsistent treatment of data, that tend to bias the proposed criteria towards an underestimation of effects. Similar and additional issues were raised by a dozen scientists during the public comment period on the draft criteria held by NMFS. At the root of the problem is the Navy's broad extrapolation from a small number of individual animals, mostly bottlenose dolphins, without taking account of what Racca et al. (2015b) have succinctly characterized as a "non- linear accumulation of uncertainty." The auditory impact criteria should be revised.	The permanent threshold shift/temporary threshold shift criteria and thresholds, as set by NMFS, include numerous conservative assumptions, such as: (1) Navy assumes no recovery of hearing during time intervals between intermittent exposures. However, multiple studies from humans, terrestrial mammals, and marine mammals have demonstrated less temporary threshold shift from intermittent exposures compared to continuous exposures with the same total energy because hearing is known to experience some recovery in between noise exposures. Therefore, the Navy's approach is known to over-estimate the effects of intermittent noise sources such as tactical sonars. (2) Marine mammal temporary threshold shift data have shown that, for two exposures with equal energy, the longer duration exposure tends to produce a larger amount of temporary threshold shift. Since most marine mammal temporary threshold shift data have been obtained using exposure durations of tens of seconds up to an hour, much longer than the durations of many tactical sources, the use of the existing marine mammal temporary threshold shift data tends to over-estimate the effects of sonars with shorter duration signals. Since marine mammal hearing and noise-induced hearing loss data are limited, both in the number of species and in the number of individual's available, attempts to minimize pseudoreplication would further reduce these already limited data sets. Specifically, with marine mammal behavioral temporary threshold shift studies, behaviorally-derived data are only available for two mid-frequency cetacean species (bottlenose dolphin, beluga) and two phocids in water pinniped species (harbor seal and northern elephant seal), with OW pinnipeds and high-frequency cetaceans only having behaviorally-derived data from one species. Arguments from Wright (2015)

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		regarding pseudo replication within the temporary threshold shift data are therefore largely irrelevant in a practical sense because of limited data. Multiple data points were not included for the same individual at a single frequency - if multiple data existed at one frequency, the lowest temporary threshold shift onset was always used. There is only a single frequency where temporary threshold shift onset data exist for two individuals of the same species: 3 kHz for dolphins. Their temporary threshold shift (unweighted) onset values were 193 and 194 dB re 1 µPa2s. Thus, Navy believes that the current approach makes the best use of the given data. Appropriate means of reducing pseudoreplication may be considered in the future, if more data become available. Many other comments from Wright (2015) and the comments from Racca et al. (2015b) appear to be mistakenly based on the idea that the shapes of the auditory weighting functions and temporary threshold shift/permanent threshold shift exposure thresholds are directly related to the audiograms; i.e., that changes to the composite audiograms would directly influence the threshold shift/permanent threshold shift exposure functions [e.g., Wright (2015) describes weighting functions as "effectively the mirror image of an audiogram" (p. 2) and states "The underlying goal was to estimate how much a sound level needs to be above hearing threshold to induce temporary threshold shift." (p. 3) — both statements are incorrect and suggest a fundamental misunderstanding of the criteria/threshold derivation.] This would require a constant (frequency-independent) relationship between hearing threshold and temporary threshold shift onset that is not reflected in the actual marine mammal temporary threshold shift data. Attempts to create a "cautionary" outcome by artificially lowering the composite audiogram thresholds would not necessarily result in lower temporary threshold shift/permanent threshold shift exposure levels, since the exposure functions are to a large extent based on fitting mathematical functions to the existing temporary threshold shift data.
NRDC-30	(4) Behavioral response thresholds For its third phase of offshore range compliance, the Navy has finally abandoned the narrowly conceived behavioral risk function that it employed in its first two rounds of programmatic environmental review. In lieu of a simple dose-	Please see the *Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III) Technical Report* (U.S. Department of the Navy, 2017) for details on how the Navy accounted for the differences in captive and wild animals in the development of the behavioral risk functions. The Navy uses the best available science in the analysis which has been reviewed by external scientists and approved by NMFS. The Navy has utilized all available data for the

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	response curve, the Navy applies a biphasic function that assumes an unmediated dose-response relationship at higher received levels and a context-influenced response at lower received levels. And instead of limiting its data sources to three studies, at least one of which— the response of captive bottlenose dolphins to tones generated in a temporary threshold shift experiment—was inapposite and should not have been used, the Navy has incorporated data from a broader set of behavioral response studies, including the SOCAL BRS and the 3S project funded jointly by the U.S., French, and Norwegian navies. We agree with the Navy that a biphasic approach is better suited to the data and incorporates contextual factors far better than the simple approach it used in previous analyses; and we concur with its expansion of data sources along with its removal of the threshold shift experiment as a basis for analysis, as we have recommended. The resulting functions, however, depend on a number of inappropriate assumptions that tend to underestimate effects. (a) Data sources For example, two of the proposed behavioral response functions rely substantially on captive animal studies, even though it is generally accepted that captive animals, especially (but not limited to) those that have previously been trained, are likely to be less responsive to intrusive sound. Every data point that informs the pinniped function, and nearly two-thirds of the data points informing the odontocete function (30/49), are derived from a captive animal study. In the case of the odontocete function, the reliance on captive studies exacerbates that function's heavy dependence on the	development of updated criteria and threshold, and limiting the data to the small number of field studies would not provide enough data with which to develop the new risk functions. In addition, the Navy accounts for the fact that captive animals may be less sensitive, and the scale at which a moderate-to-severe response was considered to have occurred is different for captive animals than for wild animals, as the Navy understands those responses will be different.

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	bottlenose dolphin, a species that is generally considered relatively insensitive, to represent a diverse set of taxa with divergent sensitivity and reactiveness to mid- frequency anthropogenic noise. If, for example, the number of wild killer whale data points (n=8) and captive bottlenose dolphin data points (n=30)—a discrepancy that owes itself to the greater accessibility of captive animals—were exchanged, such that killer whales represented the larger and bottlenose dolphins the lesser amount of data, the resulting response function would differ substantially. That result is arbitrary.	
NRDC-31	Additionally, the risk functions do not incorporate (nor does the Navy apparently consider) a number of relevant studies on wild marine mammals, such as a passive acoustic study on blue whale vocalizations and a tagging study on behavioral responses to dipping sonar, for which received levels are either available or can be estimated. It is not clear from the DEIS or from the Navy's recently released technical report on acoustic "criteria and thresholds" exactly how each of the studies the Navy employed were applied in the analysis, or how the functions were fitted to the data, but the available evidence on behavioral response raises concerns that the functions are not conservative for some species. For this reason and others, and given the obvious importance of this analysis for future acoustic impact analyses, we ask the Navy to make additional technical information available, including expert elicitation and peer review (if any), so that the public can fully comment pursuant to NEPA.	The new risk functions were developed in 2016, before several recent papers were published or the data were available. The Navy continues to evaluate the information as new science is made available. The criteria have been rigorously vetted within the Navy community, among scientists during expert elicitation, and then review by the public before being applied, it is unreasonable to revise and update the criteria and risk functions every time a new paper is published. These new and future papers provide additional valuable information, and the Navy has already begun to consult them for updates to the criteria in the future, when the next round of updated criteria will be developed. Regarding consideration of research findings involving passive acoustic study on blue whale vocalizations and behavior, Navy considered multiple recent references including but not limited to: Paniagua-Mendoza, 2017; Lesage, 2017; DeRuiter, 2017; Mate, 2016; Lomac-MacNair, 2016; Friedlaender, 2016; Mate, 2015. Thus far, no new information has been published or otherwise conveyed that would fundamentally change the assessment of impacts or conclusions of this Supplemental EIS/OEIS. To be included in the behavioral response function, data sets needed to relate known or estimable received levels to observations of individual or group behavior. Melcon et al. (2012) does not relate observations of individual/group behavior to known or estimable received levels [at that individual/group]. In Melcon et al. (2012), received levels at the HARP buoy averaged over many hours are related to probabilities of D-calls, but the received level at the blue whale individuals/group are unknown.

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		As stated in MITT Supplemental EIS/OEIS Section 3.4.2.1.2.1 (Methods for Analyzing Impacts from Sonar and Other Transducers), the derivation of the behavioral response functions is provided in the technical report titled *Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III)*. The appendices to this report detail the specific data points used to generate the behavioral response functions. Data points come from published data that is readily available and cited within the technical report.
NRDC-32	(b) Incorporating effects of dipping sonar Dipping sonar, like hull-mounted sonar, appears on the basis of preliminary data to be a significant predictor of deep-dive rates in beaked whales on SOAR, with the dive rate falling significantly (e.g., to 35% of that individual's control rate) during sonar exposure, and likewise appears associated with habitat abandonment. Importantly, these effects were observed at substantially greater distances (e.g., 30 or more kilometers) from dipping sonar than would otherwise be expected given the systems' source levels and the beaked whale response thresholds developed from research on hull-mounted sonar. Researchers have hypothesized that the inherently unpredictable nature of dipping sonar—the inability of whales to track its progress in the water—make it a disproportionately powerful stressor. Yet all the data sources used to produce the Navy's behavioral response functions concern hull-mounted sonar, an R/V-deployed sonar playback, or an in-pool source. The Navy's generic behavioral response function for beaked whales thus does not incorporate their heightened response to these sources, although such a response would be presumed to shift the function "leftward." Nor do the response functions for other species account for this difference, although unpredictability is known to exacerbate stress response in mammalian species and should conservatively be presumed, in this case, to lead to a	The Navy relied upon the best science that was available to develop the behavioral response functions in consultation with NMFS. The Navy's current beaked whale BRF acknowledges and incorporates the increased sensitivity observed in beaked whales during both behavioral response studies and during actual Navy training events. The article cited in the comment (Falcone, 2017) was not available at the time the behavioral response functions were developed. The new information and data presented in the article were thoroughly reviewed when they became available and further considered in discussions following presentation in October 2017 at a recent scientific conference. The Navy will incorporate these findings into the Navy's future behavioral response functions as appropriate. However, the Navy's current beaked whale BRF covers the responses observed in the new article since the beaked whale risk function is more sensitive than the other risk functions at lower received levels. Thus far, no new information has been published or otherwise conveyed that would fundamentally change the assessment of impacts or conclusions of this Supplemental EIS/OEIS.

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	heightened response in marine mammal species other than beaked whales.	
NRDC-33	(c) Use of distance-based "cut-offs" As with injury and mortality, the Navy applies cut-offs in estimating the number of behavioral impacts on marine mammals. The DEIS does not provide pre-adjusted take numbers, as noted above, but it is evident that these cut-offs significantly affect the estimates. As the Marine Mammal Commission observed in its HSTT comments with respect to sonar type MF1 (i.e., the most powerful hull-mounted mid-frequency sonars), "the estimated numbers of takes would be reduced to zero for odontocetes beginning where the probability of response is 40 percent, for pinnipeds where the probability of response is 27 percent, and for beaked whales where the probability of response is 28 percent (Table 3.7-11 in the [HSTT] DEIS). On a related note, takes for mysticetes would be eliminated for MF1 sources at a received level of 154 dB re 1 µPa equating to a probability of response of 17 percent." Not only does this adjustment make no sense theoretically (again as the Commission observes) since distance is already incorporated in the responses functions as a contextual factor; not only are the chosen cut-offs based for each function on little to no data; but the results are inconsistent with the available data, including but not limited to blue whale feeding response, blue whale vocalization response, and opportunistic data from strandings. As the Commission notes, "Use of cut-off distances could be perceived as an attempt to reduce the numbers of takes." We urge the Navy to abandon this arbitrary, highly concerning element in its new analysis.	The consideration of proximity (cut-off distances) was part of the criteria developed in consultation with NMFS and was applied within the Navy's acoustic effects model. Cut-off distances were used to better reflect the take potential for military readiness activities as defined in the MMPA. As stated in Draft Supplemental EIS/OEIS Section 3.4.2.1.2.1 (Methods for Analyzing Impacts from Sonar and Other Transducers), the derivation of the behavioral response functions and associated cut-off distances is provided in the 2017 technical report titled *Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III)*. Briefly, much of the data used to derive the behavioral response functions was from nearby, scaled sources, thereby potentially confounding results since it is difficult to tell whether the focal marine mammal is reacting to the sound level or the proximity of the source and/or vessel amongst other potentially confounding contextual factors that are unlike actual Navy events for which the behavioral response functions (BRF's) are being derived. To account for these non-applicable contextual factors, all available data on marine mammal reactions to actual Navy activities and sound sources (or other large-scale activities such as seismic surveys when information on proximity to sonar sources is not available for a given species group, i.e. harbor porpoises) were reviewed to find the farthest distance to which significant behavioral reactions were observed. These distances were rounded up to the nearest 5 or 10 km interval, and for moderate to large scale activities using multiple or louder sonar sources, these distances were greatly increased—doubled in most cases. The Navy's BRF's applied within these distances is currently the best-known method for providing the public and regulators with a more realistic (but still conservative where some uncertainties exist) estimate of impact and potential take under military readiness for the Proposed Action within this Final Supplemental EIS/OEIS.
NRDC-34	(d) Behavioral thresholds for explosives	Marine mammals may be exposed to isolated impulses in their natural environment (e.g., lightning). There is no evidence to support the assertion that animals have significant behavioral responses (rising to the level of 'harassment'

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	For purposes of take estimation, the DEIS effectively assumes that marine mammals do not respond behaviorally to single explosive detonations. This assumption appears to derive from final rules issued under the Marine Mammal Protection Act for ship-shock trials in the late 1990s and 2000s, and is entirely without empirical support. The Navy's preferred alternative provides for detonations with net explosive weights up to 2000 lbs., enough to sink a vessel. As the Marine Mammal Commission observed in its comments on the HSTT DEIS, "The Navy provide[s] no justification for why it believes that an animal would exhibit a significant behavioral response to two 5-lb. charges detonated within a few minutes of each other but would not exhibit a similar response for a single detonation of 50 lbs., let alone detonations of up to 2000 lbs." To restate the Commission's conclusion: The Navy, in estimating takes and assessing impacts, should accept that all in-water explosive activities, including those involving single detonations, can cause behavioral takes. IV. CONCLUSION Thank you for considering our comments. We welcome the opportunity to meet with you, your staff, and other relevant offices at any time to discuss these matters.	under the MMPA definition for military readiness activities) to temporally and spatially isolated explosions, regardless of charge size. Still, the analysis conservatively assumes that any modeled instance of temporally or spatially separated detonations occurring in a single 24-hour period would result in harassment under the MMPA for military readiness activities. Further, the criteria do not preclude the consideration of animals being behaviorally disturbed during single explosions if they are exposed above the TTS threshold, which is only 5 dB higher than the behavioral harassment threshold. The range to effect for TTS would be correlated to the size of the explosive. The Navy has been monitoring detonations since the 1990s and has not observed these types of reactions. To clarify, this monitoring has occurred under the monitoring plans developed specifically for shock trials, the detonations with the largest net explosive weight conducted by the Navy (no shock trials are proposed in this Study Area). Temporary threshold shifts (TTS) and all other higher-order impacts are assessed for all training and testing activities that involve the use of explosives or explosive ordnance. All Navy monitoring projects, reports, and publications are available on the Marine Species Monitoring website (https://www.navymarinespeciesmonitoring.us/).
Friends of the Mariana Trench (FOTMT), Ignacio V. Cabrera		
FOTMT-01	We have reviewed the MITT Supplemental EIS/OEIS and our over-arching concerns are: • Training and testing activities proposed have the potential to temporarily limit access to areas of the ocean, which has the potential to impact traditional fishing practices, and tourism in the Study Area" Supplemental MITT, pg. 3.12-16. Alternatives that do not impact traditional fishing, recreation and access to	The military is committed to continuing to work with the local community on issues that potentially affect the public, including access to fishing sites, while ensuring public safety at all times. The military actively promotes compatible use of ocean areas by minimizing public access restrictions and limiting the extent and duration of necessary closures. To clarify information presented in the Draft Supplemental EIS/OEIS, range access would not always be restricted when a range is not in use; therefore, no change has been made to the document. Range access is dependent on the nature and type of activity being conducted. The Navy does not propose a change to the ocean areas currently used by both the Navy and the

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	the ocean should be developed and analyzed including other locations.	public. Restrictions on accessing areas of co-use would continue to be infrequent and short-term, while other fishing sites in the Study Area would continue to be available to the public. Proposed training and testing activities are needed to achieve and maintain military readiness within the Study Area. Alternatives carried forward were developed to meet the Navy's purpose and need and to ensure it can fulfill its obligation under Title 10 of the U.S. Code. See Section 2.4 (Action Alternatives Development) for more detailed information on the development of alternatives and rationale on why alternative training and testing locations were deemed not feasible.
FOTMT-02	• According to the Navy's MITT Fact Sheet, the active sonar testing proposed in the ocean around the Marianas will no real effect on marine mammal; however, this contradicts studies conducted by both marine scientists and the Navy itself. In a previous environmental impact statement or EIS draft, the Navy admitted that the sonar exercises planned for 2014-2018 may unintentionally "harm marine mammals 2.8 million times over five years." Included in this estimate are two million incidents of "temporary hearing loss," and two thousand incidents of permanent hearing loss." The discrepancy should be explained, and even if modeling indicates that marine mammals may be less impacted than previously estimated, methods that reduce and avoid incidents of marine mammal harm should be implemented, reducing number of sonar exercises, avoiding areas with marine mammal activity, stopping activity if a marine mammal approaches the area, etc...	The fact sheet the commenter is referring to states, that the Proposed Action "may affect certain species, but is not expected to decrease overall health and survival of any population," and that "almost all predicted effects are behavioral responses that cause no injury." The summary of findings presented in the fact sheet is consistent with the information presented in the Draft Supplemental EIS/OEIS. The potential effects of sonar and explosives on marine mammals are quantitatively estimated using the Navy's Acoustics Effects Model (see the Technical Report, *Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing*, available on the project website for details on the quantitative methodology). Predicted effects from sonar on marine mammals are presented by species in Section 3.4.2.1.2.3 (Impacts from Sonar and Other Transducers Under the Action Alternatives) and from explosives in Section 3.4.2.2.2.3 (Impacts from Explosive Stressors Under the Action Alternatives). For the Proposed Action, over a seven-year period being requested, the Navy's quantitative analysis for acoustic and explosive sources in the MITT Study Area estimates no mortality or direct injury to any marine mammal and a total of 496 Level A exposures (i.e., PTS) and 471,407 Level B exposures (i.e., TTS and behavioral impacts). Behavioral responses by marine mammal species are predicted by the acoustic effects model. Research cited in this Supplemental EIS/OEIS and in the 2015 MITT Final EIS/OEIS indicates behavioral responses by marine mammals exposed to underwater sound vary from no response to an immediate change in behavior, such as a change in swimming direction. Behavioral

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		changes are temporary and not necessarily repeated and animals frequently return to and continue their prior behavior after the initial interruption. Information on strandings associated with Navy training and testing activities is provided in the 2017 technical report, *Marine Mammal Strandings Associated with United States Navy Sonar Activities*. NMFS, as the regulator, maintains the authoritative National Stranding Database. As summarized in the fact sheet and discussed in Chapter 5 (Mitigation), the Navy would implement a robust suite of mitigation measures to avoid or reduce potential impacts on marine mammals to the maximum extent practicable. The Navy's mitigation includes a combination of procedural mitigation measures (e.g., powering down or shutting down sonar if a marine mammal is observed within a certain distance from the sonar source) and mitigation areas (e.g., prohibiting the use of explosives within two identified areas that may be particularly important for humpback whale reproduction). Additional information about the Navy's mitigation areas is presented in Appendix I (Geographic Mitigation Assessment). Information about why the Navy cannot implement further restrictions on the type or number of activities involving active sonar and explosives in the Study Area is presented in Section 5.6.1 (Active Sonar) and Section 5.6.2 (Explosives).
FOTMT-03	• The expansions proposed in the Supplemental Impact Statement for the MITT would increase the annual rate of naval surface fire explosive rounds fired on FDM from 1,000 to 2,800 (alternative 1) or 4,200 (alternative 2). Medium-caliber gunnery increases by 700 to 94,650 rounds plus 17,500 explosive rounds. The current rate of 2,000 explosive rockets is maintained, while explosive missiles increase from 85 to 115. Explosive grenade/mortar attacks increase from 600 to 2,000 per year and small-caliber rounds from 18,000 to 30,000." The training can be completed with a lower number of rounds, so the least environmentally damaging methods should be used by eliminating live rounds, or only using a minimal number of rounds.	Proposed activities are similar to those conducted in the Study Area for decades. The military has safely and effectively trained at FDM for more than four decades. This training supports aircrew combat readiness and is critical to developing the skills needed to respond to operational missions throughout the region and ensure a stable, free, and open Indo-Pacific region. The impact of training on FDM was evaluated in both the 2010 MIRC Final EIS/OEIS and 2015 MITT Final EIS/OEIS by the Navy, NMFS, and USFWS. During development and review of the 2015 MITT Final EIS/OEIS and associated Biological Opinions, specific thresholds were established that cannot be exceeded during any given 12-month period, regardless of the frequency of training, which may differ depending on training and exercise requirements. These thresholds were established during the section 7 ESA consultation between the Navy and the U.S. Fish and Wildlife Service (USFWS) and included in the USFWS's 2015 Biological Opinion. For this Supplemental EIS/OEIS, the Proposed Action included increases in some munitions types; however,

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		because of the overall changes in the munitions types used on FDM, the net increase in net explosive weight (NEW) is less than 1 percent compared to what was analyzed in the Navy's 2015 Final EIS/OEIS and USFW's Biological Opinion. After careful examination of reinitiation triggers specified in 50 CFR § 402.16 and in the 2015 Biological Opinion, the Navy has determined that this *de minimis* increase does not warrant reinitiation of section 7 consultation.
FOTMT-04	• The Supplemental EIS for the MITT does not include the full disclosure of the cumulative impacts associated with the massive live-fire range in and around the Marianas, of which the MITT is just one component. Pitt et al (2019) reported that pathways for invasive species opened by the massive live-fire range and the Marines Relocation to Guam activities are highly likely to bring numerous invasive species to the region and beyond, to Hawai'i and the U.S. mainland. These include five species of snakes including the Taiwan Pit Viper (from Taiwan and Okinawa) and the Banded Krait (from India and Southeast Asia), both of which are venomous and can be deadly to humans. Pitt, William & Stahl, Randal & Yoder, Christi. (2010). Emerging Challenges of Managing Island Invasive Species: Potential Invasive Species Unintentionally Spread from Military Restructuring. Proceedings of the Vertebrate Pest Conference. 24. 10.5070/V424110495.	The Navy used the best available science and conducted a comprehensive review of past, present, and reasonably foreseeable actions to develop a robust analysis of cumulative impacts (Chapter 4, Cumulative Impacts). As required under NEPA, the level and scope of the analysis are commensurate with the potential impacts of the action as reflected in the resource-specific discussions in Chapter 3 (Affected Environment and Environmental Consequences). The Navy considered proposed and ongoing activities alongside other activities in the region whose impacts are truly meaningful to the analysis. Furthermore, the entire Supplemental EIS/OEIS provides the cumulative impacts analysis, not just Chapter 4. Chapter 3 provides the current effects of past and present impacts and environmental conditions that represent the baseline of the environment as currently it is; Chapter 3 also discusses the consequences or potential future impacts from Navy activities. Chapter 4 discusses other reasonably foreseeable activities to the extent they are known and the incremental impact of the Navy's proposal when added to past, present, and future impacts. The proposed Live-Fire Training Range Complex is not part of this Proposed Action. However, this proposal was included in the analysis of cumulative impacts. The Navy recognizes the importance of biosecurity, ecological integrity, and resiliency of island ecosystems to the potential introduction of invasive species to the Mariana Islands associated with military training and testing. The Navy maintains that introduction of invasive species associated with military training and testing activities is low. The Navy has a number of policies in place to prevent, interdict, and control invasive species introductions in both terrestrial and marine environments. Specific policies for marine invasive species are detailed in the following Navy Instructions: OPNAV M-5090.1 Chapter 35-3.19 (Ship and Ballast Water), M-5090.1

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		Chapter 35-3.1 (Environmentally Sound Ships), and M-5090.1 Chapter 12-3.9 (Invasive Species). For potentially invasive terrestrial species, the Navy has policies and procedures in place to reduce or remove species from potential introduction pathways through their Biosecurity Plan. These measures include coordination with U.S. Department of Agriculture (USDA) Animal and Plant Health Inspection Service (APHIS) for inspection procedures for incoming cargo, equipment, and personnel from foreign locations. It should be noted that the Navy or other military services does not have jurisdiction of other potential pathways for introduction (e.g., commercial activities, U.S. mail, non-DoD personnel). As part of the INRMP, the Navy will implement management recommendations identified in the biosecurity plan for Micronesia and Hawaii.
FOTMT-05	Below we provided details for our specific comments by section and page number: Volume 1, ES.2 Purpose of and Need for Proposed Training and Testing Activities, page ES-1: It should be stated that NMFS also has the authority to evaluate the proposed action under ESA and EFH regulations, not just MMPA.	Text in this Supplemental EIS/OEIS (ES.3 Scope and Content of this Supplemental Environmental Impact Statement/Overseas Environmental Impact Statement) refers to NMFS authority to evaluate the action under the ESA and Magnuson-Stevens Fishery Conservation and Management Act, in addition to the MMPA.
FOTMT-06	Volume 1, ES.4.1 Draft Supplemental Environmental Impact Statement/Overseas Environmental Impact Statement, page ES-2: This sentence "The Draft SEIS/OEIS is available for review and comment, and two public meetings are scheduled (February 26, 2019 in Guam and February 27, 2019 in Saipan, Commonwealth of the Northern Mariana Islands [CNMI])." needs to be updated with the actual dates of the "open houses". Also, more effort should have been made to provide for native language speakers to answer questions. If there is a true interest in engaging the public, then conducting meetings in a locally, culturally appropriate way should have been the number one priority. Additional meetings on Rota and Tinian should have also been scheduled.	Text in the Final Supplemental EIS/OEIS has been updated to reflect the actual dates of the public meetings. Due to the effects of Typhoon Wutip, Navy officials postponed the public meetings originally scheduled for February 26 and 27, 2019. The Navy held the rescheduled meetings on March 18 and 19, 2019, in Saipan and Guam respectively. The Navy also held public meetings on Tinian (March 14, 2019) and Rota (March 15, 2019). Public notice of the rescheduled public meetings was published multiple days in the *Marianas Variety*, *Pacific Daily News*, and *Saipan Tribune*. The Navy issued a press release and mailed over 500 postcards to individuals and organizations. The Navy also provided a project fact sheet translated into Chamorro. The translated fact sheet was available at all four public meetings and on the project website.

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FOTMT-07	Volume 1. Table ES.6-1: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, and Alternative 2 (continued), page ES-14: please provide a copy of the survey data collected during Periodic helicopter-based surveys of FDM have occurred since 1998 (monthly up to 2009, and quarterly thereafter through September 2016) for marine birds nesting on the island.	Survey data collected during periodic helicopter-based surveys of FDM is presented in the *Farallon De Medinilla Seabird and Tinian Moorhen Analysis* (Camp et al. 2014). The Camp et al. report is available at: https://hilo.hawaii.edu/hcsu/documents/TR60_Camp_Seabird.pdf. Camp, R.J., Leopold, C., Brinck, K.W., & Joula, F. (2014). Farallon de Medinilla Seabird and Tinian Moorhen Analysis. Hawaii Cooperative Studies Unit, University of Hawaii at Hilo. Technical Report HCSU-060. December 2014).
FOTMT-08	Volume 1 ES.6.1 Cumulative Impacts, page ES-22: Reword this sentence "Under Alternative 1 and Alternative 2, danger zones could potentially restrict access to fishing and recreational areas when ranges are in use,' to read "Under Alternative 1 and Alternative 2, danger zones will restrict access to fishing and recreational areas when ranges are in use." (striking the word potentially).	Text in the Final Supplemental EIS/OEIS has been updated to reflect the requested text revision.
FOTMT-09	Volume 1 ES.7.2 Mitigation, page ES-23. This section should be rewritten to include a summary all mitigation measures that were agreed during the original FEIS process and should also include a summary of all mitigation measures that have been implemented to date, as well as, conservation actions currently being proposed to offset additional impacts of the Proposed Action.	The Executive Summary provides a high-level summary of the document. The Navy is consulting with NMFS under the ESA for potential effects on ESA listed species and received a Biological Opinion. Mitigation measures and monitoring requirements specified in the Biological Opinion are presented in Chapter 5 (Mitigation). Mitigation measures in the Biological Opinion will also be reflected in the Record of Decision.
FOTMT-10	Volume 1 ES.7.5 Reporting, page ES-24: Please include a website where monitoring reports and reports that document environmental impacts /reductions of impacts will be posted for public access.	As noted in Section 3.0.1.1 (Navy Compiled and Generated Data), the Navy invests extensively in basic and applied research. In fact, the U.S. Navy is one of the largest funding sources of marine mammal research in the world, which has greatly enhanced the scientific community's understanding of marine species. The Navy's support and conduct of cutting-edge marine mammal research includes: marine mammal detection, including the development and testing of new autonomous hardware platforms and signal processing algorithms for detection, classification, and localization of marine mammals; improvements in density information and development of abundance models of marine mammals; and advancements in the understanding and characterization of the behavioral, physiological (hearing and

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		stress response), and potentially population-level consequences of sound exposure on marine life. Within the Study Area, the Navy has sponsored several monitoring projects to better understand marine mammal and sea turtle distribution and habitat use, and to assess the presence of corals and ESA-listed species at FDM. Additional information is available on the U.S. Navy Marine Species Monitoring Program website (https://www.navymarinespeciesmonitoring.us/).
FOTMT-11	Volume 1 ES.7.6.3 Irreversible or Irretrievable Commitment of Resources, page ES-25: The following sentences should be rewritten: "Since there would be no building or facility construction, the consumption of materials typically associated with such construction (e.g., concrete, metal, sand, fuel) would not occur" , and "Since fixed- and rotary-wing flight and ship activities could increase, relative total fuel use could increase," to read "There would be no building or facility construction, therefore; the consumption of materials typically associated with such construction (e.g., concrete, metal, sand, fuel) would not occur", and "Relative total fuel use could increase because fixed- and rotary-wing flight and ship activities could increase".	The Final Supplemental EIS/OEIS has been updated to reflect the requested change in ES.7.6.3.
FOTMT-12	Volume 1, 2 Description of Proposed Action and Alternatives, 2.1.1.2 Sea and Undersea Space, page 2-3: Even though restrictions in the Marianas Trench Marine National Monument do not apply to military exercises, the Navy still is required to determine the least environmentally damaging alternative, therefore: an alternative that includes avoiding activities that could result in direct damage, or debris accumulation in the boundary of the Marianas Trench Marine National Monument should be developed and analyzed.	The least environmentally damaging practicable alternative is a requirement under Section 404 of the Clean Water Act and does not apply to the Proposed Action as the Navy is not requesting a Section 404 Permit. The military is committed to protecting the terrestrial and marine environment during training and testing activities, and the DoD strives to reduce or minimize potential impacts as much as practicable. The alternatives carried forward were developed to meet the Navy's purpose and need and to ensure it can fulfill its obligation under Title 10 of the U.S. Code. See Section 2.4 (Action Alternatives Development) for more detailed information on the development of alternatives and rationale on why alternative training and testing locations are not feasible.
FOTMT-13	Volume 2, Table 4.2-1: Past, Present, and Reasonably Foreseeable Actions (continued), page 4- 16: For the Academic	Text in the Final Supplemental EIS/OEIS has been updated to include information on foreign vessels and organizations conducting research.

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	Research section, no mention is made of foreign vessels and organizations conducting research within the study area that is coordinated through the U.S. State Department and applicable federal agencies. Please include this information in the discussion.	
FOTMT-14	Volume 2, 5.1.2.2.3. Incident Reports, page 5-7: the incident reports that have been submitted to date (since the 2015 FEIS was published) should be made available to the public and data should be analyzed and presented in this section so that an assessment of this measure's effectiveness can be made.	To date, the Navy has had no incidents involving marine mammals, sea turtles, or ESA-listed species that were (or might have been) attributable to Navy activities in the Study Area; therefore, no incident reports have been submitted. NMFS maintains the national stranding database, and public access information is at https://www.fisheries.noaa.gov/national/marine-life-distress/national-stranding-database-public-access.
FOTMT-15	Volume 2, 5.2.1.2 Mitigation Zones, page 5-11: A discussion of how often and type of measure that have been implemented in mitigation zones to date should be included, so that an assessment of this measure's effectiveness can be made.	As discussed in Section 5.1.2.2 (Monitoring, Research, and Reporting Initiatives), the Navy developed reporting requirements in cooperation with NMFS during the MMPA and ESA consultation and permitting processes. The Navy's training and testing activity reports and incident reports are designed to verify implementation of mitigation; comply with current permits, authorizations, and consultation requirements; and improve future environmental analyses. For example, the Navy reports to NMFS if mitigation was implemented during sinking exercises (e.g., number of times explosive detonations were delayed due to marine mammal sightings). For major training exercises, the Navy's annual training and testing activity reports include information on each individual marine mammal sighting related to mitigation implementation. As described in Section 5.6.7 (Reporting Requirements), the Navy does not keep records of mitigation implementation for every training and testing activity. The Navy developed its reporting requirements in conjunction with NMFS to be consistent with mission requirements and balance the usefulness of the information to be collected with the practicality of collecting it. Additional reporting requirements would draw event participants' attention away from the complex tactical tasks they are primarily obligated to perform, such as driving a warship or engaging in a gunnery event, which would adversely impact Navy personnel safety, public safety, and the effectiveness of training or testing.
FOTMT-16	Volume 2, Chapter 5- Mitigation, pages 5-1 through 5-76. Mitigation should also include offsets for impacts that are	Chapter 5 (Mitigation) presents a full description of the robust suite of mitigation measures developed to avoid or reduce potential impacts from the Proposed

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	expected to occur. The Navy should also mitigate impacts of increased marine debris, noise, decreased air and water quality by implementing tangible improvements throughout Guam and CNMI ocean and coastal zones. Sponsoring assessments, clean- ups and restoration of areas impacted either directly or indirectly by the activities proposed in MITT should be developed and are lacking. If conservation or offset measures have been implemented through the ESA consultation process, then these measures need to be included in the discussion as to their status and level of success to date. Consideration of out of kind mitigation such as restoring areas affected by coral bleaching, providing signage for sensitive resource areas, or assistance in providing education, or trainings for all stakeholders on resource management. Regular public meetings to report out status of the proposed activities, incidents that affected public safety or environmental quality, and injury to fish, wildlife, and sensitive resource should be implemented.	Action. Information on natural resource management and stewardship projects, such as sea turtle monitoring and bird recovery programs, is discussed in the Joint Region Marianas INRMP. Other projects suggested, such a restoration for coral bleaching, is outside the scope of the Proposed Action.
FOTMT-17	The Navy recently released a draft Supplemental Environmental Impact Statement (SEIS) for the MITT for public comment. Per the MITT website, the SEIS "specifically addresses the at-sea and FDM portion of the Study Area and includes a reassessment based on updated training and testing requirements; incorporates new information from an updated acoustic effects model; updates marine mammal density data; and incorporates evolving and emergent best available science." (Supplemental Draft MITT EIS Vol. 1, pg. ES-1 Volume 2, 6.1.2 Marine Protected Areas, page 6-6: Activities within Marine Protected Areas should be avoided, and a discussion of resources protected within these areas should be included. Training for personnel involved in the proposed activities should include familiarization of rules and regulations associated with special designated area.	The 2015 MITT Final EIS/OEIS presents Marine Protected Areas within the Study Area in Table 6.1-2 (Marine Protected Areas within the Mariana Islands Training and Testing Study Area) and Figures 6.1-1 and 6.1-2 (Marine Protected Areas in Guam and Saipan). No updates were required to the table or figure during the preparation of this Supplemental EIS/OEIS.

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	In summary, the destruction of the natural habitat and non-human life of the Mariana Islands poses a dire threat to the health of the indigenous peoples of the Marianas in various ways, including increased incidences of diseases and toxic exposure caused by contamination of local food and water sources by ordnance as well as civilian injuries and deaths resulting from errors that occur during military training exercises (both of which occurred during military training range exercises on the Puerto Rican island of Vieques); Also, the destruction of the natural and human environments of the Marianas poses a dire threat to the archipelago's local tourism-based economy by straining local infrastructure and degrading an essential element attracting tourists to our islands — the natural beauty of the Marianas — along with the health and capacity of the local workforce, and the degradation of the natural environment, human health and local economy of the Marianas threatens to trigger a mass emigration from the Marianas Archipelago to the continental US, spreading two relatively small indigenous groups of people across a vast tract of land in which their ethnicity is widely unrecognized and, thus, diluting and straining Mariana Islanders' capacity to participate in cultural practices, in turn, eroding any shared sense of cultural identity and threatening to extinguish local indigenous culture outright; therefore, the project should not move forward and the no action alternative selected until more reasonable, less environmentally damaging alternatives can be developed. Thank you for the opportunity to comment. Please add us to the Supplemental EIS/OEIS mailing list to receive notifications of meetings, project information, availability of reports, or any associated future federal register notices.	

	Comment	Navy Response
PaganWatch (PW), Peter Perez		
PW-01	COMMENTS SUBMITTED IN PROTEST PaganWatch protests the Navy's intentional segregation of the activities described in the Mariana Islands Training and Testing Range (MITT) from the whole of the massive-scale live-fire training and testing activities that the Navy has introduced to the Mariana Islands in a series of related, interdependent and coordinated projects in recent years. This segregation is a blatant evasion of the Navy's legal obligations under the National Environmental Policy Act to inform affected governments and communities of the cumulative impacts of their projects. By separating "MITT activities" from the whole, the cumulative impacts are not only not discussed but they are hidden, as is the massive scale of the Navy's live-fire current activities and intentions in and around the Marianas. The result is less government and community understanding, interest and participation in the NEPA required environmental assessments (EAs) and environmental impact statements (EISs), which provide public officials with relevant information and allow a "hard look" at the potential environmental consequences of proposed projects. For ease of discussion and clarity, the whole of the current and proposed massive-scale, life-fire training and testing activities in and around the Mariana Islands will be referred to in these comments as the Marianas Bombing Range (MBR). The segregation of elements of the MBR to form smaller and seemingly isolated projects goes beyond the MITT. To date, the segregated projects are: Mariana Islands Range Complex (MIRC) - 2010 Mariana Islands Testing and Training (MITT) – 2015 Marines Relocation to Guam - 2015	The Navy has been conducting training and testing activities in the Study Area for decades and proposes to continue training in the region into the reasonably foreseeable future. The activities analyzed in this Supplemental EIS/OEIS are largely a continuation of the ongoing training and testing activities that were analyzed in the 2015 MITT Final EIS/OEIS, 2010 MIRC Final EIS/OEIS, 1999 Military Training in the Marianas Final EIS, and other environmental compliance documents. This Supplemental EIS/OEIS (1) includes the analysis of activities at sea and on FDM necessary to meet readiness requirements beyond 2020 and into the reasonably foreseeable future, (2) includes any changes to those activities previously analyzed, and (3) reflects the most up-to-date compilation of training and testing activities deemed necessary to accomplish military readiness requirements. Training and testing activities within the Study Area are not dependent on other DoD activities. It is important to note that proposed military actions are not dependent on each other for their justification. For example, proposed and ongoing training and testing activities within the Study Area would proceed regardless of whether other proposed actions are taken, such as the CNMI Joint Military Training EIS. According to CEQ regulations, training and testing activities in the Study Area may logically be viewed in isolation because they have independent utility, as they are ongoing activities. In addition, courts have upheld federal agencies' decisions to organize and plan their actions in a reasonable or rational manner. Cumulative impacts of these independent actions are analyzed in this Supplemental EIS/OEIS. Because different projects have vastly different scopes, timetables, and action proponents, a joint presentation is not practicable. The Navy used the best available science and conducted a comprehensive review of past, present, and reasonably foreseeable actions to develop a robust analysis of cumulative impacts (Chapter 4, Cumulative Impacts). As required under NEPA, the level and scope of the analysis are commensurate with the potential impacts of the action as reflected in the resource-specific discussions in Chapter 3 (Affected Environment and Environmental Consequences). The Navy considered proposed and ongoing activities alongside with other activities in the region whose

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	CNMI Joint Military Training (CJMT) – Begun 2015 Divert Activities and Exercises - 2016 Litekyan (Ritidian), Live-Fire Training Range Complex (LFTRC) - 2018 Supplemental Mariana Islands Testing and Training (MITT) – 2019 These projects build on previous projects: Military Training in the Marianas – 1999 Intelligence, Surveillance, and Reconnaissance and Strike (ISR/Strike) - 2006 Each project is subject review that leads to expansion as is happening now with the MITT. There is also a high probability, based on the Navy's pattern of rolling out new projects that add even more training and testing capacity to the MBR, that the Navy will continue to initiate new projects that expand the MBR in the future. The MBR is not a collection of projects. It is a collection of facilities and activities authorized by the Navy through segregated projects. The MBR is a resource shared by three branches of the U.S. armed forces who train both separately and together in MBR facilities that are coordinated to offer a wide range of complementary training options with little to no duplication. It is clearly a giant modern bombing range that was carefully planned and its implementation orchestrated by Navy staff with experience evading NEPA and local government and public scrutiny. Below is a partial listing that summarizes the facilities and activities within the MBR based on current and proposed activities under all the segregated projects.	impacts are truly meaningful to the analysis. Furthermore, the entire Supplemental EIS/OEIS provides the cumulative impacts analysis, not just Chapter 4. Chapter 3 provides the current effects of past and present impacts and environmental conditions that represent the baseline of the environment as it is; Chapter 3 also discusses the consequences or potential future impacts from Navy activities. Chapter 4 discusses other reasonably foreseeable activities to the extent they are known and the incremental impact of the Navy's proposal when added to past, present, and future impacts.

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	• Open Ocean - 984,469 square nautical miles around the Marianas o Massive Multi-nation Naval Exercises o Passive and Active Sonar Testing o High Energy Lasers Testing o Underwater Explosives Testing o Missile Launch by Ships o Shelling by Ship • Tinian - 2/3 of the island o Airbase for Military Exercises o Artillery Firing Range o Mortar Firing Range o Tank Maneuvers Range o Amphibious Assault Beaches o Live-fire Maneuver Area o High Hazard Impact Zone o Beach Landing Craft Training o Small Boat Training • No'os (FDM) - Entire island o Air to Ground Bombing o Small, Medium and Large Caliber Gunnery o Grenades, Small Caliber Weapons o Aircraft-mounted Machineguns • Pagan - Entire island o 1,000 LB Aerial Bombardment Practice o Shelling from Navy Ships Practice o Field Artillery - Direct Firing Range o Field Artillery - Indirect Firing Range o Amphibious Beach Assault (6 areas) o Live-fire Maneuver Area o Rocket, Missile, Mortar Target Areas o High Hazard Impact Zone o Beach Landing Craft Training o Small Boat Training	

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	o Tank maneuvers o Troop ground training • Guam - Multiple Areas o Combat Vehicle Operators Course o Live-fire Shoot House o Breacher Facility o Urban Terrain Facility o Rifle Range o Pistol Range o Machinegun Range o Modified Record Firing Range o Non-standard Small Arms Range o Hand Grenade Range Though its strategic practice of breaking the MBA into segregated projects that it presents as isolated, unrelated projects, the Navy fails in its NEPA mandated obligation to provide public officials with relevant information and allow a "hard look" at the potential environmental consequences of the MBA. The Marianas public, local governments, and other stakeholders are not afforded the opportunity to be informed of the cumulative impacts of the destructive activities occurring in the MBA. Some segregated projects appear to only apply to Guam, while others appear to only apply to Saipan, while still others appear apply only to the CNMI's northern islands and Tinian. The MITT appears to only apply to the open ocean and FDM. Consequentially, the governments and communities in these separate islands think the project does not affect them and do not get involved. But each project affects every island and all the people of the Marianas because they are coordinated and interrelated projects that produce impacts not only as separate projects, but cumulatively.	

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	It is impossible to arrive at a complete, informed understanding of the cumulative impacts of all the proposed activities when they are presented one at a time, to be considered in isolation, as if each does not add to the impacts of the others. The cumulative impacts threaten the environmental health of the entire archipelago. The impacts will have cascading effects on the tourism-based economies of both Guam and the CNMI as well as on human health as our waters, land and air are contaminated by MTR activities. The U.S. Navy is well documented to be the world's biggest polluter and the worst of their activities will now be carried out on and around the Marianas. The resulting diminished attractiveness of the Marianas as a tourist destination will damage the tourism-based economies in the CNMI and Guam. The threat to human health caused by environmental contamination and the constant danger of errant ordnance hitting populated areas will force families to move away from live-fire areas and even entire islands. When considered in its true scope as a massive live fire range surrounding and on all but one of the populated Mariana islands and non-populated islands as well, the MTR is an existential threat to the American people living in Guam and the CNMI.	
PW-02	The Navy's proposal is in direct contradiction to Executive Order 12898 "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" and therefore must be withdrawn. Executive Order 12898 provides that "*each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations*."	This Supplemental EIS/OEIS fully complies with Executive Order 12898. Environmental justice is analyzed in Section 3.12 (Socioeconomic Resources and Environmental Justice) and Executive Order 12898 is listed as one of the environmental compliance requirements that were considered in preparing this Supplemental EIS/OEIS (Table 6.1-1, Summary of Environmental Compliance for the Proposed Action). In Section 3.12 (Socioeconomic Resources and Environmental Justice), the Navy analyzes the impacts of the proposed activities on socioeconomic resources and evaluates if the Proposed Action would result in a disproportionate effect on minority or low-income populations. While impacts on certain resources (e.g., accessibility to fishing sites) may increase, these impacts are not expected to be substantial. Traditional fishers in Guam and the CNMI would not be disproportionately impacted by testing and training activities

	Comment	Navy Response
	The U.S. insular islands of American Samoa, Guam, the U.S. Virgin Islands, and the CNMI all suffer high levels of poverty. But among them the CNMI is the poorest. According to the 2010 CNMI Census the CNMI has the lowest annual family median income (MFI); only $22,455 compared to Guam's $50,607, American Samoa's $24,706, and the U.S. Virgin Islands' $45,058. This is about one third of MFI in the U.S. mainland where MFI is $64,400. The CNMI's low MFI is persistent, achieving a miniscule growth of just $1,180 across the 20-year period from 1990 when CNMI MFI was at $21,275 per year. The census on the poverty level covered 53,366 individuals. The data showed 11,693 individuals were below 50 percent of the poverty level; 32,885, below 125 percent of poverty level and 40,368, below 185 percent of the poverty level. The proposed continuation and expansion of MITT live-fire and weapons testing activities described in the DSEIS/OEIS will do tremendous and irreversible damage and harm to the CNMI. The proposed activities are literally ruining our islands' reputation and appeal as beautiful and peaceful islands. We are rapidly becoming known as the world's biggest bombing range rather than a tourist destination. Loss of access to the sea as a result of the MITT activities negatively impacts local commercial and recreational fishing as well. These impacts cause economic damage to the CNMI by discouraging tourism and blocking commercial fishing. The overall effect of the proposed activities is to severely reduce economic options and opportunities for the already impoverished people of the CNMI, 97.6 percent of which are ethnic minorities. The proposed activities will bring deeper and more painful poverty to the community. This is a classic "not in my backyard" scenario where the CNMI is a scapegoat that is being forced to bear a burden that would be unthinkable in	because traditional fishing practices likely occur in the same general areas as recreational fishing, which are close to shore and far from the majority of training and testing activities. The military is committed to continuing to work with the local community on issues that potentially affect the public, including access to fishing sites while ensuring public safety at all times. The military actively promotes compatible use of ocean areas by minimizing public access restrictions and limiting the extent and duration of necessary closures. To clarify information presented in the Draft Supplemental EIS/OEIS, range access would not always be restricted when a range is in use; therefore, no change was made to the document. Range access is dependent on the nature and type of activity being conducted. The Navy is not proposing any geographic expansion of the training and testing area in this Supplemental EIS/OEIS as the proposed activities are similar to those conducted in the Study Area for decades. However, waters around FDM within 3 NM from shore would continue to be permanently closed for safety reasons due to the potential presence of unexploded ordnance. Waters around FDM within 12 NM from shore would be closed for safety reasons as necessary when the range is in use. Restrictions on accessing areas of co-use would continue to be short-term, while other fishing sites in the Study Area would continue to be available to the public.

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	any wealthy mainland American community. The proposal is therefore not in compliance with Executive Order 12898.The following questions pertain to the requesting agency's compliance with Executive Order 12898. 1. Is it your position that Executive Order 12898 does not apply to the U.S. military? If so, why not? 2. Is it your position that the protections of Executive Order 12898 do not apply to Americans living in the CNMI? If so, why not? 3. Are the adverse human health and environmental effects of proposed activities in the CNMI in proportion to what affluent and non-minority communities in the rest of the United States of America must bear for the same purposes? If yes, please explain and cite examples.	
PW-03	The proposed activities threaten the health and safety of the public. The activities described in the DSEIS/OEIS add to the damage already done to the community by the Navy and the Air Force who use the Mariana islands for live-fire training and weapons testing. These activities are poisoning our waters, destroying our land, killing our wildlife, polluting our air and ruining our health. Expended Navy ordnance can be found on and around every populated island and in most unpopulated islands as well. Some of it is unexploded and poses a continuous danger to people, especially children, who live and play among it. We now have to consider the potential for injuries to divers and swimmers who are in the water when the Navy conducts active sonar testing. There have been instances where civilians in the water during testing were seriously injured. On August 25, 1994 a scuba diver was accidentally exposed to testing of the US Navy's LFA sonar system. (Comments	The safety of the public and military personnel is of utmost importance to the military. The Navy employs precautions when planning and conducting training and testing activities, such as ensuring impact areas and targets are unpopulated prior to potentially dangerous activities; canceling or delaying activities if public or personnel safety is a concern; notifying the public of the location, date, and time of potentially dangerous activities; implementing temporary access restrictions to training and testing areas; and conducting thorough environmental and safety reviews for all test systems before tests are conducted on range sites. Section 3.13 (Public Health and Safety) includes details regarding safety and inspection procedures for aviation, submarine navigation, surface vessel navigational, sonar, electromagnetic, laser, high-explosive ordnance, and weapons firing and ordnance expenditure safety. Section 3.13 (Public Health and Safety) documents how and to what degree the activities described in Chapter 2 (Description of Proposed Action and Alternatives) could impact public health and safety. In the section, public health and safety stressors are analyzed. Additional information regarding the Navy's standard operating procedures is provided in Section 2.3.3 (Standard Operating Procedures) and Chapter 5 (Mitigation).

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	submitted at Public Hearing of California Coastal Commission, 12/12/97). The ship transmitting the sonar was over 100 miles northwest of the diver who reported distinct and disorienting lung vibration as a result. Pestorius and Curley (1996) exposed Navy divers to low frequency active sonar and reported that one of the divers had to be hospitalized and was later under treatment for seizures. A Hawaiian resident who was in the water when the Navy was conducting their low frequency active sonar test in Hawaii in March, 1998 was disoriented and nauseous afterward and had to see a physician who diagnosed her with symptoms comparable to acute trauma. (Declaration filed in court, March 25, 1998.) The Navy admitted that this swimmer was exposed to the sonar at 120 dB while she was in the water, far below the operational sonar at 240 dB. In her court declaration this woman also detailed the behavior of nearby dolphins while the broadcast was taking place. The dolphins' behavior, in her view as a naturalist and long-term observer of dolphins, was abnormal, including staying close to shore, staying near the surface and vocalizing excessively. According to the Navy's own test results on the bioeffects of low frequency (100-500 Hz, which is the frequency range of LFA) underwater sound on human divers, at 140-148 decibels a small number of divers rate their aversion to the sound as very severe. At 157 decibels they estimate that at least 20% of divers will immediately abort an open ocean dive. At 160 decibels they say the lung resonance created by LFA may induce "significant decrements in vestibular function." This effect on vestibular function may have caused the stranding of the beaked whales in the Mediterranean (Nature, 1998) when they were exposed to the sonar at 150-160 dB. Lung hemorrhaging was observed in rodents exposed to 170-184 decibels. Above 184 decibels liver hemorrhage and soft tissue damage are likely. The Navy says significant concussion effects	Based on the analysis presented in this Supplemental EIS/OEIS, public health and safety would not be adversely affected because standard operating procedures are in place to ensure there is no overlap between military and non-military activities. Various means are used to communicate information to the public about areas restricted to public or commercial activities and are described in Section 3.13 (Public Health and Safety). As specified in Title 33 CFR Subpart 72.01, Notices to Mariners, the U.S. Coast Guard issues information to the public concerning maritime navigation. Additionally, nautical charts issued by the National Oceanic and Atmospheric Administration include these federally designated zones and areas. Operators of recreational and commercial vessels have a duty to abide by maritime regulations administered by the U.S. Coast Guard. Waters around FDM within 3 NM from shore are permanently closed for safety reasons due to the potential presence of unexploded ordnance.

	Comment	Navy Response
	are unlikely to occur at levels below 194 decibels but don't explain how they reached this conclusion. According to the Navy's Draft Environmental Impact Statement the sonar sound field around the transmitting ship will be 180 dB up to 1 km away and 150-160 dB up to 160 km away (100 mi). This means that many marine animals will be exposed to LFA sonar levels capable of causing stranding and, possibly, lung hemorrhaging over large areas of the ocean. The DSEIS/OEIS also describes the Navy's intention to test high-energy laser weapons in the waters surrounding the CNMI as well. There is little information on the potential impacts of these weapons on public safety and on marine wildlife. The following questions pertain to the threat to human health caused by the Navy's testing of active sonar and high-energy lasers in our waters. 1. Can you guarantee that nobody will be killed or injured by active sonar or high-energy laser testing in the MITT? 2. What is the nature of potential injuries to humans from these weapons? 3. Access to underwater environment is critical to our island communities that relies on the ocean for food, recreation and tourism. How will MITT activities impact this access, how can the Navy avoid putting restrictions on this access? 4. What specifically, in terms of resources and the value of those resources, will be damaged, reduced or lost as a result of MITT weapons training and testing activities? What other kinds of underwater weapons testing and training in the MITT pose a threat to human health and safety?	

	Comment	Navy Response
PW-04	The DSEIS/OEIS fails to fulfil the requirement under NEPA to inform the public when it failed to make the information in the DSEIS/OEIS available to the public in a form that they could reasonably access and understand. For most people in the CNMI, English is not their first language. For almost all of us, English is not a strength. Yet the DSEIS/OEIS is 1500 pages of moderate to highly technical. Based on hundreds of conversations with members of the CNMI public by myself and colleagues, most people find EIS documents to be intimidating reading. Very few are able to comprehend the consequences of the proposed activities due to EIS documents' highly technical nature and complicated presentation. It is hard not consider that the massive DSEIS/OEIS is intentionally incomprehensible for 95% of the CNMI population in order to take advantage of the low level of reading comprehension as a strategy to avoid informing the public of the impacts of the supplemental MITT proposal. Many people here in the CNMI find this decision to produce such a document apprehensible, manipulative and grossly self-serving by the U.S. Navy. If the Navy truly wanted to follow the intent and spirit of the EIS process they would have provided versions in our local and official languages of Chamorro and Carolinian, and they would have provided comprehensive summaries that made the information accessible to the public. The NEPA process was not followed when the U.S. military failed to do effective outreach that informs the community about the impacts of its project. A version of the DSEIS/OEIS in local languages and an effective outreach program with mechanisms in place to measure its success in informing the community is both reasonable and required to comply with	The Navy understands the complexity of the information presented within this Supplemental EIS/OEIS. This Supplemental EIS/OEIS contains a rigorous scientific analysis of the potential impacts of the Navy's proposal, and thoroughly explains the scientific methodology, analysis methods, and findings. The Navy attempts to explain challenging concepts, methods, and the results of the analysis as clearly as possible in this Supplemental EIS/OEIS and developed public informational materials for lay audiences. The Navy prepared project brochures, videos, a website, and posters, using layperson terms to enhance public understanding of the information presented in this Supplemental EIS/OEIS. A project fact sheet was also translated into Chamorro. The informational materials, including the translated fact sheet, were made available at all four public meetings and on the project website (http://mitt-eis.com/). The Navy held four open house public meetings, one each on Tinian (March 14, 2019), Rota (March 15, 2019), Saipan (March 18, 2019), and Guam (March 19, 2019). The public meetings were an ideal opportunity for the public to ask questions of Navy team members about the analysis documented in this Supplemental EIS/OEIS. The Navy encouraged the public to attend these meetings and broadly notified the public through the media, including paid newspaper advertisements and news releases, and direct mail, including letters, postcards, and emails. The Navy has received feedback from attendees that the open-house format is more conducive to promoting public understanding and constructive dialogue. Open house meetings allow a greater number of individuals to directly engage and interact with Navy team members and ask questions about this Supplemental EIS/OEIS, as well as provide comments on the document. When planning the dates and locations for public meetings, the Navy considered cultural and religious holidays whenever possible. To better accommodate stakeholders and the public, the Navy provided 75 days to review and comment on the Draft Supplemental EIS/OEIS, which is 30 days longer than the minimum required time for review under NEPA. The Navy appreciates input received from local government agencies and communities on how it can improve public notification and outreach efforts.

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	the directives and intent of the National Environmental Policy Act (NEPA). In responding to this section, please ensure that the following questions that relate to compliance with the NEPA mandated requirement to conduct effective outreach that informs the community and stakeholders of the impacts of the proposed activities are answered fully: 1. Were the reading level and language skills of the CNMI community ascertained in advance of the public comment period in order to inform the outreach strategy? 2. Was any effort made to survey the public during the public comment period to find out if the information was reaching the stakeholders? 3. Was any effort made, such as the use of focus groups, in order to learn whether or not the average CNMI reader had the English literacy skills to successfully read and understand the DSEIS/OEIS and make an informed assessment of how the proposed activities would affect them?	
Ohana Ho`opakele (OHO), Ronald Fujiyoshi		
OHO-01	I find the MITT EIS totally inadequate. I oppose the inclusion of the Guam - Hawaii corridor in this EIS. This EIS is simply a request to damage nature and natural resources. Who speaks out on behalf of nature and the preservation of nature and natural resources? I see no agency that represents nature or nature's resources. Then, the only organization or representative that stands on behalf of nature or nature's resources are the public, or more specifically the indigenous people. The Chamorro people are the only ones that represent nature. Their voice must be listened to!	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.

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	This process is not fair. It is biased against the Chamorro people who represent nature. Thus, this MITT EIS is a flawed process. It cannot pass the simplest verdict of, "Is this process fair?" Thank you for allowing me and my organization to comment on this EIS!	
Mariana Islands Fishing Co-Operative (MIFCO), Gerhard Sword		
MIFCO-01	I am a fisherman. Farrallon De Medinilla (FDM) is the largest reef in Micronesia and with an abundance of a variety of fish. Our fishermen enjoy going to FDM because you never come back empty handed. Closure of Medinilla started at 3 miles then grew to 10 miles and now sits at 13 miles. Additionally, the closures used to be 3 months a year are now about 80% of the year. The open fishing times are set at a time when the waters are too rough to tread north. Safety and fuel impede venturing for fishing further north as the cell phone and VHF radio range ends at FDM. This has forced the fishermen to over-fish the southern Mariana islands fishing stocks and resort to fishing methods which cause more environmental damage. Further escalation of bombing and shelling will further diminish the times when we can fish at FDM. The real owners of the lands and waters, our children, are impacted by the very fact that they are denied the privilege of fishing in the northern islands due to the military closures. Although the lands are “leased” to the United States, the United States Navy proposes to increase shelling, bombing and	The military understands that fishing is an important socioeconomic and cultural resource for the people of the CNMI and will continue to work with the fishing community to enable safe access to fishing areas around FDM. The Navy restricts public access within a 3 NM danger zone around FDM for safety. Beyond 3 NM, the Navy may need to temporarily close the area from 3 to 12 NM for safety reasons during potentially hazardous training activities using explosives. The Navy is committed to working with fishers to accommodate the need for access to productive fishing sites. To help civilian mariners better plan fishing and boating activities that involve accessing the waters around FDM, the Navy notifies them through various means, such as U.S. Coast Guard-issued Notices to Mariners, newspapers, and social media of the time periods when FDM will not be in use for several consecutive days. Announcing in advance when FDM will be in use (and when it will not be in use for an extended period of time) facilitates use of waters around FDM by the public during time periods that will not conflict with training and testing activities. Impacts on accessibility to popular fishing areas in or adjacent to the northern part of W-517 remain accessible when activities are conducted in the southern part of the warning area (Figure 3.12-5). While closure of the entire warning area had been a concern of fishers (Tibbats & Flores, 2012), the accommodation by the military allows areas within W-517 to be open to non-military vessels for fishing and transit to Galvez Bank, Santa Rosa Reef, and White Tuna Banks (see

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	destruction of FDM up to 4 times the current allowance. This is pure negligence of damaging the land owner's property. The owners are our children. Our islands are an environmental trust, left by our forefathers. There should be a reduction in bombing and shelling since we have suffered long enough going on 40 years of the loss of use of these waters and reefs. Sonic testing should NOT happen as many of our sea creatures are destructively affected by sonar and will further upset our fragile ecosystem. We are very limited in land area and we must conserve and protect our miniscule amount of lands assign by the almighty God for our people. We are still cleaning up after World War 2 with live ammo still being unearthed every day. The Chamorro and Carolinian people almost lost our language and culture to the Spanish, Germans and Japanese and now we are in damage of losing our environment and lands to the United States of America. The US Navy is blessed that at the end of the day you all go back to your comfortable homes and families while we are left with an environmental mess and land that will be totally useless. Please curb the destruction of our lands, waters and way of life. God bless our service men and women and may God Bless the people of the Commonwealth of the Northern Mariana Islands.	Section 3.12, Socioeconomic Resources, in the 2015 MITT Final EIS/OEIS for details). As described in Section 2.3.3.2 (Sea Space and Airspace Deconfliction), the Navy restricts public access within a 3 NM danger zone around FDM for safety. Beyond 3 NM, Section 2.3.3.2 (Sea Space and Airspace Deconfliction, the Navy schedules training and testing activities to minimize conflicts with the use of sea space to ensure safety and minimize conflicts within areas used for commercial and recreational fishing, subsistence use, and tourism. The Navy is not proposing a change to the ocean areas currently used by both the Navy and the public in this Supplemental EIS/OEIS. Restrictions on accessing areas of co-use would continue to be periodic and short term (with the exception of the danger zone extending from shore to 3 NM around FDM that is permanently restricted and inaccessible to the public for safety reasons), while other fishing and tourism sites in the Study Area would continue to be available to the public. Regarding overfishing, the National Marine Fisheries Services manages fisheries in U.S. waters and sets regulations on fishing to help sustain fisheries. The Navy is not involved in setting those regulations.

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Commission on Decolonization (COD), Melvin Won Pat. Borja		
COD-01	The DEIS admits that there is still much to be learned about how sonar affects marine mammals, yet still claims that sonar testing will have no significant impacts on these animals. We have seen multiple cases of beached whales on island with very little explanation as to why this is happening. Lack of research and lack of information should not be reason to simply assume that our marine wildlife is unaffected by sonar testing. More research must be done before the U.S. Military is permitted to proceed with any amount of sonar testing (both active & passive) so that the people of Guam can make an informed decision on this proposed action. This is a stipulation set forth by D.O.D. - I suggest you honor it.	As explained in the Navy's technical report on marine mammal strandings (*Marine Mammal Strandings Associated with U.S. Navy Sonar Activities, 2017*, which is available on the project website [https://mitt-eis.com/]) marine mammal strandings have been a historic and ongoing occurrence attributed to a variety of causes, both natural and anthropogenic. Over the last 50 years, increased awareness and reporting has led to more information about species affected and raised concerns about anthropogenic sources of stranding. While there have been limited numbers of marine mammal mortalities potentially associated with U.S. Navy activities, the root causes are not clear in most cases. The Navy has continued to fund basic research on marine mammals, including behavioral response studies specifically designed to determine the effects on marine mammals from the Navy's use of mid-frequency sonar and other transducers. Relevant data needed for improving these analytical approaches for population level consequences resulting from disturbances will continue to be collected during projects funded by the Navy's marine species research programs. Navy funded projects have provided nearly the entirety of marine mammal science collected in the Marianas. In fact, prior to Navy funding of marine mammal science, there had not been any dedicated marine mammal surveys performed in the Mariana Islands. The Navy will continue to meet its mission requirements as it funds research investigating the potential effects of training and testing on marine species. The Navy has implemented an adaptive management plan in coordination with NMFS to periodically review recent science and evaluate its mitigation procedures.
COD-02	With a training & testing area that is 984,469 sq. miles, it is difficult to imagine that the proposed activities do not predict a significant impact on air quality, marine vegetation & marine habitats or that the proposed bombing of FDM (& Pagan for that matter) would have no significant impact on our cultural resources. This islands & this ocean are some our most valuable resources and any threat to them is a significant impact. 12,580 detonations per year for 5 years is	The military is committed to protecting the environment during the conduct of its military training and testing activities, including FDM. Effects from military training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of the EIS/OEIS. Also, as described in Chapter 5 (Mitigation) of this Supplemental EIS/OEIS, the Navy implements mitigation measures during its training and testing activities to avoid or reduce potential impacts on biological and cultural resources.

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	unacceptable, & mitigations like "posting qualified lookouts" or "participating in the U.S. Coral Reef Task Force" are not only inadequate, they are insulting. Furthermore, this type of hyper-militarization of our island is counterproductive and even destructive to Guahan's right to decolonize - a right recognized by the United Nations as per Resolution 1514 & 1541 - a resolution signed by the U.S. binding them in sacred trust to uphold.	Training and testing activities are proposed to occur at sea and on FDM. Tables 2.5-1 and 2.5-2 of Chapter 2 (Description of Proposed Action and Alternatives) in this Supplemental EIS/OEIS present current and proposed training and testing activities. The Navy analyzed land-based activities on Guam, Saipan, Tinian, and Rota in the 2015 MITT Final EIS/OEIS; the Navy did not reanalyze land-based activities in this Supplemental EIS/OEIS because there are no changes proposed to those land-based activities. The Proposed Action does not include Pagan.
Chamorro Cultural Development and Research Institute (CCDRI), Trini Torres		
CCDRI-01	In the first place, we do not want the transfer of the many thousands of marines (5,000 to 8,000+marines) to Guam -- the dumping ground for the marines from Okinawa to Guam. Then-- you need lands, housing, tearing down/clearing of forests (including lime forests), animal habitats, destruction of natural and historical treasures, the killing of the Mariana crow, the kingfisher, the Mariana fruit bats, the hayun lagu, the numerous marine large and small animals (including microbes), the corals and their reefs which protect the safety of our Island of Guam from sea storms and which very importantly provide habitats for fishes and other marine creatures, big and microbes. The ruining of the sea bottoms (which will never be cleaned up just as the military left their old war machines, training arms and machineries, and war gears in Puerto Rico Culebra and Vieques ocean waters left or dumped, to rust and rot (actual views during my visit during a conference there in 2000). The ruining of our indigenous fishing habitats as we have been deprived from fishing in our traditional fishing waters in developed marine preserves, and in the ocean and fresh water bodies under control of the military bases and ammunition storages, and the restricted areas for military trainings and military control of harbors. And now you are demanding to	Training and testing activities are proposed to occur at sea and on FDM. Tables 2.5-1 and 2.5-2 of Chapter 2 (Description of Proposed Action and Alternatives) in this Supplemental EIS/OEIS present current and proposed training and testing activities. The Navy analyzed land-based activities on Guam, Saipan, Tinian, and Rota in the 2015 MITT Final EIS/OEIS; the Navy did not reanalyze land-based activities in this Supplemental EIS/OEIS because there are no changes proposed to those land-based activities. The Navy will continue to implement procedural and mitigation measures to avoid, minimize, and mitigate environmental impacts from the Proposed Action. The Proposed Action does not include the transfer of Marines to Guam.

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	have permanent control of the ocean waters and beaches within the "Finegayan" military training and firing range. And in addition, an especially large area in our sea for danger range to involve the presence of ships and their dangerous sonar and rocket firing, explosions, and every war maneuver possible and live-training activities to be conducted. You mean to take over another big part of our most fertile land, another large area of our ocean waters, Litekyan, with its pristine beach, trees and plants? And you also mean to keep us out from fishing in Litekyan--fishing, which we have traditionally depended on for our survival? Do you want to keep repeating the many harm and destructions your U.S. military bases abroad have done to Guam and Puerto Rico, and other hand and destructions they have done to America and the World (Vine, David, 2015. BASE NATION: How U.S. Military bases abroad harm America and the World; New York, pp. 144-148.) and are still doing to American and the World. Do not forget the destruction the U.S. Military have done in their bases in the world. And most important, let's not forget the impacts on the environmental ecosystem and natural resources on Guam's surrounding lands. Their firing range complex and what are being fired from it, above and below into the surrounding lands and tree areas and the ocean, and from the beaches to the depths of the sea are tremendously noisy, frightening, and deafening to our Guam Island people. Live ammunitions firing by military in training, particularly the presence of numerous marines, machine guns firing, bring nightmares to our Chamoru people, just as what happened to our Charnoru people during and after World War II. We don't really want the marines, their dependents and the administrative staff here in large numbers on Guam. My offspring and I are also heirs to the Finegayan land (original	

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	name is Finaguayok (Northwest Field). Finaguayok was then a very fertile land with tropical trees like the rare ijit trees, and historic remains of our ancestors. My own grandfather owned a large parcel of land in Finaguayok, and he and other farmers used to farm a lot on a daily basis to feed their families and to sell. Now that land is taken up and controlled by the U.S. Military and now reserved for the Marines and their dependents (and a large number of administrative staff who were also known with Marines to have raped Okinawan women?) All of these marines and their dependents and administrative staff could be based in any or several states in the continental U.S. Why not? Costs should also be considered. We don't welcome these people on Guam. We are also at present overcrowded with people from other Micronesians, Filipinos, and others from other countries allowed by the U.S.to migrate to Guam. We can depend on ourselves for our survival and especially on sustainability for our survival. Si Yu'os ma'ase' (May God have Mercy), Chamoru Yul	
EarthJustice (EJ), David L. Henkin		
EJ-01	The National Environmental Policy Act ("NEPA") commands all federal agencies, including the Navy, to prepare an environmental impact statemen t ("EIS") for all "major Federal actions significantly affecting the quality of the human environment." 42 U.S.C. § 4332(2)(C). "The primary purpose of an [EIS] is to serve as an action-forcing device to insure that the policies and goals defined in [NEPA] are inf used into the ongoing programs and actions of the Federal Government." 40 C.F.R. § 1502.1. An EIS must "provide full and fair discussion of significant environmental impacts and [must] inform decision makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the	The Navy has been conducting training and testing activities in the Study Area for decades and proposes to continue training in the region into the reasonably foreseeable future. The activities analyzed in this Supplemental EIS/OEIS are largely a continuation of the ongoing training and testing activities that were analyzed in the 2015 MITT Final EIS/OEIS, 2010 MIRC Final EIS/OEIS, 1999 Military Training in the Marianas Final EIS, and other environmental compliance documents. This Supplemental EIS/OEIS: 1) includes the analysis of activities at sea and on FDM necessary to meet readiness requirements beyond 2020 and into the reasonably foreseeable future; 2) includes any changes to those activities previously analyzed; and 3) reflects the most up-to-date compilation of training

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	quality of the human environment." Id. An EIS must discuss, among other things: the environmental impact of the proposed federal action, any adverse and unavoidable environmental effects, any alternatives to the proposed action, and any irreversible and irretrievable commitment of resources involved in the proposed action. 42 U.S.C. §4332(2)(C); see also id. § 4332(2){E). <u>Effects of the Action</u> The Draft SEIS falls far short of complying with NEPA's command for the Navy to take a "hard look" a t the environmental consequences of its proposed training and testing activities in the Mariana Islands. 'Ilio' ulaokalani Coalition v. Rumsfeld, 464 F.3d 1083, 1094 (9th Cir. 2006). To comply with NEPA, the SEIS must thoroughly analyze all impacts associated with all proposed activities, including all "ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health" effects. 40 C.F.R. § 1508.8. Among other things, the SEIS must analyze the impacts to local communities from noise, restrictions on access to fishing grounds, restrictions on access to beaches used for recreation and subsistence activities, and disruptions to marine and air transportation between the Mariana Islands that is vital for, among other things, access to emergency medical treatment. The SEIS must disclose all impacts, "whether direct, indirect, or cumulative." *Id.*	and testing activities deemed necessary to accomplish military readiness requirements. This Supplemental EIS/OEIS fully complies with NEPA, includes extensive studies and analysis, and, using the best available science, exceeds the required hard look at impacts on the human and natural environment. The military is committed to protecting the environment while training and conducting testing. A comprehensive analysis of potential effects on environmental resources from Navy training and testing activities is presented in Chapter 3 (Affected Environment and Environmental Consequences) of the Draft Supplemental EIS/OEIS. These resources include: water quality and sediment quality, marine habitats, marine mammals, fish, sea turtles, birds, socioeconomics, cultural resources, and invertebrates. While some impacts would occur from training and testing activities, the analysis concludes that impacts would be minimal and would not have a significant impact on the environment. As described in Chapter 5 (Mitigation), the Navy implements mitigation measures during its training and testing activities to avoid or reduce potential impacts on biological and cultural resources.
EJ-02	*Cumulative Impacts* With respect to cumulative impacts, the SEIS must consider the full range of past, current and planned future military activities in the Mariana Islands. See id. §§ 1508.7, 1508.25{a)(2) & (c). The quality of life of local communities in	The Navy used the best available science and conducted a comprehensive review of past, present, and reasonably foreseeable actions to develop a robust analysis of cumulative impacts (Chapter 4, Cumulative Impacts). As required under NEPA, the level and scope of the analysis are commensurate with the potential impacts of the action as reflected in the resource-specific discussions in Chapter 3

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	the Mariana Islands is threatened by a wide range of current and proposed military activities that the Navy is obliged to, but failed to, examine fully in the SEIS. The Draft SEIS acknowledges the Navy's duty to analyze the cumulative impacts of a number of past, present and reasonably foreseeable "military mission, testing, and training activities" in the Marianas, including, but not limited to, the relocation of thousands of Marines from Okinawa to Guam, the Commonwealth of the Northern Mariana Islands ("CNMI") Joint Military Training ("CJMT") proposal, and Divert activities and exercises. See Draft SEIS at Table 4.2-1. Unfortunately, the Draft SEIS then fails to take the requisite "hard look" and, instead, provides only cursory, conclusory statements. For example, the Draft SEIS states vaguely that "[o]ther military activities that limit access to popular fishing sites could increase cumulative socioeconomic impacts on commercial, recreational, and subsistence fishers beyond impacts associated with the Proposed Action." Id. at 4-45. The Draft EIS then notes the potential for "significant cumulative impacts on certain socioeconomic resources in the Study Area ... if they resulted in extensive limitations on accessibility by residents, businesses, and tourists to ocean areas needed for commercial, recreational, and subsistence fishing and tourism." *Id.* The Draft SEIS fails, however, to "provide any objective quantification" of these potentially significant impacts, and "[t]he reader is not told what data the conclusion was based on, or why objective data cannot be provided." Klamath-Siskiyou Wildlands Ctr. v. Bureau of Land Mgmt., 387 F.3d 989, 994 (9th Cir. 2004). Such "[g]eneral statements about possible effects and some risk" do not satisfy NEPA. Neighbors of	(Affected Environment and Environmental Consequences). The Navy considered proposed and ongoing activities alongside with other activities in the region whose impacts are truly meaningful to the analysis. Furthermore, the entire Supplemental EIS/OEIS provides the cumulative impacts analysis, not just Chapter 4. Chapter 3 provides the current effects of past and present impacts and environmental conditions that represent the baseline of the environment as it is; Chapter 3 also discusses the consequences or potential future impacts from Navy activities. Chapter 4 discusses other reasonably foreseeable activities to the extent they are known and the incremental impact of the Navy's proposal when added to past, present, and future impacts. The Navy acknowledges the potential for cumulative impacts on some socioeconomic resources that depend on access to certain areas of the marine environment, such as fishing and tourism. The Navy used the best available data and information to analyze how the proposed training and testing activities would impact fishing and tourism in Section 3.12 (Socioeconomic Resources and Environment Justice). Metrics, including fisheries landings and trends in visitation to Guam and the CNMI, are used to quantify the analysis to the extent data are available. It is reasonable to assume that military training and testing activities that require exclusive use of ocean space (e.g., around FDM), if only temporarily, would contribute to access limitations by the public to those areas. Analysis results in Section 3.12 (Socioeconomic Resources and Environment Justice) show impacts on accessibility would not be significant.

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	Cuddy Mountain v. U.S. Forest Serv., 137 F.3d 1372, 1380 (9th Cir. 1998).[1]	
EJ-03	*Impacts to Marine Mammals* MITT activities threaten serious harm to marine mammals, with Navy use of sonar and explosives posing particularly significant threats. See generally U.S. Navy, Request for Regulations and Letter of Authorization for the Incidental Taking of Marine Mammals Resulting from U.S. Navy Training Activities in the Mariana Islands Training and Testing Study Area (Feb. 2019) ("LOA Application") (seeking authorization to harm marine mammals in conducting MITT activities); 84 Fed. Reg. 9,495 (Mar. 15, 2019). To satisfy NEPA's command to provide "high quality" environmental information to public officials and the public, the Navy must evaluate those impacts based on the most up-to-date scientific information available. See 40 C.F.R. § 1500.l(b). As a threshold matter, the Draft SEIS's analysis of impacts to marine mammals relies substantially on scientific recommendations about marine mammal noise exposure criteria that are over a decade old. See, e.g., Draft SEIS at 3.4-93 (citing Southall et al., 2007). The Navy must revise its analysis to incorporate the latest scientific knowledge on this critical topic. See, e.g., Southall et al., Marine Mammal Noise Exposure Criteria: Updated Scientific Recommendations for Residual Hearing Effects, Aquatic Mammals, 45(2): 125-232 (Mar. 2019) (enclosed).	This Supplemental EIS/OEIS does in fact rely on best available science to assess acoustic impacts on marine mammals. The acoustic criteria used in the analysis in this Supplemental EIS/OEIS are provided in the Technical Report titled *Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III)*. This technical report was included in the description of the acoustic and explosive impact analyses in this Supplemental EIS/OEIS and is available at https://mitt-eis.com. Southall et al. (2019) was published after the Notice of Availability of the Draft Supplemental EIS/OEIS. As shown in the above technical report, however, the auditory criteria used in the Navy's analysis and the recommended criteria in Southall et al. (2019) are the same.
EJ-04	In addition, the Draft SEIS fails to take the legally required "hard look" at the impacts to marine mammals in the Marianas of stranding events related to the Navy's use of sonar, including, but not limited to, mid-frequency active ("MFA") sonar, and explosives. As the Navy has previously acknowledged, "[s]onar use during exercises involving the U.S.	Cuvier's beaked whale strandings in the Study Area are summarized in Section 3.4.1.17.5 (Species-specific Threats) in the background information on Cuvier's beaked whales. The Navy's analysis of impacts on beaked whales took into account their greater sensitivity to disturbance relative to other marine mammals, as demonstrated by the data used to develop the behavioral response criteria for beaked whales [see the technical report titled *Criteria and Thresholds for U.S. Navy*

	Comment	Navy Response
	Navy has been identified as a contributing cause or factor in five specific mass stranding events" that "have resulted in about 40 known cetacean deaths, consisting mostly of beaked whales and with close linkages to m id-frequency active sonar activity." LOA Application at 92.[2] The Navy has further conceded that "[i]mpulsive sources (e.g., explosions) also have the potential to contribute to strandings." LOA Application at 165. In the Draft SEIS, the Navy notes that many marine mammals have died or been injured in stranding events in the Mariana Islands, including species known to be extremely sensitive to anthropogenic noise, including Navy sonar. See, e.g.. ., Draft SEIS at 3.4-8. Such species include Cuvier's beaked whales, which the draft SEIS notes has had repeated stranding events in the Marianas in the past 12 years and is known to be particularly vulnerable to Navy sonar. *Id.* at 3.4-28. The Draft SEIS fails to mention, however, that "MFA sonar was detected near Saipan concurrent with [the August 21, 2011] stranding event involving two Cuvier's beaked whales." Simonis et al., M id-frequency active sonar and beaked whale acoustic activity in the Northern Mariana Islands, Journal of the Acoustical Society of America, 140(4) (November 2016) (enclosed).	*Acoustic and Explosive Effects Analysis (Phase III)* available at https://mitt-eis.com]. This Final Supplemental EIS/OEIS includes additional information of Cuvier's beaked whale strandings relative to sonar use in the Study Area in Section 3.4.2.1.1.6 (Stranding) under Environmental Consequences due to Acoustic Stressors in the Marine Mammal section (Section 3.4). Additional information does not change the conclusions of the analysis of potential impacts on Cuvier's beaked whales described in this Final Supplemental EIS/OEIS.
EJ-05	Similarly, the Draft SEIS notes that melon-headed whales experienced a "mass stranding" event involving a few hundred animals at Sasanhaya Bay, Rota in 2004, but fails to disclose or analyze the implications of a National Oceanic and Atmospheric Administration ("NOAA") study that concluded a similar mass stranding event involving melon-headed whales in Hawai'i was likely caused by Navy sonar. Draft SEIS at 3.4-35; see Southall et al., Hawaiian Melon-headed Whale (Peponacephala electra) Mass Stranding Event of July 3-4, 2004, NOAA Technical Memorandum NMFS-OPR-3 1(April 2006) (enclosed); see also Draft SEIS at 3.4-36 ("melon-headed	Please see the technical report cited in the Draft Supplemental EIS/OEIS and this Final Supplemental EIS/OEIS titled *Marine Mammal Strandings Associated with U.S. Navy Sonar Activities* (www.mitt-eis.com) for a discussion of the melon-headed whales observed at Hanalei Bay, Hawaii and concurrently at Sasanhaya Bay, Rota in 2004. As explained in that report, it is unlikely that sonar caused the melon-headed whales to enter Hanalei Bay or resulted in the behaviors noted. In 2004, the Navy verified that there was no sonar use in the Mariana Islands area during or preceding the 2004 Sasanhaya Bay mass stranding, nor were any Navy surface ships at sea in the vicinity.

	Comment	Navy Response
	whales may be particularly sensitive to impacts from anthropogenic sounds").	
EJ-06	That Navy sonar may be responsible for the Cuvier's beaked whales and melon-headed whales that died and were injured in these stranding events cannot be dismissed lightly. The Navy failed, however, to disclose and analyze in its Draft SEIS the potential link between the Navy's use of sonar and explosives and these stranding events, or the multiple other stranding events in the Marianas involving Cuvier's beaked whales, melon-headed whales, and other marine mammal species. See, e.g., Draft SEIS a t 3.4-28 (four known dwarf sperm whale strandings in the Mariana Islands), 3.4-30 (three reported false killer whale strandings in Study Area), 3.4-35 (melon-headed whale strandings on Guam in 1980 and 2009), 3.4-38 (stranding of pygmy sperm whale in Study Area). Overall, the Draft SEIS's failure to take the requisite hard look a t the potential for Navy sonar and explosives to provoke stranding events that cause death or injury to marine mammals violates NEPA's command to "insure that [high quality] environmental information is available to public officials and citizens before decisions are made and before actions are taken." 40 C.F.R. § 1500.l(b).	Although records of marine mammal strandings exist as far back as 1878 in Guam, reporting of marine mammal strandings across the Mariana Islands has likely only become consistent in recent years, similar to other regions, whereas sonar use has occurred in the area around the Mariana Islands for decades. While exact causes of strandings are uncertain, scientists have identified potential contributing factors for strandings, including age, illness, or disease; ingestion of marine debris/plastics; contaminant load; and manmade sources. A small number of strandings have been associated with the use of U.S. Navy sonar; none of these have occurred in the Study Area. The technical report cited in the Draft Supplemental EIS/OEIS and this Final Supplemental EIS/OEIS titled *Marine Mammal Strandings Associated with U.S. Navy Sonar Activities* (available at https://mitt-eis.com) summarizes: (1) stranding events associated with Navy sonar activities, and (2) strandings speculated but not linked to Navy sonar activities. This report also discusses other natural and anthropogenic factors that have been shown to contribute to strandings. The Center for Naval Analysis (CNA) recently conducted a statistical study of correlation of beaked whale strandings around the Mariana Islands with the use of U.S. Navy sonar, finding that insufficient evidence of a correlation exists. The CNA study used the complete record of all U.S. Navy sonar use between 2007 and 2019, including major training events, joint exercises, and unit level training/testing. The analysis also included the complete beaked whale stranding record for the Mariana Islands through 2019. Following the methods in Simonis et al. (2020), the CNA analysis found insufficient evidence of a correlation between sonar use and beaked whale strandings when considering the complete sonar use record. The CNA finding is in contrast to the finding in Simonis et al. (2020), which depicted a significant correlation between beaked whale strandings and Navy sonar use. However, the Simonis et al. (2020) result relied on substantially incomplete or inaccurate assumptions about U.S. Navy sonar use around the Mariana Islands. CNA also conducted statistical analyses specific to each island where beaked whale strandings have been observed in the Mariana Islands, similarly finding insufficient evidence of a correlation to sonar use. Additional information on the findings of

	Comment	Navy Response
		the CNA analysis are presented in Section 3.4.2.1.1.6 (Stranding) in Chapter 3.4 (Marine Mammals). The Navy's analysis of impacts on beaked whales took into account their greater sensitivity to disturbance relative to other marine mammals, as demonstrated by the data used to develop the behavioral response criteria for beaked whales [see the technical report titled *Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III)* available at https://mitt-eis.com]. This Final Supplemental EIS/OEIS includes additional information of Cuvier's beaked whale strandings relative to sonar use in the Study Area in Section 3.4.2.1.1.6 (Stranding) under Environmental Consequences due to Acoustic Stressors in the Marine Mammal section (Section 3.4). Additional information does not change the conclusions of the analysis of potential impacts on Cuvier's beaked whales described in this Final Supplemental EIS/OEIS. As described in Section 5.1.2.2.1 (Marine Species Research and Monitoring Programs), for this Final Supplemental EIS/OEIS, the Navy agreed to several additional research and monitoring initiatives designed to help advance the understanding of beaked whales and strandings in the MITT Study Area. The Navy will co-fund the Pacific Marine Assessment Program for Protected Species (PACMAPPS) Mariana Islands survey in spring-summer 2021 and future studies starting in 2022 to help document beaked whale occurrence, abundance, and distribution in the Mariana Islands. The Navy will also fund additional stranding response and necropsy analyses for the Pacific Islands region, and research on a framework to improve statistical stranding analysis. Collaboratively with NMFS, the Navy will fund and organize an expert panel to provide recommendations on scientific data gaps and uncertainties for further protective measure consideration to minimize potential impacts of Navy training and testing activities on beaked whales in the Mariana Islands.
EJ-07	*Alternatives* The alternatives section "is the heart of the environmental impact statement." Id. § 1502.14. In this section, the Navy	The military is committed to protecting the terrestrial and marine environment during training and testing activities, and the DoD strives to reduce or minimize potential impacts as much as practicable. The alternatives carried forward were developed to meet the Navy's purpose and need and to ensure that it can fulfill its

	Comment	Navy Response
	must "[r]igorously explore and objectively evaluate all reasonable alternatives," devoting ''substantial treatment to each alternative considered in detail ... so that reviewers may evaluate their comparative merits." Id. § 1502.14(a), (b). The core purpose of the alternatives analysis is to "sharply def in[e] the issues and provid[e] a clear basis for choice among options by the decisionmaker and the public." Id. § 1502.14. As discussed above, local communities in the Mariana Islands face serious threats from military activities. Accordingly, in the scoping comments we submitted for the SEIS in September 2017, we urged the Navy to consider a range of alternatives that would allow the Navy to carry out its mission while avoiding or, at least, minimizing the impacts on those communities. As noted in our scoping comments, reasonable alternatives include eliminating or severely restricting training and testing activities in locations that would inflict high levels of noise on the civilian population, would restrict access to fishing grounds, would restrict access to beaches used for recreation or subsistence, and/or would disrupt the ability of civilians to travel between islands by air or sea (e.g., to access medical treatment or visit with relatives). The Draft SEIS fails to consider all such alternatives, violating NEPA's command "to permit informed public comment on ... choices or alternatives that might be pursued with less environmental harm." Lands Council v. Powell, 395 F.3d 1019, 1027 (9th Cir. 2004).	obligation under Title 10 of the U.S. Code. See Section 2.4 (Action Alternatives Development) for more detailed information on the development of alternatives. As required by the CEQ regulations, the Navy included the No Action Alternative. In Appendix I (Geographic Mitigation Assessment), the Navy analyzed area restrictions to ensure decision makers take into account all possible approaches which would mitigate environmental impacts. Pursuant to 40 CFR 1502.14(f) appropriate mitigation measures can be considered outside the context of reasonable alternatives. Tables 2.5-1 and 2.5-2 in Chapter 2 (Description of Proposed Action and Alternatives) present the current and proposed training and testing activities. The training and testing activities largely occur in locations away from the public and thus would not result in high levels of noise on the civilian population. The Navy analyzed land-based activities on Guam, Saipan, Tinian, and Rota in the 2015 MITT Final EIS/OEIS; the Navy did not reanalyze land-based activities in this Supplemental EIS/OEIS because no changes are proposed to those land-based activities. The military is committed to continuing to work with the local community on issues that potentially affect the public, including access to fishing sites while ensuring public safety at all times. The military actively promotes compatible use of ocean areas by minimizing public access restrictions and limiting the extent and duration of necessary closures. The Navy does not propose a change to the ocean areas currently used by both the Navy and the public. Restrictions on accessing areas of co-use would continue to be infrequent and short-term, while other fishing sites in the Study Area would continue to be available to the public.

	Comment	Navy Response
EJ-08	In our scoping comments, we also urged the Navy to consider alternatives that eliminate--or, at least, severely limit-training and testing activities in biologically sensitive areas. After all, as NOAA has recognized, there is a general consensus among the scientific community that "[p]rotecting important marine mammal habitat is… the most effective mitigation measure currently available" to reduce the harmful impacts of mid-frequency sonar on marine mammals. Letter from Jane Lubchenco, then-Under Secretary of Commerce for Oceans and Atmosphere, to Nancy Sutley, then-Chair of the Council on Environmental Quality at 2 (Jan. 19, 2010) (enclosed). We specifically urged the Navy to consider alternatives that impose restrictions on MITT activities in areas identified as likely calving grounds for humpback whales during the winter months when humpbacks are present in the Marianas (December to April). Unfortunately, the Draft SEIS fails to evaluate any alternative that would prohibit all use of sonar in the two "geographic mitigation areas" proposed for humpbacks--Marpi Reef and Chalan Ka noa Reef--during the few months when humpbacks are present in the Mariana Islands to breed, birth and nurse. Instead, the Draft SEIS examines only a single alternative, in which the Navy would merely report to NMFS the total hours of MF1 surface ship hull-mounted MFA sonar used in these areas. Draft SEIS at I-12, I-20. This proposed "mitigation" does nothing to protect humpbacks. It is entirely feasible and reasonable for the Navy to consider alternatives that prohibit the use of sonar altogether in these limited portions of the MITT Study Area during the few months when humpbacks are present. The Navy is proposing to establish a "geographic mitigation area" to benefit spinner dolphins in the nearshore waters of Agat Bay, Guam, where	Recognizing the importance of the Mariana Islands to marine mammals, the Navy has developed three geographic mitigation areas in this Supplemental EIS/OEIS. Appendix I (Geographic Mitigation Assessment) includes information about areas considered and evaluated to be potential mitigation areas. Each area was assessed based on two criteria: (1) is the area a key area of biological importance for one or more marine mammal species or sea turtle species for an important life process, and (2) would the mitigation result in an avoidance or reduction of impacts. In addition, implementation of the area as a mitigation area must be practical and allow the Navy to carry out its mission requirements. The Navy used the best available scientific data on vulnerable or sensitive species, such as humpback whales, to identify the three geographic mitigation areas that met the two criteria. Updates to the appendix have been made in the Final Supplemental EIS/OEIS based on the Navy's ESA and MMPA consultations with NMFS. Appendix I (Geographic Mitigation Assessment) details the geographic mitigation areas where training and testing activities using explosives would be prohibited, and surface ship hull-mounted MF1 mid-frequency active sonar would be prohibited or restricted seasonally. To meet training and testing requirements in the Mariana Islands, the Navy needs to have the ability to conduct activities using mid-frequency sonar in relatively shallow-water environments, such as in the vicinity of Saipan, which are limited in the Study Area. In Hawaii, the Navy was able to prohibit mid-frequency sonar (MF1) use in the 4-Islands Region Mitigation Area as additional shallow water areas are available, preserving the ability to train and test with mid-frequency sonar in relatively shallow waters in the Study Area.

	Comment	Navy Response
	MF1 sonar will be prohibited year-round. Id. at I-24 to I-26. In Hawai'i, the Navy likewise has prohibited all use of MF1 sonar in the 4-Islands Region Mitigation Area during the winter months when humpbacks are present. U.S. Navy, Hawaii-Southern California Training and Testing Final EIS/OE IS at 5-70 to 5-72 (Oct. 2018) (excerpts enclosed). The Navy has no excuse for refusing to consider alternatives involving a similar prohibition in important humpback whale habitat off Saipan. Thank you for your consideration of these comments.	

Table K-4: Response to Comments from Individuals

	Comment	Navy Response
Else Demeulenaere (ED)		
ED-01	The proposed actions in the MITT Study Area, using active sonar, explosives and other detrimental actions allow for over 80,000 takings of 26 marine mammal species per year for five years and allow to damage or kill over six square miles of endangered coral reefs. The Mariana Islands archipelago is part of the Micronesia-Polynesia biodiversity hotspot and is recognized internationally. Therefore, this valuable biodiversity, which is part of the archipelago's cultural and natural heritage, is at stake. I'm also concerned about the coastal habitats and their destruction, due to debris and pollutants. Damage to the coastal habitats can be detrimental for the fauna and flora inhabiting these habitats. Sea turtle, sea birds, … can be adversely affected by habitat destruction, ingestion of dangerous substances. It is also unclear what will happen to injured animals. The cumulative effects from previous, current and future actions is unknown and certainly not the sustainable future our people are hoping for. I'm also concerned about the islands' people's mental and physical health. Families have been displaced away from some of the northern islands long time ago, during previous colonization, families still have descendants who might want to visit these islands, and even relocate back. In addition, land and submerged cultural resources/sites will be affected, as well fishing grounds. The thought of not having that possibility anymore to return to their homeland due to military training and or contamination of military expended material is a true concern. The traditional healers in the archipelago stand in solidarity with each other and feel the connection that binds them as all the Mariana Islands are one. Again, the cumulative effect or potential impact is not	This Supplemental Environmental Impact Statement (EIS)/Overseas EIS (OEIS) fully complies with the National Environmental Policy Act (NEPA). Using the best available science, the extensive studies and analysis conducted by the Navy exceeded the required hard look at impacts on environmental resources. The potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. In accordance with Council on Environmental Quality (CEQ) guidance, Chapter 4 (Cumulative Impacts) focused on impacts that are truly meaningful. This was accomplished by reviewing the direct and indirect impacts that would occur for each resource area. Key factors considered were the current status and sensitivity of the resource and the intensity, duration, and spatial extent of the impacts of each potential stressor. In general, long-term and widespread impacts were considered more likely to contribute to cumulative impacts than short-term and localized impacts. Those impacts on a resource that were considered to be negligible were not considered further in the analysis. The level of analysis for each resource was commensurate with the intensity of the impact identified in Chapter 3 (Affected Environment and Environmental Consequences). As explained in the Navy's technical report (*Marine Mammal Strandings Associated with U.S. Navy Sonar Activities*, 2017 [www.mitt-eis.com]), marine mammal strandings have been a historic and ongoing occurrence attributed to a variety of causes, both natural and anthropogenic. Over the last 50 years, increased awareness and reporting has led to more information about species affected and raised concerns about anthropogenic sources of strandings. While there have been limited numbers of marine mammal mortalities potentially associated with U.S. Navy activities, the root causes are not clear in most cases. NMFS, as the regulator, maintains the authoritative National Stranding Database.

	Comment	Navy Response
	stated. I know the use of Tinian, Pagan, and Ritidian Life Fire Training Range is not part of this EIS but it adds up to all the actions undertaken in the archipelago with no end in sight. Fishing grounds has been off limits in Guam and will be again in the future, which impacts substance fishing for families (noncommercial use), and therefore affect the local fishing community. A paper published in the Royal Society shows a naval mid-frequency active sonar ban on MFASs around the Canary Islands successfully prevented additional BW MSEs in the region, but atypical MSEs have continued in other places of the world, especially in the Mediterranean Sea, with examined individuals showing a correlation (https://royalsocietypublishing.org/doi/10.1098/rspb.2018.2533) between marine mammals strandings and sonar use. Due to this obvious link, these practices are abandoned in some parts of the world. During the informational briefing at the legislature it was stated that the local agencies have not received any previous MITT reports outlining activities and their affects. Monitoring reports from previous mine and detonation, and damage to corals, animals and plants need to be available for the public. Again, the cumulative effect of all the activities is not clear to the agencies and the public. For the people of Mariana Islands, this is the opposite of a sustainable and secure future, it is one of fear to lose the most valuable of all: their land, natural and cultural resources.	The Center for Naval Analysis (CNA) also recently conducted a statistical study of correlation of beaked whale strandings around the Mariana Islands with the use of U.S. Navy sonar, finding that insufficient evidence of a correlation exists. The CNA study used the complete record of all U.S. Navy sonar use between 2007 and 2019, including major training events, joint exercises, and unit level training/testing. The analysis also included the complete beaked whale stranding record for the Mariana Islands through 2019. Following the methods in Simonis et al. (2020), the CNA analysis found insufficient evidence of a correlation between sonar use and beaked whale strandings when considering the complete sonar use record. The CNA finding is in contrast to the finding in Simonis et al. (2020), which depicted a significant correlation between beaked whale strandings and Navy sonar use. However, the Simonis et al. (2020) result relied on substantially incomplete or inaccurate assumptions about U.S. Navy sonar use around the Mariana Islands. CNA also conducted statistical analyses specific to each island where beaked whale strandings have been observed in the Mariana Islands, similarly finding insufficient evidence of a correlation to sonar use. Additional information on the findings of the CNA analysis are presented in Section 3.4.2.1.1.6 (Stranding) in Chapter 3.4 (Marine Mammals). As described in Section 5.1.2.2.1 (Marine Species Research and Monitoring Programs), for this Final Supplemental EIS/OEIS, the Navy agreed to several additional research and monitoring initiatives designed to help advance the understanding of beaked whales and strandings in the MITT Study Area. The Navy will co-fund the Pacific Marine Assessment Program for Protected Species (PACMAPPS) Mariana Islands survey in spring-summer 2021 and future studies starting in 2022 to help document beaked whale occurrence, abundance, and distribution in the Mariana Islands. The Navy will also fund additional stranding response and necropsy analyses for the Pacific Islands region, and research on a framework to improve statistical stranding analysis. Collaboratively with NMFS, the Navy will fund and organize an expert panel to provide recommendations on scientific data gaps and uncertainties for further protective measure consideration to minimize potential impacts of Navy training and testing

	Comment	Navy Response
	Else Demeulenaere, MSc Supported by: Susan Aguon, Betty Malakai, Yo' åmte Zita D. Pangelinan, Victor D. Pangelinan, Sr. Lourdes Pangelinan, Grace Campos, SSND Dena Rendon, Lina P. Atalig	activities on beaked whales in the Mariana Islands. Information on current monitoring projects, technical reports, conference presentations and data are available on the Navy's Marine Species Monitoring Program website at https://www.navymarinespeciesmonitoring.us/. The Navy's assessment of potential impacts reflects using the best available and applicable science determined in consultation with NMFS. This includes analysis of the cumulative impacts, mid- and high-frequency active sonar, underwater detonations, and activities within the Marianas Trench Marine National Monument. The training activities within the Study Area are not expected to have significant effects on those resources designated for special protection under the Marianas Trench Marine National Monument designation. Furthermore, the Presidential Proclamation included that the prohibitions included in the Proclamation shall not apply to the activities and exercises of the Armed Forces. The mitigation measures followed during military activities and exercises within the Monument ensure that the activities are consistent so far as is reasonable and practicable with the Proclamation. Section 3.8 (Marine Invertebrates) includes an analysis of potential impacts on coral. A detailed analysis of potential impacts on coral around FDM is also provided. Based on the analysis, coral fauna are healthy and robust, and the nearshore physical environment and basic habitat types at FDM would remain unchanged. These conclusions are based on (1) a limited amount of physical damage, (2) very low levels of partial mortality and disease (less than one percent of all species observed), (3) absence of excessive mucus production, (4) good coral recruitment, and (5) complete recovery by 2012 of the 2007 bleaching events. Smith and Marx (2016) also concluded that the health, abundance, and biomass of fishes, corals, and other marine resources in those habitats are as good as, or better than, those in similar habitats elsewhere in the Mariana Archipelago. The Navy funded additional reef surveys in the nearshore areas of FDM in 2017. The results were approved for public release in September 2018 and are available at https://apps.dtic.mil/dtic/tr/fulltext/u2/1069450.pdf. The 2017 survey found little evidence that training has affected coral reef communities at FDM. Only three relatively fresh ordnance items were observed,

	Comment	Navy Response
		but no blast pits, craters, or significant areas of coral breakage were observed. The ordnance observed during the 2017 survey was almost exclusively old, encrusted in marine life, and had no discernable impact on surrounding communities. The analysis of potential impacts on environmental justice is limited primarily to traditional fishing practices, because, with the exception of training activities at FDM, the vast majority of activities occur at sea, where potential socioeconomic impacts are limited to commercial, recreational, and tourism activities that take place in the marine environment, including fishing. As described in Section 3.12.1.4 (Environmental Justice), fishing for subsistence is not easily distinguishable from recreational or commercial fishing in the small boat fishing communities of the CNMI, even for a single fishing trip, and fishers who use their own catch as a regular source of food are not necessarily minority or low-income.
Matthew Ulloa (MU)		
MU-01	I am a local residence of the Island of Guam and I do have my own concerns about the protection of our coral reefs that surround around island because I am a fisherman and also, I was a part of the "REEF RANGER" program with the Guam National Park service. So, I would like to take part in this organization and whatever plans to help save our coral reefs	Marine life and marine habitat are important to the Navy. Please contact the Guam National Park Service regarding the Reef Ranger program.
Dorathina Herrero (DH)		
DH-01	*Marine Habitat most of the explosive military expended materials would detonate at or near the water surface. training activities that include bottom-laid in-water explosions would affect marine habitat structure. bottom substrates could be disturbed by vessel and in-water device strikes, military expended materials, seafloor devices used for military readiness	Marine life and marine habitat are important to the Navy. Using the latest science and technology, the Navy completed extensive analyses and computer-based modeling to determine impacts and develop science-based protective measures to reduce or avoid potential impacts on marine life. All potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practicable, procedural and geographic mitigation

	Comment	Navy Response
	activities, and from walking, standing, or swimming in the nearshore waters. *socioeconomic resource and environmental injustice may result in impacts on commercial and recreational fishing, traditional fishing practices, or tourism when areas of co-use are temporarily inaccessible to ensure public safety during training and testing activities. please see attached copied text from PDF doc (Effects of Underwater Explosions on Life in the Sea) found here: https://ia802804.us.archive.org/35/items/DTIC_ADA315490/DTIC_ADA315490.pdf	measures during its training and testing activities to reduce potential impacts on marine life. The Navy's analysis indicates that, with implementation of its protective mitigation measures, there would be no significant impacts on marine species. [18456] This Supplemental EIS/OEIS does not propose a change to the ocean areas currently used by both the Navy and the public. Restrictions on accessing areas of co-use would continue to be relatively infrequent and short term, while other fishing and tourism sites in the Study Area would continue to be available to the public. The military is committed to continuing to work with the local community on issues that potentially affect the public, including access to fishing sites.
Eric Borja (EB)		
EB-01	I do not support the testing site. Our coral reefs are important to our marine resources and for our islands. please do not threaten our ocean for testing sites.	Marine life and marine habitat are important to the Navy. Using the latest science and technology, the Navy completed extensive analyses and computer-based modeling to determine impacts and develop science-based protective measures to reduce or avoid potential impacts on marine life. Potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practicable, procedural and geographic mitigation measures during its training and testing activities to reduce potential impacts on marine life. The Navy's analysis indicates that, with implementation of its protective mitigation measures, there would be no significant impacts on marine species. [18456] Section 3.8 (Marine Invertebrates) includes an analysis of potential impacts on coral. A detailed analysis of potential impacts on coral around FDM is also provided. Based on the analysis, coral fauna are healthy and robust, and the nearshore physical environment and basic habitat types at FDM would remain unchanged. These conclusions are based on (1) a limited amount of physical

	Comment	Navy Response
		damage, (2) very low levels of partial mortality and disease (less than one percent of all species observed), (3) absence of excessive mucus production, (4) good coral recruitment, and (5) complete recovery by 2012 of the 2007 bleaching events. Smith and Marx (2016) also concluded that the health, abundance, and biomass of fishes, corals, and other marine resources at FDM are as good as, or better than, those in similar habitats elsewhere in the Mariana Archipelago. The Navy funded additional reef surveys in the nearshore areas of FDM in 2017. The results were approved for public release in September 2018 and are available at https://apps.dtic.mil/dtic/tr/fulltext/u2/1069450.pdf. The 2017 survey found little evidence that training has affected coral reef communities at FDM. Only three relatively fresh ordnance items were observed, but no blast pits, craters, or significant areas of coral breakage were observed. The ordnance observed during the 2017 survey was almost exclusively old, encrusted in marine life, and had no discernable impact on surrounding communities.
Timothy Murer (TM)		
TM-01	Why don't you go blow up your own land and leave ours alone. You Americans are a trash race with no care in the world talking what's not yours and destroying people's homes but as long as it isn't yours it's okay right. I hope Russia fucks you guys up soon. Leave Guam alone	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Katrina West (KW)		
KW-01	The MITT allows 81,962 takings of 26 different marine mammal species (including whales and dolphins) per year for 5 years due to detonation, sonar, and other training and testing activity within the MITT The MITT also allows damage or kill of over 6 square miles of endangered coral reefs plus additional 20 square miles of coral reef around FDM through the use of highly explosive bombs.	Marine life and marine habitat are important to the Navy. Using the latest science and technology, the Navy completed extensive analyses and computer-based modeling to determine impacts and develop science-based protective measures to reduce or avoid potential impacts on marine life. Potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practicable, procedural and geographic mitigation measures during its training and testing activities to reduce potential impacts on marine life. The Navy's analysis indicates that, with implementation of its protective

	Comment	Navy Response
	We are deeply concerned about the consequences such actions will have on the significant resources our great ocean and land provide us in the Mariåna Islands. These actions have a devastating impact on indigenous culture and lifeways, increase our dependence on imported foods sources, and erode our resilience. Do not expand, protect the environment.	mitigation measures, there would be no significant impacts on marine species. The Navy is formally consulting with NMFS concerning potential impacts of the proposed training and testing activities on all marine mammals protected under the MMPA and known to occur in the MITT Study Area. The Navy has updated this Supplemental EIS/OEIS based on section 7 consultation and will incorporate all reasonable and prudent measures, and terms and conditions that are set forth in the Biological Opinion, in the Record of Decision. Section 3.8 (Marine Invertebrates) includes an analysis of potential impacts on coral. A detailed analysis of potential impacts on coral around FDM is also provided. Based on the analysis, coral fauna are healthy and robust, and the nearshore physical environment and basic habitat types at FDM would remain unchanged. These conclusions are based on (1) a limited amount of physical damage, (2) very low levels of partial mortality and disease (less than one percent of all species observed), (3) absence of excessive mucus production, (4) good coral recruitment, and (5) complete recovery by 2012 of the 2007 bleaching events. Smith and Marx (2016) also concluded that the health, abundance, and biomass of fishes, corals, and other marine resources at FDM are as good as, or better than, those in similar habitats elsewhere in the Mariana Archipelago. The Navy funded additional reef surveys in the nearshore areas of FDM in 2017. The results were approved for public release in September 2018 and are available at https://apps.dtic.mil/dtic/tr/fulltext/u2/1069450.pdf. The 2017 survey found little evidence that training has affected coral reef communities at FDM. Only three relatively fresh ordnance items were observed, but no blast pits, craters, or significant areas of coral breakage were observed. The ordnance observed during the 2017 survey was almost exclusively old, encrusted in marine life, and had no discernable impact on surrounding communities. Section 3.11.1.3 (Cultural/Traditional Practices and Beliefs) has been added to this Supplemental EIS/OEIS. The Navy is not proposing any geographic expansion of the training and testing

	Comment	Navy Response
		area in this Supplemental EIS/OEIS. Proposed activities are similar to those conducted in the Study Area for decades.
Carl Cruz (CC)		
CC-01	Why are you destroying the earth? To be prepared to protect the US, but you are destroying the US. The money won't be of any value once your time on earth has passed and what you're doing to the planet will end up effecting life for our children! Test your bombs on area 51 or places you have ALREADY destroyed. Leave the ocean alone!	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Anthony Sablan (AS)		
AS-01	"Protect the American chamorro people and the almost extinct wildlife indigenous to the marianas.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Erisa Cristobal (EC)		
EC-01	No more further militarizing our lands and our waters without Decolonization! CHamorus should not have to bear the burden that the United States of America has placed on this island and it’s resources! Decolonization before mitigation!	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Ann-Marie Taitague (AMT)		
AMT-01	Please don’t do this to our island.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.

	Comment	Navy Response
Marinna Julian (MJ)		
MJ-01	Y'all really do not need more than what y'all currently possess. Using this extra land in order to train will poison water that locals, you, and your own families will ingest. If earth gets wrecked from the environmental problems, you'll get sent to war to fight for scarce resources for a little bit. But eventually the world will be so desperate, the military can no longer exist when civilized society breaks down. And when that happens, y'all will be too old to go toe to toe with younger, desperate people trying to survive like you. So you're really just playing yourselves by contributing to the earth's demise with this proposed plan. Our country's biggest threat in the future is the planet's wrath not another country.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Kayle Tydingco (KT)		
KT-01	The MITT "study area" will permit the destruction of our natural resources. This destruction has to stop. The Bikini Atoll test site is a reminder to us all of what happens when Pacific Islanders comply for the "good of humanity" (jelly babies, cancer, contaminated waters). I'm sure you'd like us all to believe that your test site is designed "for our protection" as our waters become depleted of fish and coral.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities. In addition, the military is committed to protecting public health and safety. Section 3.13 (Public Health and Safety) includes an analysis of potential impacts associated with underwater energy, in-air energy, physical interactions, and secondary stressors.
Miehilani Trinidad (MT)		
MT-01	I reject the degradation and the plans the USA Military will subject my home and the natural resources too, endangering my future and the rights of my children and their children to a naturally & occurring environment. This God given environment was created as an oasis to protect, shelter and restore the people and all other inhabitants. Leave it alone	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities. In addition, the military is committed to protecting public health and safety. Section 3.13 (Public Health and Safety) includes an analysis of potential impacts associated with underwater energy, in-air energy, physical interactions, and

	Comment	Navy Response
	please and allow us to prosper.	secondary stressors.
Jonita Kerr (JK)		
JK-01	Referring to Quantifying Acoustic Impacts for Phase III Technical Report, page 6-7, 6. Mitigation Effectiveness. I take issue with procedural mitigation procedures based on trained Lookouts. Should active sonar by implemented, sonar waves travel many kilometers beyond a trained Lookout's scope of view. It's true that this method is not 100% effective for sighting cetaceans or sea turtles, however, given the inherent flaws and assumptions that animals might leave the area if they hear or feel sonar, this does not constitute mitigation.	The Navy's procedural mitigation measures for active sonar involve trained Lookouts observing and implementing mitigation. Mitigation includes power down zones within 1,000 yard (yd.) and 500 yd., and a 200 yd. shut down mitigation zone if a marine mammal is present. There is not a requirement for Lookouts to visually observe thousands of kilometers, as the commenter implies. For the highest source levels (the active sonar sources with the longest predicted ranges to Permanent Threshold Shift [PTS]), the mitigation zones extend beyond the average ranges to PTS for all marine mammal and sea turtle species found in the MITT Study Area; therefore, the mitigation zones for active sonar will help avoid or reduce the potential for exposure to PTS for marine mammals. The active sonar mitigation zones also extend into a portion of and beyond the average ranges to Temporary Threshold Shift (TTS) for marine mammals and sea turtles, respectively; therefore, mitigation will help avoid or reduce the potential for some or all exposure to TTS.
Angela Hoppe (AH)		
AH-01	Hafa Adai, I am a Chamoru woman. Born and raised on Guam. I moved away for college opportunities in Hawaii which is where I now reside. Hawaii and Guam have many things in common, especially as a military training site. Growing up on Guam the trainings my home island is utilized for was always sensationalized. We would watch “airshows” at Anderson Air Force Base in awe. Our community saw the military as knights in shining armor and we felt privileged that our home could be used for such a noble cause as training the tip of the spear for military strategic positioning. When I moved away and attended college, I was on the outside looking in. The devastatingly high rates of cancer, of	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities. The use of Litkeyan is not included as part of this Proposed Action. In addition, the military is committed to protecting public health and safety. Section 3.13 (Public Health and Safety) includes an analysis of potential impacts associated with underwater energy, in-air energy, physical interactions, and secondary stressors.

	Comment	Navy Response
	suicide of chronic preventable disease correlates to the use of our islands and surrounding neighbor islands such as the Marshall Islands as training sites. The environmental impact statement you are releasing cannot be assessed from an objective lens. Detonating this sacred site will devastate the natural habitat and poison the water and land both our people and all living creatures need to sustain themselves. I oppose the use of Litkeyan for the use of training due to the devastating irreversible impacts it will cause to the environment. There is little left to save, please support our request to not use Litkeyan as a site.	
Odyessa San Nicolas (OSN)		
OSN-01	I am against any type of training in the Marianas. It will effect our environment and animals around. We should be protecting our islands not destroying it for war training.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Kate Quiambao (KQ)		
KQ-01	As a child of Guam, Marianas Islands, and the Pacific, I DO NOT support the MITT! Please do not allow all these trainings within the Pacific Ocean! It will kill precious organisms that are already trying to survive in the oceans they live in today. Please think about the future! Please think about the long-term effects of this activity! It will effect our way of life, our culture, and all the previous animals. I do not support the MITT.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.

	Comment	Navy Response
Mathew Bamba (MB)		
MB-01	People writing all this are probably wasting our time. You probably don't even dive a fuck about the environment. Your military has used our island as a dump for many years, taken our most prime lands for your bases. Now you want to use our waters as your training ground. Why don't you go use somewhere else like San Diego or New York City as training ground? You don't give a fuck about anything but yourselves. Playing world police, and colonizing lands. Leave our waters alone go do your training somewhere else other than our place of relaxation	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Edrienne Garrido (EG)		
EG-01	Why do DOD keep on forcibly taking land and destroying it? When will this be put to an end? It's unjust and unfair for the people of Guam, especially for the Chamorus. Too many things have been taken from them, have some respect, Guam is the only home they have.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
N DeLisle Duenas (NDD)		
NDD-01	I strongly oppose any and all of the U.S. military's training and testing in the Mariana Islands. There exists a long history of military-related contaminations in Guam, the Marianas and throughout Micronesia, which certainly cannot be "mitigated" when further militarization is taking place. Any new proposed militarization whether through training, testing and land acquisition — as well as the U.S. military's ongoing occupation and activities — are a major detriment to the health and environment of the people in the region. Absolutely no detonations of any magnitude should occur, nor should any marine life and coral reefs be compromised or adversely effected; the MITT mitigation and allowance for "81,962 takings of 26 different marine mammal species per year for 5 years due to detonation, sonar and other training and testing activity" and the "kill of over 6 square miles of	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities. Section 3.8 (Marine Invertebrates) includes an analysis of potential impacts on coral, including a detailed analysis of potential impacts on coral around FDM. Based on the analysis, coral fauna are healthy and robust, and the nearshore physical environment and basic habitat types at FDM would remain unchanged. These conclusions are based on (1) a limited amount of physical damage, (2) very low levels of partial mortality and disease (less than one percent of all species observed), (3) absence of excessive mucus production, (4) good coral recruitment, and (5) complete recovery by 2012 of the 2007 bleaching events. Smith and Marx (2016) also concluded that the health, abundance, and biomass of fishes, corals, and other marine resources at FDM are as good as, or better than, those in similar habitats elsewhere in the Mariana Archipelago. The Navy funded additional reef surveys in the nearshore areas of FDM in 2017. The

	Comment	Navy Response
	endangered coral reefs plus additional 20 square miles of coral reefs around FDM" (No'os) are unacceptable. Additionally, the marine life and environmental balance of the Marianas plays an incredibly important role in Micronesian seafaring traditions, which are older than the United States nation itself. Much more respect and regard should thus be given to these oceans that are deeply part of the region's cultural identities. I additionally oppose the separation of MITT activities in the Programmatic Agreement, which works to delineate and divide the Marianas region. Also, on the premise of "National Security," the rhetoric to train, test and occupy "so that the military may meet their respective missions to be combat-ready and capable of winning wars, and maintaining freedom of the seas" is a manipulative colonial ideology that places the homes, lives, health and values of Mariana islanders beneath that of the United States. The proposed MITT, ongoing and further militarization, explosive tests and occupation of lands for military trainings are just updated forms of colonialization in the Pacific; and thus also detrimental to decolonization efforts in the region. Leave Tinian, Pågan, Guam — all of the Marianas and Micronesia — alone! Lastly and for the record, I also strongly opposed the 2015 Record of Decision, and live-fire training ranges near Litekyan (Ritidian).	results were approved for public release in September 2018 and are available at https://apps.dtic.mil/dtic/tr/fulltext/u2/1069450.pdf. The 2017 survey found little evidence that training has affected coral reef communities at FDM. Only three relatively fresh ordnance items were observed, but no blast pits, craters, or significant areas of coral breakage were observed. The ordnance observed during the 2017 survey was almost exclusively old, encrusted in marine life, and had no discernable impact on surrounding communities. The potential effects of sonar and explosives on marine mammals are quantitatively estimated using the Navy's Acoustics Effects Model (see the Technical Report, *Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing*, available on the project website for details on the quantitative methodology). Predicted effects from sonar on marine mammals are presented by species in Section 3.4.2.1.2.3 (Impacts from Sonar and Other Transducers Under the Action Alternatives) and from explosives in Section 3.4.2.2.2.3 (Impacts from Explosive Stressors Under the Action Alternatives). For the Proposed Action, over a seven-year period being requested, the Navy's quantitative analysis for acoustic and explosive sources in the MITT Study Area estimates no mortality or direct injury to any marine mammal and a total of 496 Level A exposures (i.e., PTS) and 471,407 Level B exposures (i.e., TTS and behavioral impacts). Behavioral responses by marine mammal species are also predicted by the acoustic effects model. Research cited in this Supplemental EIS/OEIS and in the 2015 MITT Final EIS/OEIS indicates behavioral responses by marine mammals exposed to underwater sound vary from no response to an immediate change in behavior, such as a change in swimming direction. Behavioral changes are temporary and not necessarily repeated, and animals frequently return to and continue their prior behavior after the initial interruption. Information on strandings associated with Navy training and testing activities is provided in the 2017 technical report, *Marine Mammal Strandings Associated with United States Navy Sonar Activities*. NMFS, as the regulator, maintains the authoritative National Stranding

	Comment	Navy Response
		Database. As summarized in the fact sheet and discussed in Chapter 5 (Mitigation), the Navy would implement a robust suite of mitigation measures to avoid or reduce potential impacts on marine mammals to the maximum extent practicable. The Navy's mitigation includes a combination of procedural mitigation measures (e.g., powering down or shutting down sonar if a marine mammal is observed within a certain distance from the sonar source) and mitigation areas (e.g., prohibiting the use of explosives within two identified areas that may be particularly important for humpback whale reproduction). Additional information about the Navy's mitigation areas is presented in Appendix I (Geographic Mitigation Assessment). Information about why the Navy cannot implement further restrictions on the type or number of activities involving active sonar and explosives in the Study Area is presented in Section 5.6.1 (Active Sonar) and Section 5.6.2 (Explosives).
Maria Hernandez (MH)		
MH-01	As a CHamoru woman born and raised on Guam, I feel strongly about the preservation of our island's environmental, cultural and historical resources. I resent that our region is the largest training area in the world considering the wide expanse of other locations the military could train without adversely and permanently impacting our land and cultural resources, which we are fighting to preserve after centuries of colonialism. I am infuriated about the 12,580 detonations of various magnitudes per year over the span of five years. I oppose the damaging/killing/bombing of over 6 square miles of endangered coral reefs and 20 square miles of coral reef around FDM. Our GovGuam agencies have spoken about the concerns of various detonations on our coastal floors and how they will impact sea life. Recently, a biologist with the Department of Agriculture testified stating the EIS does not have current information about true impacts to marine mammals. Such mammals have been	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities. Using the latest science and technology, the Navy completed extensive analyses and computer-based modeling to determine impacts and develop science-based protective measures to reduce or avoid potential impacts on marine life. Potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practicable, procedural and geographic mitigation measures during its training and testing activities to reduce potential impacts on marine life. The Navy's analysis indicates that, with implementation of its protective mitigation measures, there would be no significant impacts on marine species. The Navy reviewed the best available scientific data and information on marine mammals available for inclusion in the Draft Supplemental EIS/OEIS, and incorporated relevant information into the marine mammals impact analysis in this Supplemental EIS/OEIS. Peer-reviewed scientific publications are considered

	Comment	Navy Response
	photographed giving birth to marine mammal and endangered species listed organisms at the Agat offshore mine detonation site. Additionally, the administrator of the Guam Coastal Management Program of the Bureau of Statistics and Plans has stated that particles may be consumed by organizations around detonation sites that have the potential to affect the food chain. I also strongly oppose the proposed bifurcation for the MITT. We have, and always will be, one Marianas. I am a mother, daughter, sister, friend to many who call Guam home. I am concerned about the health effects of military training on my growing family. I am concerned that the 12,580 detonations across our region will add further toxicity to our increasingly toxic 210 square mile island. Military activities including missiles, torpedoes, radar, sonar systems, mine and strike warfare, anti-submarine warfare, as well as air water and surface warfare will adversely impact our cultural heritage, historic sites, native plants and animals, marine life, fishing, travel by boat, tourism, and public health and safety. Our home, our history is not your training ground. It is not your target practice.	to be the most reliable and accurate sources of data and information and were used throughout this Supplemental EIS/OEIS to support the analysis and conclusions. Well-respected and historically vetted government reports (e.g., marine mammals stock assessment reports) were also used to support the analysis. Any newly published data and information relevant to the analysis of potential impacts on marine mammals that has become available since the Draft Supplemental EIS/OEIS was incorporated into this Supplemental EIS/OEIS. Recently published information by NMFS indicates that the Mariana Islands may be a calving area for humpback whales. In consideration of this, the Navy has developed in this Supplemental EIS/OEIS a geographic mitigation area at Marpi Reef off Saipan (see Appendix I, Geographic Mitigation Assessment). Two photographs that are Associated Press File photos depict this calf; mention of those photos has been added to this Supplemental EIS/OEIS. To reiterate, a single known occurrence of a newborn calf approximately 19 years ago does not indicate the area to be an established and routinely used sperm whale calving and nursery habitat. While it is possible that several species of marine mammals could occur at the Agat Bay Mine Neutralization Site, the Navy's procedural mitigation measures involving observing for marine mammals and sea turtles prior to conducting activities using explosives at the site reduces the likelihood of potential impacts on marine species. Please refer to Chapter 5 (Mitigation) for additional information on the Navy's procedural mitigation measures. As discussed in Sections 3.8 (Marine Invertebrates) and 3.9 (Fishes) of this Supplemental EIS/OEIS, recent surveys conducted by the Navy (Smith and Marx, 2016) at FDM found that coral fauna are healthy and robust, and the nearshore physical environment and basic habitat types at FDM would remain unchanged. These conclusions are based on (1) a limited amount of physical damage, (2) very low levels of partial mortality and disease (less than one percent of all species observed), (3) absence of excessive mucus production, (4) good coral recruitment, and (5) complete recovery by 2012 of the 2007 bleaching events. Smith and Marx (2016) also concluded that the health, abundance, and biomass of fishes, corals, and other marine resources at FDM are as good as, or better than, those in similar habitats elsewhere in the Mariana Archipelago. The Navy funded additional reef surveys in the nearshore areas of FDM in 2017. The

	Comment	Navy Response
		results were approved for public release in September 2018 and are available at https://apps.dtic.mil/dtic/tr/fulltext/u2/1069450.pdf. The 2017 survey found little evidence that training has affected coral reef communities at FDM. Only three relatively fresh ordnance items were observed, but no blast pits, craters, or significant areas of coral breakage were observed. The ordnance observed during the 2017 survey was almost exclusively old, encrusted in marine life, and had no discernable impact on surrounding communities. This Supplemental EIS/OEIS and the 2015 MITT Final EIS/OEIS include discussions of the fate and transport of specific chemicals with specific references to chemical properties of munitions and munitions constituents. Although binding to sediments is one possible outcome (e.g., for PCBs), other chemical pollutants behave differently. For example, when metals are exposed to seawater, they begin to slowly corrode, a process that creates a layer of corroded material between the seawater and uncorroded metal. This layer of corrosion removes the metal from direct exposure to the corrosiveness of seawater, a process that further slows movement of the metals into the adjacent sediments and water column. This is particularly true of aluminum. Elevated levels of metals in sediments would be restricted to a small zone around the metal, and any release to the overlying water column would be diluted and influenced by mixing and diffusion. Although there are few specific studies on bioaccumulation in the CNMI, there are other studies cited concerning metals deposition in the marine environment in waters off of military training ranges. For example, the Navy's Final Supplemental EIS/OEIS includes discussions of multiple studies off of Vieques Island in Puerto Rico, Pamlico Sound in North Carolina, and a Canadian military site (Canadian Forces Maritime Experimental and Test Ranges near Nanoose Bay, British Columbia) for lead and lithium. This Supplemental EIS/OEIS also includes information that suggests that the majority of concerns regarding bioaccumulation are associated with urban coastal environments with specific point source and non-point source contributors of pollutants. The studies concerning military sites suggest that metals exposed to seawater are of less concern because of decreased bioavailability.

	Comment	Navy Response
Nia Serneo (NS)		
NS-01	This is unconscionable on an environmental and social perspective. This island and the surrounding waters are vital to our livelihood and is already being threatened by many other variables such as climate change. In fact, we are still recovering from the environmental and social impact of WW2. We do not need to cause more harm in the name of "national defense."	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Will Flores (WF)		
WF-01	I am a former serviceman in the U.S. Coast Guard and I am from Guam. I fully support the presence and integration of the U.S. Armed Forces on Guam but this I can't support. The U.S. has a duty to its citizens and itself to protect our resources-including those same resources that we have already deemed endangered or threatened. You can't harm animals or their habitat. It's illegal. I'm not an activist by a long shot but what this plan proposes is a wildly illegal plot to showcase force in this region. Please take into consideration a revision to the training locations and the effects that you will have on our marine life. Please consider the people you will be most affecting if this proposal is allowed to pass as it is.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Julia Faye Munoz (JFM)		
JFM-01	The damage of 6 square miles of endangered coral reefs, plus additional 20 square miles of coral reef around FDM through the use of highly explosive bombs, poses an extreme environmental threat. In regards to acoustic stressors, as acknowledged in the MITT Draft Supplemental EIS/OEIS Volume II, "little information is available on the potential	As discussed in Sections 3.8 (Marine Invertebrates) and 3.9 (Fishes) of this Supplemental EIS/OEIS, recent surveys conducted by the Navy (Smith and Marx, 2016) at FDM found that coral fauna are healthy and robust, and the nearshore physical environment and basic habitat types at FDM would remain unchanged. These conclusions are based on (1) a limited amount of physical damage, (2) very low levels of partial mortality and disease (less than one percent of all species

	Comment	Navy Response
	impacts on marine invertebrates from exposure to sonar and other sound-producing activities." To determine that the analysis presented in the 2015 MITT Final EIS/OEIS is "valid and applicable" based on two studies/literary reviews (Roberts et al. (2016) and Hawkins & Popper (2017)) is insufficient given the need to more holistically assess the impacts of acoustic stressors on marine invertebrates. Further analysis of environmental impact onto coral reefs as a result of the MITT is necessary, not just in regards to acoustic stressors but in all aspects of the MITT.	observed), (3) absence of excessive mucus production, (4) good coral recruitment, and (5) complete recovery by 2012 of the 2007 bleaching events. Smith and Marx (2016) also concluded that the health, abundance, and biomass of fishes, corals, and other marine resources at FDM are as good as, or better than, those in similar habitats elsewhere in the Mariana Archipelago. The Navy funded additional reef surveys in the nearshore areas of FDM in 2017. The results were approved for public release in September 2018 and are available at https://apps.dtic.mil/dtic/tr/fulltext/u2/1069450.pdf. The 2017 survey found little evidence that training has affected coral reef communities at FDM. Only three relatively fresh ordnance items were observed, but no blast pits, craters, or significant areas of coral breakage were observed. The ordnance observed during the 2017 survey was almost exclusively old, encrusted in marine life, and had no discernable impact on surrounding communities. This Supplemental EIS/OEIS fully complies with the NEPA. Using the best available science, the extensive studies and analysis conducted by the Navy exceeded the required hard look at impacts on environmental resources. Potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. The Navy uses the best available science to support the impact analysis and conclusions. As described in Section 3.8 (Marine Invertebrates), new studies on particle motion detection by Roberts et al. (2016) reinforces the finding that mechanical receptors on some invertebrates are found on various body parts. In addition, these structures are connected to the central nervous system and can detect some movements or vibrations that are transmitted through substrate (Edmonds et al., 2016). Even though some invertebrates may be able to sense or detect particle motion, they would not be impacted by acoustic sources used during training and testing activities, and a recent literature review on assessing impacts of underwater noise on marine fishes and invertebrates (Hawkins & Popper 2017) does not change this conclusion.

	Comment	Navy Response
Vera De Oro (VDO)		
VDO-01	It is a travesty to allow such destruction to the oceans and land in and around the Mariana Islands that this MITT is proposing. The military is fully aware of what this proposal will do to the environment yet will proceed without regard to the long-term effects. I am indigenous to the Marianas and love my island. Chamorus have survived here for millenia and this proposal is surely going to affect our environment. The scope of the size that will be affected is huge. Would states allow this much destruction to happen in their backyard? Stop the evil destructive war games that is designed not to protect us but to line the pockets of military industrial complex	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Heidi Cody (HC)		
HC-01	We need to speak for the younger generations that don't have a voice. It is our civic duty to ensure that future generations can have clean air, land and water. No military buildup and testing. Let's honor and preserve Guam and its surroundings.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Monaeka Flores (MF)		
MF-01	Around the island, I am constantly reminded of the destruction from a legacy of war. From multiple sites of contamination, to areas of land that are still scarred from the violent American recapture of World War II, to areas taken away from families through eminent domain, and important	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities. Using the latest science and technology, the Navy completed extensive analyses and computer-based modeling to determine impacts and develop science-based protective measures to reduce or avoid potential impacts on marine life. Potential effects

	Comment	Navy Response
	sacred sites closed from public access - all I can see is war. From silent forests caused by the military spraying of chemicals or the import of invasive species, to silent forests because the birds and bats had to escape the loud sounds of military training and war jets flying overhead - all I hear is war. From contamination from jet fuel leaks in our soil, to the many lives lost because of diseases linked to the military contamination from Guam to the Marshall Islands - all around us is war. The U.S. military's appetite to increase their hold over areas of land and ocean continues to grow like an insatiable parasite. Almost every week, we learn of new contamination sites, pristine areas of land being destroyed, scared ancestral sites being desecrated, of dead whales and other sea life washing up on our shores, of damaged coral reef and limestone forest habitat - all at the hands of the military and in the name of national defense. What is clear to me, is that the U.S. military is not a good partner, not a good steward, and that the people of Guam do not have a fair say in what happens in our land and waters. This is NOT real security. What do they intend to defend if they destroy so much? Guam, the Mariana Islands, and the larger Micronesian region are especially vulnerable to impacts of climate change, which are further exacerbated and complicated by the destructive actions of the U.S. military. We have so much at stake and we have already lost so much. Now, the military wants to break down the activities to simplify things, when instead it is watering down the cumulative destruction of all of these connected actions. It is a manipulation of perception and legal parameters to justify this destruction.	from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practicable, procedural and geographic mitigation measures during its training and testing activities to reduce potential impacts on marine life. The Navy's analysis indicates that, with implementation of its protective mitigation measures, there would be no significant impacts on marine species. The Navy reviewed the best available scientific data and information on marine mammals available for inclusion in the Draft Supplemental EIS/OEIS and incorporated relevant information into the marine mammals impact analysis in this Supplemental EIS/OEIS. Peer-reviewed scientific publications are considered to be the most reliable and accurate sources of data and information and were used throughout this Supplemental EIS/OEIS to support the analysis and conclusions. Well-respected and historically vetted government reports (e.g., marine mammals stock assessment reports) were also used to support the analysis. Any newly published data and information relevant to the analysis of potential impacts on marine mammals that has become available since the Draft Supplemental EIS/OEIS was incorporated into this Supplemental EIS/OEIS. Recently published information by NMFS indicates that the Mariana Islands may be a calving area for humpback whales. In consideration of this, the Navy has developed in this Supplemental EIS/OEIS a geographic mitigation area at Marpi Reef off Saipan (see Section 5.4.2, Mitigation Areas for Marine Mammals and Sea Turtles, in this Supplemental EIS/OEIS). The proposed training and testing activities in this Supplemental EIS/OEIS are needed to achieve and maintain military readiness within the Study Area. This includes the use of underwater mine charges up to 20 lb. at the Agat underwater detonation site. Underwater detonation activities at Apra Harbor and Piti would remain a charge of 10 lb. The use of 20 lb. underwater mine charges was originally assessed in the 2015 Final MITT EIS/OEIS. This Supplemental EIS/OEIS furthers the Navy and other military services' execution of their roles and responsibilities under 10 U.S.C. section 8062.

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	I strongly oppose the continued destruction caused by the Navy's training and testing activities that include the use of active sonar and explosives in the Mariana Islands Training and Testing (MITT) study area and in the Mariana Islands Range Complex (MIRC). I oppose the continued taking of marine mammals, of rare and endangered species, and of coral reef as a result of military training and testing activities. The MITT draft SEIS does not include up to date research on the impacts of sonar, vessel interactions, and explosives detonation in the water on marine mammals. Activities are planned for a known whale birthing sites. Turtles have died from vessels in areas limited to military activities. Important local fishing areas have been closed to the public. I oppose the continued contamination of sea life from military materials left from these activities and damage to hard bottom substrate, which supports the health of corals and reefs. I oppose the destructive impacts on our cultural practices, our food resources, and our economic sovereignty. I oppose the increase in underwater mine charges. The Navy has not provided the rational for the increase, nor does it make its findings on impacts from activities, including surveys taken before and after exercises, available to the public. I oppose the continued destruction to our ancestral sites and cultural resources. The SEIS does not incorporate all the cultural resources that may be impacted. The U.S. military wants us to believe that they understand how "irreplaceable" the air, land and sea of the Marianas Islands are. They will use our own words to try to make us think this. They will say that some of them also call our islands, "home". They will say that they need the islands,	

	Comment	Navy Response
	because it gives the U.S. a global and strategic presence, but they will not say how the island, sea, and people are being used as collateral damage. The military will say that the islands have always provided a "safe training and testing environment for the U.S. military," and not say how it has never been a safe environment for the people of the Marianas. They will say they need realistic training, that it helps with humanitarian efforts and work to keep the "U.S., its territories and environment protected and safe". They will not say how they continue to colonize and harm the indigenous peoples of these islands. They will argue that they are a "cleaner Navy" when are constantly reminded otherwise. There is so much more contamination and destruction that is not made public. How does this make us safer? I oppose this continued injustice. I oppose the continued destruction and poisoning of our land, seas, water, and people. I oppose the continued occupation and destruction of the Marianas. I oppose the relocation of Marines from Okinawa to Guam. I oppose the continued occupation of sacred and stolen land. I oppose the continued desecration of our sacred sites.	
PJ San Nicolas (PJSN)		
PJSN-01	Our island has many natural resources that will be significantly affected in the short term and will eventually be destroyed in the long term. The native biological life cycles and ecosystems will be disturbed to a point that the community will be affected greatly as well. The most amazing part of all this is that the military knows this, but is unfazed and as eager as ever to have more control over our island. The language is plain and simple within this EIS, and it says	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.

	Comment	Navy Response
	that life will get harder, our cultural practices will be lost, animal and plant life will be negatively affected. Yet, there isn't any hesitation in your plans. Its beyond funny how the government criticizes citizens' and non citizens' behavior when this behavior is so extremely sketchy, yet unquestioned.	
Margaret Anderson (MA)		
MA-01	Though I deeply respect the military here on Guam, the taking of Ritidian land and "more" land and sea from the people of this island is reprehensible. You need a shooting range? Build one on the vast amount of land you already have. You need to test? Ban sonar and other water testing that harms sea animals. Get smarter. Figure out a better way. Protect the land and allow the Chamorro people to have the Ritidian land of their ancestors.	The shooting range is not part of the Proposed Action. The 2015 MITT Final EIS/OEIS analyzed land-based activities on Guam, Saipan, Tinian, and Rota; the MITT Supplemental EIS/OEIS did not reanalyze land-based activities because there are no changes proposed to those land-based activities.
Zoltan Grossman (ZG)		
ZG-01	Dear Project Manager, I am a Professor of Geography and Indigenous Studies at The Evergreen State College in Olympia, Washington, with my Ph.D. in Geography from the University of Wisconsin. I am commenting on the Mariana Islands Training and Testing Activities Draft Supplemental Environmental Impact Statement/Overseas Environmental Impact Statement, focusing on the topic of cultural resources. I have long been concerned about the effects of explosives and other forms of physical disturbance and strikes (as mentioned in Table 3.0-1) on cultural resources, including sacred sites that may be accessed by citizens exercising their religious freedoms. Many of the objections to naval bombing of Kaho'olawe in Hawai'i and Vieques in Puerto Rico, for	The MITT Supplemental EIS/OEIS pertains to activities that occur at sea and on FDM. The Navy is required to comply with both NEPA and the National Historic Preservation Act (NHPA), as well as a host of other environmental statutes that pertain to the Proposed Action. As described in Section 2.3.3 (Standard Operating Procedures) and Chapter 5 (Mitigation) of this Supplemental EIS/OEIS, the Navy is committed to avoiding cultural resources and mitigating any potential negative impacts from it training and testing activities. NHPA applies to historic properties, a specific subset of cultural resources. Under the Act, the Navy must consider the undertaking's effects upon historic properties. However, Section 3.11.1.3 (Cultural/Traditional Practices and Beliefs) has been added to the MITT Final Supplemental EIS/OEIS as part of the study so as to analyze the Navy's potential impact on the broader category of cultural resources and traditional practices and beliefs. Consultations with CNMI Historic Preservation Officer (HPO), Guam HPO, and

	Comment	Navy Response
	example, stemmed from the explosives' physical and acoustic effects on cultural resources, not simply on environmental resources. The same is true in the Territory of Guam and the Commonwealth of the Northern Mariana Islands (CNMI). The Mariana Islands Training and Testing (MITT) would allow the Navy to execute 12,580 detonations (of various magnitudes) every year for five years. I attended several recent events in Seattle, Portland, and Olympia, hosted by my college and the Veterans for Peace organization, that focused on military testing and training in the Pacific. The more than 250 attendees viewed a video of a B-52 bombing No'os (Farallon de Medinilla) in the CNMI, with multiple M-117 bombs (Freeman 2014). When the bombs struck, there were audible gasps in the audience. It was not known what kind of sacred shrines or other Indigenous cultural resources might have either been directly struck by the bombs, or damaged through earthquakes or acoustic effects from the B-52 bombing strikes. I find the Draft Supplemental EIS/Overseas EIS wholly inadequate in addressing concerns about cultural resources of the CHamoru and other Indigenous peoples in Pacific territories. The word "cultural" only appears on 10 pages out the total 682 pages of the report. The report refers to mitigation actions that the military has taken to avoid damage to terrestrial and underwater cultural resources, without specifying in any detail what the mitigation actions have involved. Alternatives 1 and 2 propose that mitigation actions "previously implemented to avoid and protect submerged historic properties would continue to be implemented,"	interested stakeholders under Section 106 of the NHPA is ongoing and development of new Programmatic Agreements (PAs) to replace and update the now expired 2009 MIRC PA is also in progress. While the consultation focuses on historic properties, all input on cultural resources has been welcomed to help inform the Navy's analysis of cultural resources under NEPA. As Navy continues to actively consult and develop a new PA for the MITT undertaking, the Parties have executed interim PAs which incorporate all of the terms and mitigations of the 2009 MIRC PA. The interim PAs took effect after the expiration of the 2009 MIRC PA and serve to maintain the DoD's compliance with Section 106 of the NHPA for MITT activities. The interim PA with the CNMI HPO expires September 10, 2020, while the interim PA with Guam HPO expires June 30, 2020. The Navy has reviewed and incorporated the best available science on cultural resources, including underwater cultural heritage and maritime archeology, in this Supplemental EIS/OEIS.

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	without specifying the actions, or using any measurement to assess the success or failure of the previous mitigation actions. Simply ordering mitigation does not automatically result in protection of cultural sites, whether terrestrial or underwater. What kind of damage assessments have been carried out, and with what kind of consultation with CNMI or other regional officials, local cultural practitioners or holders of local place-based. cultural knowledge, or academic archeological experts? How exactly have cultural resources been protected "by reducing the potential for interaction with underwater detonation activities"? (2.3.35). Do the report's authors simply take the naval officials claims of mitigation on faith? Has the Naval Facilities Engineering Command engaged with the extensive literature on underwater cultural heritage (UCH) and maritime archeology? It could also engage with the maritime archeology literature about the effects of armed conflict on underwater cultural heritage, which has numerous overlaps with military testing and training issues. Michael de Ruy's 2014 study at Flinders University, "Under the Cruel Sea: Effects of Armed Conflict on Underwater Cultural Heritage" examined case studies from Iraq, Sri Lanka, and Korea, and concluded "underwater cultural heritage is at risk in armed conflict. The main hazards to UCH generated by armed conflict are identified as explosions, unexploded ordnance, marine pollution, military construction, mechanical stress, sunken craft and debris, looting and military use or occupation. When vulnerable UCH is exposed to any of these hazards, or the myriad secondary hazards they can cause, one or more of the intrinsic heritage values of the site may be	

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	changed, resulting in an adverse effect" (De Ruy 2014, 88). U.S. citizens are becoming more aware of the effects of military testing and training being done in our name in the Pacific, and in particular in territories such as the CNMI where the citizens do not have full democratic control over military operations. Deputy Defense Secretary Robert Ellsworth stated in 1976, before the Compact that led to the formation of the CNMI, "The ability to deny the Northern Marianas to the military of other nations, coupled with the right to operate and base U.S. forces in the area, is important to the maintenance of [a credible defense] posture[.]" (Horey 2011, 192). In times of "geopolitical tensions, the CNMI constitutes an important part of the informal U.S. empire in the Pacific" (Pöllath 2018, 240). It is a travesty that the people of the Territory of Guam and the CNMI do not have full self- determination over their ancestral lands and oceanic territory, and their decisions continue to be made in Washington, D.C. on their behalf, without adequate consultation with local citizens or their elected government officials. Although I live 5,458 miles from the repeatedly bombed island of No'os (Farallon de Medinilla), my voice as a U.S. citizen in this EIS process counts equally with, or even more than, a local CNMI citizen who fishes near the island, and had ancestors who lived and worshipped there. That is also a travesty, especially when the Navy's decisions affect an Indigenous culture that is wholly unique to the affected MITT area. The people who are most affected by the Navy's decisions	

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	should have a central seat at the table, and their voices should be elevated in any review process. The Bush administrations halted the bombing of Kaho'olawe and Vieques, and I hope CHamoru concerns about the bombing of No'os are also heard in Washington D.C, as they are being heard in Washington state. For these and other reasons, I would support the No Action Alternative, because it "would result in fewer stressors that potentially affect submerged cultural resources" (Table ES.6-1). Dr. Zoltán Grossman	
Cara (Flores) Mays (CM)		
CM-01	1. You don't use the most recent research for marine animals and marine life. This is unacceptable and is new information that is ignored and would change the analysis and conclusion. 2. Research is extremely limited. No efforts have been made to collect data from the local people who fish, surf, swim in these areas almost daily. This would be new information that would change the analysis and conclusions. 3. Your website says that public participation is an important part of this process and yet, this information is entirely inaccessible to the public. Even educated people can read this document and still have no idea what it says. And who has time to read such a lengthy document when they're trying to pay bills? The most difficult language is used and the summaries are not sufficient. True intentions and impact are hidden in verbiage which seems to be intentional and substantial studies that are more current or don't fit the DoD bias have been left out. This document prevents a true commenting process because it is only accessible to a very	This Supplemental EIS/OEIS fully complies with NEPA. Using the best available science, the extensive studies and analysis conducted by the Navy exceeded the required hard look at impacts on environmental resources. Potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. The Navy reviewed the best available scientific data and information on marine mammals available for inclusion in the Draft Supplemental EIS/OEIS, and incorporated relevant information into the marine mammals impact analysis in this Supplemental EIS/OEIS. Peer-reviewed scientific publications are considered to be the most reliable and accurate sources of data and information and were used throughout this Supplemental EIS/OEIS to support the analysis and conclusions. The Navy is consulting with the National Marine Fisheries Service (NMFS) under the Marine Mammal Protection Act (MMPA) and Endangered Species Act (ESA) for potential impacts of the Proposed Action on marine mammals. This Supplemental EIS/OEIS contains a detailed list in Appendix A of training and testing activities descriptions, which includes lists of what types of military expended materials are included in each activity. The health of coastal

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	small portion of the population. 4. Impact on mental health of people reading this document and submitting comments is not considered. 5. Impact on mental health of native Chamorus and locals who are impacted by this ongoing massive training is not considered and should be clarified. 6. The research that inspired this article should be considered: https://www.smithsonianmag.com/science/talking-to-whales-180968698/ 7. The document needs to clarify by list - what bullets/bombs/devices will be used; what impact each will have on the ocean water, species, ocean floor and eco-systems; what each is composed of; what residue, each will leave after testing/training is complete; what potential effect each of these have on marine life, eco system, people who will consume marine food sources and people. 8. This is dumb. I'm so tired of small island peoples and whole parts of the ocean being sacrificed so that the Department of Defense can cause more environmental destruction and excuse it by saying that they need to be ready for war. This is selfish and irresponsible and if you are deeply unhappy, it's because you should be ashamed to be a part of it.	communities, fisheries, and ecosystems is important to the Navy. Section 3.1 (Sediments and Water Quality) concludes that chemical, physical, and biological changes to sediment or water quality as a result of military expended munitions (as stated in the comment, bullets/bombs/devices) would be measurable but below applicable standards, regulations, and guidelines, and would be within the existing conditions or designated uses. The Navy will comply with all applicable laws and regulations. This Supplemental EIS/OEIS also includes information that suggests that the majority of concerns regarding bioaccumulation are associated with urban coastal environments with specific point source and non-point source contributors of pollutants. The studies concerning military sites suggest that metals exposed to seawater are of less concern because of decreased bioavailability. The Navy fully recognizes the importance of public participation in the development of this Supplemental EIS/OEIS and has exceeded requirements for providing public notification, project information, and the opportunity for the public to submit comments on the analysis. This Supplemental EIS/OEIS fully complies with NEPA, CEQ requirements, and Navy instructions for implementing NEPA. The Navy understands the complexity of the information presented within this Supplemental EIS/OEIS. This Supplemental EIS/OEIS contains a rigorous scientific analysis of the potential impacts of the Navy's proposal, and thoroughly explains the scientific methodology, analysis methods, and findings. The Navy attempts to explain challenging concepts, methods, and the results of the analysis as clearly as possible in this Supplemental EIS/OEIS and developed public informational materials for lay audiences. The Navy prepared project brochures, videos, a website, and posters, using layperson terms, to enhance public understanding of the information presented in this Supplemental EIS/OEIS. A project fact sheet was also translated into Chamorro. The informational materials, including the translated fact sheet, were made available at all four public meetings and on the project website (http://mitt-eis.com/).

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		The Navy held four open house public meetings, one each on Tinian (March 14, 2019), Rota (March 15, 2019), Saipan (March 18, 2019), and Guam (March 19, 2019). The public meetings provided an opportunity for the public to ask questions of Navy team members about the analysis documented in this Supplemental EIS/OEIS. The Navy encouraged the public to attend these meetings and broadly notified the public through the media, including newspaper advertisements and news releases, and direct mail, including letters, postcards, and emails. The Navy has received feedback from attendees that the open-house format is more conducive to promoting public understanding and constructive dialogue. Open house meetings allow a greater number of individuals to directly engage and interact with Navy team members and ask questions about this Supplemental EIS/OEIS, as well as provide comments on the document. Although the Navy took cultural and religious holidays into account when planning the dates and locations for public meetings, those considerations had to be balanced with the deadlines and schedules of the large number of federal and local agency stakeholders, as well as the overall schedule of this Supplemental EIS/OEIS. To try to accommodate stakeholders and the public, the Navy provided 75 days to review and comment on the Draft Supplemental EIS/OEIS, 30 days longer than the minimum required time for review. Section 2.3.1 (Changes to Proposed Activities) describes those activities that change in this Supplemental EIS/OEIS. As shown in Table 2.5-1 (Current and Proposed Training Activities), the only new training activity proposed in this Supplemental EIS/OEIS is Surface Ship Object Detection. As shown in Table 2.5-2 (Current and Proposed Testing Activities), proposed new testing activities include Radar and Other System Testing and Simulant Testing. These activities and associated systems have already been tested by the Navy in other locations, but not in the MITT Study Area. Therefore, they are new to the Study Area and have been analyzed for environmental impacts in this Supplemental EIS/OEIS. The training and testing activities proposed in this Supplemental EIS/OEIS are

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		part of the overall Navy program and are not unique to the Mariana Island Range Complex. Appendix A (Training and Testing Activities Descriptions) of this Supplemental EIS/OEIS provides detailed data sheets describing each training and testing activity.
Sonya Ann Perez (SAP)		
SAP-01	I am commenting to plead with the DOD to haunt the expansion of their training area within the oceans surrounding our beautiful Mariana islands. I am a mother of an 11-month-old baby boy and I want him to grow up to experience the beaches and waters as I once had. If they continue with this “project”, the dreams I once had for my son might not become a reality. This will hurt our oceans, our land, our people, and our culture. Our people deserve better. Our ocean deserves better. Our planet deserves better.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities. The Navy is not proposing any geographic expansion of the training and testing area in this Supplemental EIS/OEIS. Proposed activities are similar to those conducted in the Study Area for decades.
Darryl Delgado (DD)		
DD-01	1) Section 1 Purpose and Need fails to identify existing ranges that may be used to perform additional "training" and "testing" and only calls out Mariana Islands to be used. There is no justification as to why existing training/testing areas cannot be used. 2) Section 3.11 - Cultural Resources: This section specifies that no live bombs will be used within 3 miles of the Mariana Islands, however, beyond the 3-mile radius from the islands, live bombs will be used and will affect all sea life. Data has shown that sea turtles, whales, etc. migrate throughout the archipelago and are highly likely to be within the testing zone during evolutions. Furthermore, there is no plan to remove live bombs that have not been detonated in the proposed training areas.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities. Existing training areas are proposed to be used under this Supplemental EIS/OEIS. This Supplemental EIS/OEIS to the 2015 MITT Final EIS/OEIS supports ongoing and future training and testing activities conducted at sea and on Farallon de Medinilla (FDM) within the Study Area beyond 2020. The activities analyzed are largely a continuation of the activities previously analyzed. This Supplemental EIS/OEIS: (1) includes the analysis of activities at sea and on FDM necessary to meet readiness requirements beyond 2020 and into the reasonably foreseeable future, (2) includes any changes to those activities previously analyzed, and (3) reflects the most up-to-date compilation of training and testing activities deemed necessary to accomplish military readiness requirements. The alternatives carried forward were developed to meet the Navy’s purpose and need and to ensure fulfilment of obligation under Title 10 of the United States Code. See Section 2.4 (Action Alternatives Development) for more

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		detailed information on the development of alternatives and rationale on why alternative training and testing locations are not feasible. Location of live munitions use remains consistent with previous training and testing activities. Marine life and marine habitat are important to the Navy. Using the latest science and technology, the Navy completed extensive analyses and computer-based modeling to determine impacts and develop science-based protective measures to reduce or avoid potential impacts on marine resources. Potential effects from military training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation) of this Supplemental EIS/OEIS, the Navy implements mitigation measures to avoid and minimize the potential effects of the Proposed Action on marine resources. Please see Section 3.4 (Marine Mammals) for the analysis of impacts on marine mammals, and Section 3.5 (Sea Turtles) for the analysis of impacts on sea turtles. The Navy is consulting with the NMFS under MMPA and ESA to ensure that the Proposed Action will not put the population and the future of marine species within the Study Area in jeopardy.
Victoria Cepeda Diaz (VCD)		
VCD-01	As a daughter born and raised on this island, I object to the training and testing in our ocean. Our brothers and sisters have lost their homes in Banabas and the Marshallas. What more do we Islanders need to lose? The military bases on island already take up prime lands of our islands, so to do "research" and "testing" in our ocean is unnecessary. I refuse to have our marine life and marine environment to undergo whatever testings are being proposed. What will affect military personnel and their families who are stationed here temporarily, will surely affect me and my son and the rest of our families here on island. Enough is enough. Our jungles and sacred medicinal plants	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.

	Comment	Navy Response
	have been destructed and destroyed, and all this taking and taking and injustice needs to stop. You saved my grandparents and great grandparents, thank you. You do not need to save me or those of us now who are fully aware and capable of what we as a people and inhabitants of this island need. We live here and our roots run deep, so that means no testing, training or research in our ocean(s). NA PARA. Respetu i tano yan i hanom tåsi of our peoples.	
Cristina Bejado LeBrun (CBL)		
CBL-01	I whole-heartedly disagree with this military training and testing on the island of Guam or in our waters. Guam is the island of the CHamoru people, not an American detonation zone or "tip of the spear." We are more than that. Our island has hopes and dreams that our children & future generations to come will be able to swim, fish, and hunt in our waters, just as our ancestors did, without the detriment that this training will cause. This particular training & testing will harm the ecological and environmental sustainability that our island and community has worked so hard to keep in tact for years. For example, traditional, recreational, & commercial fishing will be hindered by such detonations & training. Fishing and tourism is one of Guam's most common sources of economy, and destroying the habitats of marine life that we rely on isn't WRONG. There is NOTHING from this military plan that would benefit the island at all. Our island was never meant to host this many people, and quite frankly, the visitors are destroying a place where Pacific Islanders call HOME. How would you feel if we decided to detonate your home and turned a blind eye to all of the negative, LIFE-THREATENING impacts that it had on your lifestyle and your family's future? Please, we beg of you, take this training somewhere else. It is not allowed nor welcomed on Guam.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities. The Proposed Action will not restrict traditional, recreational, or commercial fishing. The Navy issues Notices to Mariners (NOTMARs) to advise fishers when fishing areas are temporarily restricted. The Navy also implements procedural mitigation measures to avoid or reduce impacts of the Proposed Action on marine and cultural resources.

	Comment	Navy Response
Addy C (AC)		
AC-01	This is unacceptable. Does it not weigh on your conscience that marine life and the livelihood of an entire population of humans will be destroyed at your hands? We do not need this type of harmful wreckage for the sake of testing. Please reconsider your actions.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Shane Quintanilla (SQ)		
SQ-01	It's ridiculous to say "Please DO NOT move forward with bomb detonations and sonar use in our fragile waters. Please honor what we consider sacred and honor our cultural beliefs." It is ridiculous to say that because as human beings, YOU SHOULD KNOW that it is WRONG. Complete disregard for beliefs and cultural insensitivity almost always breeds "terrorism." DO NOT turn the indigenous people of Guam into terrorists. Just respect our deep desire to preserve what little we have, protect our fragile ecosystem and honor our beliefs as we honor the US Governments societal etiquette.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Veronica Mendez-Arriola (VMA)		
VMA-01	You are destroying g food and the tourism I industry. Not to mention the human consequence of killing people by poisoning them. U live here and my children live here and you are destroying our home.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Monica Flis (MoF)		
MoF-01	Please protect our natural environment and resources in the Marianas.	Marine life and habitat are important to the Navy. The Navy trains worldwide, not just in the MITT Study Area. Using the latest science and technology, the Navy completed extensive analyses and computer-based modeling to determine

	Comment	Navy Response
	From what I understand, the MITT will the largest DOD training area in the world. Training would include underwater bombers detonations and sonar training. The MITT allows 81,962 takings of 26 different marine mammal species (including whales and dolphins) per year for 5 years due to detonations, sonar, or other training and testing activity. The MITT also allows damage or kill of over 6 square miles of endangered coral reefs plus additional 20 square miles of coral reef around FDM through the use of highly explosive bombs. I find this all unacceptable. I am deeply worried about the consequences such actions will have on the resources our ocean and land provide us in the Mariåna Islands. These actions will have a devastating impact for the future of our islands and people.	impacts and develop science-based protective measures to reduce or avoid potential impacts on marine life. The Navy's acoustic effects model predicts that the vast majority of marine mammals' exposure to acoustic stressors (sonar and explosives) would cause temporary changes in behavior. The Navy avoids areas where coral reefs are present to the greatest extent practicable. Long-term surveys of nearshore waters and habitat surrounding FDM have shown very little disturbance from Navy activities. These surveys also indicate that the health, abundance, and biomass of fishes, corals, and other marine resources in those habitats are as good as, or better than, those in similar habitats elsewhere in the Mariana Archipelago (see Smith and Marx, 2016). Potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practicable, procedural and geographic mitigation measures during its training and testing activities to reduce potential impacts on marine life. The Navy's analysis indicates that, with implementation of its protective mitigation measures, there would be no significant impacts on marine species.
Brian Lee Flores (BLF)		
BLF-01	I am native to these lands. I am a veteran. Of all the land owned by the USA, you opt and plan to devastate our nature lands, and the place I call home. You have massive plains and deserts, space multiple times the mass of the Marianas to use, yet you choose to make ours your playground of war simulation. You as a country have taken enough from natives from the eastern shore, over the west coast, and onto the Pacific islands. It's disgusting the true history of America. This is how you reward your citizens who have very little, and have a deep sense of patriotism. I deeply oppose this, and I dare say, it will change my mind on how I view this country.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.

	Comment	Navy Response
	You do too much wrong to everything you touch.	
Chae Phillips (CP)		
CP-01	Do not bring the firing range here to Guam. Guam has so much history in our lands & waters. For the sake of the future of Guam and the Mariana islands and the natural habitat for many species, we do not want a fire range on our island, our home.	The firing range is not part of the Proposed Action.
Lenae Nofziger (LN)		
LN-01	I do not support the expansion of the Department of Defense training area. This expansion will have negative impacts on both animals and humans. The MITT allows 81,962 takings of 26 different marine mammal species (including whales and dolphins) per year for 5 years due to detonation, sonar, and other training and testing activity within the MITT. That represents an unacceptable threat to marine mammals. Further, disrupting this ecosystem affects the humans who rely on it.	The Navy is not proposing any geographic expansion of the training and testing area in this Supplemental EIS/OEIS. Proposed activities are similar to those conducted in the Study Area for decades. Marine life and habitat are also important to the Navy. The Navy trains worldwide, not just in the MITT Study Area. Using the latest science and technology, the Navy completed extensive analyses and computer-based modeling to determine impacts and develop science-based protective measures to reduce or avoid potential impacts on marine life. The Navy's acoustic effects model predicts that the vast majority of marine mammals' exposure to acoustic stressors (sonar and explosives) would cause temporary changes in behavior. The Navy avoids areas where coral reefs are present to the greatest extent practicable. Long-term surveys of nearshore waters and habitat surrounding FDM have shown very little disturbance from Navy activities. These surveys also indicate that the health, abundance, and biomass of fishes, corals, and other marine resources in those habitats are as good as, or better than, those in similar habitats elsewhere in the Mariana Archipelago (see Smith and Marx, 2016). Potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practicable, procedural and geographic mitigation measures during its training and testing activities to reduce potential impacts on marine life. The Navy's analysis indicates that, with implementation of its protective mitigation measures, there would be no significant impacts on

	Comment	Navy Response
		marine species.
Christian Life Center (CLC) Steven McManus		
CLC-01	I have served as the pastor of our church for more than 25 years as well as the founder and president of Southern Christian Academy since 1994. I am also the founder of Career TEch High Academy Charter School which seeks to begin in the fall of 2019. As an educator and community leader for the island of Guam, I am deeply opposed to the creation and expansion of the MITT program for the following reasons: I. Irreversible damage to limited natural resources and endangered species. This has already been litigated when the US Navy was found to violate environmental law: The U.S. District Court, District of Hawaiʻi, found that the U.S. Navy and the National Marine Fisheries Service violated the law when they failed to meet multiple requirements of the Marine Mammal Protection Act, the Endangered Species Act, and the National Environmental Policy Act when authorizing the Navy's plan. Smarting from their recent legal loss in Hawaii, is the US DoD trying to transgress US law again in a less known area with less opposition? Is the DoD prepared to waste their time and money litigating against the rule of law?	The Navy is not proposing any geographic expansion of the training and testing area in this Supplemental EIS/OEIS. Proposed activities are similar to those conducted in the Study Area for decades. The 2015 Hawaii-Southern California Training and Testing EIS/OEIS-related settlement agreement has no bearing on the MITT Supplemental EIS/OEIS. The Navy has been conducting training and testing activities in the Study Area for decades, and this supplement to the 2015 MITT Final EIS/OEIS supports the continuation of that training and testing. The activities analyzed in this Supplemental EIS/OEIS are largely a continuation of the ongoing training and testing activities that were analyzed in the 2015 MITT Final EIS/OEIS, 2010 MIRC EIS/OEIS, 1999 Military Training in the Marianas Final EIS, and other environmental compliance documents. Proposed training and testing activities are needed to achieve and maintain military readiness within the Study Area. This Supplemental EIS/OEIS furthers the Navy's and other military services' execution of their roles and responsibilities under 10 U.S.C. section 8062. All potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. As described in Chapter 5 (Mitigation), the Navy implements procedural and geographic mitigation measures during its training and testing activities to avoid or reduce potential impacts on marine life. This science-based analysis indicates, with implementation of the Navy's protective mitigation measures, there is not a significant impact on marine species. The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.

	Comment	Navy Response
	II. Counterproductive to Sustainability Sound bi-partisan science has already proven that the destruction of our natural resources for the betterment of humanity (advancement of national defense) is just plain non-sense. See the following: In 1946, Navy Commodore Ben Wyatt met with the 167 people living on Bikini Atoll. Wyatt asked the Marshallese to relocate, and for use of their atoll "for the good of mankind." He explained that they were a chosen people and that perfecting atomic weapons could prevent future wars. The residents were promised they could return one day, but realistically they had no choice in this matter. Immediately following this speech, the U.S military began preparations to relocate the residents to Rongerik Atoll, an uninhabited island with limited resources 125 miles away. Residents of Bikini Atoll resettled in 1969, but then evacuated in 1978, after radiation levels were determined to be excessive. I thought we were done with such archaic and inhumane practices. Its 2019, not 1946! Surely, we can come up with less destructive practices to insure the survival of humanity.	
Marilyn Schofield (MS)		
MS-01	Further exploitation is an affront to the people of the Marianas. More whale & dolphin beachings, further destruction of already compromised coral reefs, loss of endangered species, more contamination, more poisoning of our natural resources. Killing our environment is akin to destroying our island homes, culture, traditions & literally sickening & killing our people. This is a form of cold-blooded	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.

	Comment	Navy Response
	genocide, disrespect for us as a people & utter disregard for the environment. Please reconsider your decision. Guam & the Marianas Islands Chain is more than a military experiment it is home to fellow human beings who deserve the same respect, safe haven, environmental preservation, dignity & freedoms as the rest of the United States. Sincerely, Marilyn Pangelinan Schofield	
Rebekah Garrison (RG)		
RG-01	Your presence in Guåhan is an extension of the US settler state. Your imagined community of island buffers, that encircle the continent, is not an expression of settler responsibility but a painful and constant reminder to the CHamoru, Kanaka Maoli, and Boricua communities of their statuses as US island colonies and colonized peoples. Instead of expanding US Empire's colonial cartographies and violent structures of destruction into these oceanic spaces, take time to critically self-reflect on what you really know about Indigenous histories and counter-narrative critique to your continual acts of arrogance through perpetuating manifest destiny and the white man's burden. What you're doing is painful to Indigenous communities. Shame on you and the delusional realm in which you impose power, privilege, and Eurocentric ways of understanding space, history, and the present onto our planet's and humanity's future. This is the second time that I send this message to you. The first time was in January 2019 when I submitted this exact comment for the Danger Zones and Restricted Areas: Pacific Ocean at Naval Base Guam Telecommunication Site, Finegayan Small Arms Range, on the Northwestern Coast of Guam. Curiously, you did not publish this comment and share with the	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities. The Navy is not proposing any geographic expansion of the training and testing area in this Supplemental EIS/OEIS. Proposed activities are similar to those conducted in the Study Area for decades.

	Comment	Navy Response
	CHamoru community. Why is that? Are you ashamed of what you're doing? I oppose the MITT now and always. White settlers invented the very laws still used to govern society—still used to erase Indigenous claims to land. As settlers/immigrants/arrivants, white or not, wealthy or poor, we all uphold settler structures of control that disempower Indigenous communities. We settlers must do better.	
George Delgado (GD)		
GD-01	This idea concerns the community due to such ignorance and lack of obligation to our planet. Everything you are doing as our government's military is evil and abusive to the masses and mother earth Gaia. Your time is over and change is coming.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Gwen Kim (GK)		
GK-01	This is an egregious destruction of Moana Nui for military hegemony. People's of the Earth will stand against this ♡✊♡	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
De-Anna Taijeron (DAT)		
DAT-01	I am deeply concerned about the consequences such actions will have on the significant resources our great ocean and land provide us in the Mariåna Islands. These actions have a devastating impact on indigenous culture and lifeways, increase our dependence on imported foods sources, and erode our resilience. Have respect for this land that you are visiting. You will be destroying it, and take time to consider how this will fully IMPACT the world in terms of global warming. How can you protect a country, when you're destroying the planet it is on?	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.

	Comment	Navy Response
Alexandra Quenga Kerr (AQK)		
AQK-01	I am a concerned citizen of Guam. I am cognizant of the various current and emerging geo-political threats to the US and US-occupied territories, but I have concerns over the DOD's perceived need to expand military training in the Marianas. I am concerned that this vast expansion of the MITT zone will come at the cost of the Mariana Islands' agency to conduct its own affairs and administer its own lands and resources. I am concerned that a possible separation of the Mariana island programmatic agreement into two separate programmatic agreement goes against that wishes of the people of the Mariana islands and acts to perpetuate a schism between the two governments and in the power of the Mariana people to act as advocates for their cultural and natural resources. Although geo-politically distinct because of differing colonizer histories, in recent years, sentiment for a 'One Marianas' has been expressed in the general public in both CNMI and Guam. Pre-historically and environmentally, the Mariana Archipelago are a seamless collective of islands. I oppose any moves to create separate programmatic agreements for the CNMI and Guam. There is concern that decisions made in the SEIS do not use or cite information on marine animal that is most recently available. Strandings, sightings, whale births do not seem to be accounted for. This is in reference to an April 15th joint informational briefing at the Guam Legislature with several participating Guam agencies. A biologist at the Department of Agriculture confirmed during this session that the Agat offshore mine detonation site is an area where sperm whales have recently been recorded giving birth. This was not	The Navy is required to complete independent statutory obligations under both NEPA and NHPA. Thus, the Navy has prepared the MITT Supplemental EIS/OEIS and is pursuing continued compliance with the NHPA using the Section 106 process. The Navy is not proposing any geographic expansion of the training and testing area in this Supplemental EIS/OEIS. Proposed activities are similar to those conducted in the Study Area for decades. The Navy reviewed the best available scientific data and information on marine mammals available for inclusion in the Draft Supplemental EIS/OEIS, and incorporated relevant information into the marine mammals impact analysis in this Supplemental EIS/OEIS. Peer-reviewed scientific publications are considered to be the most reliable and accurate sources of data and information and were used throughout this Supplemental EIS/OEIS to support the analysis and conclusions. Well-respected and historically vetted government reports (e.g., marine mammals stock assessment reports) were also used to support the analysis. Any newly published data and information relevant to the analysis of potential impacts on marine mammals that has become available since the Draft Supplemental EIS/OEIS was incorporated into this Supplemental EIS/OEIS. Recently published information by NMFS indicates that the Mariana Islands may be a calving area for humpback whales. In consideration of this, the Navy has developed in this Supplemental EIS/OEIS a geographic mitigation area at Marpi Reef off Saipan (see Appendix I, Geographic Mitigation Assessment). Two photographs that are Associated Press File photos depict this sperm whale calf; mention of those photos has been added to this Supplemental EIS/OEIS. To reiterate, a single known occurrence of a newborn calf approximately 19 years ago does not indicate the area to be an established and routinely used sperm whale calving and nursery habitat. While it is possible that several species of marine mammals could occur at the Agat Bay Mine Neutralization Site, the Navy's procedural mitigation measures involving observing for marine mammals and sea turtles prior to conducting activities using explosives at the site reduces

	Comment	Navy Response
	mentioned in the SEIS. The annual take of marine animals, although anticipated by your estimates not to be reached, is quite high, 400,000 over a five-year period. This is in consideration of the fact that the Guam Coastal Zone Management has an acceptable take per year of 0. It is also my opinion that marine animal take in any given year for any activity should be 0 whether in surrounding waters or at sea. As research on whales increases, we are increasing our knowledge of cetaceans and their intelligence as complex social beings. How would anticipated takes affect the ability of pods to function as a whole? How might the proposed military exercise affect the ability of marine mammals to birth their offspring? I also object to the use of the word "take." It seems to be a choice of word that obscures the full impact of the harm that could potentially be done to marine mammals and fish. I urge you to call it "harassment, injury, or kill." I am concerned about sonar use, especially as it relates to whale strandings and potential permanent hearing loss for Kogia breviceps: "Sonar use during exercises involving the U.S. Navy has been identified as a contributing cause or factor in five specific mass stranding events: Greece in 1996; the Bahamas in March 2000; Madeira Island, Portugal in 2000; the Canary Islands in 2002, and Spain in 2006 (Cox et al., 2006; Fernandez, 2006; U.S. Department of the Navy, 2017c). These five mass strandings resulted in about 40 known cetacean deaths consisting mostly of beaked whales and with close linkages to mid-frequency active sonar activity. In these	the likelihood of potential impacts on marine species. Please refer to Chapter 5 (Mitigation) for additional information on the Navy's procedural mitigation measures. Please see the technical report cited in the Draft Supplemental EIS/OEIS and this Final Supplemental EIS/OEIS titled *Marine Mammal Strandings Associated with U.S. Navy Sonar Activities* (available at www.mitt-eis.com), which summarizes (1) stranding events associated with U.S. Navy sonar activities and (2) strandings speculated but not linked to U.S. Navy sonar activities. This report also discusses other natural and anthropogenic factors that have been shown to contribute to strandings. Over the last 50 years, increased awareness and reporting has led to more information about species affected and raised concerns about anthropogenic sources of stranding. While there have been limited numbers of marine mammal mortalities potentially associated with U.S. Navy activities, as noted by the commenter, the root causes are not clear in most cases. NMFS, as the regulator, maintains the authoritative National Stranding Database. The Center for Naval Analysis (CNA) also recently conducted a statistical study of correlation of beaked whale strandings around the Mariana Islands with the use of U.S. Navy sonar, finding that insufficient evidence of a correlation exists. The CNA study used the complete record of all U.S. Navy sonar use between 2007 and 2019, including major training events, joint exercises, and unit level training/testing. The analysis also included the complete beaked whale stranding record for the Mariana Islands through 2019. Following the methods in Simonis et al. (2020), the CNA analysis found insufficient evidence of a correlation between sonar use and beaked whale strandings when considering the complete sonar use record. The CNA finding is in contrast to the finding in Simonis et al. (2020), which depicted a significant correlation between beaked whale strandings and Navy sonar use. However, the Simonis et al. (2020) result relied on substantially incomplete or inaccurate assumptions about U.S. Navy sonar use around the Mariana Islands. CNA also conducted statistical analyses specific to each island where beaked whale strandings have been observed in the Mariana Islands, similarly finding insufficient evidence of a correlation to sonar

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	circumstances, exposure to non-impulsive acoustic energy was considered a possible indirect cause of death of the marine mammals (Cox et al., 2006)." (3.4-87 3.4 Marine Mammals (pdf p.319 vol1)) Strandings are a public safety bio-hazard, requiring time and resources from the local government to oversee clean up and ensure no harm to humans. How might the military determine if a potential future stranding on Mariana Island shores is not caused by military activities, and if it is, how would the military help to mitigate the cost of strandings on the local government? I am concerned that the potential negative impacts to Kogia brevicieps whales are not addressed in the sonar use mitigation section: "The analysis in Section 3.4.2.1.2 (Impacts from Sonar and Other Transducers) of this SEIS/OEIS indicates that pygmy and dwarf sperm whales (Kogia whales) are the only deep-diving marine mammal species that could potentially experience PTS impacts from active sonar in the Study Area. The 30-minute wait period for vessel deployed sources will cover the average dive times of marine mammal species that could experience PTS from sonar in the mitigation zone, except for Kogia whales." (pdf p.288 vol2). What is the potential mitigation for the possible harm done to Kogia breviceps?	use. Additional information on the findings of the CNA analysis are presented in Section 3.4.2.1.1.6 (Stranding) in Chapter 3.4 (Marine Mammals). The NMFS Pacific Islands Regional Office and Science Center coordinates responses to marine mammal strandings through the National Marine Mammal Health and Stranding Response Program. The Navy does not anticipate that any marine mammal strandings would result from Navy activities in the Study Area. Since the inception of current monitoring protocols over a decade ago, no marine mammals have been reported distressed or injured in association with Navy training and testing activities. The Navy will continue to coordinate with NMFS to better understand potential impacts on marine mammals, both through adaptive management and notification and reporting under the Letter of Authorization under the MMPA. As described in Section 5.1.2.2.1 (Marine Species Research and Monitoring Programs), for this Final Supplemental EIS/OEIS, the Navy agreed to several additional research and monitoring initiatives designed to help advance the understanding of beaked whales and strandings in the MITT Study Area. The Navy will co-fund the Pacific Marine Assessment Program for Protected Species (PACMAPPS) Mariana Islands survey in spring-summer 2021 and future studies starting in 2022 to help document beaked whale occurrence, abundance, and distribution in the Mariana Islands. The Navy will also fund additional stranding response and necropsy analyses for the Pacific Islands region, and research on a framework to improve statistical stranding analysis. Collaboratively with NMFS, the Navy will fund and organize an expert panel to provide recommendations on scientific data gaps and uncertainties for further protective measure consideration to minimize potential impacts of Navy training and testing activities on beaked whales in the Mariana Islands. Behavioral responses by marine mammals are predicted by the Navy's acoustic effects model. Research cited in this Supplemental EIS/OEIS and in the MITT 2015 Final EIS/OEIS indicates that behavioral responses by marine mammals exposed to underwater sound vary from no response to an immediate change in behavior (e.g., change in swimming direction). Behavioral changes are temporary and not necessarily repeated and animals frequently return to and continue

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		their prior behavior after the initial interruption. Information on strandings associated with Navy training and testing activities is provided in the 2017 technical report, *Marine Mammal Strandings Associated with United States Navy Sonar Activities*. In addition, Section 3.4.2.1.1.6 (Stranding) has been expanded to include additional information about strandings of beaked whales in the Mariana Islands and the Navy's support of efforts to better understand the causes of marine mammal strandings. The Navy will implement mitigation to avoid or reduce potential impacts from active sonar on marine mammals. The Navy's mitigation zones extend beyond the average range to PTS for all marine mammal species, including Kogia. Therefore, the Navy anticipates that mitigation will help avoid or reduce the potential for PTS from active sonar for Kogia.
Janice Toves (JT)		
JT-01	When will you realize the importance of our waters and land and any damage to it directly correlates to our lives and our children. When you hurt our waters, you hurt the food that we rely on to feed our families. If you want to test things, go to your own backyard, in your own community and we'll see how that goes. Life may mean little to you people more than money and power but with no people, food, environment YOU WILL HAVE NOTHING TO HAVE POWER OVER. DO YOU NOT SEE THE DAMAGE THAT YOU DO AND THE POWER THAT YOU OVER OUR LIVES?! WHEN OUR FUTURE IS RIDDLED WITH DISEASE AND DEATH AND OUR CHILDREN UNABLE TO SURVIVE OR THRIVE IT WILL BE TOO LATE. ARE YOU NOT SOME OF THE SMARTEST PEOPLE IN THE ENTIRE WORLD? WHEN WILL YOU REALIZE THAT WE CANNOT FLUSH THE OCEAN AND REVERSE ANY DAMAGE YOU CAUSE. I RESPECT THE GOVERNMENT SYSTEM, I AM APART OF IT, I AM A	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.

	Comment	Navy Response
	PRODUCT OF IT. PLEASE FIND ALTERNATE MEANS TO GET YOUR CONTROL. WE ARE NOT JUST PROPERTY!	
Allan Santos (AS)		
ASA-01	I Urge your officials NOT to Destroy Guam, and the Marianas Islands already limited natural resources the US military has already seized and destroyed so much Native property and territory resulting in loss of native Flora and Fauna and habitat... We must protect these islands for the future generations to enjoy. I urge you to STOP the buildup NOW! Enough is enough!	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Jourdene Rosella Aguon (JRA)		
JRA-01	Expanding the military presence or intrusion on these lands will not improve your war efforts, only science and technology will do that, in terms of your weaponry. The massive amount of money spent on this endeavor is an assertion of dominance, not a tactical move to improve safety or lethality: more money can be funneled into the likes of Microsoft, Cisco, Boeing, or even other bio or chemical companies that produce better weapons, vehicles, toxins and viruses. Win your wars smarter, with better weapons, better tech, and better equipped soldiers-- don't need any more land from an already exploited island. Yankee, stay at home.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities. The Navy is not proposing any geographic expansion of the training and testing area in this Supplemental EIS/OEIS. Proposed activities are similar to those conducted in the Study Area for decades.
Chelsea Uhl (CU)		
CU-01	I don't believe the military should be taking MORE land and ocean and training/destroying it. Enough of the world has be unnecessarily taken and being destroyed. Micronesian people	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.

	Comment	Navy Response
	are being poisoned and shafted out of their culture and property. No more bombing and trainings	The Navy is not proposing any geographic expansion of the training and testing area in this Supplemental EIS/OEIS. Proposed activities are similar to those conducted in the Study Area for decades.
Eliseo Silverio III (ES)		
ES-01	I am a resident of Guam and have heard of DOD's plan to expand the training range. I do not agree as it does not conserve and protect the regions rich natural resources and ecosystems. Destroying coral reef systems through training and detonating bombs will have great impacts on the regions livelihood, the marine animals and our oceans.	The Navy is not proposing any geographic expansion of the training and testing area in this Supplemental EIS/OEIS. Proposed activities are similar to those conducted in the Study Area for decades. Marine life and marine habitat are important to the Navy. Using the latest science and technology, the Navy completed extensive analyses and computer-based modeling to determine impacts and develop science-based protective measures to reduce or avoid potential impacts on marine life. Potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practicable, procedural and geographic mitigation measures during its training and testing activities to reduce potential impacts on marine life. The Navy's analysis indicates that, with implementation of its protective mitigation measures, there would be no significant impacts on marine species.
Jessie Davis (JD)		
JD-01	I am against the MITT plan to bomb the west Pacific for "training." Why would you endanger humans and animals, many of which are already endangered, with your "Training"? What a senseless waste of life and money!	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Kimberly Diego (KD)		
KD-01	Why does a professional and large US organization even need to be told of the effects and consequences of these actions?	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.

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	Guam is not just a military base but home to thousands of people who care and love the island we live in. Thousands of our grandchildren who won't be able to experience the paradise we live in now because of what? We love and have pride in the US military and what they have done for us in the past. It would be a shame to have to say that they are not only our saviors but our cause of destruction. yours truly, GUAM LOVER	
Lani Perez (LP)		
LP-01	I am opposed to this project!!!!!!!	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Kalani Perez (KP)		
KP-01	I am opposed to this project!!!	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Uriah Aguon		
UA-01	This shouldn't even be an issue! Why would they need to militarize more? How many bases or depots, or whatever do they already have? If you need to build more, build it on your own soil. If you continue to defrqde the land, then you'll begin to degrade the people and eventually their culture. If you don't care abput that, then care about preserving the land so that there's still something natural for people to stand on and live off of twenty years from now. Show some consideration; show some respect!	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.

	Comment	Navy Response
Geraldine Pablo (GP)		
GP-01	These planned military training in the ocean will have an affect on animal, coral and sea plants. This will negatively impact the delicate balance of the environment that will ripple and affect further out than the training area. I do not want the ocean around the Mariana Islands to become an underwater desert....no life. This will in turn affect our land. Have not learned from the past?	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Jesse Chargualaf (JC)		
JC-01	I don't want my homeland to host the MITT. The UN charter says that the territorial administrator should not harm the territory's natural resources. The MITT will harm our sea life and our lives as well. The military thinks we will be content with how they run things and how they run many aspects of our lives, but we are not content, we will fight.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Nicole Sablan (NS)		
NS-01	I am against the Mariana Islands Training and Testing Supplemental EIS/OEIS project!!!	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Simone Bollinger		
SB-01	Please slow down with your use of the Marianas as a training ground for weapons. Many of us don't condone it and our marine life is unique and worth preserving. Please listen.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Natasha Cruz (NC)		
NC-01	I do not support this project. This will have damaging effects to the ocean, coral reefs, & land of the Mariana's Islands. The lasting effects on the islands in the Marianas and will severely affect our natural resources.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
James Slao (JS)		

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JS-01	Every empire has failed by over extending themselves, trying to conquer more than they can handle and taking a shit where they eat/sleep. The military is nothing more than a bunch of corporations with corporate greed and disconnect from the lands they grab and destroy. You are not welcome to test nothing, you have contaminated all over the islands already and now back to shit on it yet again. Testing from alaska through to california and the whole eastcoast isnt a good idea why? Just because the military is able to buy off corrupt leaders of the island and bury evidence while using your own analysis to give us fake data showing rigged test result. Just because you were successful at breaking up 3,000+ years written history/friendship between japan and guahan. Just because you give us ''aid'' with money you take from us in the 1st place. Just because you are killing our roots. Just because you have been successful so far, does not mean you are not going to fall. You are not welcome to destroy our islands. Dont think we dont know about all the chemical weapons you been testing on all our sister islands either, justice is not the word since justice can be bought, the word is karma. Now feel free to go home and never look back.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.

	Comment	Navy Response
Elilai Rengiil (ER)		
ER-01	I am incredibly concerned that the marine species and our coral reefs will not survive the Navy's underwater detonations. As ocean acidification increases we should be doing all we can to protect our reefs from further damage. The reef is a source of livelihood for people dependent on their natural resources to survive and so by continuing with this project you are endangering lives.	This Supplemental EIS/OEIS fully complies with NEPA. Using the best available science, the extensive studies and analysis conducted by the Navy exceeded the required hard look at impacts on environmental resources. Potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practicable, procedural and geographic mitigation measures during its training and testing activities to reduce potential impacts on marine life. The Navy's analysis indicates that, with implementation of its protective mitigation measures, there would be no significant impacts on marine species.
Christopher Guerrero (CG)		
CG-01	Of grave concern is the omittance of the most latest, pertinent scientific data concerning all marine mammal species thus far observed or noted to be within the proposed areas. This lack of the most recent scientific data highlights faulty data collection practices and unacceptable shortcomings within the MITT EIS, considering the magnitude and scope of such intense Military related proposed activities. Certain species of whales, such as Sperm Whales, have been observed and documented by the local scientific community as giving birth within the proposed areas of the MITT. This data has been omitted or excluded from consideration and has not been included into the MITT EIS. Improper data collection, faulty analysis techniques, incomplete research data on specific species of whales to be impacted all lead to a faulty, inaccurate MITT EIS.	In this Supplemental EIS/OEIS, the Navy cites peer-reviewed scientific publications and government reports that document the latest research on marine mammals. The Navy has reviewed those publications and completed extensive analyses and computer-based modeling to determine impacts and develop science-based protective measures to reduce or avoid potential impacts on marine life. Potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practicable, procedural and geographic mitigation measures during its training and testing activities to reduce potential impacts on marine life. The Navy's analysis indicates that, with implementation of its protective mitigation measures, there would be no significant impacts on marine species. Two photographs that are Associated Press File photos depict this sperm whale calf; mention of those photos has been added to this Supplemental EIS/OEIS. To reiterate, a single known occurrence of a newborn calf approximately 19 years ago does not indicate the area to be an established and routinely used sperm whale calving and nursery habitat. While it is possible that several species of marine mammals could occur at the Agat Bay Mine Neutralization Site, the

	Comment	Navy Response
		Navy's procedural mitigation measures involving observing for marine mammals and sea turtles prior to conducting activities using explosives at the site reduces the likelihood of potential impacts on marine species. Please refer to Chapter 5 (Mitigation) for additional information on the Navy's procedural mitigation measures.
Sienna Kaske (SK)		
SK-01	I do not agree with this at all and you will harm the environment and the people.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities. This Supplemental EIS/OEIS fully complies with NEPA. Using the best available science, the extensive studies and analysis conducted by the Navy exceeded the required hard look at impacts on environmental resources. Potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS.
Jaya Black-Lazo (JBL)		
JBL-01	I don't agree with this! I oppose this! I don't think this is a good idea!	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Aiko Yamashiro (AY)		
AY-01	I would like more clarification on section 3.11 "Cultural Resources." In the Public Scoping Comments, it is noted that the Navy should conduct a cultural survey of FDM. The response of the EIS is that a survey done in 1996 reported no archaeological sites. However, in an earlier part of section 3.11, re: Saipan, the same conclusion was drawn (no archaeological sites) but then it is stated that a 2011 survey revealed new information. 1996 sounds like a long time ago to base a claim that there are no submerged cultural resources in FDM, especially considering advances in archaeology as well as in Indigenous research methodologies since 1996. I would ask the Navy to do due diligence of resurveying FDM, in order to support the claim that there are	The Navy is required to comply with both NEPA and Section 106 of the NHPA. To meet the requirements under Section 106, consultations with CNMI HPO, Guam HPO, and interested stakeholders have been ongoing since January 2019. One of the objectives of the consultation is to replace the now expired 2009 MIRC PA. The consultation revealed that there is much interest in a survey of FDM. This request is being considered. Additionally, appropriate mitigations will be developed through the consultation process. NHPA applies to historic properties, a specific subset of cultural resources. Under the Act, the Navy must consider the undertaking's effects upon historic properties. However, Section 3.11.1.3 (Cultural/Traditional Practices and Beliefs) has been added to the MITT Final Supplemental EIS/OEIS as part of the study so as to analyze the Navy's potential

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	no noteworthy cultural sites in the area. I would also suggest the Navy consult with cultural experts, and research stories and song, to consider the significance of the area not just as a static bounded place, but as a place historically and culturally connected to other parts of the ocean and islands (i.e., that may be mentioned in stories and songs about other places). I would also like to see this section of the report recognize broader cultural significance of not just sites, but animals, plants, etc., and track impact to these elements as well. I would like to see this level of rigorous and respectful research in this EIS before decisions can be made. We are responsible to both our ancestors and our children to care for our culture so this is a big responsibility. Thank you for allowing this voice to be heard.	impact on the broader category of cultural resources and traditional practices and beliefs.
Caitlin Feitz (CF)		
CF-01	I am a mother of 3 and married to a navy active duty member. I am very concerned with how our world is changing and especially concerned for my children. I do not want the earth to be destroyed anymore! These underwater tests should not be done. All the animals that are hurt with sonar testing alone should be a deterrent for you all. Also, the deterioration from the blasts to the ocean can't be good for the environment. I understand your wanting to make bigger badder weapons but come on. Let's think about the planet we live on! Please and thank you 🙏 I know I'm just a civilian and this is probably a pointless comment but I would appreciate a little more thought on what everyone else that live on this planet or at least on the islands about how they feel about these "tests".	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Serena Ngaio (SN)		
SN-01	There is no need to continue harming the environment in Guahan through military training and testing. There has been substantial land theft and incredible damage wrought on the	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.

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	lands, species, and marine life unique to Guahan already as a result of U.S. military greed and it is unnecessary to continue encroaching on what little is left to the Indigenous peoples of that place. Leave this place alone.	
Joanna Vretos (JV)		
JV-01	Please do not expand the U.S. Navy's military training and testing on Guam and surrounding areas. The resources the land and water provide to human, animal and other life are immeasurable and so important. Protect the air, land and water for future generations by stopping efforts to expand military training. That said about the important environmental implications, Americans do not want our world destroyed for expanded "protection" - because it will lead to more wars: for natural resources.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities. The Navy is not proposing any geographic expansion of the training and testing area in this Supplemental EIS/OEIS. Proposed activities are similar to those conducted in the Study Area for decades.
Shelly Johnston (SJ)		
SJ-01	As a former resident of the Marianas/current resident of a coastal area where whales play an important role in tourism and the ecosystem at large, I'm writing regarding concerns about impacts of the proposed increase in training and testing in this draft SEIS. Due to the sheer volume of this document and the focus of this proposal on obtaining Marine Mammal Protection Act and Endangered Species Act permits for "taking" listed species, this comment primarily focuses on marine animals; however, many of these concerns also relate to habitat, biodiversity, the economy, and preservation of the culture and tradition of the people of the Marianas as a whole. Although the slight extension of the comment period was helpful and much appreciated, this draft report is simply too extensive for the average community member to review and comment on the range of technical information and	As noted in Section 3.0.1.1 (Navy Compiled and Generated Data), the Navy invests extensively in basic and applied research. In fact, the U.S. Navy is one of the largest funding sources of marine mammal research in the world, which has greatly enhanced the scientific community's understanding of marine species. The Navy's support and conduct of cutting-edge marine mammal research includes marine mammal detection, including the development and testing of new autonomous hardware platforms and signal processing algorithms for detection, classification, and localization of marine mammals; improvements in density information and development of abundance models of marine mammals; and advancements in the understanding and characterization of the behavioral, physiological (hearing and stress response), and potentially population-level consequences of sound exposure on marine life. Information on current monitoring projects, technical reports, conference presentations and data are available on the Navy's Marine Species Monitoring Program website at

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	conclusions regarding impacts and appropriate mitigation activities within the report in the time provided. As both the Navy and other scientific studies agree, although marine mammals rely on sound for all the fundamental biological and ecological aspects of their lives including navigation, prey location and capture, predator avoidance, and communication (including during migration and reproduction), the "causal mechanism for mortality of individuals from naval sonar remains unknown, as does the extent of its impact" (see S.J. Dolman et al./Marine Pollution Bulletin 58 (2009) 465–477). Given uncertainties regarding impacts, I believe additional monitoring should be conducted in the Marianas to ensure current and proposed activities do not have significant impacts on marine animals, as well as the ecosystems and communities that rely on these species. In general, it would be helpful if the Navy provided summaries of technical documents that could be more accessible to lay-people, but based on the information presented, I wonder how the significance of impacts of effects of sonar use and in-water weapons including explosives and "new technology" can be credibly assessed, let alone minimized and mitigated given the lack of good data regarding impacts or well developed data regarding the range and distribution of marine mammals and sea turtles in the Marianas? The Navy itself acknowledges critical data gaps in the supplemental information included in the draft SEIS/OEIS. For example, the report, Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III) (June 2017)	https://www.navymarinespeciesmonitoring.us/. Technical reports are also provided on the website at https://mitt-eis.com/. Based on the analysis presented in this Supplemental EIS/OEIS and use of best available data, additional monitoring or tagging is not required in order for the Navy to comply with NEPA. However, it is important to note that, within the Study Area, the Navy has sponsored several monitoring projects to better understand marine mammal and sea turtle distribution and habitat use, and to assess the presence of corals and ESA-listed species at FDM. Additional information is available on the U.S. Navy Marine Species Monitoring Program website (https://www.navymarinespeciesmonitoring.us/). The Navy will also continue to support marine mammal surveys in waters surrounding Guam and the CNMI to better quantify the abundance and distribution of marine mammals and to increase scientific understanding of marine mammal behavior in the Study Area. Future monitoring efforts would be coordinated with NMFS. In the Draft Supplemental EIS/OEIS, the Navy took a hard look at the potential impacts of the Proposed Action on marine mammals and sea turtles using the best available science. The Navy's quantitative analysis process for analyzing impacts from active sonar and explosives has been reviewed by external scientists and approved by NMFS. The Navy also worked collaboratively with NMFS to develop mitigation measures using input from military operators, the best available science, predicted activity impact footprints, and marine species monitoring and density data. The Navy has implemented and will continue to implement procedural mitigation measures designed to reduce or avoid impacts on marine mammals in the Study Area (see Chapter 5, Mitigation). At this time, these procedural mitigation measures represent the most practicable methods for protecting marine mammals while allowing the Navy to complete its training and testing mission. Recognizing the importance of the Mariana Islands to marine mammals, the Navy has developed three geographic mitigation areas in this Supplemental

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	states that "equal loudness contours are available for only a single marine mammal (a dolphin) across a limited range of frequencies (2.5 to 113 kHz)". However, it appears that these loudness contours were used to model effects across nine marine animal species groups "under the assumption that reaction time is correlated with subjective loudness" and therefore effects. Numerous behavior effects have been identified in regards to sonar use on marine animals. A National Oceanic and Atmospheric Administration study said the Navy's use of sonar contributed to the beaching of 16 whales and two dolphins in the Bahamas in 2000. Eight of those whales died, showing hemorrhaging around their brains and ear bones, possibly because they were exposed to loud noise. There is no scientific doubt that intense acoustic energy from Navy sonar and other active sound sources can kill, injure, or significantly alter the behavior of marine mammals, whose sensitive hearing and reliance on sound for communication, foraging, and avoidance of predators make them particularly vulnerable. Scientists have documented mass strandings; mortal injuries, including lesions and hemorrhaging in vital organs; and behavioral changes in numerous marine mammal species following naval sonar training exercises around the world. Even where animals escape physical injury, the use of military explosives can significantly alter their behaviors. These are significant effects in any region and should be avoided and minimized where ever possible. It would be helpful if the total number of hours of active and passive sonar and total number and extent of explosions being proposed, and the total number of modeled "take" for	EIS/OEIS. Appendix I (Geographic Mitigation Assessment) includes information about areas considered and evaluated to be potential mitigation areas. Each area was assessed based on two criteria: (1) is the area a key area of biological importance for one or more marine mammal species or sea turtle species for an important life process, and (2) would the mitigation result in an avoidance or reduction of impacts. In addition, implementation of the area as a mitigation area must be practical and allow the Navy to carry out its mission requirements. The Navy used the best available scientific data on vulnerable or sensitive species, such as humpback whales, to identify the three geographic mitigation areas that met the two criteria. Updates to the appendix have been made in this Supplemental EIS/OEIS based on the Navy's ESA and MMPA consultations with NMFS. In addition, the Navy developed its reporting requirements in conjunction with NMFS as discussed in Section 5.1.2.2 (Monitoring, Research, and Reporting Initiatives). The commenters' assertion that a lack of equal loudness contours for all marine mammal species equates to a critical data gap is incorrect. As described in the technical report titled *Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III)* (June 2017), reaction times to tones can be measured using a scientifically valid assumption that reaction time is correlated with subjective loudness (Pfingst et al., 1975; Stebbins, 1966). The guidance for commercial whale watching vessels was specifically designed for vessels whose sole purpose is to intentionally approach marine mammals. The Navy's use of vessels during training and testing activities is fundamentally different from the purpose of commercial whale watching. Navy vessels never intentionally approach marine mammals. Navy procedural mitigation measures require vessels to maneuver to maintain a distance of at least 500 yd. from whales and 200 yd. from other marine mammals (except bow-riding dolphins), which are larger standoff distances than the guidance for whale watching vessels mentioned by the commenter. It is not practical for the Navy to implement vessel speed restrictions in response to a marine mammal sighting for the

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	all marine species for the duration of this activity were summarized to ease review. However, even without this information, it is clear that explosions, sonar and ship strikes during Navy exercises could harm marine life. It does not follow that a best practice to protect marine mammals is to simply monitor with a "look out" and stop activities if animals are spotted – as the Navy notes in the draft SEIS, "Lookouts will not be 100 percent effective at detecting all individual marine mammals and sea turtles within the mitigation zones for each activity. This is due to the inherent limitations of observing marine species and because the likelihood of sighting individual animals is largely dependent on observation conditions (e.g., time of day, sea state, mitigation zone size, observation platform) and animal behavior (e.g., the amount of time an animal spends at the surface of the water). This is particularly true for sea turtles, small marine mammals, and marine mammals that display cryptic behaviors (e.g., surfacing to breathe with only a small portion of their body visible from the surface)". Mitigation measures such as tagging animals with GPS and avoiding areas where they congregate to feed or breed as well as their migration corridors would seem like a better approach to avoiding impacts to these important creatures. It would be helpful if the final SEIS/OEIS detailed in a clear readable what mitigation measures and alternatives have been considered for the MITT. Have marine animal migration routes and breeding areas been identified and avoided throughout the range? Are there alternatives such as avoiding use of explosives and high intensity sonar during breeding and migration periods that could further reduce	reasons detailed in Section 5.3.4.1 (Vessel Movement). The Navy's procedural mitigation measures for active sonar involves trained Lookouts observing and implementing mitigation measures within a 1,000 yd. to 500 yd. power-down mitigation zone, and a 200 yd. shutdown mitigation zone. The mitigation zones for active sonar extend beyond the ranges at which permanent threshold shift (PTS) would occur for all marine mammal species found in the Study Area; therefore, mitigation will help avoid or reduce the potential for exposure to PTS. It is not practical for the Navy to implement larger mitigation zones during active sonar activities for the reasons detailed in Section 5.3.2.1 (Active Sonar). Behavioral responses by marine mammals and sea turtles are predicted by the Navy's acoustic effects model. Research cited in this Supplemental EIS/OEIS and in the MITT 2015 Final EIS/OEIS indicates that behavioral responses by marine mammals exposed to underwater sound vary from no response to an immediate change in behavior (e.g., change in swimming direction). Behavioral changes are temporary and not necessarily repeated. Unlike noise associated with commercial shipping, for example, sound sources used by the military do not continuously produce sound. Given the range of possible responses and variability in the type and severity of behavioral responses observed in marine mammals, potential long-term or population-level impacts are speculative. The Navy has addressed recent research on possible long-term effects in Section 3.4.2.1.1.7 (Long-Term Consequences) in this Supplemental EIS/OEIS and in Section 3.4.3.1.3 (Long-Term Consequences to the Individual and the Population) in the 2015 MITT Final EIS/OEIS. The Navy funds research on marine mammal responses to underwater sound, including sonar (e.g., Goldbogen et al. 2013) and has funded marine mammal surveys in the MITT Study Area (e.g., Fulling et al. 2011). For additional discussion on the potential effects of stressors on marine mammals, refer to Section 3.4.1.7 (General Threats), 3.4.2.1.1.3 (Physiological Stress), and 3.4.2.1.1.5 (Behavioral Reactions). As discussed in Section 5.1.2.2 (Monitoring, Research, and Reporting Initiatives), the Navy developed its reporting requirements in conjunction with NMFS to be

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	impacts to marine mammals and sea turtles? Are additional monitoring and studies being proposed within the area to support data collection and more informed decision making to achieve Navy readiness and environmental sustainability objectives? Are there other best practices that the Navy is implementing to reduce contributions to ocean noise? The World Cetacean Alliance's Global Best Practices for Responsible Whale and Dolphin Watching suggests that for commercial whale watching, best practices include that: Once within 300 metres of a cetacean, boat speed should be reduced to a no wake speed, avoiding gear changes and any sudden changes of speed or direction within this vicinity, except in cases of emergency; Boats should not approach a whale closer than 100 metres and should not approach a dolphin or porpoise closer than 50 metres; Boats must switch off echo sounders within 300 metres of a cetacean, if it is safe to do so. Based on this guidance, it seems that the Navy should consider limiting speeds and sonar use if they are within 300 meters as well. To supplement mitigation activities with monitoring and data collection, as well as ensure transparency and compliance with proposed mitigation measures, Lookouts on Navy vessels should log details of animals they spot, behavior observed, and the Navy's response to the sighting.	consistent with mission requirements and balance the usefulness of the information to be collected with the practicality of collecting it. The Navy's training and testing activity reports and incident reports are designed to verify implementation of mitigation; comply with current permits, authorizations, and consultation requirements; and improve future environmental analyses (https://www.navymarinespeciesmonitoring.us/). The Navy reports to NMFS if mitigation was implemented during sinking exercises (e.g., number of times explosive detonations were delayed due to marine mammal sightings). For major training exercises, the Navy's annual training and testing activity reports include information on each individual marine mammal sighting related to mitigation implementation. In the unlikely event that a vessel strike of a marine mammal should occur, the Navy would provide NMFS with relevant information pertaining to the incident, including, but not limited to, vessel speed. Additional reporting would be ineffective and impractical for the reasons detailed in Section 5.6.7 (Reporting Requirements). This Supplemental EIS/OEIS (1) includes the analysis of activities at sea and on FDM necessary to meet readiness requirements beyond 2020 and into the reasonably foreseeable future, (2) includes any changes to those activities previously analyzed, and (3) reflects the most up-to-date compilation of training and testing activities deemed necessary to accomplish military readiness requirements. Proposed activities are similar to those that have been conducted in the Study Area for decades. This Supplemental EIS/OEIS supports the issuance of federal regulatory permits and authorizations under the MMPA and the ESA. The MMPA authorization for this Supplemental EIS/OEIS would be valid for seven years. It is important to note that the Navy is then bound by the limits of its expected types and levels of activities to comply with the permits and authorizations. If a need arises that exceeds those predicted activities, the Navy would be required to conduct additional environmental analyses.

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	Impacts to marine animals can harm endangered and threatened species groups as well as the marine ecosystem and the people that rely on it for food, recreation, and tourism, which is the lifeblood of the CNMI economy in particular. It does not appear that the long-lasting effects of these impacts have been well categorized for the proposed duration of this activity, which itself is unclear. How long will these proposed actions continue? Will additional time and area modifications be made for the duration of these activities as new range data, reports on species sightings, and other best practices become available? Anyone that has spent time in the Marianas understands that the culture of these islands is closely linked to the well-being of marine species and the tradition of inter-island travel. The treatment of impacts to the health of the marine ecosystem and the culture of the people who have four thousand years of navigational history throughout the island chain does not appropriately address the significance of impacts to food fish, sea life in general, and free navigability through these waters. In a fifteen-island chain with a strong history of intra-island navigation, the loss of access to a whole island and a twelve nautical mile zone around that island is significant. The harassment and potential death of already imperiled species is significant. The potential loss of tourism revenue due to species declines and increased stress on habitats and marine life is significant. Relying on data from other regions to try to claim otherwise is <u>simply not responsive</u> to the context of the Marianas or the relative intensity of the activities that are being proposed here – activities which have been limited in other ranges due to known impacts to marine life. Data being used to make claims regarding the significance of impacts	The Navy has funded numerous biological resource surveys in the MITT Study Area, including in the CNMI. Additional surveys are ongoing and the Navy plans to continue supporting marine species surveys in the future. In addition to surveys conducted in the MITT Study Area, the Navy has and will continue to use best available data from training and testing activities conducted within other Navy study areas, such as Hawaii and Southern California, which are the same or very similar to activities being conducted in the MITT Study Area. If there is a lack of data in the Study Area, it is acceptable to use the best scientific data, regardless of source, to determine potential impacts. The military is committed to continuing to work with the local community on issues that potentially affect the public, including access to fishing sites that are important to the culture. The analysis presented in Section 3.12 (Socioeconomic Resources and Environmental Justice) uses the best available data and includes an analysis of the importance of fishing as a socioeconomic and cultural resource for the people of the CNMI. The Navy does not propose a change to the ocean areas currently used by both the Navy and the public. Restrictions on accessing areas of co-use would continue to be infrequent and short term, while other fishing sites in the Study Area would continue to be available to the public. The military understands that fishing and tourism is an important socioeconomic and cultural resource for the people of the CNMI and will continue to work with the fishing and boating community to enable safe access in areas of co-use. The Navy understands the complexity of the information presented within this Supplemental EIS/OEIS. The Navy attempts to explain challenging concepts, methods, and the results of the analysis as clearly as possible and developed public informational materials for lay audiences. The Navy prepared project brochures, videos, a website, and posters, using layperson terms, to enhance public understanding of the information presented in this Supplemental EIS/OEIS. A project fact sheet was also translated into Chamorro. The

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	should be based on local conditions. If data doesn't exist to describe the unique context of the cultural and socio-economic resources that will be impacted with expanded use of the MITT range then that data should be collected and shared in plain English as well as translated into Chamoru and Carolinian so some of the most potentially effected stakeholder groups can understand these potentially significant impacts and share their knowledge of appropriate mitigation options. Instead, by publishing nearly 2,000-page reports with additional supporting materials online and scheduling public hearings in a hotel conference room, the Navy has taken an approach to information sharing that limits involvement from the public at large. If the NEPA process aims to support meaningful community involvement in decision-making and improved resource management outcomes, then the Navy should take active steps to involve the community in this process instead of doing the bare minimum required to "check the box" on engagement requirements. I sincerely hope that when this report is updated and the next round of public comments are opened that the Navy considers publishing notices of the public comment period in local papers and on local radio stations, holding meetings at public meeting spaces with ample parking – potentially in more than one location and for more than a two-hour period during what is dinner time for many families – and providing a longer comment period to allow for more meaningful engagement and comment development. Thank you for your consideration and your commitment to the NEPA process.	informational materials, including the translated fact sheet, were made available at all four public meetings and on the project website (http://mitt-eis.com/). To better accommodate stakeholders and the public, the Navy provided 75 days to review and comment on the Draft Supplemental EIS/OEIS. The comment period for the Draft Supplemental EIS/OEIS was from February 1, 2019 to April 17, 2019, which is 30 days longer than the minimum required time for review (40 CFR section 6.203(c)(3)(v)). Although the Navy took cultural and religious holidays into account when planning the dates and locations for public meetings, those considerations had to be balanced with the deadlines and schedules of the large number of federal and local agency stakeholders, as well as the overall schedule of this Supplemental EIS/OEIS. The Navy held four open house public meetings, one each on Tinian (March 14, 2019), Rota (March 15, 2019), Saipan (March 18, 2019), and Guam (March 19, 2019). The public meetings provided an opportunity for the public to ask questions of Navy team members about the analysis documented in this Supplemental EIS/OEIS. The Navy encouraged the public to attend these meetings and broadly notified the public through the media, including newspaper advertisements and news releases, and direct mail, including letters, postcards, and emails. The Navy has received feedback from attendees that the open-house format is more conducive to promoting public understanding and constructive dialogue. Open house meetings allow a greater number of individuals to directly engage and interact with Navy team members and ask questions about this Supplemental EIS/OEIS, as well as provide comments on the document.

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	Sincerely, Shelly Johnston	
David Baker (DB)		
DB-01	I strongly feel that the implementation and expansion of the MITT and MBR should be immediately halted. These activities will cause irreversible damage to the ecosystems within the bombing and training areas at a time when our planet is undergoing anthropogenic (human-caused) changes, including but not limited to climate change, ocean acidification, overfishing and pollution. But adding the destructive activities you propose on top of these other damaging inputs, you're causing irreversible damage to ecosystems and the livelihoods and quality of life for the local people living nearby. Please do not continue to engage in and expand these training and bombing activities. Find a suitable location, and wait until after we, as a global society, get a handle on these larger factors.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities. The Navy is not proposing any geographic expansion of the training and testing area in this Supplemental EIS/OEIS. Proposed activities are similar to those conducted in the Study Area for decades.
Melissa Mekras (MM)		
MM-01	I urge you to desist with this project. Guam is already the largest DoD training area in the world. Guam's ecological fate is in your hands. The communities most affected by climate change are indigenous peoples and marginalized populations. Our continued land grabs and modern colonization are a shame that needs to end if we have any hope of saving our planet and specifically if the	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities. Potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practicable, procedural and geographic mitigation measures during its training and testing activities to reduce potential impacts on marine life. The Navy's analysis indicates that, with implementation

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	island of Guam has any hope. Already by calling it a U.S. territory we remove any ability for them to vote for themselves. The people of Guam CLEARLY do not want this, and that needs to be respected. And the people who do want this may need it out of necessity because of late-stage capitalism, and the glimmer of hope that they may make some money out of it which is ridiculous. The only benefactor of this project would be the military, for a short time of course, until the planet can no longer take the continued carbon emissions and pollution and wipes us out one way or another. Your underwater bomb detonations and sonar are PROVEN to harm and kill marine life, and the cautions you have laid out are not expansive enough. Our oceans are already under great threat from plastic pollution, continued oil spills, coral bleaching, ocean acidification, and the rising sea levels (which also threats coastal and island communities such as Guam). It is our duty as adults to speak for the younger generations to come. It is our civic duty to ensure that they have clean air, land, and water.	of its protective mitigation measures, there would be no significant impacts on marine species or habitat.
Travis Wells (TW)		
TW-01	I am opposed to this project and buildup. The military does not respect the voice and the interest of the CHamoru people or the international law that prohibits military buildup on colonized territory.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Shari Bush (SB)		
SB-01	Although I am not currently residing on Guam, I was born and raised there. My brother lives there with his children, my	Marine life is important to the Navy. Section 3.8 (Marine Invertebrates) includes an analysis of potential impacts on coral. A detailed analysis of potential impacts

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	niece and nephew are 10 and 6 years old. My father lives on Saipan. I have graduated from the University of California, Irvine with a B.S. in Earth System Science and have a comprehensive understanding of the issues facing Guam's marine environment, not only from my studies but from growing up there. Swimming in the oceans around Guam in the 90's and early 00's I saw firsthand the degradation of coral reefs around the island. Bleaching from stress, erosion and warming oceans. Other impacts of climate change will cause many problems for the waters around Guam as well; ocean acidification and rising seas will heavily impact these important ecosystems. However, our open waters are just as important. Scientists and mathematicians have come out against detonating bombs underwater, as it will harm vulnerable marine mammals. Our oceans are already stretched so thin from overfishing and plastic pollution. The valuable organisms that will be harmed by these tests are already suffering from such man-made disasters, and it would be irresponsible to subject them to further danger from a direct and avoidable harm. Please consider further the detrimental harm to marine mammals and the degradation of environment that testing and training will do to the proposed area.	on coral around FDM is also provided. Based on the analysis, coral fauna are healthy and robust, and the nearshore physical environment and basic habitat types at FDM would remain unchanged. These conclusions are based on (1) a limited amount of physical damage, (2) very low levels of partial mortality and disease (less than one percent of all species observed), (3) absence of excessive mucus production, (4) good coral recruitment, and (5) complete recovery by 2012 of the 2007 bleaching events. Smith and Marx (2016) also concluded that the health, abundance, and biomass of fishes, corals, and other marine resources at FDM are as good as, or better than, those in similar habitats elsewhere in the Mariana Archipelago. The Navy funded additional reef surveys in the nearshore areas of FDM in 2017. The results were approved for public release in September 2018 and are available at https://apps.dtic.mil/dtic/tr/fulltext/u2/1069450.pdf. The 2017 survey found little evidence that training has affected coral reef communities at FDM. Only three relatively fresh ordnance items were observed, but no blast pits, craters, or significant areas of coral breakage were observed. The ordnance observed during the 2017 survey was almost exclusively old, encrusted in marine life, and had no discernable impact on surrounding communities. The Navy is consulting with the NMFS under MMPA and ESA to ensure that the Proposed Action will not put the population and the future of marine species within the Study Area in jeopardy.
Kimberly Hammond (KH)		
KH-01	I am strongly opposed to this project. My family lived in the Marshall Islands and I grew up in the pristine environment. Do not let the Navy ruin it!	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Tim Cespedes (TC)		
TC-01	I oppose the military's plans to destroy our sacred land. If the US is really "full" as the president has stated, then why would we destroy any land where our people can live?	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.

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	This is sacred homeland. Do not destroy it.	
Darryl Lai (DL)		
DL-01	I oppose this project. Please address the following issues: • How explosive weapons pollute the air, land and water and threaten your health. • How active sonar testing should be stopped unless the Navy proves it doesn't harm fish and marine mammals. • How the destruction of No'os (FDM) is occurring and all bombing should be stopped immediately since it is leased land and the destruction is irreversible • How increased training will further interfere with access to fishing and sea travel • How the Navy hasn't done an adequate study on the impacts of underwater explosive weapons on marine life • How the Navy's providing a 1500 page EIS without further explanation and in English only creates a barrier to public understanding of the impacts • How the Navy is hiding the cumulative impact of its massive Marianas Bombing Range by breaking it into smaller projects • Inadequate time for the public and government to read and process the 1500 page EIS Moreover, you do realize people live in these areas? Please address these issues for the people who live there.	The health of coastal communities, fisheries, and ecosystems is important to the Navy. Section 3.1 (Sediments and Water Quality) concludes that chemical, physical, and biological changes to sediment or water quality would be measurable but below applicable standards, regulations, and guidelines, and would be within the existing conditions or designated uses. The Navy complies with all applicable laws and regulations. The military is committed to protecting the environment during the conduct of its military training and testing activities. A comprehensive analysis of potential effects on environmental resources from Navy training and testing activities is presented in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. These resources include sediments and water quality, marine habitats, marine mammals, fishes, sea turtles, marine birds, and marine invertebrates. While some impacts would occur from training and testing activities, the analysis concludes that impacts would be minimal and would not have a significant impact on the environment. Also, as described in Section 2.3.3 (Standard Operating Procedures) and Chapter 5 (Mitigation) of this Supplemental EIS/OEIS, the Navy implements, to the maximum extent possible, mitigation measures during its training and testing activities. The Navy took a hard look at the potential impacts of the Proposed Action on marine mammals and sea turtles using the best available science. The Navy's quantitative analysis process for analyzing impacts from active sonar and explosives has been reviewed by external scientists and approved by NMFS. The Navy also worked collaboratively with NMFS to develop mitigation measures using inputs from the operational community, the best available science, predicted activity impact footprints, and marine species monitoring and density data. The Navy will implement procedural mitigation measures to avoid or

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		reduce potential impacts on marine mammals and sea turtles whenever and wherever applicable activities occur in the Study Area, as detailed in Chapter 5 (Mitigation). The military understands that fishing is an important socioeconomic and cultural resource for the people of the CNMI and will continue to work with the fishing community to enable safe access to fishing areas around FDM. The military is committed to continuing to work with the local community on issues that potentially affect the public, including access to fishing sites. As stated in Section 3.8.2.2 (Explosive Stressors) of this Supplemental EIS/OEIS, although the vast majority of explosions occur at distances greater than 3 nautical miles (NM) from shore (where water depths are greater than the depths where shallow-water coral species occur), some explosions may occur close to marine invertebrates that could kill or injure them. Explosions near the seafloor and very large explosions in the water column may impact shallow-water corals of any life stage, hard-bottom habitat and associated marine invertebrates, and deep-water corals. Effects could include physical disturbance, fragmentation, or mortality to sessile organisms and pelagic larvae. Energy from an explosion at the surface would dissipate below detectable levels before reaching the seafloor and would not injure or otherwise impact deep-water, benthic marine invertebrates. Marine life is important to the Navy. Using the latest science and technology, the Navy completed extensive analyses and computer-based modeling to determine impacts and develop science-based protective measures to reduce or avoid potential impacts on marine life. As explained in the Navy's technical report on marine mammal strandings (*Marine Mammal Strandings Associated with U.S. Navy Sonar Activities*, 2017 [www.mitt-eis.com]), marine mammal strandings have been a historic and ongoing occurrence attributed to a variety of causes, both natural and anthropogenic. Over the last 50 years, increased awareness and reporting has led to more information about species affected and raised

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		concerns about anthropogenic sources of strandings. While there have been limited numbers of marine mammal mortalities potentially associated with U.S. Navy activities, the root causes are not clear in most cases. NMFS, as the regulator, maintains the authoritative National Stranding Database. The Navy analyzes for TTS and PTS effects to the stock level for the species as presented in Section 3.4.2.1 (Acoustic Stressors). The vast majority of estimated impacts are behavioral. Small numbers of TTS are estimated for these resident odontocete populations around the Marians Islands such that most individuals would not receive TTS, and a small number of individuals could receive one to a few TTS per year. TTS only suppresses a portion of an animal's hearing and complete recovery normally occurs within a period of minutes to hours. Additionally, TTS thresholds are used conservatively in the Navy's model in that they do not account for recovery of the ear in between noise exposures (e.g., individual sonar pings) and assume animals are ideal receivers (i.e., facing the sound source). The Navy updated the MITT Final EIS/OEIS to include the most recent dive reports (released in 2013, with dives occurring in 2012), and the EIS/OEIS includes information discussed below. The Navy's analysis of mass movement and erosion on FDM includes historical photograph analyses and direct observations during dive surveys conducted off FDM since 1999. Additionally, the Navy will investigate methods to baseline current physical conditions on FDM and to monitor those conditions over time.. The report information has been added to Section 3.1 (Sediments and Water Quality), with specific new text in Section 3.1.3.1.5.3 (Farallon de Medinilla Specific Impacts) in the MITT Final EIS/OEIS and in Section 3.1 of this Supplemental EIS/OEIS. It should be noted that, since the signing of the ROD in 2015, the dive surveys have been published (Smith, S. H., D. E. Marx. 2016. "De-facto marine protection from a Navy bombing range: Farallon De Medinilla, Mariana Archipelago, 1997 to 2012," Marine Pollution Bulletin, 102(1):187–198). The 1999–2004 surveys were completed by a Navy contractor and a representative from the USFWS, NMFS

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		and the CNMI. All surveys since 2004 have been performed by the NAVFAC and Expeditionary Warfare Center's Scientific Diving Services (SDS). Direct ordnance impacts upon the submerged physical environment, which were clearly attributable to training activities, were detected in dive surveys conducted in 2007, 2008, 2010, and 2012. Indirect impacts, such as ordnance that skipped or eroded off the island and rock and ordnance fragments blasted off the island, were detected every year. However, natural phenomena such as typhoons, tropical storms, large wave events, tsunamis/micro-tsunamis, and earthquakes are the primary disturbances, which shape and modify FDM's physical environment between the intertidal zone and depths of 30 m. During the 2004 survey, the dive survey team (which included representatives of stakeholder agencies cited above and a Navy contractor) noted changes to the submerged lands relative to observations made between 1999 and 2003. These physical changes included (1) fresh boulder/rock slides; (2) submerged rock areas off the southern tip of FDM, that appeared to have been peeled back to expose bright yellow-orange patches of underlying rock; and (3) cracked and broken coral colonies. The 2004 report (released in 2005) stated: "Examination of photographs from 1944 indicate that changes in the geologic structure of the island by erosion and mass wasting…have been going on for decades." No newly submerged cliff blocks were observed between 2005 and 2012. The detonation of live ordnance, and the impact of inert ordnance, both act to fracture rock and make the island more susceptible to the impacts of earthquakes, typhoons, and other natural erosional forces. Small to moderate sized (generally < 30 cm) fresh rock fragments have been observed yearly. Many, if not most of these, are clearly the result of training activities. However, the number and size of these items and the locations in which they occur have not resulted in any significant changes to the topography or significant adverse impacts on marine biological resources. In 2017, the Navy funded additional surveys in the nearshore areas of FDM. The results were approved for public release in September 2018, and available at https://apps.dtic.mil/dtic/tr/fulltext/u2/1069450.pdf. The 2017 survey found little evidence that training has affected coral communities at FDM.

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		Only three relatively fresh ordnance items were observed, but no blast pits, craters, or significant areas of coral breakage were observed. The ordnance observed during the 2017 survey was almost exclusively old, encrusted in marine life, and had no discernable impact on surrounding communities. Public safety is also important to the Navy and various means are used to communicate information on areas restricted to public or commercial activities. As discussed in the Draft Supplemental EIS Section 2.3.3.2 (Sea Space and Airspace Deconfliction), the Navy has worked, and will continue to work, collaboratively with local communities to deconflict sea space used for fishing to the maximum extent practicable, such as avoiding known fishery infrastructures (e.g., fish aggregating devices) and high-use fishing areas. To help civilian mariners better plan fishing and boating activities that involve accessing the waters around FDM, the Navy notifies them through various means, such as U.S. Coast Guard-issued Notices to Mariners and social media. The Navy has been conducting training and testing activities in the Study Area for decades and proposes to continue training in the region into the reasonably foreseeable future. The activities analyzed in this Supplemental EIS/OEIS are largely a continuation of the ongoing training and testing activities that were analyzed in the 2015 MITT Final EIS/OEIS, 2010 MIRC Final EIS/OEIS, 1999 Military Training in the Marianas Final EIS, and other environmental compliance documents. Environmental regulations, including those associated with NEPA, MMPA, and ESA require that the military reanalyze impacts from its activities after a designated time period and reapply for any needed permits. According to the CEQ regulations, the proposed training and testing activities in the MITT Study Area may logically be viewed in isolation, because the activities are ongoing, have independent utility, and primarily occur in offshore waters beyond 3 NM from shore (with the notable exception of activities occurring at FDM). In addition, courts have upheld federal agencies' decisions to organize and plan their actions in a reasonable or rational manner.

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		The Navy understands the complexity of the information presented within this Supplemental EIS/OEIS. This Supplemental EIS/OEIS contains a rigorous scientific analysis of the potential impacts of the Navy's proposal, and thoroughly explains the scientific methodology, analysis methods, and findings. The Navy attempts to explain challenging concepts, methods, and the results of the analysis as clearly as possible in this Supplemental EIS/OEIS and developed public informational materials for lay audiences. The Navy prepared project brochures, videos, a website, and posters, using layperson terms, to enhance public understanding of the information presented in this Supplemental EIS/OEIS. A project fact sheet was also translated into Chamorro. The informational materials, including the translated fact sheet, were made available at all four public meetings and on the project website (www.mitt-eis.com). The Navy held four open house public meetings, one each on Tinian (March 14, 2019), Rota (March 15, 2019), Saipan (March 18, 2019), and Guam (March 19, 2019). The public meetings provided an opportunity for the public to ask questions of Navy team members about the analysis documented in this Supplemental EIS/OEIS. The Navy encouraged the public to attend these meetings and broadly notified the public through the media, including newspaper advertisements and news releases, and direct mail, including letters, postcards, and emails. The Navy has received feedback from attendees that the open-house format is more conducive to promoting public understanding and constructive dialogue. Open house meetings allow a greater number of individuals to directly engage and interact with Navy team members and ask questions about this Supplemental EIS/OEIS, as well as provide comments on the document. The Navy took cultural and religious holidays into account when planning the dates and locations for public meetings. To try to accommodate stakeholders and the public, the Navy provided 75 days to review and comment on the Draft Supplemental EIS/OEIS, 30 days longer than the minimum required time for

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		review. The Navy appreciates input received from local government agencies and communities on how it can improve public notification and outreach efforts. The Navy provided the public 75 days to review and comment on the Draft Supplemental EIS/OEIS, 30 days longer than the minimum recommended time for review of Navy documents. Cumulative impacts from multiple military activities, including those identified in the comment, are discussed in Chapter 4 (Cumulative Impacts) of this Supplemental EIS/OEIS. Combining all projects into a single analysis would not aid in the public and local governments' review, because these different projects and actions vary greatly in their scopes, timetables, action proponents, and potential environmental impacts. The Navy conducted a 45-day public scoping period, four public meetings following publication of the Draft Supplemental EIS/OEIS, and provided 75 days for stakeholders and the public to review and comment on the Draft Supplemental EIS/OEIS. These outreach efforts have afforded the public the opportunity to ask questions about the proposed training and testing activities as well as cumulative impacts from multiple military activities occurring in the region.
Hope Trautman (HT)		
HT-01	I think this bombing is a terrible idea and I oppose to it	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Daniel Cespedes (DC)		
DC-01	It is a strong concern of mine that the Navy's activity in and around the Mariana Islands (Guam, CNMI, and Northern Islands including Pågan) as per the MITT will adversely affect the health of the local population, specifically in regards to the maritime culture which is currently undergoing a vital phase in its restoration. As I write this comment, traditional canoes are being built on Guam and Saipan (from organizations such as Ulitao and 500 Sails), and swimming, navigation, and sailing techniques are being taught to locals	Public safety is also important to the Navy and various means are used to communicate information on areas restricted to public or commercial activities. As discussed in the Draft Supplemental EIS/OEIS Section 2.3.3.2 (Sea Space and Airspace Deconfliction), the Navy has worked, and will continue to work, collaboratively with local communities to deconflict sea space used for fishing and other boating activities to the maximum extent practicable, such as avoiding known fishery infrastructures (e.g., fish aggregating devices) and high-use fishing areas. To help civilian mariners (including those conducting recreation activities) better plan fishing and boating activities that involve accessing the waters

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	of all ages which are activities of ineffable value to the health and culture of the Mariana Islands. The use of these proa canoes will enable inter-island travel, reintroduce a culture of sustainable seafaring, and will enable the citizens of Guam and the CNMI to travel to the Northern Islands in accordance with local travel laws. The Navy's presence and use of munitions, sonar, and otherwise for training in the waters of the Mariana Islands will most certainly pose risks for these essential seafaring activities and the local American citizens who take part in them. The presence of more military ships around the coastlines of the islands will require ample communication to ensure all citizens using traditional canoes for travel and fishing do not accidentally cross paths with military operations. Plans to mitigate these kinds of dangerous instances have not been addressed. The plans to use Pågan as a training ground will absolutely interfere with the life quality of local citizens, as well as their use of traditional sailing vessels to and around the island. Citizens who use traditional sailing vessels in the Northern Mariana islands (specifically Tinian and Farallon De Medinilla), in their legal recreational use of local waters, will be at risk of crossing paths with dangerous military operations. The risk of encountering previous military operations in the form of unexploded ordinances (UXO's) is also of great risk and the cleanup of these threats has still not been addressed by the Navy. This abuse of American land by American forces is entirely irresponsible. Citizens who use local waters to swim for health	around FDM, the Navy notifies them through various means, such as U.S. Coast Guard-issued Notices to Mariners and social media. Pagan is not part of this Proposed Action. Training and testing activities are proposed to occur at sea and on FDM. Tables 2.5-1 and 2.5-2 in Chapter 2 (Description of Proposed Action and Alternatives) in this Supplemental EIS/OEIS present current and proposed training and testing activities. The Navy analyzed land-based activities on Guam, Saipan, Tinian, and Rota in the 2015 MITT Final EIS/OEIS; the Navy did not reanalyze land-based activities in this Supplemental EIS/OEIS because there are no changes proposed to those land-based activities. Marine life and marine habitat are important to the Navy. Using the latest science and technology, the Navy completed extensive analyses and computer-based modeling to determine impacts and develop science-based protective measures to reduce or avoid potential impacts on marine life. Potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practicable, procedural and geographic mitigation measures during its training and testing activities to reduce potential impacts on marine life. The Navy's analysis indicates that, with implementation of its protective mitigation measures, there would be no significant impacts on marine species.

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	improvement may be affected by the use of sonar activity in the waters of the Mariana Islands. Marine animal activity in the wake of sonar use is inconclusive and swimmers may be affected by their behavior. Insufficient information is in the MITT in regards as to how their livelihoods will be protected from the complications of sonar use in nearby waters. All of these risks have been inadequately addressed. Therefore, it would be an egregious error for the Navy to move forward with the MITT without reexamining the plan to account for how local canoe and seafaring culture would be protected. After all, the purpose of the MITT and the Navy's presence in the Pacific is to strengthen the protection and safety of the American people. The Navy would be working against the interest of protecting the American people by moving forward with the MITT without further studies about how to protect the livelihood of the local citizens, and their participation in the healthy activities of swimming and traditional sailing.	
Melissa Greff (MG)		
MG-01	leave those islands alone and stop bombing altogether. i'm vehemently opposed to this kind of violence and even more opposed to a US military presence in these islands. leave them alone.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Veronica Rosser (VR)		
VR-01	I am opposed to this project! It is immoral!	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Hila'an Pali'I (HP)		
HP-01	Stop destroying our irreplaceable resources for your stupid war games please. The earth is not yours to destroy. You have	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.

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	to share it with us and the rest of mankind so please stop ruining it for us all	
Artemia Perez (AP)		
AP-01	Hafa Adai, As an indigenous CHamoru woman, I feel the future of Guahan weighing heavily on my mind at all times. One of the pillar values of the CHamoru people is the concept of "inafa'maolek" which translates literally to "to make better for everyone." So, you see, I have come to understand that my purpose in life is not entirely my own. It has been and will continue to be to serve my community and my island. It is through such a value that I've learned that my contributions, good and bad, to this world, have incalculable impacts on lives I may never come to know. Guam is many things, but grounds for military advancement is not one of them. Put fabot, please, consider the irreplaceable resources at risk. See this issue through the eyes of a people who's holistic soul and culture is embedded in its land, animals, air, and most importantly, in this case, the ocean. The ocean is what connects us. The ocean is life. The ocean is sacred. This project allows for 12,580 detonations per year for five years. In five years, the world's scape will be completely different if we continue at this rate of carelessness. The	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities. The Navy took a hard look at the potential impacts of the Proposed Action on marine mammals and sea turtles using the best available science. The Navy's quantitative analysis process for analyzing impacts from active sonar and explosives has been reviewed by external scientists and approved by NMFS. The Navy also worked collaboratively with NMFS to develop mitigation measures using inputs from the operational community, the best available science, predicted activity impact footprints, and marine species monitoring and density data. The Navy will implement procedural mitigation measures to avoid or reduce potential impacts on marine mammals and sea turtles whenever and wherever applicable activities occur in the Study Area, as detailed in Chapter 5 (Mitigation).

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	marine life to include the 26 different marine mammal species that the military intends to "take" (harm/kill) as means of progressive testing, will undoubtedly shift the status of these species; status meaning becoming endangered or threatened. We need to focus on revitalizing our waters. The biggest threat to our island is not a militant enemy, but it is our recklessness with the environment.	
Kayla Dela Rosa (KDR)		
KDR-01	I truly believe it is crucial to the existence of our untouched and unscathed oceans to only be further explored to understand better how our world itself works. The notion for advocating a “legal” way to destroy some of these things will be faced with much regret in future times. If there is a way to stop this testing in our ocean, please, do whatever it takes to stop. Not substitute or find out how to accomplish between the thin lines, just stop. Altogether. We only have two homes in each and every single one of our lifetimes, those include the earth and our bodies, let us take the utmost care of both equally.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Casierra Cruz (CaC)		
CaC-01	How has the Dept. of the Navy garnered community voice and input in the supplemental draft of the EIS/OEIS analysis? Has the Navy intentionally sought input from local fishermen or other indigenous/native environmental stewards, protectors, and researchers from the Mariana Islands? What, if any, were some of the concerns, arguments, and/or agreed upon statements voiced by community members and leaders in the proposed draft? How were some of the concerns addressed and/or mitigated by representatives of the	The Navy complies with all applicable environmental laws, including its requirements under NEPA when developing this Supplemental EIS/OEIS. NEPA requires federal agencies to provide opportunities for meaningful public involvement. Comments received during the scoping period were considered in the development of the Draft Supplemental EIS/OEIS. Comments received on the Draft Supplemental EIS/OEIS have been considered in the development of this Final Supplemental EIS/OEIS.

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	department? Part of assessing the potential environmental impacts associated with ongoing military activities requires holistic evaluation. In the past decade, what did this evaluation plan consist of? What were some of the questions and/or statements evaluated regarding human resources, cultural resources, and public health/safety? How were they measured? What would the prospective evaluation plan entail? Will the plan take into account the grave impact of climate change in the Mariana Islands and how the ongoing, proposed military activities will exacerbate such effects? In regards to complete transparency and clarity on the breadth of information presented, how will the Navy ensure the results of the analysis are disseminated properly to the community and are culturally tailored enough for any community member to understand and comprehend on various levels? Has the Navy explored alternative avenues to help disseminate such pertinent information - such as working with local environmental agencies/organizations, conservation districts, the Department of Public Health and Social Services, or the educational system with the intent to maximize community involvement and allow adequate time for community members to express what can potentially happen to their water, land, and overall environment they heavily rely on?	From past experience, the Navy has concluded that the open-house-style public meeting format used during this Supplemental EIS/OEIS public meetings is the most conducive to effective dialogue. Open-house-style meetings allow a greater number of individuals to engage and interact with Navy team members and ask questions of subject matter experts. At the public meetings (Tinian Public Library, March 14, 2019; Rota Mayor's Conference Hall, March 15, 2019; Saipan Kanoa Resort, March 18, 2019; and University of Guam, March 19, 2019), multiple comment opportunities were provided to the public. A stenographer was available to record verbal comments and written comments were accepted. The Navy accepted comments from the public, and Navy team members stationed at the posters were responsible for discussing this Supplemental EIS/OEIS and responding to questions from the public. This Supplemental EIS/OEIS fully complies with NEPA. Using the best available science, the extensive studies and analysis conducted by the Navy exceeded the required hard look at impacts on environmental resources. Potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. In accordance with CEQ guidance, the cumulative impacts analysis focused on impacts that are truly meaningful. This was accomplished by reviewing the direct and indirect impacts that would occur on each resource under each of the alternatives. Key factors considered were the current status and sensitivity of the resource and the intensity, duration, and spatial extent of the impacts of each potential stressor. In general, long-term and widespread impacts were considered more likely to contribute to cumulative impacts than short-term and localized impacts. Those impacts on a resource that were considered to be negligible were not considered further in the analysis. The level of analysis for each resource was commensurate with the intensity of the impacts identified in Chapter 3 (Affected Environment and Environmental Consequences).
Davina Artero (DA)		
DA-01	Please don't destroy our oceans. I am 22 years old and I would love to show my children and grandchildren the	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.

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	beauty of our island's ocean. The ocean plays a very important part of our lives and if we don't take care of our ocean. We will suffer the consequences for it one day and it'll be too late to make amends. Don't try to fix the ocean when it becomes too late cause there is no turning back. The ocean has taken care of us for billions of years. It provides us with food but we have become greedy with it and have over fished and hunted on sea creatures that are an important part of balancing the ecosystem. With you using our waters a bombing area with destroy the ocean even more and we won't be able to come back from that. This is my island and don't want it to become a war zone. You have taken our land and pride. Your country has taken so much from us already. PLEASE DONT TAKE OUR OCEAN AWAY FROM US.	
Female Topasna (FT)		
FT-01	Hafa Adai, I am a concerned citizen, parent, grandparent, daughter, sister etc. I have had so many concerns with the military's intentions of Guam. My concerns are based on research and testimonials of a variety of people. I will name 2 general ones that cover many situations. First, I feel that they often say they care about the island however, many of their actions say or prove otherwise. SECOND, I have many personal experiences of cancer in my family and friends. I wholeheartedly feel it they are all due to the many military activities on the whole island. (contamination, bombings, practice bombing on the while Marianas Island.) I am always hopeful that there will be a better balance of the military and the people of Guam. However, the US military's track record not only on Guam but around the world says	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.

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	there is little hope for a better balance. I hope and pray our voices will be heard and our concerns are taken more seriously.	
Erlinda Montecalvo (EM)		
EM-01	I strongly oppose the ongoing increase military training activities on land base and at sea training using sonar, explosive and other manner of detonation. The effect is destructive and have irreversible devastating consequences to marine life, (whales, turtles, Dolphins, coral, reef fish and other rare species), restricted/off limit access to fishing, cultural sites and recreational beaches. Mr. John Van Name stated the military have been conducting training testing activities around the island for decades, but he did not provide clarity on the environmental impact of operations. Was there an environmental sampling performed? When and what was the results. If we allow the military activities (military preparedness) to continue, the capacity for this destruction is immense, unexploded ordnance, unsafe debris, toxic waste on land and ocean. The future for my grandchildren is bleak. The future for Guahan will be to conduct environmental restoration resulting from past DOD activities- 1) study phase, 2) clean phase. We are still finding and removing WW II debris. This will take years and years to happen.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities. The Navy has implemented and will continue to implement standard operating procedures and mitigation measures to reduce or avoid impacts on marine resources in the Study Area (see Section 2.3.3, Standard Operating Procedures; and Chapter 5, Mitigation)
Kiara Quichocho (KQ)		
KQ-01	Håfa adai. I am a resident and native of Guåhan (Guam), writing with concern for the future of my home and all people who call the Marianas home. When, and if, this comment is read I urge the parties involved to reevaluate the detriments of prolonging any and all testings in the MITT “study area”. I assure that my, along with many other concerns regarding these activities are not fabricated nor unprecedented. They are extremely relevant and justified given that those activities	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.

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	compromise the limited chances we have to address and mitigate those issues which are detrimental to our ocean and our islands. Ocean acidification, rising sea levels, and bleached coral (to name a few) ARE NOT false apprehensions. They are tangible issues with real, visible implications which will most definitely harm and alter our future as a region and as a people. To continue this is both politically and morally unacceptable. Knowingly endangering the lives of animals and people of the Marianas for the purpose of "security" is not only a neocolonial pursuit but also exemplifies American exceptionalism at the expense of Pacific territories, a tradition which proves to drive the DoD's decisions regardless of the lives which will be periled as a result of them. If these implications and consequences are not enough to justify a mere re-evaluation of ongoing and future activities in the Marianas, it is obvious that no amount of substantive comments from the effected communities would alter those decisions and the fate of our islands are unanimously left to DoD.	
Haruna Saito (HS)		
HS-01	Hello, Please consider the impacts of your actions to our island. Please consider the impacts of your actions on the marine life. Please consider the continued loss of culture from the constant stealing of what belongs to the island and its people. PLEASE consider the people of this island, the land, the ocean, and everything in it. Consider this again and again until it becomes aligned with the what the island needs. Thank you.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.

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Abby Crain (AC)		
AC-01	I Do Not support the expansion. I DO NOT SUPPORT THE EXPANSION I don't not want testing or underwater explosions in or around the Guam waters.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities. This Navy Supplemental EIS/OEIS does not propose any geographic expansion of the training and testing area.
Karmen Vilander (KV)		
KV-01	To whom it may concern, In the maritime world we have seen the effects that sonar has on migrating whales and general sea life. I am originally from the Pacific Northwest where we have seen these effects and are now having to play catch up. I am not suggesting we should ban testing but perhaps work harder for a compromise that can benefit both our ocean and our military. Thank you, Karmen Vilander	Marine life is important to the Navy. Using the latest science and technology, the Navy completed extensive analyses and computer-based modeling to determine impacts and develop science-based protective measures to reduce or avoid potential impacts on marine life. Potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practicable, procedural and geographic mitigation measures during its training and testing activities to reduce potential impacts on marine life. The Navy's analysis indicates that, with implementation of its protective mitigation measures, there would be no significant impacts on marine species.
Raymond Lujan (RL)		
	I am in STRONG opposition to the Mariana Island Training and Testing Study Area. Decisions regarding the MITT were done without the consent of the CHamoru people of Guåhan. It is neither democratic nor socially just. The ways in which Congress has exercised its unilateral authority to our island is a blatant disrespect and disregard to its people. Article 73b in "Chapter XI: Declaration Regarding Non- Self- Governing Territories" of the U.N. Charter instructs administering countries "to develop self- government, to take due account of the political aspirations of the peoples, and to assist them in the progressive development of their free political	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.

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	institutions, according to the particular circumstances of each territory and its peoples and their varying stages of advancement". A strong military presence on an unincorporated island territory who has yet to exercise their international right to political self-determination, is unmistakably a conflict of interest. The U.S. as the administering power of Guåhan is legally obligated, both federally and internationally, to aid the island towards the path of self- governance and that is all. The military presence and planned military build-up, including the MITT Study Area, violates the intention of the criterion mentioned in the article above. Whether it is the physical desecration of our ancient CHamoru sites, the political deprivation of voice and representation to the U.S. as second class citizens, or EIS "public involvement" commenting periods, Congress, the Navy, and its affiliates couldn't be any clearer that the needs of the CHamoru people of Guåhan come second to theirs.	
Matthew Simpson (MS)		
MS-01	I do not agree with the MITT plan as it will be detrimental to the environmental well-being of the area to be used. The environmental impact assessment should not be glossed over. The planet does not need the USA to set off more practice bombs. This is shameful and will reflect poorly on the part that the US military has had to play in the degradation of the environment and resources which it should be protecting. I feel that the impact on whales should be more closely analyzed. I would like to see more importance given to the toxic pollution of ancestral lands important to the indigenous people of the region.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.

	Comment	Navy Response
Kianna Reyes (KR)		
KR-01	As a native indigenous to the island of Saipan (roughly 136 miles from Guam), I do not support the Department of Defense's decision to utilize Chamorro ancestral lands or any of the surrounding areas (including the oceans around the Marianas Islands) as a base for weapons-testing. The U.S. Naval Forces have already acknowledged the fact that hundreds of aquatic animals (including whales, corals, and fish) will most likely perish when confronted with training methods that include the use of underwater sonar and bomb detonations. In addition, the Navy has also confessed to the likelihood that millions of maritime creatures will probably experience temporary hearing loss during the process of field training. Underwater sonar has also been known to produce slow-rolling sound waves that top up to 235 decibels. In most cases, it only takes about 140 decibels to reach the threshold of pain. Whales have been known to strand themselves in shallow waters in attempt to escape the unbelievable agony - and even bleed from the eyes and ears when rapidly changing depth to escape. As the Department of Defense cannot guarantee the safety of lives led underseas, I will not support and will continue to advocate against these methods until an alternative solution can be reached. As there is no effective way the military is able to redirect all marine wildlife away from an underwater training spot, it remains a fact that the methods used in training will continue to harm, harass, and even life forms residing within a reasonable distance to the grounds. It is for these reasons (and many more), that I will continue to hold my place of	Marine life and marine habitat are important to the Navy. Using the latest science and technology, the Navy completed extensive analyses and computer-based modeling to determine impacts and develop science-based protective measures to reduce or avoid potential impacts on marine life. Potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practicable, procedural and geographic mitigation measures during its training and testing activities to reduce potential impacts on marine life. The Navy's analysis indicates that, with implementation of its protective mitigation measures, there would be no significant impacts on marine species.

	Comment	Navy Response
	opposition against field training conducted underseas, above-ground, and around the Marianas Islands.	
Lisa Marquez (LM)		
LM-01	please dont renew contract in Guam, their island needs a break from all the damage you all have done	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Lawrence Lizama (LL)		
LL-01	According to the EIS statement, the purpose of the training is to maintain, train, and equip combat ready forces for winning wars, deterring aggression, and maintaining freedom of the seas. However, what wars is the US fighting other than those brought about and continued by them? What aggression is the US deterring other than the aggression they bring about through the militarization of our region? What freedom of the seas is the US maintaining when their own fellow citizens, second class citizens, on Guahan aren't even free to explore their own seas? These issues that the military states are the reasons, purposes, and needs for this training are only increasing the danger in our region. Increasing the training area in this region will only increase our chances to be a target for an enemy of the US. The military already has more than enough, not only in Guahan but also in the CNMI. I want to reference section 3.10.2.1 of Volume II regarding acoustic stressors. In this section, it clearly states that there will be periods of continuous noises from explosions or some being for a short duration and they will affect the bird population. The section explicitly states that birds may be killed, injured, or expend their energy trying to get away from the explosions during these activities. This is clearly a negative environmental impact that the military doesn't seem to care about. Our bird population is already in a dangerous state because of the brown tree snake that was	The health of coastal communities, fisheries, and ecosystems is important to the Navy. Section 3.1 (Sediments and Water Quality) concludes that chemical, physical, and biological changes to sediment or water quality would be measurable but below applicable standards, regulations, and guidelines, and would be within the existing conditions or designated uses. The Navy complies with all applicable laws and regulations. The military is committed to protecting the environment during the conduct of its military training and testing activities. A comprehensive analysis of potential effects on environmental resources from Navy training and testing activities is presented in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. These resources include sediments and water quality, marine habitats, marine mammals, fishes, sea turtles, marine birds, and marine invertebrates. While some impacts would occur from training and testing activities, the analysis concludes that impacts would be minimal and would not have a significant impact on the environment. Also, as described in Section 2.3.3 (Standard Operating Procedures) and Chapter 5 (Mitigation) of this Supplemental EIS/OEIS, the Navy implements, to the maximum extent possible, mitigation measures during its training and testing activities to avoid and minimize impacts on marine and cultural resources.

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	introduced to the islands through US military cargo. The military as a so-called "responsible environmental steward" is clearly irresponsible, as we have seen historically in the region and in this EIS. The proposal to increase the training area is also alarming because it will not only affect the Marianas, but also the surrounding areas. The military is ignoring the fact that the chemicals, explosives, munitions and other military wastes don't have borders. These lines that the military drew up for the training site don't exist in nature. The environment has no borders. It is clear that these activities will affect the people and other species living in this region as outlined in section 3.0 of Volume I, regarding the affected environment and environmental consequences. Our water and air quality are in even more danger with this MITT in combination with the militarization at Litekyan, which sits on the water lens and limestone forests. The military has shown in the past, and also recently with the pool tablets in the drinking water, that they can't even provide quality water for their dependents living on base. How much more can we trust the military to protect the environment? The EIS also fails to outline how this will affect future generations, especially with the ongoing obstacles from climate change. These proposed training activities for the MITT are not sustainable practices in such a critical period for our region and the rest of the world, regarding climate change. If the military were to truly be a responsible steward of the environment, then it should seriously consider that these activities outlined are not for the protection of the environment and are clearly destructive. It should also take into consideration climate change as a threat multiplier and	

	Comment	Navy Response
	how these activities will add to the progression of climate change, thus further increasing chances of conflict. The proposed training in these areas as being "responsible" is blatant disrespect for the Chamoru people, all those who call Guahan home, and their environment. It makes no consideration for the wellbeing of the environment in these areas and the people inhabiting these islands, especially not the generations to come.	
Alicia Mafnas (AM)		
AM-01	Please do not proceed with the testing in our ocean! We need to protect our sea animals and waters! Think about how it will negatively affect our environment and economy! Think about our future, our children, your children! Sonar training will especially kill our whales and dolphins... Imagine future generations never knowing these incredibly intelligent and majestic creatures. Please listen to our outcry. Please have a heart. Si yu'us ma'ase	Marine life and marine habitat are important to the Navy. Using the latest science and technology, the Navy completed extensive analyses and computer-based modeling to determine impacts and develop science-based protective measures to reduce or avoid potential impacts on marine life. Potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practicable, procedural and geographic mitigation measures during its training and testing activities to reduce potential impacts on marine life. The Navy's analysis indicates that, with implementation of its protective mitigation measures, there would be no significant impacts on marine species.
Victoria Espaldon (VE)		
VE-01	I am completely against DOD's Marianas island testing renewal/expansion.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities. This Navy Supplemental EIS/OEIS does not propose any geographic expansion of the training and testing area.
Maria Calori (MC)		
MC-01	EIS Comments The NEPA process itself is flawed in that it puts the perpetrator of the action in power and leaves the (lay)	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.

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	citizens being affected at a disadvantage as the accusers - long documents written in military jargon expected to be read and analyzed in short amounts of time. Comments received are expected to be concise and specific, backed by science. WE, the citizens, are innocent until proven guilty - not you, U.S. Department of Defense (/Department of the Interior) ; You have been proven guilty over and over and over again. The Marshall Islands, Sumay, Hagåtña, my grandparents, my parents - living (dying) proof of your trespasses. I reject any and all military training in and around Guam and the Mariånas. Bombing, Firing ranges, jets fueling and flying overhead, and war training exercises all have a negative impact on all living species most especially native species of sea mammals, fruit bats, monitor lizards, butterflies (and other native insects), trees, shrubs, plants (used in native medicines). Guam's limestone forests are very limited and species that depend on that habitat are struggling to survive. The northern islands allow us to research and learn more about our pristine habitats and how to ensure the survival of species threatened in Guam. As a people, the CHamoru and other locals suffer from high rates of cancer and illness resulting from exposure to chemicals specifically used by the U.S. military. Military exercises also have an emotional and mental impact on the community at large, please refer to and read in entirety "Colonial Dis-Ease: US Navy Health Policies and the Chamorros of Guam, 1898–1941 (Pacific Islands Monographs Series)" by Anne Perez Hattori.	

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Stephanie Piper (SP)		
SP-01	We need to project our oceans, ocean life, and the corals! I'm standing up for what is right for environment.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Rebecca Delafield (RD)		
RD-01	I wish to comment on the plans to continue the bombing of Farallon de Medinilla, the expanded military exercises in the Mariana Islands and the waters surrounding. I feel that the process has neglected to account for significant environmental and cultural impacts on the island and ocean environments. Specifically, the bombing of Pagan, which has historical sites and until relatively recently had residents that were able to live off the land, is akin to the bombing of Kaho'olawe in the Hawaiian Islands. The cleanup of Kaho'olawe is still ongoing after nearly two decades and serves as a disturbing illustration of the both the damage that can be inflicted by bombing and the historic inadequacy of U.S. military to address the harm done. This should not be replicated in Pagan and Tinian, resulting in the citizens of the islands to bear the cost through loss of access to these historic treasures and through having to clean up after it is no longer found useful to the military. The environmental impacts related to the use of Naval sonar and underwater are explosives are a serious concern and to date, the extent of the impact to marine mammals is unclear. The fact that there are restrictions in place for areas in Hawaiian waters, but those same protections have not been included in this Draft Supplemental EIS/OEIS points to a disregard for the science that we have and suggests that other scientific concerns might be ignored in this assessment in order to pursue the Navy's stated aims.	The Navy is not proposing any geographic expansion of the training and testing area in this Supplemental EIS/OEIS. Proposed activities are similar to those conducted in the Study Area for decades. Training and testing activities within this Supplemental EIS/OEIS are proposed to occur at sea and on FDM. Tables 2.5-1 and 2.5-2 in Chapter 2 (Description of Proposed Action and Alternatives) present the current and proposed training and testing activities. The Proposed Action does not include Pagan. The potential effects of sonar and explosives on marine mammals are quantitatively estimated using the Navy's Acoustics Effects Model (see the technical report *Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing*, available on the project website). Predicted effects from sonar on marine mammals are presented by species in Section 3.4.2.1.2.3 (Impacts from Sonar and Other Transducers Under the Action Alternatives) and from explosives in Section 3.4.2.2.2.3 (Impacts from Explosive Stressors Under the Action Alternatives). No mortality or direct injury to any marine mammals is predicted. Appendix I (Geographic Mitigation Assessment) details three areas, one in Agat Bay off Guam and two off Saipan, as geographic mitigation areas where training and testing activities using explosives would be prohibited, and surface ship hull-mounted MF1 mid-frequency active sonar would be prohibited or restricted seasonally. In this Supplemental EIS/OEIS, the Navy cites peer-reviewed scientific publications and government reports that document the latest research on marine mammals. The Navy has reviewed those publications and completed extensive analyses and computer-based modeling to determine impacts and develop science-based protective measures to reduce or avoid potential impacts

	Comment	Navy Response
		on marine life. Potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practicable, procedural and geographic mitigation measures during its training and testing activities to reduce potential impacts on marine life. The Navy's analysis indicates that, with implementation of its protective mitigation measures, there would be no significant impacts on marine species.
Justine Guzman (JG)		
JG-01	How does one do think about doing something on purpose knowing it has a big effect on marine life? LIFE! Living things will be affected. I'm hoping and praying that whoever has the last word on this decision, puts themselves in our shoes, our shoes that walk daily on this beautiful island we call home. I hope that they come to realize how life threatening this is and says NO on moving forward with having our oceans compromised any more than they already are. Please also think about our future generations so that they may grow up with clean water, land and air.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Maria Barcinas (MB)		
MB-01	I oppose the expansion and renewal of the Mariana Islands Training and Testing outlined in this proposal. I believe that the military can conduct sufficient realistic training and testing without the use of live fire detonations the waters of the Marianas. These trainings will harm our ocean and negatively impact our ability to live sustainably through decrease in the overall health of the environment. Public information regarding the results and harm to the environment and sea life as a result of the training needs	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities. The Navy is not proposing any geographic expansion of the training and testing area in this Supplemental EIS/OEIS. Proposed activities are similar to those conducted in the Study Area for decades.

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	should be increased and shared within a more timely manner to create more effective mitigation strategies.	
Kathleen Bejado (KB)		
KB-01	Håfa Adai, Militarism on Guahan has posed detrimental effects to the island for a long time now. We have been losing our identity as a culture because of colonization and now we are losing our lands because of it as well. Research has already proven that these testings will harm and kill our sea life - which is something of great importance to our culture. The world is already seeing effects due to climate change like rising sea levels, coral bleaching, and ocean acidification. Our island cannot withstand any more issues when we are already dealing with so much. Please take all of these comments into consideration and think about the future of our island and of our people. Our lands and our oceans mean the world to us... they are a part of who we are as people, I hope you understand that. Si Yu'os Må'åse'	Training and testing activities are proposed to occur at sea and on FDM. Tables 2.5-1 and 2.5-2 in Chapter 2 (Description of Proposed Action and Alternatives) of this Supplemental EIS/OEIS present current and proposed training and testing activities. The Navy analyzed land-based activities on Guam, Saipan, Tinian, and Rota in the 2015 MITT Final EIS/OEIS; the Navy did not reanalyze land-based activities in this Supplemental EIS/OEIS because there are no changes proposed to those land-based activities.
Tina Grandinetti (TG)		
TG-01	I am writing to express serious concerns about the environmental impacts of the MITT. 1. Training and testing activities will limit access to the ocean and its fishing resources. Though the EIS says these will only be temporary, even short-term denial of access can have profound impacts on the cultural rights of Chamorro people as well as impacts to tourism. 2. In areas where live fire training occurs, or where access is	Marine life and marine habitat are important to the Navy. Using the latest science and technology, the Navy completed extensive analyses and computer-based modeling to determine impacts and develop science-based protective measures to reduce or avoid potential impacts on marine life. Potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practicable, procedural and geographic mitigation measures during its training and testing activities to reduce potential impacts on marine life. The Navy's analysis indicates that, with implementation

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	temporarily restricted, contamination and pollution is likely. What happens to the people who return to those areas for fishing or recreation. The US Military has a well-documented history of contaminating Micronesia and leaving its people to suffer the health effects of such contamination. Any proposal should be accompanied with extensive, binding, and well-funded plans for cleanup. 3. The EIS says there will not be substantial impact on marine mammals. This contradicts studies conducted by both marine scientists and the Navy itself. In a previous EIS draft, the Navy admitted that the sonar exercises planned for 2014-2018 may unintentionally "harm marine mammals 2.8 million times over five years." While the EIS states that the majority of these harms will only be "harassment", harassment at this magnitude and frequency will have detrimental effects. 4. I am deeply concerned with the proposal to increase the number of naval surface fire explosive rounds fired on Noʻos [Farallon de Medinilla]. This does immense, undeniable, and probably irreversible damage to an island ecosystem and repeats the crimes that the US military committed on Kahoʻolawe. The US Military consistently fails to rehabilitate damaged ecosystems. Noʻos is part of the cultural and physical heritage of the Chamorro people. 5. The Supplemental EIS for the MITT does not include the full disclosure of the cumulative impacts associated with the massive live-fire ranges and transit corridors that connect California, Hawaii, and the Marianast. Pitt et al (2019) reported that pathways for invasive species opened by the massive live-fire range and the Marines Relocation to Guam activities are highly likely to bring numerous invasive species	of its protective mitigation measures, there would be no significant impacts on marine species. This Supplemental EIS/OEIS does not propose a change to the ocean areas currently used by both the Navy and the public. Restrictions on accessing areas of co-use would continue to be relatively infrequent and short term, while other fishing and tourism sites in the Study Area would continue to be available to the public. The military is committed to continuing to work with the local community on issues that potentially affect the public, including access to fishing sites. The use of explosive ordnance during training and testing activities occurs on FDM, at locations far from shore, and at a few areas closer to shore specifically designated for certain types of explosives (e.g., Outer Apra Harbor UNDET Site). Refer to Chapter 2 (Description of Proposed Action and Alternatives) for details on where training and testing activities using explosives would occur and maps depicting the locations of nearshore ranges and areas where explosives may be used. FDM has been used as a target area for both explosive and non-explosive munitions since 1971. Between 1997 and 2012, the Navy has conducted 14 underwater scientific surveys around the island, providing a consistent, long term investigation of a single site where munitions have been used regularly (Smith & Marx, 2016). Marine life assessed during these surveys included algae, corals, benthic invertebrates, sharks, rays, bony fishes, and sea turtles. The investigators found no evidence, over the 16-year period, that the condition of the physical or biological resources had been adversely impacted to a significant degree by the training activities (Smith & Marx, 2016). Furthermore, they found that the health, abundance, and biomass of fishes, corals, and other marine resources were as good as, or better than, those in similar habitats elsewhere in the Mariana Archipelago. The authors concluded that restricting access to the islands has created a de facto marine preserve for many reef fish species targeted by fishers. Explosive ordnance used far offshore sinks to the seafloor where water depths are several hundred meters or more, and little to no light is present. Water temperatures at these depths approach freezing temperature

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	to the region. It is also completely arbitrary to review these ranges and transit corridors separately, as the impacts on the Pacific Ocean and cumulative. The US Military has effectively turned huge swaths of the Pacific into its training area.	and, under these conditions, the degradation rate of metals, including ordnance, is extremely slow. Ordnance and other expended materials that become buried in soft sediments where little to no oxygen penetrates would degrade even more slowly. Under these conditions, constituent materials and other degradation products, most of which occur naturally in the marine environment, would be released into the environment slowly and in areas inaccessible to humans (see Section 3.1 (Sediments and Water Quality) for details. The potential effects of sonar and explosives on marine mammals are quantitatively estimated using the Navy's Acoustics Effects Model (see the technical report *Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing*, available on the project website, for details on the quantitative methodology). Predicted effects from sonar on marine mammals are presented by species in Section 3.4.2.1.2.3 (Impacts from Sonar and Other Transducers Under the Action Alternatives) and from explosives in Section 3.4.2.2.2.3 (Impacts from Explosive Stressors Under the Action Alternatives). No mortality or direct injury to any marine mammals is predicted. The Navy has supported multi-year dive surveys of waters surrounding FDM since 1999, with the most recent dive survey available from 2017. While nearshore impacts can occur from errant ordnance targeted at FDM; these impacts are short term and localized, with no evidence of coral reef or other habitat. In 2017, the Navy funded additional surveys in the nearshore areas of FDM. The results were approved for public release in September 2018, and available at https://apps.dtic.mil/dtic/tr/fulltext/u2/1069450.pdf. The 2017 survey found little evidence that training has affected coral communities at FDM. Only three relatively fresh ordnance items were observed, but no blast pits, craters, or significant areas of coral breakage were observed. The ordnance observed during the 2017 survey was almost exclusively old, encrusted in marine life, and had no discernable impact on surrounding communities. The paper by Smith and Marx (2016) cited in Section 3.4 (Marine Mammals) of this Supplemental EIS/OEIS concludes that the habitat surrounding FDM is as good as, or better than, other areas in the CNMI and that restricting access to the

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		island and nearshore waters has resulted in the area becoming a “de facto” marine preserve. The vast majority of takes under the MMPA noted in this Supplemental EIS/OEIS are Level B harassment involving behavioral response which have the "potential to disturb behavioral patterns," and involve no physical harm or injury. As noted in Appendix E (Estimated Marine Mammal and Sea Turtle Impacts from Exposure to Acoustic and Explosive Stressors Under Navy Training and Testing Activities) and in the species breakdown in Section 3.4 (Marine Mammals), these instances of Level B harassment take place over many species, many stocks, and many locations; not to specific populations or critically endangered species in particular. While the Navy models all of its activities to estimate the potential number of takes of marine mammals by species, to overall totals is an over estimation due to various reasons listed in this Supplemental EIS/OEIS. Research cited in this Supplemental EIS/OEIS and in the MITT 2015 Final EIS/OEIS indicates that behavioral changes are temporary and not necessarily repeated. The Navy has addressed recent research on possible long-term effects in Section 3.4.2.1.1.7 (Long-Term Consequences) in this Supplemental EIS/OEIS and in Section 3.4.3.1.3 (Long-Term Consequences to the Individual and the Population) in the 2015 MITT Final EIS/OEIS. Based on this research, long-term effects to individuals and populations from short-term, intermittent noise exposures are not anticipated. Potential impacts on marine mammals are further reduced by mitigation that will be implemented for all activities using sonar and explosives. In addition, the Navy has developed three geographic mitigation areas in the MITT Study Area (see Appendix I, Geographic Mitigation Assessment) where the use of explosives would be prohibited, and surface ship hull-mounted MF1 mid-frequency active sonar would be prohibited or restricted seasonally. The U.S. Navy recognizes the importance of biosecurity, ecological integrity, and resiliency of island ecosystems to the potential introduction of invasive species to the Mariana Islands associated with military training and testing. The Navy has a number of policies in place to prevent, interdict, and control invasive species introductions in both terrestrial and marine environments. Specific federal and Navy policies for marine invasive species can be found at: Public Law 104-332,

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		National Invasive Species Act of 1996, Executive Order 13112 (Invasive Species) and amended by Executive Order 13751 (Safeguarding the Nation from the Impacts of Invasive Species), OPNAV M-5090.1 Chapter 35-3.19. (Ship and Ballast Water), M-5090.1 Chapter 35-3.1 (Environmentally Sound Ships), and M-5090.1 Chapter 12-3.9 (Invasive Species).
Elsa Pangelinan (EP)		
EP-01	I completely disagree with the United States Military using part of the Mariana Islands as a military field which includes activities such as bombing, training, and other related ones. Our islands pristine water, island and air is what gives life to people and animals. Destroying natural habitats and ecosystems of animals greatly place them at risk for extinction and possibly low count of population. Military activities affect the physical environment in the following ways: 1) pollution if the air, land, and water 2) immediate long term side effects of natural resources damaged 3) nuclear weapons development and production 4) land use 5) militarization of outer space	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities. Using the latest science and technology, the Navy completed extensive analyses and computer-based modeling to determine impacts and develop science-based protective measures to reduce or avoid potential impacts on marine life. Potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practicable, procedural and geographic mitigation measures during its training and testing activities to reduce potential impacts on marine life. The Navy's analysis indicates that, with implementation of its protective mitigation measures, there would be no significant impacts on marine species.
Anna Hawkins (AH)		
AH-01	We respect the military for their sacrifices now can the military respect what's left of our culture, land and ocean? Why remember what it was when we can work with what we have and make things better. I get we need to defend ourselves with weapons but have you ever wonder the biggest weapon we can use is love and not fear. When we all	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.

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	stand together as 1 fighting for the same cause. This is worst then going into a country and bombing it and stripping their rights!! These animals can't defend themselves from the only home they know and these animals all play a part in our life. Please remember we have one home we call Earth!!	
Christian Oasay (CO)		
CO-01	100% AGAINST this military training. The environment is still trying to recover from all other previous trainings conducted. I'm from Hawaii and we know how devastating the tests can end up. You've already done enough damage to the land and now you want to start damaging the oceans. These tests are gonna have such a negative impact on our planet. Pretty sure there are more options to practice training than this current proposal.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Siobhon McManus (SM)		
SM-01	https://www.frontiersin.org/articles/10.3389/fmars.2017.00295/full from this article by Dr. E. C. M. Parsons, George Mason University "The risks military sonar poses to cetaceans received international attention with a highly-publicized mass stranding of Cuvier's beaked whales (Ziphius cavirostris), Blainville's beaked whales (Mesoplodon densirostris), and northern minke whales (Balaenoptera acutorostrata) in the Bahamas in 2000. This was the first time that the US Government determined a stranding to be the result of mid-frequency active sonar use. Subsequently attention has been drawn to other mass strandings coincident with naval	Marine life and habitat is also important to the Navy. The Navy trains worldwide, not just in the MITT Study Area. Using the latest science and technology, the Navy completed extensive analyses and computer-based modeling to determine impacts and develop science-based protective measures to reduce or avoid potential impacts on marine life. The Navy's acoustic effects model predicts that the vast majority of marine mammals' exposures to acoustic stressors (sonar and explosives) would cause temporary changes in behavior. Potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practicable, procedural and geographic mitigation measures during its training and testing activities to reduce potential impacts on marine life. The Navy's analysis indicates that, with implementation of its protective mitigation measures, there would be no significant impacts on marine species.

	Comment	Navy Response
	exercises, including events preceding the 2000 mass stranding. The list of species for which mass strandings have been linked to naval exercises has also increased to include other beaked whales, dwarf and pygmy sperm whales (Kogia spp.), pilot whales (Globicephala spp.), several dolphin species (Stenella sp. and Delphinus delphis), and harbor porpoises (Phocoena phocoena). In particular, there have been several mass strandings in the northern Indian Ocean coincident with naval exercises—including one of the largest (200–250 dolphins)—which have received little attention. Changes in beaked whale behavior, including evasive maneuvering, have been recorded at received levels below <100 dB re 1 µPa (rms) and mass stranding may occur at received levels potentially as low as 150–170 dB re 1 µPa. There is strong scientific evidence to suggest that a wide range of whale, dolphin and porpoise species can also be impacted by sound produced during military activities, with significant effects occurring at received levels lower than previously predicted. Although there are many stranding events that have occurred coincident with the presence of naval vessels or exercises, it is important to emphasize that even the absence of strandings in a region does not equate to an absence of deaths, i.e., absence of evidence does not mean evidence of absence. Strandings may be undetected, or be unlikely to be observed because of a lack of search effort or due to coastal topography or characteristics. There may also be "hidden" impacts of sonar and exercises not readily observable (e.g., stress responses). Due to the level of uncertainty related to this issue, ongoing baseline monitoring for cetaceans in exercise areas is important and managers should take a precautionary approach to mitigating impacts and protecting species."	As explained in the Navy's technical report on marine mammal strandings (*Marine Mammal Strandings Associated with U.S. Navy Sonar Activities*, 2017 [www.mitt-eis.com]), marine mammal strandings have been a historic and ongoing occurrence attributed to a variety of causes, both natural and anthropogenic. Over the last 50 years, increased awareness and reporting has led to more information about species affected and raised concerns about anthropogenic sources of stranding. While there have been limited numbers of marine mammal mortalities potentially associated with U.S. Navy activities, the root causes are not clear in most cases. NMFS, as the regulator, maintains the authoritative National Stranding Database. The Center for Naval Analysis (CNA) also recently conducted a statistical study of correlation of beaked whale strandings around the Mariana Islands with the use of U.S. Navy sonar, finding that insufficient evidence of a correlation exists. The CNA study used the complete record of all U.S. Navy sonar use between 2007 and 2019, including major training events, joint exercises, and unit level training/testing. The analysis also included the complete beaked whale stranding record for the Mariana Islands through 2019. Following the methods in Simonis et al. (2020), the CNA analysis found insufficient evidence of a correlation between sonar use and beaked whale strandings when considering the complete sonar use record. The CNA finding is in contrast to the finding in Simonis et al. (2020), which depicted a significant correlation between beaked whale strandings and Navy sonar use. However, the Simonis et al. (2020) result relied on substantially incomplete or inaccurate assumptions about U.S. Navy sonar use around the Mariana Islands. CNA also conducted statistical analyses specific to each island where beaked whale strandings have been observed in the Mariana Islands, similarly finding insufficient evidence of a correlation to sonar use. Additional information on the findings of the CNA analysis are presented in Section 3.4.2.1.1.6 (Stranding) in Chapter 3.4 (Marine Mammals). Section 3.4.2.1.1.6 (Stranding) has been expanded to include additional information about strandings of beaked whales in the Mariana Islands and the Navy's support of efforts to better understand the causes of marine mammal

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	In January of this year, an 11-foot 1,000-pound beaked whale was found on the reef flats of Agat and then Dadi Beach on Naval Base. The MITT-EIS does not account for numerous studies linking US Navy sonar testing to damaging effects on cetaceans. The MITT-EIS is insufficient in gauging the negative impact these testings will specifically have on cetaceans within the Marianas Islands region. More independent studies are needed. A tangential note: The MITT-EIS is completely inaccessible to the general public — in language, length, and response time. We have never been given an adequate amount of time or resources to properly digest and disseminate the information within this statement, let alone gather substantial responses from our communities.	strandings. As part of the MMPA consultation with NMFS, a stranding plan will be developed that details Navy actions in the event of a mass stranding that would be potentially linked to Navy activities. NMFS is the lead agency for stranding response and Navy will continue to support NMFS as required and outlined in the stranding plan. As described in Section 5.1.2.2.1 (Marine Species Research and Monitoring Programs), for this Final Supplemental EIS/OEIS, the Navy agreed to several additional research and monitoring initiatives designed to help advance the understanding of beaked whales and strandings in the MITT Study Area. The Navy will co-fund the Pacific Marine Assessment Program for Protected Species (PACMAPPS) Mariana Islands survey in spring-summer 2021 and future studies starting in 2022 to help document beaked whale occurrence, abundance, and distribution in the Mariana Islands. The Navy will also fund additional stranding response and necropsy analyses for the Pacific Islands region, and research on a framework to improve statistical stranding analysis. Collaboratively with NMFS, the Navy will fund and organize an expert panel to provide recommendations on scientific data gaps and uncertainties for further protective measure consideration to minimize potential impacts of Navy training and testing activities on beaked whales in the Mariana Islands. The Navy understands the complexity of the information presented within this Supplemental EIS/OEIS. This Supplemental EIS/OEIS contains a rigorous scientific analysis of the potential impacts of the Navy's proposal and thoroughly explains the scientific methodology, analysis methods, and findings. The Navy attempts to explain challenging concepts, methods, and the results of the analysis as clearly as possible in this Supplemental EIS/OEIS and developed public informational materials for lay audiences. The Navy prepared project brochures, videos, a website, and posters, using layperson terms, to enhance public understanding of the information presented in this Supplemental EIS/OEIS. A project fact sheet was also translated into Chamorro. The informational materials, including the translated fact sheet, were made available at all four public meetings and on the project website (http://mitt-eis.com/). To better accommodate stakeholders and the public, the Navy provided 75 days to review and comment on the Draft Supplemental EIS/OEIS, which is 30 days longer than the minimum required time for review. Due to the effects of

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		Typhoon Wutip, Navy officials postponed the public meetings originally scheduled for Feb. 26 and 27, 2019. The Navy held the rescheduled meetings on March 18 and 19, 2019 in Saipan and Guam respectively. The Navy also added meetings on Tinian (March 14, 2019) and Rota (March 15, 2019). Public notice of the rescheduled public meetings was published multiple days in the Marianas Variety, Pacific Daily News, and Saipan Tribune. The Navy issued a press release and mailed over 500 postcards to individuals and organizations.
Mary Dema-ala (MD)		
MD-01	As a citizen of the United States, a resident of Guam, and a human being on this planet Earth...this military training area will not only affect our corals and local environment but will also endanger the planet we live on. We do not need this training area. We do not want this training area. Please put a stop to this NOW.	Marine life and habitat is also important to the Navy. The Navy avoids areas where coral reefs are present to the greatest extent practicable. Long-term surveys of nearshore waters and habitat surrounding FDM have shown very little disturbance from Navy activities. These surveys also indicate that the health, abundance, and biomass of fishes, corals, and other marine resources in those habitats are as good as, or better than, those in similar habitats elsewhere in the Mariana Archipelago (see Smith and Marx, 2016). Potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practicable, procedural and geographic mitigation measures during its training and testing activities to reduce potential impacts on marine life. The Navy's analysis indicates that, with implementation of its protective mitigation measures, there would be no significant impacts on marine species.
Madison Coveno (MC)		
MC-01	Our oceans are already under so much threat from plastic pollution and overfishing. Runoff from industrial agriculture is causing ocean dead-zones and global warming is causing coral bleaching. Guam in particular has already lost so much of our coral reef, and we are home to 2 species of endangered sea turtles. And long-range sonar can affect whales, dolphins, and other sea life even from far away! Our oceans are part of our ecosystem, if we destroy them it will	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.

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	affect not only our ability to enjoy the outdoors and observe beautiful animals (a major source of tourism money on Guam, by the way), but will actually threaten our survival- the oceans help absorb CO2 from the air and slow global warming. PLEASE do not destroy our oceans any further with unnecessary military exercises. Please consider alternate ways of conducting training, and keep any potentially destructive practices to a bare minimum. Harassing endangered species is against the law- please hold the military to a high standard when it comes to environmental protection!	
AJ Taimanglo (AJT)		
AJT-01	I sat thinking about how to write a "substantive" comment that contains practical importance, value, or effect. I proceeded looking through the extremely lengthy documents you've posted trying to extract information that highlight why you shouldn't proceed with further testing and training. After a while, I realized that it was completely silly. It would be foolish of me to repeat what you already know. You know that without a doubt that what you are doing is harmful to the Chamoru people and our environment. This commenting process is but a mere formality when considering that the military has a legacy of taking without asking. The "practical importance, value, or effect" that I offer is that I AM A NATIVE of this land that you will be destroying yet again and who will feel the aftermath of further training and testing long after you leave. It is heartbreaking knowing that it is the Chamoru people who will have to endure the mess you've made and our responsibility to heal it. There is still	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.

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	room for you to change the legacy you've created for yourselves by listening to the Chamoru people and actually considering our well-being. Testing and training for the sake of "security" is not an excuse nor will it ever be.	
Camarin Meno (CM)		
CM-01	I do not support this initiative. I believe it will be harmful to CHamoru cultural heritage sites, and believe it will harm existing CHamoru cultural practices. I also believe that the initiative has failed to fully examine the effects on our marine life. More importantly, I am in strong disagreement with the manner in which this initiative has been carried out, without the consent of the people of the Mariana Islands.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities. Section 3.11.1.3 (Cultural/Traditional Practices and Beliefs) has been added to this Supplemental EIS/OEIS. This Supplemental EIS/OEIS analyzes effects of the Proposed Action on marine resources. This analysis is presented in Section 3.3 (Marine Habitats), Section 3.4 (Marine Mammals), Section 3.5 (Sea Turtles), Section 3.7 (Marine Vegetation), Section 3.8 (Marine Invertebrates), and Section 3.9 (Fishes).
Shannon McManus (SM)		
SM-01	The proposed expansion for this training area in our Pacific region and all U.S military training in our region should be put to a stop. As Pacific Islanders, we are the most vulnerable to the adverse effects of climate change in our islands and seas, which have only been accelerated by the military industrial complex's rampant pollution and destruction caused by these kinds of training exercises. We cannot continue to allow military "preparedness" for wars the US has no business fighting to take precedence over all manner of life being threatened by these trainings. The harmful toxic waste, the destruction of our coral reefs that lead to a lack of biodiversity in sea life, making us more vulnerable to rising sea levels / storm driven waves, whale beachings and deaths from sonar testing - none of it should be collateral. The	The Navy is not proposing any geographic expansion of the training and testing area in this Supplemental EIS/OEIS. Proposed activities are similar to those conducted in the Study Area for decades. The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.

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	people of the Pacific are not, should never be collateral damage for the US Department of Defense.	
April Silvestre (AS)		
ASi-01	By proceeding with the mistreatment of the waters surrounding the island, disastrous consequences will arise that will not only affect the ocean environment itself, but the island environment that benefits from a healthy ocean ecosystem. But seeing as how this is common sense, I will also attempt to appeal to emotion and ask that this island is given the respect it deserves as it is not only a home, but a life that deserves to be protected.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Christabel Calicdan (ChC)		
ChC-01	It starts with us the people of earth to make a change, all unnecessary testing in the oceans are changing and harming us along with the planet and the animals. We all are affected. Global warming is happening why not make a change to save earth and our people, also our kids so they may have a future and a place to call home! We must make a stand now more than ever, no more saying oh it's ok someone else will pick up our mess, NO! It's time we all stand and unite and stop hurting earth, animals, and our people!	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Pika Fejeran (PF)		
PF-01	I wholeheartedly object to training and testing in the waters of the Marianas. Our waters are some of the most diverse- definitely the most diverse in the US. Why use our waters for these trainings and testings? Find another location where large ocean mammals will not be harmed. There is no way that the military's new technology is harmless to whales and other ocean mammals- in fact, quite the opposite- we have already seen the stranding and needless death of whales that were trying to escape the sonar or whatever testing is already happening. To expand the scope and area of testing will	The Navy is not proposing any geographic expansion of the training and testing area in this Supplemental EIS/OEIS. Proposed activities are similar to those conducted in the Study Area for decades. Marine life and marine habitat are important to the Navy. Using the latest science and technology, the Navy completed extensive analyses and computer-based modeling to determine impacts and develop science-based protective measures to reduce or avoid potential impacts on marine life. Potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this

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	multiply the negative effects and will harm the ocean we call home.	Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practicable, procedural and geographic mitigation measures during its training and testing activities to reduce potential impacts on marine life. The Navy's analysis indicates that, with implementation of its protective mitigation measures, there would be no significant impacts on marine species.
Mario Martinez (MaM)		
MaM-01	The Mariana Islands should not be used for training and testing. It adversely affects the natural resources for a temporary goal. The Marianas islands has been governed by many nations in the past. They come and go. It is not ok for the current occupying nation to destroy the very limited resources the Marianas currently has just so the occupier can train their military. There is far more space and opportunity to train in the continental United States, train there.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Marissa Wright (MW)		
MW-01	I oppose any further military development on Guam. These plans are disrespectful and waste of funding and resources. Guam's fragile environment should be protected and preserved at all times.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Chloe Babauta (CB)		
CB-01	I am concerned for the state of Guam's marine life and environment, due to potential environmental impacts of the proposed action for the Mariana Islands training and testing. I am speaking in opposition to these detrimental effects to the island and its ocean surroundings. The following points are outlined based on information from the draft supplemental EIS at www.MITT-EIS.com. Most of the explosive military expended materials would	Marine life and marine habitat are important to the Navy. Using the latest science and technology, the Navy completed extensive analyses and computer-based modeling to determine impacts and develop science-based protective measures to reduce or avoid potential impacts on marine life. Potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practicable, procedural and geographic mitigation measures during its training and testing activities to reduce potential impacts on marine life. The Navy's analysis indicates that, with implementation

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	detonate at or near the water surface. Training activities that include bottom-laid in-water explosions would affect marine habitat structure. Bottom substrates could be disturbed by vessel and in-water device strikes, military expended materials, seafloor devices used for military readiness activities, and from walking, standing, or swimming in the nearshore waters. The use of sonar and other transducers would have the potential to expose marine mammals to sound-producing activities which would present risks that could range from a temporary or permanent threshold shift, auditory masking, physiological stress, or behavioral responses. The use of munitions in the water or near the water's surface present a risk to marine mammals in close proximity to the explosion, because the resulting shock waves can cause injury or result in the death of an animal. Bottom-feeding marine mammals would be more likely to encounter expended materials that have already sunk to the floor. In the unlikely event that a marine mammal encounters and ingests expended material, the individual might be negatively affected if the material becomes lodged in the digestive tract. Marine mammals would be exposed to multiple secondary causes of impact associated with training and testing activities in the study area. In-water explosions have the potential to injure or kill prey species that marine mammals feed on. The use of sonar and other transducers, explosives, in-water electromagnetic devices, vessels and in-water devices, military expended materials, seafloor devices, and military expended materials of ingestible size associated with training	of its protective mitigation measures, there would be no significant impacts on marine species.

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	and testing activities may affect sea turtles present within the study area. The use of military expended materials and munitions may cause short-term or long-term disturbance to an individual sea turtle due to ingestion of munitions used in training activities. The use of cables and wires, and decelerators/parachutes may cause short-term or long-term disturbance to an individual sea turtle. Physical disturbance and strike and the use of in-water explosives could affect marine vegetation by destroying individual plants or damaging parts of plants. The use of explosives, military extended materials, and seafloor devices during military readiness activities could affect marine vegetation by destroying individual plants or damaging parts of plants. These activities also may affect fishes and marine invertebrates. These activities may result in impacts on commercial, recreational, and traditional fishing practices, or tourism, when areas of co-use are temporarily inaccessible to ensure public safety during training and testing activities. Resources that will be permanently and continually consumed by project implementation include water, electricity, natural gas, and fossil fuels. Greenhouse gas emissions would increase from the baseline by approximately 20 percent.	
Helana Leon Guerrero (HLG)		
HLG-01	Please DO NOT expand the area and frequency of military training for the MIRC in the Pacific Ocean. Your bombs and	The Navy is not proposing any geographic expansion of the training and testing area in this Supplemental EIS/OEIS. Proposed activities are similar to those

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	sonar training are negligent toward the natural inhabitants of the ocean. The effects to the aquatic life are massive and detrimental to our livelihood here on the islands. We are real people with love for our land and oceans. We pray, beg, and plead that your eyes will be opened to how badly our land, sea, and culture will suffer.	conducted in the Study Area for decades. The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Lena Leishman (LeL)		
LeL-01	Please stop the underwater testing. I am a diver and lover of the water and ocean. The things we do as humans affects the habitats of all of the creatures. Guam already has a huge problem with limited marine life and underwater bombs and tests will put the marine life still at more risk. We have awesome pods of dolphins and manta rays that are dwindling. Our coral beds are dying of from damage and bleaching. Stop the testing and experimenting which can harm and risk this environment and change the Marianas underwater habitat forever!	Marine life and marine habitat are important to the Navy. Using the latest science and technology, the Navy completed extensive analyses and computer-based modeling to determine impacts and develop science-based protective measures to reduce or avoid potential impacts on marine life. Potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practicable, procedural and geographic mitigation measures during its training and testing activities to reduce potential impacts on marine life. The Navy's analysis indicates that, with implementation of its protective mitigation measures, there would be no significant impacts on marine species.
Lauren Swaddell (LS)		
LS-01	Obviously, the military's mission is to national security. That is to be respected. However, the health of the ocean's marine life (fish, reptile, mammal, coral, plant, other invertebrates) are all dependent on the suitability of the ocean as their only environment. We as Americans rely on healthy fisheries and healthy coral reef ecosystems. Sonar and explosives will disrupt, damage, or destroy marine life that support our fisheries. Increased instances of beached whales have occurred in the region. With overall ocean health in decline, "minimizing impact" to marine life is not enough. Having zero negative impact on marine life is the minimal requirement to slow the negative impact on our economic and food	Marine life and marine habitat are important to the Navy. Using the latest science and technology, the Navy completed extensive analyses and computer-based modeling to determine impacts and develop science-based protective measures to reduce or avoid potential impacts on marine life. Potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practicable, procedural and geographic mitigation measures during its training and testing activities to reduce potential impacts on marine life. The Navy's analysis indicates that, with implementation of its protective mitigation measures, there would be no significant impacts on marine species.

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	prosperity. Having a positive impact on marine life by aiding natural resource managers with watershed restoration, coral reef restoration, and marine protected areas can boost homeland security, economic security, and food security--all arguably components of national security. Sonar impacts while shown to be disruptive to marine mammals are not completely understood, and using sonar at this stage of a lack of understanding when there are reduced marine mammal populations is irresponsible and a poor example to the world. Further, when coral reef ecosystems are damaged, the reduce the natural ecological services that are vital to the Mariana Islands: fisheries habitats; protection from coastal erosion from wave action, strong storms, and tsunamis; revenue from tourism; cultural enrichment; and recreation. Coral reef ecosystems in the Marianas are already impacted by increased incidences of elevated sea surface temperatures, over-fishing, increased ocean acidity, sedimentation, invasive and nuisance species, disease outbreaks, recreational misuse, boat groundings, abandoned equipment, and pollution. The abandoned casings will be akin to abandoned equipment, and explosives will damage already stressed reef ecosystems in need of recovery. Even if corals are impacted away from military bases, the coral and fish spawning circulations that occur can be disrupted causing population reductions in areas near US military bases. Military bases on Guam benefit from coral ecosystems because most are located near coasts. The reef ecosystems protect those regions and reduce flooding in surrounding areas. These services make military installations safer and make travel/commuting into bases by military personnel safer as well. Other benefits corals have been the potential for important pharmaceutical discoveries, such as the ones that treat various cancers and HIV. The Marianas have the	Section 3.8 (Marine Invertebrates) includes an analysis of potential impacts on coral. A detailed analysis of potential impacts on coral around FDM is also provided. Based on the analysis, coral fauna are healthy and robust, and the nearshore physical environment and basic habitat types at FDM would remain unchanged. These conclusions are based on (1) a limited amount of physical damage, (2) very low levels of partial mortality and disease (less than one percent of all species observed), (3) absence of excessive mucus production, (4) good coral recruitment, and (5) complete recovery by 2012 of the 2007 bleaching events. Smith and Marx (2016) also concluded that the health, abundance, and biomass of fishes, corals, and other marine resources at FDM are as good as, or better than, those in similar habitats elsewhere in the Mariana Archipelago. The Navy funded additional reef surveys in the nearshore areas of FDM in 2017. The results were approved for public release in September 2018 and are available at https://apps.dtic.mil/dtic/tr/fulltext/u2/1069450.pdf. The 2017 survey found little evidence that training has affected coral reef communities at FDM. Only three relatively fresh ordnance items were observed, but no blast pits, craters, or significant areas of coral breakage were observed. The ordnance observed during the 2017 survey was almost exclusively old, encrusted in marine life, and had no discernable impact on surrounding communities.

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	highest biodiversity (over 200 observed species of coral) in the US (compared to 20-60 in the Caribbean), thus the potential to add to US health security is greater by protecting the Mariana coral reef ecosystems. I urge you to consider using simulations rather than active sonar and explosives over our vulnerable and valuable natural resources that need more help. The benefits that healthy oceans provide are hard to mitigate at the same time scale they would be damaged. The amount of financial resources needed to mitigate could be very high and the economic value these marine and coastal resources provide would be lost if damaged. https://eos.org/articles/new-program-connects-ocean-health-and-national-security https://www.guampdn.com/story/news/2019/03/03/military-proposes-sonar-use-more-whales-wash-up-guams-shores/2865769002/ https://oceanleadership.org/the-state-of-our-ocean/ https://www.frontiersin.org/articles/10.3389/fmars.2016.00087/full https://www.google.com/url?sa=t&source=web&rct=j&url=https://www.boem.gov/Marine-Mammals-And-Noise-Fact-Sheet/&ved=2ahUKEwi4w8DUouzhAhXnUN8KHb2lAZMQFjAEegQIBRAB&usg=AOvVaw0WrU70h2jqjePRl7Y2gyAP&cshid=1556230655197 https://www.icriforum.org/about-coral-reefs/benefits-coral-reefs https://coral.org/coral-reefs-101/why-care-about-reefs/medicine/	
Amber Kirschbaum (AK)		
AK-01	I cannot urge you enough not to carry through with this or rather, the renewal of this. The environment and habitat have already suffered enough. The sonar testing will be of	Marine life and marine habitat are important to the Navy. Using the latest science and technology, the Navy completed extensive analyses and computer-based modeling to determine impacts and develop science-based protective

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	great detriment to the surrounding ocean wildlife which is already fighting so hard for its preservation.	measures to reduce or avoid potential impacts on marine life. Potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practicable, procedural and geographic mitigation measures during its training and testing activities to reduce potential impacts on marine life. The Navy's analysis indicates that, with implementation of its protective mitigation measures, there would be no significant impacts on marine species.
Reina Ross (RR)		
RR-01	Don't expand your testing area! Please. The ocean and sea life are important.	The Navy is not proposing any geographic expansion of the training and testing area in this Supplemental EIS/OEIS. The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Narcis Nalani (NN)		
NN-01	Please, discontinue your plans. The people of Guam have already suffered and sacrificed enough. I would like future generations to be able to have a place to call home that has not been destroyed, polluted, or bulldozed down due to the military. Our ocean and marine life should not be taken advantage of or destroyed because they do not have a voice of their own.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities. Using the latest science and technology, the Navy completed extensive analyses and computer-based modeling to determine impacts and develop science-based protective measures to reduce or avoid potential impacts on marine life. Potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practicable, procedural and geographic mitigation measures during its training and testing activities to reduce potential impacts on marine life. The Navy's analysis indicates that, with implementation of its protective mitigation measures, there would be no significant impacts on marine species.
Veronica Dydasco (VeD)		
VeD-01	Can we stop bombing around the Marianas? It's cause so much destruction for our people, the land, and ocean. So many people getting sick from the poison you put in our air and the sea life just disappearing before our eyes. It's	Marine life and marine habitat are important to the Navy. Using the latest science and technology, the Navy completed extensive analyses and computer-based modeling to determine impacts and develop science-based protective measures to reduce or avoid potential impacts on marine life. Potential effects

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	heartbreaking because I feel like we don't matter. I know we're just a small island in the middle of nowhere but we are real people that want what's best for our lives and home. I know it seems like some of us just want to fight for what we want but we really just want you guys to understand where we are coming from and help make it better. Please help the Marianas and the aquatic life by bombing no more.	from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practicable, procedural and geographic mitigation measures during its training and testing activities to reduce potential impacts on marine life. The Navy's analysis indicates that, with implementation of its protective mitigation measures, there would be no significant impacts on marine species.
Demiliza Saramosing (DS)		
DS-01	My name is Demiliza Saramosing, a PhD student at American Studies at the University of Minnesota. As a graduate student that is invested in decolonial and Indigenous sovereignty scholarship and activism in Hawai'i and the Oceania context, I am alarmed by the potential negative environmental consequences of the MITT. For example, Section 3.4.2.1.5 notes that marine mammals would be "…exposed to sounds caused by the firing of weapons, objects in flight, and inert impact of non-explosive munitions on the water's surface… these are impulsive sounds generated in close vicinity to or at the water surface, with the exception of items that are launched underwater." In addition, in section 3.3.2.1, the EIS states that "...mine warfare training and testing activities utilizing bottom placed detonations would only occur in the existing mine warfare underwater detonation areas at Piti, Agat, and Outer Apra Harbor." It is important to note that these areas are all populated by civilians and that fisherman, tourists, and young locals often visit and swim in the area. Furthermore, in section 3.0.4.2.1.1., the EIS elaborates that "Detonations would typically occur in waters greater than 200 ft. in depth, and greater than 3 NM from shore, with the exception of existing mine warfare areas, including Outer Apra Harbor,	Marine life and marine habitat are important to the Navy. Using the latest science and technology, the Navy completed extensive analyses and computer-based modeling to determine impacts and develop science-based protective measures to reduce or avoid potential impacts on marine life. Potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practicable, procedural and geographic mitigation measures during its training and testing activities to reduce potential impacts on marine life. The Navy's analysis indicates that, with implementation of its protective mitigation measures, there would be no significant impacts on marine species. Underwater detonations take place in designated areas that are located away from popular dive sites, primarily for human safety. See Section 2.3.3.5 (Underwater Detonation Safety) of this Supplemental EIS/OEIS for details of the Navy's standard operating procedures.

	Comment	Navy Response
	Piti, and Agat." Conducting explosive detonations close to the civilian populated areas is clearly alarming, especially since Marine Drive runs near the coastline of these villages. These are only a few examples of the alarming environmental consequences of the MITT. Thus, as a scholar activist of Oceania, I cannot possibly support the project.	
Ashley Castro (AC)		
AC-01	Please. There is no tolerance for any more destruction of my island and ocean. Please think about the results these underwater trainings will undergo if you to do this. Please keep in mind that I am a 23-year-old, undergraduate from University of Guam who looks forward to having my children enjoy the pristine reef/ocean with a healthy marine life, not contaminated toxic water that will prevent us from acquiring such experiences. I am an aspiring marine biologist who needs to protect and conserve our tåsi (ocean) and I will speak up for what is right. Our ocean surrounding the island has already suffered by having our fish absorb toxic compounds which our people thrive on in local supermarkets or just backyard fishing. It is devastating to know that the training of war is more important that protecting the people. Please protect us, don't destroy us. Our island is small but our gratitude will be eternal. Thank you for your time.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Tia Muna Aguon (TMA)		
TMA-01	My wish is that You and or the military and or any other personnel would completely discontinue and no longer conduct further trainings or testings in the marianas. The	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.

	Comment	Navy Response
	people of the land and those that occupy it matter. The lives of our future generations matter. Please stop the trainings and the testing. Please don't rape of us our land and prevent us from going to places on our island. These places are sacred to us, and your trainings and testings do not supersede our rights to the land and all that it stands for us and our children and our children's children. Please stop.	
Kenneth Garrido (KG)		
	The Military has been a part of my family, my grandfather was in the Navy before and during the WW-II, my father along with his brothers and my mother brothers were all in the military serving in Korea and Vietnam along with my immediate family siblings and cousins, my question is why would the military withhold plans that they decide to be utilizing our island and the rest of the chain of islands in the Marian's we our loyal citizens and have sacrificed a lot for this great Country the US, all we r asking is that for the purpose of training dropping bombs, and using our islands as a place to hold Nuclear and biochemical warfare we the people should be aware and should have an opinion whether we allow this, pls respect the people that live here especially on this side of the world bc with China next door and North Korea, we r in imminent danger at any time and we do not want history to repeat itself, we r at the mercy of God and only you the US can stop this ! Thank you 🙏🙏🙏	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Selencia Saladier (SS)		
SS-01	Guam is my home. A few years ago, I wouldn't be able to say that since I was born and raised and still living in the states, but over the last few years, I have connected with my island and have learned so much about it. My biggest regret is not	Potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practicable, procedural and geographic

	Comment	Navy Response
	learning about my culture, heritage, and island earlier and lacking an interest of where I am from. I have so much more to learn about my culture and island, but with military buildup and harmful testing activities, the islands environment and culture have been extremely affected and continues to change. Our ancestors land and culture they planned on their passing down generation to generation is not worth compromising. The military's testing activities proposal will impair my island, my home, my ancestors' home.	mitigation measures during its training and testing activities to reduce potential impacts on marine life.
Veronica Salas (VS)		
VS-01	Hafa Adai. The impact of proposed actions and tests will have longer negative effects on the Mariana Islands and its surrounding waters in all aspects than the time it takes to construct and carry out your general mission. Restricting access to lands that hold vital flora that are used in traditional, medicinal healing practices is hazardous to the wellbeing of the people living on these islands. As parts of the island continue to be developed, more and more areas of important plant life are being cleared away. Litekyan or Ritidian continues to hold plants that are necessary to practice and perpetuate traditional healing methods. Residents are already restricted from this place. Making it nearly accessible poses a major shift in social interaction between the people and its healers. The use of sonar will expose marine mammals to sound producing actives that will have negative effects on their wellbeing. These include: auditory masking, behavioral responses, stress, etc.	Potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practicable, procedural and geographic mitigation measures during its training and testing activities to reduce potential impacts on marine life. The Navy is consulting with NMFS under MMPA and ESA for potential impacts on marine mammals and ESA species, respectively. Mitigation resulting from these consultations will be implemented to minimize impacts. Ritidian is not part of the Proposed Action.

	Comment	Navy Response
	The materials that you leave behind in the waters will no doubt come in contact with marine life and expose them to unnecessary threats. Mistaking these for food items or other forms of predators, these animals' reactions to introduced materials will affect their way of life. These tests and materials could also drive away existing food sources for these marine mammals. It is already a federal mandate to protect sea turtles. Litekyan/Ritidian is home to many. The MITT-EIS will in essence be violating and endangering an animal that is protected by law. The introduction of materials that will be necessary to carry out the training will have negative effects on the turtle and its natural breeding grounds. There will be many negative effects if this project is pushed forward. The U.S. military has within its possession testing sites already in existence for this mission. The U.S. military is also intelligent and resourceful enough to do what it must without having to impose its might, unnecessarily. You have enough space. You have enough resources to dominate without needing to test or create new measures of that destructive dominance. This is all we have. We just want to protect and preserve it. Thank you.	
Nathan Pablo (NP)		
NP-01	stop your testing. you're harming animals	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.

	Comment	Navy Response
Logan Aaron Lee (LAL)		
LAL-01	The EIS "training" that your military commits is a crime against Earth and all life. I am requesting all of the bombings, underwater detonations, and sonar training be stopped indefinitely and immediately for the sake of our Ocean and the respect towards Ocean life. I will only ask you please stop these childish war games once. If continued, i will become a threat towards your entire company and motivation to persur these actions. Mahalo for listening. You've been warned. I will take action for our Mother Earth and do all within my means to defend her. Now, meditate/pray on that and let the light of all that is guide you well.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Elisabeth Castro (EC)		
EC-01	I am appalled and infuriated that the military has such disregard to indigenous needs, voices, and land. Litekyan is my family's home, and we have been fighting for it to be returned to us for generations while the military can simply desecrate our sacred spaces because they want to shoot some guns (that we don't want on island either but it's clear that the imperialist forces are alive and strong).	Litekyan is not part of the Proposed Action.
Heather Garrido (HG)		
HG-01	My people have been ignorant too long but not anymore. The amount of testing on the island is overbearing and we are dealing with the consequences. You can’t keep doing this to us because of the “organic act.” You can’t continue to control us. Test out of Guam, out of the Marianas and out of Micronesia.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.

	Comment	Navy Response
Camille Denight (CD)		
CD-01	Hafa Adai, I am worried about many things that will happen should you proceed to move forward with all the military projects proposed for Guam but three specific resources that concern me are: 1. Our Drinking Water 2. The Ocean and Marine Life surrounding our Island 3. The destruction of Ancient Chamorro Cultural Artifacts The firing range that is in planning is set to be constructed is above our natural aquifer and on an Ancient sacred cultural site. Please find another place to put this. We already import so much - please do not build anything over our source of water. No person can survive without clean water - this is a terrible idea and is not worth the risk. We are a small island with limited resources and land - build a firing range somewhere else. How many times have the people in this region already suffered because of the US military assuming that their actions will not have an impact on the resources and then they do! Water is essential to life - building a firing range with whatever ammunition you have over our water source is a threat to our water source and a threat to the lives here. So much of this island has been destroyed by war - whatever we have left of the past is extremely precious. Why do you think that destroying artifacts of ancient Chamorro Culture is okay? This mentality is one of the main reasons why the US has terrorists targeting innocent people in the country.	Potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practicable, procedural and geographic mitigation measures during its training and testing activities to reduce potential impacts on marine life. The firing range is not part of the Proposed Action.

	Comment	Navy Response
	People are angry that people in power (like the military) have no respect for different cultures and environments. Please do not sonar test in our surrounding ocean. It's obvious that this kills a lot of marine life. This is a natural resource that people here do care about. It's not okay to just kill all this sea life and think that it's justified because you need to test sonar.	
Mi'Yah Max (MM)		
	I DON'T APPROVE THE TEST BOMBINGS IN OUR OCEANS. this is so harmful to the environment, the coral reefs and the animals who live there. please for the love of god STOP.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Amber Ritter (AR)		
AR-01	I believe that the military should end all sonar usage, firing ranges and endless taking of indigenous lands. Due to the military's doing, land and sea are being ravaged at an incredible rate. Whales, dolphins and other marine life are beached due to the interference of the military sonar. The land is being polluted by nuclear waste run-off and the like. This is the land that CHamorus have been living off of for thousands of years and have seen so much destruction just in the last hundred years under the American occupation. The military already has 75-80% of Guahan's land mass and continues to ask for more for firing ranges and other "important facilities". The priority of the government should be in preserving the ancient grounds of a culture that continues to fight against colonization. The U.S military is the world's biggest polluter and we don't have the choice to say that we don't want it on our land. We may get to comment on this study which will more than likely happen regardless of	Potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practicable, procedural and geographic mitigation measures during its training and testing activities to reduce potential impacts on marine life. The firing range is not part of the Proposed Action.

	Comment	Navy Response
	how Guam's citizens, who are American citizens too through the Organic Act, feel. Please heed our cries for self-determination and our right to our lands and right the wrong that has happened for far too long. Thank you for your time.	
Charlene Santos (CS)		
CS-01	Our islands are sacred. Our lands are sacred. Please stop destroying our home. Our children need to feel and see the beauty we experienced growing up as kids. Put fabot ✊	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Jayvin Chargualaf (JC)		
JC-01	Stop testing military weapons on my island. Your weapons will not help the island grow or benefit it, but only bring more damage than they already have. Go test elsewhere if testing really is that necessary like in a desert where there is no life. I know the earth is big enough to test military weapons in another place than on an island full of life. An island is beneficial to the earth and life, unlike a weapon that brings destruction and death.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Jerrold Castro (JeC)		
JeC-01	For far too long the people of Guam and the Northern Marianas have had little opportunity to affect the outcome of activities in our waters, so I want to thank you for giving us this chance to express our concerns. The impact of military activities on our islands contribute to the loss of usable land that is essential to an island culture. My great grandfather Juan Rivera Castro lost a significant portion of his land in Liktekyan (commonly known as Ritidian) through imminent domain that he used as his livelihood in a thriving copra industry at his time. Those lost fruits of his labor were not passed down to his decedents. After those lands where given back to the people of Guam, because of	Potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practicable, procedural and geographic mitigation measures during its training and testing activities to reduce potential impacts on marine life. Liktekyan, bombing of Pagat, and military housing are not part of the Proposed Action.

	Comment	Navy Response
	threat for another reason for imminent domain, the government of Guam had to reassign that land as wildlife refuge to protect the cultural significance of that portion of our island. Now, that same land is again being threatened by the current military buildup for the establishment of ranges. The CHamoru people and our culture continues to be threatened now by the ongoing military activities as it was hundreds of years ago while under the colonial occupation by Spain and during the pre-World War II period by The United States. The use of the Marianas archipelago for military exercises continue to have an impact on our environment. The threat of sonar activities is affecting migration of whales and other species. The bombing of Pagat and other islands are destroying indigenous wildlife and flora. The construction of the ranges and military facilities in Tailalo (northern Guam) are destroying endangered wildlife and flora that the people of Guam have been trying to preserve for decades. Additionally, the largest water lens on Guam is located in that area of the island. We have significant concerns about polluting that area when there may be other areas that would be better suited for service members and their families. Why can't they live off of local economy housing? The money invested in building facilities inside the fence may be better used in improving essential services outside the fence. I plead your serious consideration to stop all military activities for the buildup and exercises in the Marianas and come up with better solutions that address both the people of the Marianas archipelago and the US interests. The people of the	

	Comment	Navy Response
	Marianas can no longer accept the effects that these activities are having on our land, waters, and culture.	
Paige Reyes (PR)		
PR-01	Potential Environmental Impacts of the Proposed Action for the Mariana Islands Training and Testing: Marine Habitats - Most of the explosive military expended materials would detonate at or near the water surface. Training activities that include bottom-laid in-water explosions would affect marine habitat structure. Bottom substrates could be disturbed by vessel and in-water device strikes, military expended materials, seafloor devices used for military readiness activities, and from walking, standing or swimming in the nearshore waters. Marine Mammals - the use of sonar and other transducers would have the potential to expose marine mammals to sound-producing activities which would present risks that could range from a temporary or permanent threshold shift, auditory masking, physiological stress, or behavioral responses. The use of munitions in the water or near the water's surface present a risk to marine mammals located in close proximity to the explosion, because the resulting shock waves can cause injury or result in the death of an animal. Bottom-feeding marine mammals would be more likely to encounter expended materials that have already sunk to the floor. In the unlikely event that a marine mammal encounters and ingests expended material, the individual might be negatively affected if the material becomes lodged in the digestive tract. Marine mammals would be exposed to multiple secondary causes of impact associated with training and testing activities in the study area. In-water explosions	Marine life and marine habitat are important to the Navy. Using the latest science and technology, the Navy completed extensive analyses and computer-based modeling to determine impacts and develop science-based protective measures to reduce or avoid potential impacts on marine life. Potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practicable, procedural and geographic mitigation measures during its training and testing activities to reduce potential impacts on marine life. The Navy's analysis indicates that, with implementation of its protective mitigation measures, there would be no significant impacts on marine species.

	Comment	Navy Response
	have the potential to injure or kill prey species that marine mammals feed on. Sea Turtles - the use of sonar and other transducers, explosives, in-water electromagnetic devices, vessels and in-water devices, weapons, military expended materials, seafloor devices, and military expended materials of ingestible size associated with training and testing activities may affect sea turtles present within the study area. The use of military expended materials and munitions may cause short-term or long-term disturbance to an individual sea turtle due to ingestion of munitions used in training activities. The use of cables and wires, and decelerators/parachutes may cause short-term or long-term disturbance to an individual sea turtle. Marine vegetation - physical disturbance and strike and the use of in-water explosives could affect marine vegetation by destroying individual plants or damaging parts of plants. The use of explosives, military expended materials, and seafloor devices during military readiness activities could affect marine vegetation by destroying individual plants or damaging parts of plants. Marine invertebrates - use of explosives, vessels and in-water devices, military expended materials and seafloor devices, associated with training and testing activities may impact individual marine invertebrates. The use of in-water explosives, vessels and in-water devices, military expended materials and seafloor devices, explosive by-products, and unexploded ordinance during military readiness activities may have an adverse effect on sedentary invertebrate beds or reefs.	

	Comment	Navy Response
	Fish - the use of sonar and other transducers, explosives, and in-water electromagnetic devices may affect fishes. The use of vessels and in-water devices, aircraft, weapons, military expended materials, seafloor devices, cables, wires, decelerators/parachutes, and military expended materials of ingestible size associated with training and testing activities may affect fishes. The use of sonar and other transducers, in-water explosives, in-water electromagnetic devices, vessels and in-water devices, cables, wires, decelerators/parachutes, and military expended materials associated with training and test activities may affect fishes within the study area. Socioeconomic resources and environmental justice - may result in impact on commercial and recreational fishing, traditional fishing practices, or tourism when areas of co-use are temporarily inaccessible to ensure public safety during training and testing activities. Other notable facts: resources that will be permanently and be continually consumed by project implementation include water, electricity, natural gas and fossil fuels. Greenhouse gas emissions would increase from the baseline by approximately 20 percent.	
Hannah Andersen (HA)		
HA-01	The use of Marianas Archipelago land, including the surrounding ocean of the same region, for conducting military weapons/environmental testing is unconscionable and unconstitutional. The proposed action for this region is permanently destructive and demoralizing to the wildlife and native populations of this region. I'm going to cut my vernacular for a sec and say this—you are batshit evil if you move forward without considering the considerable cry from	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.

	Comment	Navy Response
	indigenous groups to restore their rights to their ancestral/present land.	
Lorimarie Naputi (LN)		
	I am a native-born Chamorro who was born and raised on Guam. I may not be living on the island currently, but I am still very deeply involved and engaged in activities that affect the wellbeing of my island, it's nature, culture, and it's way of being. While I do have a military background as a military brat and understand the goal of wanting to protect our country, we need to also respect the locations and the beings involved in our practices. In-water bombings can cause damage to the various wildlife that live within the water. Guam, being an island in the middle of the Pacific Ocean relies very heavily on its water-life and the animals and vegetation within in. We operate on tourism, so maintaining as natural and as healthy of an environment as we can to appeal to tourist is an essential aspect of our economy. We cannot risk the possible displacement of animals and the corals/vegetation that inhabit the area. That being said, these bombings can cause serious behavioral changes to animals that inhabit the area. These waters that are called home will become inhospitable for the wild animals who will become accustomed to fleeing the test area to the point of not returning, leaving the vegetation and the entire structure of that ecosystem in a very vulnerable state. Once again, this can also be linked back to the tourism industry by then mitigating our snorkeling industries as we would have hardly anything to see.	Marine life and marine habitat are important to the Navy. Using the latest science and technology, the Navy completed extensive analyses and computer-based modeling to determine impacts and develop science-based protective measures to reduce or avoid potential impacts on marine life. Potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practicable, procedural and geographic mitigation measures during its training and testing activities to reduce potential impacts on marine life. The Navy's analysis indicates that, with implementation of its protective mitigation measures, there would be no significant impacts on marine species.

	Comment	Navy Response
	Sonar tests are also another aspect of environmental disruption as it can have drastic effects on the marine mammals that rely on echolocation. Despite the general facts booklet including a graph that claims that roughly 99% of harm done to the marine mammals consists of Level B Harassment, it is important to note these "small" or "insignificant" effects. Wild animals, unlike humans, are not readily equipped to adapt or force their surroundings to benefit them. Marine mammals need their supersensitive hearing to locate one another, identify threats, as well as navigate. If these animals have dulled hearing thresholds, even temporarily, it can cause some serious effects that may begin to increase as the sea sonar testing continue. To include their swimming patterns, we need to understand that if they are then enduring dulled hearing thresholds and are also facing behavioral changes that may not make much sense to them, we are leaving them in a very vulnerable position as these animals go against their innate instincts for survival and begin acting out in a fit of stress or discomfort. We also need to address the importance of protecting Guam's corals. Guam once had many coral, beautiful colorful reefs, but are not facing bleached corals that end up getting washed along the shores. We need to respect and protect the remaining corals as often as we can, and we can begin by avoiding the introduction of chemicals or other imbalances to their environment. Shrapnel or leaked chemicals from the explosives can have serious effects on the coral and it would only be noticed once it was too late. Overall, we need to respect the land and the water by taking these "small" issues into serious reflection. Not all harm to	

	Comment	Navy Response
	the environment will be visible or direct, but that is why we must take all of our actions seriously and go forth with deep contemplation of our actions.	
Amanda Bamba (AB)		
AB-01	The air, land, and sea in the Northern Marianas Islands is not yours to destroy. No testing. No bombing. No interference by a government that doesn't belong there.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Kaitlin McManus (KM)		
KM-01	Håfa Adai! Most people know me as Kaity. Im part Chamorro, part Haole and part Palauan. I was born is Saipain and lived most of my life here in Guam. I am now raising my 4 children here on this beautiful island. Its a blessing. But I am worried. I am worried that other people who live here are not being caretakers of our island, our home as God commanded us to in Genesis. Yes Gods very first commandment to mankind was to be caretakers of the Earth. I hold that dear to my heart just like our Inifresi, our promise and pledge on Guam . Incase you forgot or dont know the Inifresi, here it is: Ginen i mas takhelo' gi Hinasso-ku, i mas takhalom gi Kurason-hu, yan i mas figo' na Nina'siñå-hu, Hu ufresen maisa yu' para bai hu Prutehi yan hu Difende i Hinengge, i Kottura, i Lengguahi, i Aire, i Hanom yan i tano' Chamoru, ni'Irensiå-ku Direchu ginen as Yu'os Tåta. Este hu Afitma gi hilo' i bipblia yan i banderå-hu, i banderan Guåhan. (And in case you are not aware of what it means, here is the Englush translation:)	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.

	Comment	Navy Response
	From the highest of my thoughts, from the deepest of my heart, and with the utmost of my strength, I offer myself to protect and to defend the beliefs, the culture, the language, the air, the water and the land of the Chamorro, which are our inherent God-given rights. This I will affirm by the holy words and our banner, the flag of Guåhan! I pray that in the name of our Almighty Creator, that the destruction you are bringing to our island will stop and if not, I pray you reap what you sow. Thankfully God is a God of forgiveness and mercy. If you stop now and do what is right, you will be redeemed. But if you continue, surely it will not just be our island that suffers in the long run. It will be your soul. The money you get for the work and destruction you cause is not anywhere near the cost of losing your integrity and soul. God is watching you. He sees the wrong you are doing. He sees us all. He cares for His Creation. It is good to Him and good to us. Think of what you are doing. The bombing and testing that will destroy and damage our island and waters. Shame on you. It is a wicked thing. Ecclesiastes 3:17 New International Version (NIV) 17 I said to myself, “God will bring into judgment both the righteous and the wicked, for there will be a time for every activity, a time to judge every deed.”	

	Comment	Navy Response
Josephine Ong (JO)		
JO-01	My name is Josephine Ong, a MA candidate at Asian American Studies at UCLA, where I am studying the history of Filipino migration to the Marianas. As a graduate student that has extensively studied the Marianas and someone that grew up in Guåhan/Guam, I am alarmed by the potential negative environmental consequences of the MITT. For example, Section 3.4.2.1.5 notes that marine mammals would be "…exposed to sounds caused by the firing of weapons, objects in flight, and inert impact of non-explosive munitions on the water's surface… these are impulsive sounds generated in close vicinity to or at the water surface, with the exception of items that are launched underwater." For marine mammals like dolphins and whales, such sounds could severely impact their echolocation and thus navigation & hunting skills that are important for their everyday survival. In addition, in section 3.3.2.1, the EIS states that "...mine warfare training and testing activities utilizing bottom placed detonations would only occur in the existing mine warfare underwater detonation areas at Piti, Agat, and Outer Apra Harbor." It is important to note that these areas are all populated by civilians and that fisherman, tourists, and young locals often visit and swim in the area. Furthermore, in section 3.0.4.2.1.1., the EIS elaborates that "Detonations would typically occur in waters greater than 200 ft. in depth, and greater than 3 NM from shore, with the exception of existing mine warfare areas, including Outer Apra Harbor, Piti, and Agat." Conducting explosive detonations close to the civilian populated areas is clearly alarming, especially since Marine Drive runs near the coastline of these villages. Furthermore, this could impact the surrounding beach	Marine life and marine habitat are important to the Navy. Using the latest science and technology, the Navy completed extensive analyses and computer-based modeling to determine impacts and develop science-based protective measures to reduce or avoid potential impacts on marine life. Potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practicable, procedural and geographic mitigation measures during its training and testing activities to reduce potential impacts on marine life. The Navy's analysis indicates that, with implementation of its protective mitigation measures, there would be no significant impacts on marine species. Mitigation measures associated with the use of sonar and explosives are presented in Section 5.3 (At-Sea Procedural Mitigation to be Implemented) and implemented as appropriate wherever the military trains and tests. Underwater detonation areas are permanently designated safety zones, danger zones, and restricted areas. These areas were designated in accordance with 33 CFR part 165 or 33 CFR part 334. The designation does not expire, and the Navy intends to continue use of the detonation areas to support its mission. The Navy is permitted to conduct underwater detonation activities in accordance with their MMPA and ESA compliance. As discussed above, public notice is provided prior to certain training activities occurring, such as underwater detonations.

	Comment	Navy Response
	tourists visit and waters that fishermen frequent to feed their families. These are only a few examples of the alarming environmental consequences of the MITT. Thus, as a graduate student studying the history of the Marianas and former resident of Guåhan/Guam, I am shocked that such environmental impacts would be approved by the military and do not support the MITT project.	
Ralph Eurich Patacsil (REP)		
REP-01	The proposed action for the MITT would have a number of negative impacts on the local marine habitat and ecosystem. Vessels, in-water strikes, military expended materials, seafloor devices used for military readiness activities, and any and all other traffic/training exercises in the area would disturb substrates and all nearby reef structures. The use of sonar and other transducers are potentially detrimental to marine mammals, notably cetaceans—whales and dolphins, that use echolocation or bio-sonar systems to in their natural functions like communication and feeding. Sonar has been implicated in causing behavioral changes and other biological damage in these mammals, resulting in deaths and mass beaching events. In-water explosions also have the potential to injure or kill prey species that are natural food sources to marine mammals and may overall disturb the general ecological makeup of the zone's marine ecosystem. The MITT may also result in the disturbance of commercial, recreational, and traditional fishing practices when areas of co-use are temporarily inaccessible to ensure public safety during training activities.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Veroni Sablan (VS)		

	Comment	Navy Response
VS-01	Not coming from a place of anger but of hope. I do see the military efforts to gain the trust of the people of Guam. I see the efforts made to try and help our community. I believe if the military wants to make a powerful positive impact in the community for generations to come, putting a halt to any testing on or near our island is necessary. Our children are depending on us now to make the right decisions.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Ryan Smith (RS)		
RS-01	I'm writing this as a former resident of Guam and a proud family member of veterans. I value the military and the lifestyle it has afforded my family and I. With this in mind, the military has an obligation to protect and serve the United States. Part of this responsibility also includes doing so in an honorable way. The expansion of testing and taking over land would cause harm to American citizens by destroying their land and wellbeing. In addition, it is of utmost importance that the environment is kept safe as well. The testing will cause die offs of local species which are essential to the health of the pacific and islands there. Please consider keeping the land and ocean pristine and protected so that Guam and the Marianas islands, along with Micronesia at large, remain healthy places to live. I hope my concerns are taken seriously and that as someone who knows and values the military life I am given gravitas in my comments.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities. The Navy is not proposing any geographic expansion of the training and testing area in this Supplemental EIS/OEIS. Proposed activities are similar to those conducted in the Study Area for decades.

	Comment	Navy Response
Angelica Gagan (AG)		
AG-01	You hurt my home, you hurt me and thousands of Chamorros. Out of all the places in the world, you choose a beautiful island to destroy for your testing purposes? There are hundreds and thousands of miles of nothing land in the United States that you can use to destroy. Show humility and humanity and DO NOT continue with this destructive project.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Michala Connelley (MiC)		
MiC-01	substantive	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Ramona Nelson (RN)		
RN-01	I support the NO Action option in the MITT Study area. The Navy's proposal for the use of additional lands on Guahan for the purpose of military readiness activities is highly insensitive and threatens the quality of life for all living beings that have made the land and waters of Guahan home. Specifically, the proposed areas for these trainings have strong historical and cultural significance to the CHamoru people and the military should consider utilizing the existing lands on Andersen Air Force Base and Naval Station. I oppose the use of additional tests under water as the ocean is a valuable resource and supports the livelihood of many CHamorus which will be threatened through the use of underwater explosions and sonar testing. The endangered Trongkun Haya (Serianthes Nelsonii) tree which my Great Grandfather Peter Nelson identified, is located near these proposed activities and its ability to survive/thrive will be jeopardized if the military pursues its plans.	Protecting marine life and habitat is also important to the Navy. The Navy trains worldwide, not just in the MITT Study Area. Using the latest science and technology, the Navy completed extensive analyses and computer-based modeling to determine impacts and develop science-based protective measures to reduce or avoid potential impacts on marine life. The Navy's acoustic effects model predicts that the vast majority of marine mammals' exposures to acoustic stressors (sonar and explosives) would cause temporary changes in behavior. Potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practicable, procedural and geographic mitigation measures during its training and testing activities to reduce potential impacts on marine life. The Navy's analysis indicates that, with implementation of its protective mitigation measures, there would be no significant impacts on marine species. In addition, Section 3.4.2.1.1.6 (Stranding) has been expanded to include additional information about strandings of beaked whales in the Mariana Islands and the Navy's support of efforts to better understand the causes of marine mammal strandings.

	Comment	Navy Response
	I oppose the exposure of in-water explosions that Marine mammals must endure as there is no way that the preparers of this Environmental Impact Student will be able to accurately state that these explosions will not injure nor effect the marine mammals feeding patterns. Additionally, the proposed sonar testing along with these in-water explosions may result in greater dead whales that will tragically wash up on our shores. As indicated in previous news stories, one Cuvier beaked whale that stranded in Merizo on March 23rd of 2015. Another Cuvier beaked whale stranded on July 26th of 2015 in the village of Agat. An 11-foot, 1,000-pound beaked whale was found on the reef flats off the waters of Agat on Jan. 17, 2019. Lastly, instead of linking a video to watch a clip about the military: Watch an informational video about the importance of Navy training and testing in the Mariana Islands Training and Testing EIS/OEIS Study Area, there should be a clip about the impacts these trainings will have on the environment to include the recent	As explained in the Navy's technical report on marine mammal strandings (*Marine Mammal Strandings Associated with U.S. Navy Sonar Activities*, 2017 [https://mitt-eis.com/]), marine mammal strandings have been a historic and ongoing occurrence attributed to a variety of causes, both natural and anthropogenic. Over the last 50 years, increased awareness and reporting has led to more information about species affected and raised concerns about anthropogenic sources of stranding. While there have been limited numbers of marine mammal mortalities potentially associated with U.S. Navy activities, the root causes are not clear in most cases. NMFS, as the regulator, maintains the authoritative National Stranding Database.
Malcolm Worsham (MaW)		
MaW-01	Returning back to Federal Government Employment, Federal Aviation Administration, (FAA) on the Island of Tinian Divert Airfield Installation in FY 2020....+. PLEASE: Send ALL Information for this Design and Installation to: Malcolm Worsham PO Box 1072 Rancho Cordova, CA. 95741 Malcolm Worsham, Disability Retired FAA Electronic Technician	Information concerning the U.S. Air Force Tinian Divert Infrastructure Improvements can be found at http://pacafdivertmarianaseis.com/.

	Comment	Navy Response
	hm (916) 647-3102 malworsham@aol.com malworsham@gmail.com	
Clare Calvo (ClC)		
ClC-01	Guam has been soil, water, and air location for warfare testing, storage, and practice for years, since WWII. The health of our island and her people have suffered the consequences of that. Neurological disorders, cancer clusters, type 2 Diabetes, are a few among many that have affected our people. From drums in Mong to Big Navy, all the way down to Malesso Bay, back up to Andersen base, everything from agents purple and orange, PCBs, chemical test kits, mustard gas. Investigations have been ongoing and still no results/response in years. Our NCDs disparities are alarming and this needs to stop!!!! Whenever a military personnel is diagnosed with cancer, there have been instances that they were not even counted but instead sent off island. Our numbers are not fully accurate because of this, and because of those undiagnosed. Kindly take this somewhere else.	Potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practicable, procedural and geographic mitigation measures during its training and testing activities to reduce potential impacts on marine life.
Lee Taitano (LT)		
LT-01	FDM is one of our islands that is presently being bombed. May I suggest that you partially clean her up for landing exercises and continue using the other portion for target practice and / bombing. Pagan is a beautiful island with unique fauna and flora. Pagan has been inhabited though sparsely for years. One reason that many were forced to relocate to Saipan was due to misunderstood volcanic activity. Yet some cannot abandon their birthplace, nor the serenity and earth-based life she	Potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practicable, procedural and geographic mitigation measures during its training and testing activities to reduce potential impacts on marine life. The Proposed Action does not include Pagan.

	Comment	Navy Response
	offers. More bombing will not only destroy this Gem that is Pagan, but destroy and pollute the ocean. The Chamorro and Carolinian people are a sea faring people. We depend on the ocean and our islands for our very sustenance. No to bombing Pagan. No.	
Alexis Street (AS)		
AST-01	I pray for my family and friends in close proximity to your testing area, I pray for future generations who, due to this harmful testing will never know the beauty of Guam and the surrounding areas, I pray for the immediate future of our earth which is directly harmed by such massive testing and training protocols that are not kept in check with regard to boundaries, efficacy, and replenishment. I pray for those conducting the training and testing for their immediate safety and for their emotional well-being, as it cannot be easy knowing you are directly responsible for the disruption of the natural habitat of millions of species of God-given life, which have immediate and lasting effects many of which we have yet to experience. My prayer is that the government responsible for these tests and trainings, with its massive reach due to its coffers of financial resources dedicated to death and destruction, more wisely use these resources to truly protect its constituents instead of harming us in the name of protection preparation.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.

	Comment	Navy Response
	1 suggestion is to go buy an island that poses the absolute least opportunity for harm to life to conduct these tests and training sessions. I pray that this comment section is not to patronize yet to empower us to have our voices truly heard and our prayers, suggestions, concerns, and wisdom truly considered prior to making a decision that has implications for the entire world. Amen, and thanks for listening!	
Ignacio Aquiningoc (IA)		
IA-01	I have lived on Tinian all my life and I am worried and concerned of the negative impact that the military will bring to my island and to the northern islands. I am opposed to this project.	Potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practicable, procedural and geographic mitigation measures during its training and testing activities to reduce potential impacts on marine life. Proposed Action does not include the Northern Islands.
Leah Nathan (LN)		
LN-01	Good evening, I am writing to express deep concerns with the proposed military training and testing activities in the Marianas Island region. As a resident of Guam, as well as AD military family member, I believe in the mission of national security through global health, and ever more presently that means a healthy environment for the communities that depend on it as well as the world at large. Specific to this issue, my concerns are:	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.

	Comment	Navy Response
	-Overall short- and long-term devastation to the delicate habitats and lives of plants and wildlife both in the sea and on land, including turtles, sea mammals, plant life, coral, etc. -Extensive and irreparable damage to already at-risk ocean ecosystems. Ones that are essential for local economies as well as the health of the planet. -The well documented risks to marine mammals from the use of sound-producing devices. Additionally, the damage this equipment poses to fish and marine invertebrates. -Damaging waste material (physical and chemical) under water, on land, and in the overall ecosystems of the Marianas. -The strain on already strained resources- energy, water, land. -Greater consumption of fossil fuels, leading to more greenhouse gases with direct connection to the dire implications of climate change that we all, especially as military personnel and families with a direct connection to global security concerns, are facing. I would like to see the military on Guam and in the Marianas use their presence as a force for future-thinking actions that preserve and better the environment. The proposals in question do just the opposite. Thank you.	
Luis DeleonGuerrero (LD)		
LD-01	I understand the need for DOD to train and the need for training areas, I feel that in order to train in our areas DOD need to take special consideration the need to preserve the	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.

	Comment	Navy Response
	marine and land animals and fish. I have seen how DOD moves troops and equipment from place to place and even with all the measures in place to keep unwanted plants or animals out some still get introduced inadvertently. Should the United States DOD take these islands away for testing and training it should consider all the changes its presence and actions do to the environment and correct them should correction not be possible then compensation for the losses need to be made to the CNMI or the people of the CNMI. The DOD knows that measures in place now are inadequate to keep all nonnative plants, animals, and pollutants off these islands.	
Chloe Tyznik (CT)		
CT-01	Hello! While I appreciate that the military needs to expand, I am strongly opposed to the proposed expansion in Guam. This is a delicate ecosystem that does not need to be ravaged anymore. You will be destroying history and people's ways of life. Thank you for your time.	The Navy is not proposing any geographic expansion of the training and testing area in this Supplemental EIS/OEIS. Proposed activities are similar to those conducted in the Study Area for decades. Potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practicable, procedural and geographic mitigation measures during its training and testing activities to reduce potential impacts on marine life.
Elma Tenorio (ET)		
ET-01	Stop all training/bombing on the Northern Marianas Islands.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities. The Proposed Action does not include the Northern Islands.

	Comment	Navy Response
Tyler Yu (TY)		
TY-01	I am against military buildup in the CNMI. This will have devastating and lasting negative effect on those targeted islands for generations especially on Pagan Island. When you take a natural habitat and disrupt them in anyway, you are altering the ecosystem one way or the other especially in a large scale like the military have planned. I have no confidence that US DOD will follow through with their promise even with their environmental impact study. The study can be skewed to the benefit of the US DOD. EPA and all the US government will always act on the benefit of the US before any people. I've seen this many time living in the US. They should consider hiring a third-party environmental activist to be a part of the study. We need to learn from Guam military buildup, Bikini atoll, and even Diego Garcia. Once US DOD takes a hold, there's no way to go back. The most they'll do is compensate what they have destroyed. Money comes and goes. They need to take responsibility of their actions. As an example, they have yet to properly dispose of radioactive material that's buried in a dome in one of the atolls in Marshall island. Guam's people had their land taken away as well as the natives that's been barred from Diego Garcia. Why would this be any different. They need to first fix those underlying issues before the study can be trusted.	The Proposed Action does not include the military buildup in the CNMI, including Pagan. Training and testing activities are proposed to occur at sea and on FDM. Tables 2.5-1 and 2.5-2 in Chapter 2 (Description of Proposed Action and Alternatives) in this Supplemental EIS/OEIS present current and proposed training and testing activities. Potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practicable, procedural and geographic mitigation measures during its training and testing activities to reduce potential impacts on marine life.
Luciano Rangamar (LR)		
LR-01	I am in full support of our military readiness and might, with that I would like to make a suggestion and somewhat demand. Instead of Tinian and Pagan, why not Anatahan? Why? Well for one, containment - FDM or Farrallon de Medinilla is and continue to be a training ground, so why not	Training and testing activities are proposed to occur at sea and on FDM. Tables 2.5-1 and 2.5-2 in Chapter 2 (Description of Proposed Action and Alternatives) in this Supplemental EIS/OEIS present current and proposed training and testing activities. The Proposed Action does not include Pagan.

	Comment	Navy Response
	include Anatahan for a time being. Another thing as a former resident the terrain could use a little earth moving tools.	
Guillermo Borja (GB)		
GB-01	Tinian is a very tiny Island.However,2/3rd of our island falls under the Dept of Defense and that our community has little resources on the remaining 1/3rd. Fishing and Farming will be limited as most of the best fishing and farmland are on the military leaseback. Peace and tranquility will be denied to our people because of the size of our island. (Noise Pollution). I truly understand the needs to trained our military in order to protect our nation. But, can this be done somewhere else? Now, Pagan residence are trying to move back to their island to resettle after the volcanic eruptions of Mt Pagan in the 80s.They too will be experiencing the same as Tinian. We had some experience during the Vietnam Era when they were bombing Aguiguan Island back in the 70s.We dont want to experience it once again. People cannot go to sleep until all the trainings are done. I am therefore against a major training to be conducted on Tinian and against the use of Pagan for military purposes. Thank You!	Training and testing activities are proposed to occur at sea and on FDM. Tables 2.5-1 and 2.5-2 in Chapter 2 (Description of Proposed Action and Alternatives) in this Supplemental EIS/OEIS present current and proposed training and testing activities. The Proposed Action does not include Pagan.
Joel Omar (JoO)		
JoO-01	I fully support the military build up. However, RESPONSIBLE use of the island is a MUST, lest we forget history, not to create another military wastes, and misuses. PCB and agent orange, and other hazardous waste were left behind, not properly dispose of after WW2 in all the islands.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Sheila Babauta (SB)		
SB-01	Dear evaluators, The comments and questions below are in response to the cumulative impact of the MITT.	As described in Section 2.3.3 (Standard Operating Procedures) of this Supplemental EIS/OEIS, the Navy implements, to the maximum extent possible, standard operating procedures to avoid or reduce potential impacts from the Proposed Action. Mitigation measures detailed in Chapter 5 (Mitigation) and Appendix I (Geographic Mitigation Assessment) are also implemented whenever

	Comment	Navy Response
	1. What measures are in place to prevent destruction to historic sites? 2. What mitigation efforts are offered for damages not anticipated? 3. What other alternative sites are available for military training worldwide?	and wherever applicable training or testing activities take place within the Study Area. Section 3.11 (Cultural Resources) analyzes the effects of the Proposed Action on cultural resources and the measures in place to protect known resources.
concerned citizen Torres (CCT)		
CCT-01	I strongly oppose the U.S. military industrial complex and it's proposal of eminent domain to bomb and destroy our beautiful islands for "military exercises". I especially am concerned with they types of weapons used such as depleted uranium bullets, hazardous bombs, and nuclear weapons. We are a people of peace. The U.S. is currently waging wars and invading sovereign countries in the pursuit of oil, power, and monopolization of the fiat money system. 25 cents of every tax dollar goes to fund the military industrial complex and its weapons of mass destruction. I would prefer to use that money to fund our schools pave our roads, protect our reefs, feed the hungry, and provide a social security net for the people of the world. In a time when the earth is facing climate change, where corporate interests TRUMP the environment, at a time when we need to work together as ONE human race; the last thing we need or want is the U.S. military industrial complex polluting our air, bombing our lands, coral reefs, marine life, and water with wasteful bombs, polluting vehicles, and weapons of mass destruction.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.

	Comment	Navy Response
	Take your nuclear bombs, your radiation bullets, and war machines away from here and leave my islands alone. When you are ready to fight climate change, and respect all people of the world enough not to invade their countries or bomb their lands, come back to Saipan and enjoy our BBQ. Satoshi Nakamotor	
Art Sondheim (AS)		
ASO-01	Brad Ruszala, who earned a Southwest Asia Service Ribbon with two bronze service stars, told Bush that "if my voice counts for anything, I would like to add it to the chorus of voices calling for the creation of a Marianas Trench Marine National Monument." Ruszala adds, "I may not have been born here, but this is my adopted home and I have no plans of ever leaving." Mr. Ruszala you are a huge hypocrite in claiming to try to preserve the Northern Mariana Islands. Leave your ass-kissing high dollar consultant for death and destruction. Money talks and your letter doesn't walk the talk. You are a fraud. Perhaps that is why you couldn't keep your jobs at other places on island. The Navy has ruined Vieques, Kahoolawe, and the islanders there chased you out from bombing their land. Bomb the parks of your hometowns before you destroy another island in the Pacific. Most of the bombing at FDM has been vain glorious.	Training and testing activities are proposed to occur at sea and on FDM. Tables 2.5-1 and 2.5-2 in Chapter 2 (Description of Proposed Action and Alternatives) in this Supplemental EIS/OEIS present current and proposed training and testing activities. The Proposed Action does not include Pagan.

	Comment	Navy Response
	BOMB YOUR OWN HOMETOWNS FIRST! You can start with Brad Ruszala's hometown in New York State. No to bombing Pagan! If you think it is such a wonderful idea to bomb in the 50 states!	
Barbara San Nicolas Benavente (BSNB)		
BSNB-01	The Proposed Actions described in the Mariana Islands Training and Testing EIS/OEIS (to conduct at-sea training and testing activities within the Study Area, to include the use of active sound navigation and ranging (sonar) and explosives) is a major concern to me (Barbara San Nicolas Benavente), my husband (Peter Castro Benavente) and other family members who have established permanent residency in Guam and call Guam, the Marianas, and the Micronesian Region, home. It is stated that the U.S. military must train personnel and test new technologies to defend the United States, its territories, and its interests. The inherent rights and interests of the indigenous CHamoru people and all others who choose to live in Guam and the Marianas (as past generations of our people have), are not described adequately. There lacks true representation and protection of the indigenous people's interests (land, water, environment, cultural practices and traditions) in the Proposed Actions in this MITT/EIS/OEIS. The MITT EIS/OEIS states that military personnel shares the ocean and coastal areas with the community, recognizes the importance of public access, and strives to be a good neighbor by minimizing access restrictions and limiting the extent and duration of closures of public areas whenever possible while ensuring safety at all times. On the contrary - the current occupation of CHamoru lands by the U.S. military in fact limits public access and enjoyment	The Navy is not proposing any geographic expansion of the training and testing area in this Supplemental EIS/OEIS. Proposed activities are similar to those conducted in the Study Area for decades. Training and testing activities are proposed to occur at sea and on FDM. Tables 2.5-1 and 2.5-2 in Chapter 2 (Description of Proposed Action and Alternatives) in this Supplemental EIS/OEIS present current and proposed training and testing activities.

	Comment	Navy Response
	of Guam's beaches by Guam families who are not affiliated with the military; limits access to traditional fishing areas and experiences that are passed on from one generation to the next; and limits access to harvesting of medicinal plants needed by traditional healers/practitioners, for example. With the proposed land and ocean surface danger zones relative to the establishment and/or expansion of live-fire training ranges, subsistence fishing will be severely interrupted. My husband (who has been fishing Guam's waters for over 50 years) and other traditional fishermen will face serious challenges and limitations set by the US Military for continuing to access traditional fishing spots that span from Tanguisson, through Haputo, Litekyan and Padi Point. Our children and grandchildren will lose opportunities for learning and applying traditional fishing methods as taught by our elders. Scheduled at-sea training and testing activities may result in "temporarily restricted areas" as stated, but threats to ocean life and destruction to their habitat will more than likely be permanent. Moreover, local fishermen and the rest of the public, must have year-round access to fishing Guam's waters and not just during periods of time when the military otherwise decides. The Proposed Actions described in the Mariana Islands Training and Testing EIS/OEIS doesn't provide convincing evidence/data that no harm will result and that there will not be a significant, negative impact on marine mammals and sea turtles from underwater sound and explosives associated with training and testing. Guam and the rest of the Mariana Islands and surrounding ocean and natural resources support the lives, livelihood,	

	Comment	Navy Response
	cultural identity and values of the Pacific peoples. The US Military proclaims to be an environmental steward and yet proposes continued negative action and impacts as a result of naval activities on the marine environment, land and air spaces in our Homelands.	
Anthony Reyesfirt (AR)		
AR-01	First of all, thank you very much for your service...my concerns are the live fire trainings., using high explosive ammunition's containing highly toxic carcinogen TNT. That will or already have contaminated our water system, wildlife and ecosystems..., improper management and disposal practices of countless ammunition's, that are scattered around fruitful hunting and fishing grounds. CNMI is small beautiful and one of a kind for all to enjoy it's beauty. My home is your home. Thank you again for your services.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Isa Arriola (IA)		
IA-01	Pls. see attachment.	The health of coastal communities, fisheries, and ecosystems is important to the Navy. Section 3.1 (Sediments and Water Quality) concludes that chemical, physical, and biological changes to sediment or water quality would be measurable but below applicable standards, regulations, and guidelines, and would be within the existing conditions or designated uses. The Navy will comply with all applicable laws and regulations. The military is committed to protecting the environment during the conduct of its military training and testing activities. A comprehensive analysis of potential effects on environmental resources from Navy training and testing activities is presented in Chapter 3 of this Supplemental EIS/OEIS. These resources include sediments and water quality, marine habitats, marine mammals, fishes, sea turtles, marine birds, and marine invertebrates. While some impacts would occur from training and testing activities, the analysis concludes that impacts

	Comment	Navy Response
		would be minimal and would not have a significant impact on the environment. Also, as described in Section 2.3.3 (Standard Operating Procedures) and Chapter 5 (Mitigation) of this Supplemental EIS/OEIS, the Navy implements, to the maximum extent possible, mitigation measures during its training and testing activities. The Navy provided the public 75 days to review and comment on the Draft Supplemental EIS/OEIS, 30 days longer than the minimum recommended time for review of Navy documents. The Navy is required to complete independent statutory obligations under both NEPA and NHPA. Thus, the Navy has prepared this Supplemental EIS/OEIS and is pursuing continued compliance with the NHPA using the Section 106 process. The Navy recognizes that training activities would result in exposures of stressors to marine birds discussed in this Supplemental EIS/OEIS. The Navy's analysis assumes that marine birds could suffer injury or mortality; however, for the reasons outlined in Section 4.4.6 (Marine Birds), the cumulative impacts would be low. This Supplemental EIS/OEIS (see Section 3.6, Marine Birds) includes a statistical analysis of 17 years of monthly and quarterly bird counts of the three booby species that nest on FDM. The results of this analysis were also included in Section 3.6.2.6 (Rookery Locations and Breeding Activities within the Mariana Islands Training and Testing Study Area) of the 2015 Final EIS/OEIS. In the previous NEPA document, this statistical analysis was not yet published. In the Navy's 2019 Supplemental, the same information is included in the analysis, but now cites the published article (see: Camp, R., C. Leopold, K. Brinck, and F. Juola. (2016). Farallon de Medinilla seabird and Tinian moorhen analyses. Hilo, HI: Hawaii Cooperative Studies Unit University of Hawaii at Hilo). It should be noted that the three booby species are easily seen (and therefore counted) reducing uncertainty in the survey effort. The results of the statistical analysis do not show any significant changes in population trends for the three booby species included in the analysis. The conclusions for increased numbers of activities on

	Comment	Navy Response
		FDM as not adversely impacting seabird populations is sound, as no new bombing areas would be used. In other words, the same restrictions listed and described in COMNAVMARINST 3500.4A would be carried forward under all alternatives.
Raymond Anthony Kapileo (RAK)		
RAK-01	I am born on Saipan, April 25th, 1972. Second to the youngest of 11 Children. My mother is born on Pagan Island on January 27, 1941. I've visited the island back when I was 10 years old. The floras and faunas of the islands and the resources from the sea, need to be protected and be used for the good of our people. The Floras of the island consist of many herbal plants that we the people can benefit from. Herbal plants for children that are teething is wild and rampant on Pagan. For skin rashes and many other sickness, Herbal plants are to be protected and make good use of for the people by the people with the people of the Marianas. The Faunas are rampantly growing in numbers and they are good for food for the people as well. We can benefit from these wild animals growing on Pagan. We do have endangered species growing on Pagan so let's be mindful of these animals too. One example is the Nightingale wreed wrabbler and the sea green turtles, and many more... Not only that, we have the Ocean that also provide food for the table, and many other resources that we can find in the sea. Both the land and sea provides a wealth of resources that our people can utilize to live a happy life on Pagan. If Military are creating some kind of underwater Sonar weapon then I DO NOT AGREE to a Military buildup on Pagan.	Training and testing activities are proposed to occur at sea and on FDM. Tables 2.5-1 and 2.5-2 in Chapter 2 (Description of Proposed Action and Alternatives) in this Supplemental EIS/OEIS present current and proposed training and testing activities. The Proposed Action does not include Pagan.

	Comment	Navy Response
	I do not agree for any military buildup on Pagan Island. Whatever the Military will be building on Pagan, they should also be building infrastructures like hospitals/dispensaries, schools, the roads, fix the water pipes for homes and commercial uses, and what the people would need for daily living on the island. The military and the people of the island can live and share the island together.	
Bernard Guerrero (BG)		
BG-01	Yes, I do support the US military operation and training for the military soldiers in Tinian, Saipan and Pagan Northern Islands.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Zachary Heston (ZH)		
ZH-01	I am a CHamoru/Chamorro/Chamoru. I am indigenous to the Marianas, my dad from Guåhan (Guam) and my mom from Saipan (C.N.M.I). I am not for the live fire ranges and bomb testing in the northern parts of the Marianas because simply put it is my home. I, along with many others favor against this because we want out next generations to have access to a part of their home, history, and culture. Rising seas are already taking my land, and a firing range/bomb testing or whatever it may be is not necessary. My islands are small and close to one another, so anything in one island can affect the next. I have no solution for this issue because I view this as an unnecessary thing to commence. My advice is to listen to the indigenous of the Marianas, they choose not to have the lands we call home used for war, rising seas takes our land each passing day. At the very least, let us have our land because we are a people who has a history of unnecessary bloodshed unto our people, and we aren't even taught to the	The Proposed Action does not include the establishment of new training areas. The training and testing under the Proposed Action is similar to the activities the Navy has been conducting in the Study Area for decades.

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	rest of the citizens of America, even though our islands play an important role for its strategic location, and even though us CHamoru of the Marianas enlist in the military more than any other state, mostly to make a living to support our families.	
Alphonso Yangirelit (AY)		
AY-01	The reason for me to signed up to this site is to give some of my findings while staying here in this beautiful Marianas over 29 years. A. Affects of BOMBING during WWII and . 1. FISH - They are contaminated by ordinances used during WWII up till now. Fact: People get sick and even died when they eat the fish caught by fishermen 2. BIRDS - The birds that used to be here in the islands are gone. Only few left. 3. FDM - This island was so beautiful before WWII took place. Now devastated by bombs done by the Military during WWII and even now when the Military continues their training. 4. Farming - Farming is out of question These are the facts that I see that really happen after the war and now. I would recommend that the Military exercise should be done out in the open waters far from the lands in the Marianas. Our new generations will need to have good	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.

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	environment and good lives to live happily in their life time. Thank you very much for allowing me to join this group. Looking at these three areas	
Segundo Castro (SC)		
SC-01	I am saddened to hear on the radio wave the negative impact of what the U.S. Military proposal for our island chain. For many weeks, we were bombarded with statement against the military and it is a form of feeding false information to the general public. There are many of us that supports what the U.S. Department of Defense is trying to accomplish throughout our island chain. The silent majority of our residents supports such massive influx of military training on our region. It is going to be one of the plus side for our people to realize the economic benefits for the massive. Also, the potential influx of economic growth within our community out way the concern of some of the few radical views towards the military. It will be a mistake for the United States Department of Defense to be influence on its decision by the nationalist individuals who will like to turn the CNMI into an independent island nation. It is been known that certain individuals are or were being critical against the formation of the Political Union between the United States and the CNMI from the beginning. This nationalist individuals had poison the perception of few of our younger generation and we apologized for the actions or unwarranted opinions from our brain wash teenagers during your public hearings on Tinian in the past. I owned massive properties on Tinian and Saipan, I don't see any impact to my livelihood of what the military is	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.

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	trying to do on our island. Matter of fact, my family welcome DOD's endeavors or proposal on our dearest island of Tinian. Si Yu'us Ma'ase.	
Margaret Aguilar (MA)		
MA-01	The Summary of the Draft SEIS/OEIS findings on page 8 of the MITT project information dated March 2019, states that the Cumulative Impacts: Combined impacts of past, present, and other future actions would continue to have "significant impacts" on socioeconomics, invertebrates, some individual marine mammals, and all sea turtle species in the Study Area. Where can I read more about these impacts and review the data resulting in this finding for clarification? Thank you.	Chapter 2 (Description of Proposed Action and Alternatives) of this Supplemental EIS/OEIS presents the current and proposed training and testing activities. Volumes 1 and 2, which contain discussions of potential impacts, can be found at https://mitt-eis.com/Documents/2019-Mariana-Islands-Training-and-Testing-Supplement-EIS-OEIS-Documents/Draft-Supplemental-EIS-OEIS.
Michael Hall (MH)		
MH-01	I am strongly AGAINST any development of Pagan for military purposes!! It is a beautiful and pristine island, and we should keep it that way. I really do not think it will help military might around the world by adding this to their training grounds, of which the military has enough! I am still pursuing the idea of a surf and adventure resort on Pagan. Even without that, the wildlife need peace and quiet. Why destroy even more of this planet???? Tinian is better to do your training. Military already has a lease.	Training and testing activities are proposed to occur at sea and on FDM. Tables 2.5-1 and 2.5-2 in Chapter 2 (Description of Proposed Action and Alternatives) in this Supplemental EIS/OEIS present current and proposed training and testing activities. The Proposed Action does not include Pagan.

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Kisha Borja-Quichocho-Calvo (KBQC)		
KBQC-01	As a CHamoru daughter of Guåhan, I must first acknowledge that as a taotao tåno '(person of the land) and taotao tåsi (person of the ocean), all US military activities must be halted in the Mariana Islands. This includes current activities in and around the islands as well as proposed activities with the military buildup (e.g., the realignment of marines from Okinawa to Guåhan and the use of Pågan and Tinian for live-fire training and/or amphibious training areas) and the Mariana Islands Training and Testing (MITT) study area. The US military occupation of the Marianas has caused much destruction on our environment as well as irreversible health impacts on our communities. Moreover, the US military has continued to show blatant disregard for and disrespect of the Indigenous people, islands, and culture of the Marianas. Regarding the MITT more specifically, the EIS/OEIS states that "[t]raining and testing activities, collectively referred to as 'military readiness activities,' […] prepare the Navy to fulfill its mission to protect and defend the United States and its allies, [and] have the potential to impact the environment" (1-1). The acknowledgement by the navy that the MITT activities may impact the environment is cautionary warning of what could happen to our environment (and even further, our health) if we do not address the problems with activities, such as active sonar training/testing and the use of missiles, torpedoes, and large ocean vessels. And if MITT activities harm the environment, they will consequently harm our marine mammal species, sea turtles, and marine invertebrates. Thus, such activities should not be pursued and executed in and around the Mariana Islands. Our marine life and our healthy ocean environment are vital to our survival as the Indigenous people of the Marianas. Harming either	Marine life is also important to the Navy. The analysis and the science show that there would be no significant impacts on marine species. Potential effects from military training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of the EIS/OEIS. Also, as described in Chapter 5 (Mitigation) of the EIS/OEIS, the Navy implements mitigation measures with the aim of achieving the least practicable adverse impacts on marine mammal species or stocks, to the maximum extent practicable, during its training and testing activities. Please see Section 3.4 (Marine Mammals) regarding an analysis of impacts on marine mammals. The U.S. Navy has conducted active sonar training and testing activities for decades in the sea space depicted in the Study Area with no indications of long-term consequences to marine mammals. The Navy's assessment of potential impacts reflects using the best available and applicable science determined in consultation with NMFS. This includes analysis of the cumulative impacts, mid- and high-frequency active sonar, underwater detonations, and activities within the Marianas Trench National Marine Monument. The training activities within the MITT are not expected to have significant effects on those resources designated for special protection under the Mariana's Trench Marine National Monument designation. Furthermore, the Presidential Proclamation included that the prohibitions included in the Proclamation shall not apply to the activities and exercises of the Armed Forces. The mitigation measures followed during military activities and exercises within the Monument ensure that the activities are consistent so far as is reasonable and practicable with the Proclamation. The military is committed to protecting the terrestrial and marine environment during the conduct of its training and testing activities, which includes civilians. Section 3.13 (Public Health and Safety) includes details regarding Safety and Inspection Procedures for aviation, submarine navigation, surface vessel navigational, sonar, electromagnetic, laser, high-explosive ordnance, and weapons firing and ordnance expenditure safety. Section 3.13 (Public Health and Safety) evaluates how and to what degree the activities described in Chapter 2

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	would harm us as the people of this ocean. Further, in several parts of the EIS/OEIS, the document emphasizes that the MITT activities will cause little to no harm on marine life or on the marine environment and, if there are impacts, they will be temporary and short-term. It must be noted that any impacts to our marine life and our ocean environment may easily be passed off as temporary or short-term by people who are not from our communities and are only in the islands temporarily. Overgeneralizations such as these must be avoided when working with Indigenous communities such as ours where any impact is damaging, regardless of how temporary or short-term. It is also premature of the military to assume that impacts would not be more permanent or long-term if adequate studies have not been done for the proposed MITT activities in the MITT study area. Additionally, throughout the EIS/OEIS, it is evident that there is some sort of collaboration between the US navy and federal agencies (e.g., the NMFS) in order to exempt the navy from certain measures put in place to protect our environment and our local flora and fauna. This does not keep the military accountable for its actions but instead simply allows the military to engage in whatever activities it wants, at whatever costs. This is completely unacceptable. Another issue with the MITT EIS/OEIS is the focus on the safety and protection of the United States but rarely any mention of the safety and protection of the US territory of Guåhan and the Commonwealth of the Northern Mariana Islands. The EIS/OEIS states: "The U.S. Navy carries out training and testing activities to be able to protect the United States against its potential adversaries, to protect and defend the rights and interests of the United States and its allies to	(Description of Proposed Action and Alternatives) could impact public health and safety. In the section, public health and safety stressors are analyzed. Additional information regarding the Navy's standard operating procedures is provided in Section 2.3.3 (Standard Operating Procedures) and Chapter 5 (Mitigation). The Navy provided the public 75 days to review and comment on the Draft Supplemental EIS/OEIS, 30 days longer than the minimum recommended time for review of NEPA documents.

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	move freely on the oceans, and to provide humanitarian assistance" (1-2). What about the safety and protection of the Mariana Islands and the people who call these islands home? The MITT EIS/OEIS must explain how the MITT activities will actually benefit the people of the Marianas because these islands and the waters surrounding them are our home. The military is merely a visitor in our home and should therefore act respectfully and accordingly. Finally, there are other requests that I demand the US navy address. One is the need for public hearings throughout the Mariana Islands, where island residents can deliver oral testimonies and voice our concerns (as opposed to the "public meetings"). Another community need is more time to review the MITT EIS/OEIS. We were given only two and a half months to review over 1,400 pages and then submit comments on them. This was an unfair process for our communities. Last, we need more alternatives other than No Action Alternative, Alternative 1, and Alternative 2. For example, an alternative must be included where no military activities will take place in the designated MITT study area. The EIS/OEIS claims, "The military is committed to being a good steward of the environment." It also claims that the military is constantly working with communities in the Mariana Islands to be environmentally friendly and sustainable. But I question: How are bombs and sonar testing examples of the military "being a good steward of the environment"? How are bombs and sonar testing examples of being environmentally friendly and sustainable? None of the proposed activities in the EIS/OEIS are good for the environment, nor are they sustainable. The US military must rethink its role in the Mariana Islands and the detrimental	

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	destruction it has caused and continues to cause the people, environment, flora, and fauna of the islands. They must be held accountable for their past and present actions and must stop executing activities that go against the will of the people of the Marianas.	
Guinaiya Guåhan (GG)		
GG-01	I oppose any training and testing in the Mariåna Islands, this proposal is unnecessary and also proposes to add continued dependency on US for aid while diminishing resources of the Mariånas which we have relied on for centuries. I firmly oppose any continued contamination and bomb detonations, sonar and all Military war training and games on our islands and within surrounding waters. The US militarization of the Mariåna Islands have proven to have very destructive results on our environment and natural resources. We know about the long lasting affects of militarization, testing and training on places like the Marshall Islands, Pōhakuloa, Culebra, Vieques In Puerto Rico, Kaho'olawe in Hawaii, Amchitka in the Aleutian Islands in Alaska, the list goes on and on unfortunately and we the people of these Islands do not want to partake in the continued destruction of our homes by supporting war games and contamination. The US military is known as the largest contributor to Climate change and world pollution I do not support these ways. Show us a change and begin by cleaning up your mess of fallen bombs, arms, munitions, war planes ect from our waters and land.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Bill Babauta (BB)		
BB-01	No to any future training sites within the Marianas that in any way cause harm or change to its natural environment. We are a small group of islands and indigenous people that don't stand to gain or benefit in even the smallest from the	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.

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	presence of intense military training, whether that be live fire or increased number of military occupation.	
Sandy Weaver (SW)		
SW-01	My worries and concerns for any military testing on and around our Islands are the destruction and contamination of the land, ocean and environment that will affect not only us but the marine life as well. We just don't need more contamination.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Teresa Laguaña (TL)		
TL-01	" We have not inherited this earth from our parents to do with it what we will. We have borrowed it from our children and we must be careful to use it in their interests as well as our own." I used this specific quote because it is necessary. The land of the Chamoru people is not for you to destroy with your military training for war. The land, THIS LAND, It is not yours to take and do with what you will. It never was. No more. Our island is and always will be sacred to the Chamoru people. We will not stop fighting for what is right.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Sylvia Frain (SF)		
SF-01	Training and testing activities have the potential to temporarily limit access to areas of the ocean, which has the potential to impact commercial transportation and shipping, commercial recreation and fishing, traditional fishing practices, and tourism in the Study Area. Supplemental MITT, pg. 3.12-16 According to the Navy's MITT Fact Sheet, the active sonar testing they conduct in the ocean around the Marianas has no real effect on marine mammals… However, this	The Navy is not proposing any geographic expansion of the training and testing area in this Supplemental EIS/OEIS. Proposed activities are similar to those conducted in the Study Area for decades. Marine life and marine habitat are important to the Navy. Using the latest science and technology, the Navy completed extensive analyses and computer-based modeling to determine impacts and develop science-based protective measures to reduce or avoid potential impacts on marine life. Potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected

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	contradicts studies conducted by both marine scientists and the Navy itself. In a previous environmental impact statement or EIS draft, the Navy admitted that the sonar exercises planned for 2014-2018 may unintentionally "harm marine mammals 2.8 million times over five years." Included in this estimate are two million incidents of "temporary hearing loss," and two thousand incidents of permanent hearing loss. "The expansions proposed in the Supplemental Impact Statement for the MITT would increase the annual rate of naval surface fire explosive rounds fired on FDM from 1,000 to 2,800 (alternative 1) or 4,200 (alternative 2). Medium-caliber gunnery increases by 700 to 94,650 rounds plus 17,500 explosive rounds. The current rate of 2,000 explosive rockets is maintained, while explosive missiles increase from 85 to 115. Explosive grenade/mortar attacks increase from 600 to 2,000 per year and small-caliber rounds from 18,000 to 30,000." Left out of the Supplemental EIS for the MITT is the full disclosure of the cumulative impacts associated with the massive live-fire range in and around the Marianas, of which the MITT is just one component…[A]ccording to a 2010 published research paper "Emerging Challenges of Managing Island Invasive Species: Potential Invasive Species Unintentionally Spread from Military Restructuring," pathways for invasive species opened by the massive live-fire range and the Marines Relocation to Guam activities are highly likely to bring numerous invasive species to the region and beyond, to Hawai'i and the U.S. mainland." A JOINT RESOLUTION "Relative to expressing opposition to any US military plans which threaten to degrade the natural environment, human health, indigenous culture, economic development and	Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practicable, procedural and geographic mitigation measures during its training and testing activities to reduce potential impacts on marine life. The Navy's analysis indicates that, with implementation of its protective mitigation measures, there would be no significant impacts on marine species. In accordance with CEQ guidance, the cumulative impacts analysis focused on impacts that are truly meaningful. This was accomplished by reviewing the direct and indirect impacts that would occur on each resource under each of the alternatives. Key factors considered were the current status and sensitivity of the resource and the intensity, duration, and spatial extent of the impacts of each potential stressor. In general, long-term and widespread impacts were considered more likely to contribute to cumulative impacts than short-term and localized impacts. Those impacts on a resource that were considered to be negligible were not considered further in the analysis. The level of analysis for each resource was commensurate with the intensity of the impacts identified in Chapter 3 (Affected Environment and Environmental Consequences). Please refer to Section 4.1 (Principles of Cumulative Impacts Analysis) for a discussion of the approach to analysis for cumulative effects. Table 4.2-1 lists the other actions and other environmental considerations identified for the cumulative impact analysis. This includes non-Navy actions, which result in greater effects on marine resources than those the Navy is proposing. The U.S. Navy recognizes the importance of biosecurity, ecological integrity, and resiliency of island ecosystems to the potential introduction of invasive species to the Mariana Islands associated with military training and testing. The Navy has a number of policies in place to prevent, interdict, and control invasive species introductions in both terrestrial and marine environments. Specific policies for marine invasive species can be found at OPNAV M-5090.1 Chapter 35-3.19. (Ship and Ballast Water), M-5090.1 Chapter 35-3.1 (Environmentally Sound Ships), and M-5090.1 Chapter 12-3.9 (Invasive Species). For potentially invasive terrestrial species, the Navy has in place a number of policies and procedures to reduce or remove species from potential introduction pathways. These measures include

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	political empowerment of the people of the CNMI and Guam." WHEREAS, the people of the Mariana Islands have been confronted by ever-expanding and compounding plans presented by the US military — including the Marine Relocation to Guam, the Mariana Islands Range Complex (MIRC), the Mariana Islands Training and Testing (MITT) Study Area, the Divert Activities and Exercises, and the CNMI Joint Military Training (CJMT) — all of which are interconnected projects that involve the irreparable damage of the land, sea, air, and biological systems of the Marianas archipelago; WHEREAS, military activities conducted in the Marianas threaten to harm the local population by increasing the likelihood of illnesses caused by exposure to contaminants and civilian injuries and deaths caused by botched military training exercises (both of which occurred during military training range exercises on the Puerto Rican island of Vieques), and therefore degradation of the land, water and air by any pollutants, including all physical, chemical and biologic agents should not be allowed; WHEREAS, military training and testing in the Marianas also poses a dire threat to our sustainable economic development by jeopardizing the health of the local workforce and degrading the natural beauty of the Marianas (including the many historic sites and structures around the islands and in the surrounding seas) which constitutes an essential element attracting tourists to our islands, WHEREAS, the degradation of the natural environment, human health and local economy of the Marianas threatens to trigger a mass emigration from our homeland, thus constituting an existential threat to our sense of cultural identity;	coordination with USDA APHIS for inspection procedures for incoming cargo, equipment, and personnel from foreign locations. In conclusion, the Navy maintains that introduction of invasive species associated with military training and testing activities is low. It should be noted that the Navy or other military services does not have jurisdiction of other potential pathways for introduction (e.g., commercial activities, U.S. mail, non-DoD personnel).

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	WHEREAS, following the above line of logic, it can be concluded that any damage to the natural environment of the Marianas archipelago constitutes violence enacted upon the indigenous Chamorro and Refaluwasch (Carolinian) peoples and the degradation of their cultures — for the natural environment, the indigenous peoples who dwell upon and protect the natural environment, and the cultures of those peoples constitute one indivisible whole; WHEREAS, in resisting this violence, we stand in solidarity with all islander and indigenous peoples fighting against the needless destruction of their physical persons, homelands, and cultures by the US military; NOW, THEREFORE, BE IT RESOLVED, that the CNMI and Guam Legislature, acting in the best interests of the people of the CNMI, Guam, and indigenous and islander peoples across the globe, pledge to vigorously oppose any US military plans which threaten to degrade the natural environment, human health, indigenous culture, economic development and political empowerment of the people of the CNMI and Guam.	
Anne Simonis (AS)		
ASIM-01	We, the signatories of this letter, are a group of researchers who have been studying marine mammals in the Mariana Islands, and we believe that the results of our ongoing investigation should be considered during the review of the 2019 draft EIS for the Mariana Islands Range Complex. A draft manuscript of our findings is included with this letter, which will soon be submitted for publication. The manuscript has not yet undergone a formal peer-review; however, we have sought comments from multiple external reviewers, and we do not anticipate major revisions before it is published. Below we outline our concerns about the 2019 draft EIS and offer recommendations to reduce harm and improve the understanding of how beaked whales respond to active	The issue of Navy only sonar exclusively causing mortality to beaked whale is complex for a species known to be susceptible to behavioral reactions to any anthropogenic sound including commercial shipping transits. Factoring in natural causes of mortality (e.g., disease, predation, foraging success) determining direct causal relationships is complex for any species of marine mammals, especially beaked whales. The Draft Supplemental EIS/OEIS qualitatively and quantitatively summarized potential effects to all marine mammal species, including beaked whales, within the MITT Study Area. Criteria development, modeling improvements for assessing acoustic and explosive impacts, refinements to the science used for the impact assessment framework, and Navy funded monitoring in the Marianas Islands have been advancing for over 10 years in consultation with the National Marine Fisheries Service (NMFS).

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	sonar. Concerns: 1.The 2019 draft EIS does not reflect the actual likelihood of injury and death for beaked whales within the Mariana Islands Range Complex. The examination of marine mammal stranding events in the study area did not acknowledge the association of beaked whale stranding events on Guam and Saipan with naval activity and mid-frequency active sonar. The stranding rates for beaked whales in Guam and the Mariana Islands has increased since 2007, and there is a strong association between beaked whale strandings and naval activities that utilize mid-frequency active sonar. Between June 2006 and January 2019, we document four of eight beaked whale stranding events occurring during, or within 6 days after naval activities. The probability that these events randomly occurred within this window of naval activities is extremely low (~0.03%). Guam and the Mariana Islands can be added to a global list of locations, including the Bahamas, Canary Islands, and the Mediterranean, where sonar-associated beaked whale strandings have been well documented. 2.The proposed mitigation plan is insufficient to prevent or reduce beaked whale exposure to active sonar. The proposed visual monitoring before and during the use of active sonar is not sufficient to detect beaked whales. Throughout the day and night, most beaked whale species undergo very long dives, often exceeding one hour. They spend little time at the surface and generally are difficult to	The Navy's Supplemental EIS/OEIS analysis of potential impacts on beaked whales took into account their greater sensitivity to disturbance relative to other marine mammals, as demonstrated by the data used to develop the behavioral response criteria for beaked whales [see the technical report titled *Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis* (Phase III) available at https://mitt-eis.com]. The quantitative assessment predicts that no species of beaked whale would be injured by the Proposed Action. Since receipt of this comment letter, the commenters published the draft manuscript provided as an attachment (Simonis et al., 2020). This Final Supplemental EIS/OEIS includes further information on Cuvier's beaked whale strandings relative to sonar use in the Study Area in Section 3.4.2.1.1.6 (Stranding) under Environmental Consequences due to Acoustic Stressors in the Marine Mammal section (Section 3.4), including incorporation of Simonis et al. (2020). This further information does not change the conclusions of the analysis of potential impacts on Cuvier's beaked whales described in this Final Supplemental EIS/OEIS. Navy tracking of specific events by name has become more standardized since 2008 as new tracking tools have been developed and deployed. Given the MITT Study Area's proximity to eastern Asia, Navy vessels equipped with sonar have likely been transiting and at times conducting individual and group training events with sonar in the MITT Study Area since modern hull-mounted active sonars became standard on Navy surface ships in the mid-1960s. Furthermore, the greater number of Navy ships and later improvements to passive acoustic detection technology meant there was a greater likelihood of more active sonar use from the 1960s through the late 1980s than what is currently proposed in this Supplemental EIS/OEIS. The Navy takes exception to some of the analysis and conclusions in the draft, non-peer reviewed manuscript used to inform the commenter's concerns and recommendations. Navy obtained official stranding records from NMFS' Pacific Island Fisheries Science Center (PIFSC) and Guam's Department of Agriculture's Division of Aquatic and Wildlife Resources (DAWR). In addition, PIFSC provided

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	detect and identify at sea. Especially in the waters of the Mariana Islands Range Complex, where average wind speeds are 15.3 miles per hour, the consistently high sea states make visual observation of any beaked whales particularly challenging. 3.The current beaked whale population size, distribution, and behavior on the Mariana Islands Range Complex is unknown, which prevents an authentic population-level assessment of naval impacts Considering the low density of most beaked whale populations, and the evidence of small-scale, resident population structures, detecting declines using abundance estimates from traditional line transect surveys will be difficult, if not impossible. The current beaked whale population size, distribution, and behavior on the Mariana Islands Range Complex is unknown, which prevents an authentic impact assessment. 4.There are very few personnel in the Mariana Islands who are trained to investigate the presence of traumas associated with the proposed hypothesis under investigation in sonar-associated strandings Fat and gas emboli have been symptomatic indicators of fatal beaked whale strandings related to exposure of active sonar; however, stranded animals must be found before they reach a state of advanced decomposition and examined by qualified personnel. Recommendations	the Navy with current results for Marianas Islands beaked whale strandings where necropsies had been performed or are ongoing. After careful review and analysis of these records, the Navy constructed a detailed annual summary of documented beaked whale strandings and Navy activities within the MITT Study Area from 2003 to January 2019. Given some of the points discussed subsequently, it remains unclear what the significance of small numbers of beaked whale strandings since 2007 really means in terms of population-level effects. It is only over the last 10–20 years that interest and tracking of stranded marine mammals became of higher regulatory and biological interest. One point of contention between the Navy analysis and commenter's analysis is the number of individuals that actually stranded in March 2015. The U.S. Navy, in discussion with researchers affiliated with PIFSC's stranding program, were told there were public reports of two other beaked whales in March 2015 that were pushed back into the sea. But given the unsubstantiated nature of these reports and timing, it is unclear if there was really only one stranding (carcass examined) and it was the same individual as the two previous unconfirmed reports, if there were 2 individuals with at least 1 stranding, or if there really were 3 separate beaked whales. Local news reporting at the time stated, "The first report was of a whale near Cocos Lagoon and the second report was saying it was on the reef. While biologist Brent Tibbits is trying to confirm if this was a second whale sighted or two separate sightings of the same whale, he suspects that there was only one." From the commenter's analysis, it appears the authors selected the less accurate individual count for the March 2015 event (3 individuals) (http://www.kuam.com/story/28585392/2015/03/Monday/beaked-whale-beached-in-merizo-waters). With the PIFSC and DAWR data, the Navy conducted an independent review of the beaked whale strandings. All stranding events were on Guam except for one on Saipan (Aug 2011). Between August 2007 and January 2019, there were 8 beaked whale stranding events of 1–2 beaked whales totaling 9 individuals, the majority of which were identified as Cuvier's beaked whales (7 of 8 or 88%; Aug

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	1. Based on the strong association of fatal beaked whale strandings and mid-frequency active sonar in the Mariana Islands Range Complex, we recommend a moratorium on mid-frequency active sonar in habitats known to be important to beaked whales. 2. Beaked whale fatalities should be considered as likely outcomes from proposed active sonar activities that occur in beaked whale habitat, and Level-A takes for beaked whales should be incorporated into the 2019 draft EIS. 3. To increase the likelihood of detecting beaked whales and reducing their exposure to active sonar, we recommend that mitigation plans incorporate passive acoustic monitoring for beaked whales before and during active sonar operations. 4. We recommend that a passive acoustic beaked whale survey be conducted to estimate the size of the beaked whale population on the range. 5. We urge officials to support a local team of personnel who are trained to promptly respond to marine mammal strandings, conduct necropsies and investigate the diagnostic features for gas and fat embolic syndrome. We recommend that qualified observers conduct surveys at sea and along the coast during naval operations that utilize MFAS in order to identify animals that are dead, dying, or otherwise in distress.	2007, Jan 2008, Aug 2011, Mar 2015, Jul 2015, Mar 2016, Jan 2019). This stranding event count includes the suspect at-sea visual sighting (Jul 2008). Of the 9 stranded individual beaked whales reported, 5 of 9 or 55.6% of the Cuvier's beaked whales were male (adult or subadult) (Jan 2008, Aug 2011, Mar 2015, Mar 2016, Jan 2019), 1 of 9 or 11.1% was female (Aug 2011), and 3 of 9 or 33.3% were not identified to sex (Aug 2007, Jul 2008, Jul 2015). Concurrent with the independent stranding analysis, the Navy conducted a level of activity analysis. From available internal Navy and public resources, there were 20 named Navy training events in the MITT Study Area between 2007 and Jan 2019, which corresponds to the beaked whale stranding interval used by the commenter. This review also included a Navy review of classified sonar reporting systems to document if active sonar was actually reported as being used 3 days prior to a given beaked whale stranding. From 2007 to 2019, 17 of 20 activities or 85% of named Navy events in the MITT Study Area did not co-occur with any beaked whale stranding. Of named Navy events, 2 of 20 or 10% had active sonar used prior to the stranding (Mar 2015, Mar 2016), and 1 of 8 strandings occurred after unit-level training with active sonar that was not part of a formally named Navy event. Finally, 1 of 8 stranding events occurred during a named Navy aviation event, but no active sonar was used prior to the stranding (Jan 2019), so there can be no association with Navy activity and the Jan 2019 stranding. Therefore, of the 8 reported beaked whale stranding events in the MITT Study Area from 2007 to Jan 2019, 3 of 8 strandings or 37.5% occurred when sonar had been used prior to the stranding. This is only a co-occurrence in time and space, and does not automatically imply sonar was the causative agent. For instance, 6 of 8 strandings or 62.5% occurred when there was no active sonar used prior. Finally, there has not been a beaked whale stranding in the Marianas where sonar was used prior to the stranding in close to 3 years (April 2016-February 2019). The commenter's statement that, "Half of these beaked whale stranding events were associated with naval operations that utilize MFAS" is inaccurate. Especially if talking in terms of events. As discussed above, on a sonar use basis,

	Comment	Navy Response
		37.5% occurred after sonar used and 62.5% occurred when there was no sonar used. Obviously, there are some factors at work influencing beaked whale stranding that are unrelated to Navy activities. The higher number of strandings when there was no Navy sonar used does beg the question then, of what other causative factors other than Navy sonar could be influencing beaked whale strandings in the Mariana Islands? Furthermore, if other factors are potentially involved could they have equally contributed to the strandings, with prior sonar use being coincidental? It should also be noted that PIFSC conducted necropsies on three of the beaked whales that had stranding after sonar use (2 Mar 2011, 1 Mar 2015). Histopathology did not show evidence of gas bubble disease, as gas emboli and fat emboli were not observed. The Center for Naval Analysis (CNA) also recently conducted a statistical study of correlation of beaked whale strandings around the Mariana Islands with the use of U.S. Navy sonar, finding that insufficient evidence of a correlation exists. The CNA study used the complete record of all U.S. Navy sonar use between 2007 and 2019, including major training events, joint exercises, and unit level training/testing. The analysis also included the complete beaked whale stranding record for the Mariana Islands through 2019. Following the methods in Simonis et al. (2020), the CNA analysis found insufficient evidence of a correlation between sonar use and beaked whale strandings when considering the complete sonar use record. The CNA finding is in contrast to the finding in Simonis et al. (2020), which depicted a significant correlation between beaked whale strandings and Navy sonar use. However, the Simonis et al. (2020) result relied on substantially incomplete or inaccurate assumptions about U.S. Navy sonar use around the Mariana Islands. CNA also conducted statistical analyses specific to each island where beaked whale strandings have been observed in the Mariana Islands, similarly finding insufficient evidence of a correlation to sonar use. Additional information on the findings of the CNA analysis are presented in Section 3.4.2.1.1.6 (Stranding) in Chapter 3.4 (Marine Mammals).

	Comment	Navy Response
		Given the preponderance of data described above, including the statistical analysis conducted by CNA, the Navy maintains that the comment authors have not demonstrated a strong association between beaked whale strandings and "multinational naval training operations that utilize MFAS." The author's statement that, "The high association (50%) of beaked whale stranding events with military and sonar activity, with the relative lack of beaked whale strandings before 2007, suggest that there may be particularly high risks of sonar-associated beaked whale strandings in the Mariana Islands…" is statistically incorrect in regard to actual sonar used, and makes erroneous assumptions about association between sonar use and beaked whale strandings that are not supported by all of the scientific data (# of events without stranding, necropsy results, low number of stranding co-occurring with sonar since 2015). The Navy has used passive acoustic monitoring research sensors in the Mariana Islands for monitoring projects, which has been useful in determining overall presence of marine mammal species. Information on the Navy's monitoring projects can be found on the U.S. Navy Marine Species Monitoring website (https://www.navymarinespeciesmonitoring.us/). The Navy also uses passive acoustic monitoring as mitigation during training and testing when practical (i.e., when assets that have passive acoustic monitoring capabilities are already participating in the activity). The Navy's passive acoustic devices (e.g., remote acoustic sensors, expendable sonobuoys, passive acoustic sensors on submarines) can complement visual observations for marine mammals when passive acoustic assets are already participating in an activity. Passive acoustic devices can detect vocalizing marine mammals within the frequency bands already being monitored by Navy personnel. Beaked whales are not an extensively vocal species at the surface and typically start echolocation clicks at depth of >600 feet. The very high frequency and directional signals are difficult for even the most advanced research sensors to detect. Many Navy passive acoustic sensors used during training activities monitor for lower frequencies to aid in detection of submarines and sensors, and

	Comment	Navy Response
		are not optimized for high-frequency beaked whale signals. Marine mammal detections from passive acoustic devices can alert Lookouts to possible marine mammal presence in the vicinity. Lookouts can use the information from passive acoustic detections to assist their visual observations of the mitigation zone. Based on the number and type of passive acoustic devices that are typically used, passive acoustic detections do not provide range or bearing to a detected animal in order to determine its location or confirm its presence in a mitigation zone. Therefore, it is not practical for the Navy to implement mitigation in response to passive acoustic detections alone (i.e., without a visual sighting of an animal within the mitigation zone). Adding additional passive acoustic monitoring capabilities (either by adding a passive acoustic monitoring device to a platform already participating in the activity, or by adding a platform with integrated passive acoustic monitoring capabilities to the activity) for mitigation is not practical for the reasons described in Section 5.6.3 (Active and Passive Acoustic Monitoring Devices) of the Supplemental EIS/OEIS. The Navy's Phase III mitigation zones are designed to avoid or reduce potential impacts on marine mammals to the maximum extent practical. The mitigation zones for active sonar extend beyond the average ranges to PTS for all marine mammal hearing groups, including beaked whales. Increasing the size of the Navy's active sonar mitigation zones would be impractical for the reasons described in Section 5.3.2.1 (Active Sonar). As described in Appendix I (Geographic Mitigation Assessment), the Navy developed new mitigation for the Final Supplemental EIS/OEIS to include a restriction on the number of hours of surface ship hull-mounted MF1 mid-frequency active sonar used from December 1 to April 30 within the Marpi Reef Mitigation Area and Chalan Kanoa Reef Mitigation Area. The use of surface ship hull-mounted MF1 mid-frequency active sonar is also prohibited year-round in the Agat Bay Nearshore Mitigation Area. The Navy determined that implementing geographic mitigation beyond what is described in Section 5.4 (At-Sea Mitigation Areas to be Implemented) would be impractical due to implications for safety, sustainability, and mission

	Comment	Navy Response
		requirements for the reasons described in Appendix I (Geographic Mitigation Assessment) and Chapter 5 (Mitigation). Regional marine mammal stranding response networks are a mission responsibility of NMFS. There is an existing NOAA Fisheries Marine Mammal Health and Stranding Response Program. Within the national program, there is an annual grant process (Prescott Grant Program) to which regional stranding networks can apply for funds to address (1) recovery and treatment (i.e., rehabilitation) of stranded marine mammals; (2) data collection from living or dead stranded marine mammals, and (3) facility upgrades, operation costs, and staffing needs directly related to the recovery and treatment of stranded marine mammals and the collection of data from living or dead stranded marine mammals. There is an existing regional stranding response network for the relatively small number of annual strandings in the Mariana Islands. Starting in 2018, the Navy began funding necropsy support via the PIFSC. This funding supports labor and travel for a leading regional expert to respond to and analyze select marine mammal strandings including beaked whales in Hawaii and the Marianas Islands. Therefore, the Navy is already contributing to regional marine mammal stranding response. Additional post-event surveys by the Navy are not logistically or fiscally warranted given the high number of Navy activities compared to the relatively few strandings in the region. Nor were post-event island surveys particularly effective when the Navy conducted similar surveys in areas with significantly more sonar use such as the Hawaiian Islands. As described in Section 5.1.2.2.1 (Marine Species Research and Monitoring Programs), for this Final Supplemental EIS/OEIS, the Navy agreed to several additional research and monitoring initiatives designed to help advance the understanding of beaked whales and strandings in the MITT Study Area. The Navy will co-fund the Pacific Marine Assessment Program for Protected Species (PACMAPPS) Mariana Islands survey in spring-summer 2021 and future studies starting in 2022 to help document beaked whale occurrence, abundance, and

	Comment	Navy Response
		distribution in the Mariana Islands. The Navy will also fund additional stranding response and necropsy analyses for the Pacific Islands region, and research on a framework to improve statistical stranding analysis. Collaboratively with NMFS, the Navy will fund and organize an expert panel to provide recommendations on scientific data gaps and uncertainties for further protective measure consideration to minimize potential impacts of Navy training and testing activities on beaked whales in the Mariana Islands.
Moñeka De Oro (MDO)		
MDO-01	This public process for collecting comments is not easily accessible for many residents of the Marianas. They ways in which information was shared with the community is not very effective. Town meetings, a few newspaper articles and a website just doesn't cut it if the aim to provide meaningful engagement. The mitigation plans especially In regards to impacts to historic properties in the MITT is sorely inadequate. Compounding this with the poor local leadership at the historic resources division, it is easy to see how and why a whole Ancient Village site was destroyed at Magua, Guam last year. That kind of desecration is completely disrespectful, and if the programmatic agreement allowed for that destruction it is problematic. No historic properties that are Eligible for the historic register should be impacted. All construction Near significant Historic areas should also cease until the promised cultural repository is built. One aspect that is troubling about the cultural repository is that there are no support funds for operations and personnel. What good will just a building do? Why should the government of Guam and its tax base be the ones to shoulder the operations costs to house the artifacts from sites the military is destroying?	The Navy is not proposing any geographic expansion of the training and testing area in this Supplemental EIS/OEIS. Proposed activities are similar to those conducted in the Study Area for decades. Training and testing activities are proposed to occur at sea and on FDM. Tables 2.5-1 and 2.5-2 in Chapter 2 (Description of Proposed Action and Alternatives) in this Supplemental EIS/OEIS present current and proposed training and testing activities. The Navy held four open house public meetings, one each on Tinian (Tinian Public Library, March 14, 2019), Rota (Mayor's Conference Hall, March 15, 2019), Saipan (Kanoa Resort, March 18, 2019), and Guam (University of Guam, March 19, 2019). The public meetings were an opportunity for the public to ask questions of Navy leadership, scientists, and other experts about the analysis documented in this Supplemental EIS/OEIS. The Navy encouraged the public to attend these meetings and broadly notified the public through the media, including paid newspaper advertisements and news releases, and direct mail, including letters, postcards, and emails. A voice recorder was provided for any member of the public that wanted to provide an oral comment in a language other than English. The Navy has received feedback from attendees that the open-house format is more conducive to promoting public understanding and constructive dialogue. Open house meetings allow a greater number of individuals to directly engage and interact with Navy team members and ask questions about this Supplemental EIS/OEIS, as well as provide comments on the

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	In that's same note, Why should the tax payers of Guam pay for the needed water and waste water upgrades needed to sustain this build up and expansion of military efforts?	document.
JUAN DIEGO BLANCO (JDB)		
JDB-01	PLEASE LEAVE OUR PEACEFUL ISLANDS ALONE! OUR PEOPLE HAVE SUFFERED ENOUGH BY THE WAR WE HAD NOTHING TO DO WITH BETWEEN JAPAN AND THE USA. HAVING MILITARY INSTALLATIONS ON OUR PEACEFUL ISLAND WILL INVITE ANOTHER WAR! JUST RECENTLY, NORTH KOREA THREATEN TO BOMB OUR ISLANDS DUE TO THE EXISTING MILITARY INSTALLATION ON GUAM. WHY IS AMERICA PUTTING ITS OWN CITIZENS AT RISK OF BEING NUKED? WHY IS IT THAT AMERICA FIND IT NECESSARY TO BOMB THE BEAUTIFUL ISLAND OF PAGAN? ISN'T IT ENOUGH THAT AMERICA IS PRESENTLY BOMBING OUR BEAUTIFUL ISLAND OF FDM AND WILL CONTINUE TO BOMB THE ISLAND UNTIL THE 99 YEAR $20,000.00 LEASEHOLD EXPIRES? PLEASE STOP! PEACE NOT WAR!	Training and testing activities are proposed to occur at sea and on FDM. Tables 2.5-1 and 2.5-2 in Chapter 2 (Description of Proposed Action and Alternatives) in this Supplemental EIS/OEIS present current and proposed training and testing activities. The Proposed Action does not include Pagan.
No name provided (NNP)		
NNP-01	The fact that Guam is listed as a country and not a part of the United States in the drop-down menu above is telling on how we are viewed and treated as "American" citizens. We say no to further military expansion on island. We say no to desecration of our cultural heritage sites. We say no to harming our flora and fauna. We say no to the exploitation of our lands for purposes outlined in the plans drafted by the US military.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.

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No name provided (NNP)		
NNP-02	I am strongly against bombing of any island(s) and testing that will take place in any ocean(s). These God given lands and oceans that we are preserving are for our future generations. Natural disasters are beyond anyone control and no matter what the outcome, we the People always manage to accept and gradually recover not just rebuilding our damaged houses but emotionally and financially. I say NO, NO, NO to Military Bombing.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Alvaro Santos (AlvS)		
AlvS-01	I am opposed to the military plans for the use of Pagan and Tinian for military live firing and other training activities that will inevitably impact the environments of these islands and ultimately destroy the islands themselves. The U.S. and its Pacific allies will use these islands and one can imagine the magnitude of the military activities that will take place by these multi-nation's militaries. Air space, marine space and the islands will all be significantly impacted including the economy and lives of the CNMI people. Included in the military plan is a mitigation plan to restore and protect the islands' environment somewhere in the future. THIS IS A FARCE NOTHING MORE THAN A MILITARY SALES PITCH. Take the case of the island in Hawaii just off Maui that was used by the Navy for bombing and other military training in the 1800's. After years of military live fire and bombings the island was poisoned to the point that it is now barren. The U.S. Congress appropriated $400 million for mitigation purposes to revive the barren island to no avail. Conservationists tried to restore vegetation on the island but unexploded ordinances and other toxic materials in the soil prevented soil conservation and re-vegetation. The $400	Training and testing activities are proposed to occur at sea and on FDM. Tables 2.5-1 and 2.5-2 in Chapter 2 (Description of Proposed Action and Alternatives) in this Supplemental EIS/OEIS present current and proposed training and testing activities. The Proposed Action does not include Pagan.

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	million mitigation funding ran out and little or nothing was ever accomplished as far as mitigation is concern. Land mass is extremely limited and precious to the people of the CNMI. Culturally, the people connect themselves with the air, land and sea as providers of life. To the military, land use and destructive results on the CNMI lands for military objectives are mere COLLATERAL DAMAGE. I abhor this ideology.	
AYUMI SUZUKI (AyS)		
AyS-01	Do not come. Do not do war practice. I want Alternative Zero.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
AYUMI LITULUMAR (AyL)		
AyL-01	I do not want US come to NMI and do maritally activities. I want alternative zero.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Yaong Yaing (YY)		
YY-01	Leave our island alone!!!! Mitt.com	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Jenny Deleon Guerrero (JDG)		
JDG-01	I understand the need to test in order to be better equip but I feel that testing has gone on long enough and it's time to give it a rest. The oceans creatures have endured enough suffering and death. I say no more to testing in Farallon de Medinilla.	The FDM range is operated in accordance with the terms and conditions specified in the 2015 Biological Opinion (U.S. Fish and Wildlife Service 2015). Testing activities do not occur on the FDM range.
Jerrid Igisaiar (JI)		
JJ-01	As a Northern Marianas descendant, I would not want the outer reaches of my islands to be bombed or there to be testing of sonar in any sort of way that will harm the creatures of the sea. We the people of the Northern Mariana	Marine life and marine habitat are important to the Navy. Using the latest science and technology, the Navy completed extensive analyses and computer-based modeling to determine impacts and develop science-based protective measures to reduce or avoid potential impacts on marine life. Potential effects

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	Islands detest the idea of having our islands used for military training of any sort, bombings, and sonar testing, because of the environmental consequences, consequences on the ecosystem, and the impact on the future generations. We the people of the NMI will stand up, time and time again, to confront, you, the navy with all the negative impacts you are trying to do to our creatures, to our people, and to our home. The navy has done sonar testing and look what it produced, beachings; both whales and dolphins, as well as many other species in the ocean will suffer from the sonar testing, here in the Northern Marinas Islands. May 1996, Greece, 12 beaked whales mass strandings; March 15-16, 2000, Bahamas, 16 beaked whales mass strandings; May 2000, Madeira, 3 Cuvier's beaked whales mass stranding and 1 found outside of the shoreline dead because of internal brain damage and mass bleeding through the eyes and ears. These strandings are the product of sonar testing in the ocean and this list could go on and on, proving time after time that Sonar testing in the ocean is detrimental to the ecosystem. So, we abhor the idea of, you, the navy coming to our islands and disrupting our ecosystem with your nefarious technology. To be frank, bombing our islands, that may not be inhabited by people, is still inhumane. What of the animals that preside there? They have made it their home far longer than the first conquest or visit to the NMI. So, bombing in any way, shape, or form will not be allowed by the people of the NMI. We could care less if it is for military advancement, the people, creatures, and islands of the NMI come first and foremost before any type of military exercise. It will impact our future generations because they won't know the islands as we knew it, our beautiful islands that hold such treasure that not even	from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practicable, procedural and geographic mitigation measures during its training and testing activities to reduce potential impacts on marine life. The Navy's analysis indicates that, with implementation of its protective mitigation measures, there would be no significant impacts on marine species. Note that the stranding events in this comment did not occur in the MITT Study Area and did not involve any training or testing scenarios in the Proposed Action. The Center for Naval Analysis (CNA) recently conducted a statistical study of correlation of beaked whale strandings around the Mariana Islands with the use of U.S. Navy sonar, finding that insufficient evidence of a correlation exists. The CNA study used the complete record of all U.S. Navy sonar use between 2007 and 2019, including major training events, joint exercises, and unit level training/testing. The analysis also included the complete beaked whale stranding record for the Mariana Islands through 2019. Following the methods in Simonis et al. (2020), the CNA analysis found insufficient evidence of a correlation between sonar use and beaked whale strandings when considering the complete sonar use record. The CNA finding is in contrast to the finding in Simonis et al. (2020), which depicted a significant correlation between beaked whale strandings and Navy sonar use. However, the Simonis et al. (2020) result relied on substantially incomplete or inaccurate assumptions about U.S. Navy sonar use around the Mariana Islands. CNA also conducted statistical analyses specific to each island where beaked whale strandings have been observed in the Mariana Islands, similarly finding insufficient evidence of a correlation to sonar use. Additional information on the findings of the CNA analysis are presented in Section 3.4.2.1.1.6 (Stranding) in Chapter 3.4 (Marine Mammals). For a full discussion of historical stranding events, please see the 2017 technical report *Marine Mammal Strandings Associated with U.S. Navy Sonar Activities*, found on

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	the richest man in the world could have; love. We have great pride, care, and love for those islands. Though, everyone in the NMI does not go to the outer islands, those who do and come back retell their story which expresses the importance of them even more. It is not just an island, it is a second home, it is a form of hunting and gathering for our families, and it is the essence of pure nature and the stronghold of what makes the NMI, the NMI.	the project website at www.mitt-eis.com. NMFS, as the regulator, maintains the authoritative National Stranding Database. The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Luise Q. Noisom (LQM)		
LQM-01	Dear sir, Our island is so small and it's part of us and I'm pleading that you find another place to test your bombs and sonars .The end result will be uninhabitable by birds or any creature, just death to our island and resources. Please respect our island culture and resources.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Wayne De Bellonia (WDB)		
WDB-01	As I strongly believe the Military and Navy must be prepared for any attacks we may have on our nation and islands I strongly believe the training will effect sea life and land animal life. Not to mention destruction by amphibious vehicles approaching the beaches. Millions of years of corals will be destroyed and never to come back again. I live on Saipan and I am a 45-year scuba instructor and have seen the devastation on the invasion beaches of corals that were crushed due to the landings. At that time in 1944 it was necessary. Same goes for Tinian where my father served during the war. But for training I believe there could and possibly be other islands the training could take place on. Proof of sonar effecting sea life and killing many whales has	Public safety is also important to the Navy and various means are used to communicate information on areas restricted to public or commercial activities are described in Section 3.13 (Public Health and Safety) of this Supplemental EIS/OEIS. As specified in Title 33 C.F.R. Subpart 72.01, Notices to Mariners, the U.S. Coast Guard issues information to the public concerning maritime navigation. There are three categories of Notices to Mariners: the Local Notice to Mariners (LNM), the Notice to Mariners (NTM), and the Marine Broadcast Notice to Mariners (BNM). Additionally, nautical charts issued by the National Oceanic and Atmospheric Administration include these federally designated zones and areas. Operators of recreational and commercial vessels have a duty to abide by maritime regulations administered by the U.S. Coast Guard. Waters around FDM

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	been documented. The fragile ocean environment will be effected badly and possibly never to return to normal. Fishermen that frequent the northern islands would be banned from fishing in those areas along with tourist such as myself who would love to visit and dive and fish the islands. While living in St Thomas in the United States Virgin Islands from 71-85 the Military and Navy trained in Culebera. There were plenty of errors by the Navy where the projectiles overshot their targets and hit the small town on the island killing some residents. The islanders fought for years to get all the practice there to cease. They finally got it to stop. Although the Northern Mariana Islands are mostly uninhabited I feel it will affect not only one island but all islands. With sea life and land bird and animal life leaving the area due to the loud bombings and shock waves in the water from the shelling. At this time, I find it for me to be against using the pristine Northern Mariana Islands for land and sea practicing. Hopefully you can find one of the many islands out in the Pacific to do your practice. I fully thank you all for your service and all you do to protect our country and islands. I stand behind our Military, Navy and Coast Guard all the way. I am also so proud of our President Donald J Trump for increasing the funding for our Military and Navy. May God bless you all and God's speed.	within 3 NM from shore are permanently closed for safety reasons due to the potential presence of unexploded ordnance. Landing of amphibious vehicles is not proposed as part of the Proposed Action. Training and testing activities within this Supplemental EIS/OEIS are proposed to occur at sea and on FDM. Tables 2.5-1 and 2.5-2 in Chapter 2 (Description of Proposed Action and Alternatives) present the current and proposed training and testing activities.
Maria Calori (MaC)		
MaC-01	The NEPA process itself is flawed in that it puts the perpetrator of the action in power and leaves the (lay) citizens being affected at a disadvantage as the accusers -	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.

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	long documents written in military jargon expected to be read and analyzed in short amounts of time. Comments received are expected to be concise and specific, backed by science. WE, the citizens, are innocent until proven guilty - not you, U.S. Department of Defense (/Department of the Interior) ; You have been proven guilty over and over and over again. The Marshall Islands, Sumay, Hagåtña, my grandparents, my parents - living (dying) proof of your trespasses. I reject any and all military training in and around Guam and the Mariånas. Bombing, Firing ranges, jets fueling and flying overhead, and war training exercises all have a negative impact on all living species most especially native species of sea mammals, fruit bats, monitor lizards, butterflies (and other native insects), trees, shrubs, plants (used in native medicines). Guam's limestone forests are very limited and species that depend on that habitat are struggling to survive. The northern islands allow us to research and learn more about our pristine habitats and how to ensure the survival of species threatened in Guam. As a people, the CHamoru and other locals suffer from high rates of cancer and illness resulting from exposure to chemicals specifically used by the U.S. military. Military exercises also have an emotional and mental impact on the community at large, please refer to and read in entirety "Colonial Dis-Ease: US Navy Health Policies and the Chamorros of Guam, 1898–1941 (Pacific Islands Monographs Series)" by Anne Perez Hattori.	

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Sue Uncangco (SU)		
SU-01	I strongly oppose this. The federal govt don't give a hoot about the people they are poisoning. We are dying and they deny doing anything wrong and won't give proper compensation. we are still fighting for Agent Orange in Guam. radiation fallout etc. Stop making my people suffer. Go to the mainland and do your practices.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Paul Plunkett (PP)		
PP-01	• I was active duty with the US Navy for two tours and worked both directly and indirectly with the US military for many years after that. I also have family that are now both active duty and retired from the US military. • I know very well what our military does, and that is why I'm so concerned about what they will do to the CNMI. • The CNMI will continue to support the military by providing more on active duty per capita than any other state or region. The CNMI supports the US military but does not want the military destroying their islands and using Pagan for any reason. • I know that our military has deep pockets, high paid lawyers and negotiators, and are supported by lawmakers and politicians that give them what they want. • I know that for all the money they spend, that could be much better spent elsewhere, their return on investment and environmental record is appalling. • I know they destroyed numerous islands and other areas to where they're not useable forever, and how people from	Training and testing activities are proposed to occur at sea and on FDM. Tables 2.5-1 and 2.5-2 in Chapter 2 (Description of Proposed Action and Alternatives) in this Supplemental EIS/OEIS present current and proposed training and testing activities. The Proposed Action does not include Pagan.

	Comment	Navy Response
	there deeply regret ever letting them in. • I know that still today kids in Laos, Cambodia, and Vietnam are losing their legs and lives from US military bombs dropped 50 years ago and never cleaned up. • I know that the US military needs new training locations because they completely destroyed areas they used, and because they were finally told to leave Okinawa after they beat and raped a 12 year old, raped and murdered a five year old, and committed numerous other crimes against Okinawans. And that's just one location where the US military destroyed more than just the land. • I know DOD is banking on so few people even knowing what or where the CNMI is, and that the folks and decision makers in DC will think out of sight out of mind. • I know that it was the U.S. military that caused 911 attacks against us because they were over in Saudi disrespecting their culture, just like their doing in over 160 countries now, and they'll do in the CNMI. • I know the U.S military moved into Iraq almost 20 years ago without reason and are still there. • I know the U.S military will try to bomb and destroy the CNMI for 112 or so years they propose or until they've completely destroyed it and are ready to move on to destroy somewhere else. • I know if their proposal is approved, the CNMI won't be able to limit their destructive activities that will extend	

	Comment	Navy Response
	further than just Tinian and Pagan. • I know it's time to do a lot more than speak out at a DOD sponsored hearing and write statements that will be ignored. • I know that DOD public hearings and environmental displays are just a show of good faith and to check the block that we've been heard, and that a true indicator of good faith is to first repair what DOD already destroyed. • I know DOD doesn't care what is said, and especially doesn't want that known beyond the CNMI. • I know DOD expects it will be difficult for the CNMI to coordinate an opposing unity of effort that knows how to direct their message to the right people who now don't even know what or where the CNMI is. • I know that a lot of CNMI residents have more comments and want to be heard, that not enough of them are sharing how they feel and what they don't want that DOD will do. • I know the CNMI needs to better unite and develop a strategy to address DOD's proposal that includes who needs to be involved and informed. "The only thing necessary for the triumph of evil.....is for good men to do nothing." Edmund Burke, Irish statesman My hope is that good men and women in the CNMI will better unite and stand up against what DOD proposes. Thank you,	

	Comment	Navy Response
	Paul Plunkett	
Francis Damian (FD)		
FD-01	**MITT Concerns and Consideration** **The following are ideas and concerns by the Guam Coastal Management Program regarding the Marianas Island Training and Testing proposal by the Navy.** **RESOURCE POLICIES RP3 Water Quality -** Safe drinking water shall be assured and aquatic recreation sites shall be protected through the regulation of uses and discharges that pose a pollution threat to Guam's waters, particularly in estuarine, reef and aquifer areas. The impact of explosives will have impacts to the water quality and needs to be conditioned as the siltation will have far reaching impacts due to the health of the corals and living species that will be affected. **RESOURCE POLICIES RP4 Fragile areas -** Development in the following types of fragile areas shall be regulated to protect their unique character: historic and archaeologic sites, wildlife habitats, pristine marine and terrestrial communities, limestone forests, and mangrove stands and other wetlands. The Navy must conduct surveys to identify artifacts in the coastal areas. Are there any known historical or artifacts in the coastal areas where the Navy will be conducting its activities?	The Navy submitted a Consistency Determination (CD) to the Bureau of Statistics and Plans (BSP) in December 2019 addressing proposed military training and testing activities that may affect Guam's coastal zone and coastal uses. The consistency determination was prepared in accordance with Guam's Procedures Guide for Achieving Federal Consistency with the Guam Coastal Management Program (Bureau of Statistics and Plans May 2011). BSP's response to the Navy's CD (dated March 6, 2020) can be found in Appendix C (Agency Correspondence). The Navy is in discussions with BSP in order resolve any differences and reach an agreement regarding the Navy's compliance with Guam's Coastal Management Program to the maximum extent practicable. The outcome of these discussions will be included in the ROD. The Navy has engaged with the Guam Coastal Management Program throughout the development of this Supplemental EIS/OEIS, including meeting with staff during the scoping phase and notifying the program director when the Draft Supplemental EIS/OEIS was made available for public review and comment. The Navy complies with all applicable laws and regulations. Based on the analysis presented in the Draft Supplemental EIS/OEIS and the 2015 MITT Final EIS/OEIS, the Navy concluded that all levels of metals, chemicals, and other byproducts would either be below detectable levels or at levels below existing standards, regulations, and guidelines as documented in Section 3.1 (Sediments and Water Quality). While there are no existing standards and guidelines in Guam for marine sediments and water quality related to explosives and explosive byproducts or metals in the marine environment, the Environmental Protection Agency has established criteria for concentrations of explosives, explosive byproducts, and metals in saltwater. Based on the analysis presented above and

	Comment	Navy Response
	Navy must disclose what explosives will be deployed It is unknown what explosives will be expended into the water environment making it also unknown what metals are being used and what components are involved. This should be known and recognized as harmless to the environment. Most especially the harm an unexploded ordinance brings to anyone traversing the area. The depth and distance of the explosives is critical to the destruction of the coral and colonies it resides in. What type of explosives are being proposed and what will be the impacts to our shoreline environment? **RESOURCE POLICIES RP5 Living Marine Resources -** All living resources within the territory waters on Guam, particularly corals and fish, shall be protected from overharvesting and, in the case of marine mammals, from any taking whatsoever. The depth and distance should also be considered to the impacts of living species such as endangered turtles or any other living species who may be residing or traversing the area due to the proximity of the coastline area. Sonars are a major issue that needs to be address as it will have negative effects to the marine life and the environment. The Navy needs to respond to the magnitude and the depth of sonar signals and how living species of the Ocean are affected.	in the MITT Draft Supplemental EIS/OEIS, existing federal standards and guidelines would not be violated. The MITT Supplemental EIS/OEIS predominantly pertains to activities that occur at sea. The only land-based activities as part of the MITT Proposed Action are related to the use of ordnance on FDM. The Navy is required to independently comply with the statutory requirements of NEPA and the NHPA. In the MITT Supplemental EIS/OEIS, the Navy has reviewed and incorporated the best available science to analyze potential impacts on cultural resources, including underwater cultural heritage and maritime archeology. Section 3.0.4.2 (Explosive Stressors) describes the characteristics of explosions during naval training and testing. Activities analyzed in this Supplemental EIS/OEIS that use explosives are described in Appendix A (Training and Testing Activities Descriptions). As stated in Section 3.8.2.2 (Explosive Stressors), although the vast majority of explosions occur at distances greater than 3 NM from shore (where water depths are greater than the depths where shallow-water coral species occur), some explosions may occur close to marine invertebrates that could kill or injure those invertebrates. Explosions near the seafloor and very large explosions in the water column may impact shallow-water corals of any life stage, hard-bottom habitat and associated marine invertebrates, and deep-water corals. Effects could include physical disturbance, fragmentation, or mortality to sessile organisms and pelagic larvae. Energy from an explosion at the surface would dissipate below detectable levels before reaching the seafloor and would not injure or otherwise impact deep-water, benthic marine invertebrates. Section 5.4.1 (Mitigation Areas for Seafloor Resources) presents mitigation measures the Navy would implement to avoid or reduce impacts from explosives on seafloor resources in mitigation areas throughout the Study Area. For example, the Navy will not conduct explosive mine countermeasure and neutralization activities within a specified distance of shallow-water coral reefs, live hard bottom, artificial reefs, and shipwrecks. Mitigation measures would

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	RESOURCE POLICIES RP8 Public Access - The public's right of unrestricted access shall be ensured to all non-federally-owned beach areas and all Territorial recreation areas, parks, scenic overlooks, designated conservation areas and other public lands; and agreements shall be encouraged with the owners of private and federal property for the provision of reasonable access to, and use of, resources of public nature located on the such land. The fishermen or anyone boating or even traversing in the coastlines of the military base should also be taken into consideration as to the safeguard for the loss of human life. Has the Navy considered other alternatives in this case as Guam outside of the Navy bases may actually be encroaching outside of the base limits and causing an impact to the inhabitants living within an Island environment. **DEVELOPMENT POLICIES** **Development Policies DP1 Shore Area Development -** *Only those uses shall be located within the Seashore Reserve which:-Enhance, are compatible with or do not generally detract from the surrounding coastal area's aesthetic and environmental quality and beach accessibility; or -can demonstrate dependence on such a location and the lack of feasible alternative sites.*	also help avoid or reduce potential impacts on invertebrates that inhabit these areas. The Navy took a hard look at the potential impacts of the Proposed Action on marine mammals and sea turtles using the best available science. The Navy's quantitative analysis process for analyzing impacts from active sonar and explosives has been reviewed by external scientists and approved by NMFS. The Navy also worked collaboratively with NMFS to develop mitigation measures using input from the military operators, the best available science, predicted activity impact footprints, and marine species monitoring and density data. The Navy has implemented and will continue to implement procedural mitigation measures designed to reduce or avoid impacts on marine mammals in the Study Area (see Chapter 5, Mitigation). At this time, these procedural mitigation measures represent the most practicable methods for protecting marine mammals while allowing the Navy to complete its training and testing mission. The Navy has reviewed and incorporated the best available science to support the impact analysis and conclusions for the coral reef communities. The Navy is consulting with NMFS under the ESA for potential effects on coral and received a Biological Opinion. Mitigation measures and monitoring requirements specified in the Biological Opinion are presented in Chapter 5 (Mitigation). Mitigation measures in the Biological Opinion will also be reflected in the ROD. The potential effects of sonar and explosives on marine mammals are quantitatively estimated using the Navy's Acoustics Effects Model (see the Technical Report, *Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing*, available on the project website, for details on the quantitative methodology). Predicted effects from sonar on marine mammals are presented by species in Section 3.4.2.1.2.3 (Impacts from Sonar and Other Transducers Under the Action Alternatives) and from explosives in Section 3.4.2.2.2.3 (Impacts from Explosive

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	What is the Navy doing to minimize impacts due to explosives that have any negative effects to corals and the underwater environment in the shoreline area? Since the FDM is uninhabited has there been any consideration to allow a firing range in the FDM island instead of the ones that are proposed for Guam. Having the firing range in places other than the ones proposed in Guam takes away the safety measures and duration of exercise the Military is proposing for the Island of Guam. The problem is that the removal of the danger zones here on Guam will only get exacerbated in the FDM area as there are many migratory birds and possibly endangered species that are not known at this time. In essence what we are doing to protect life here on Guam may actually transfer to species life endangerment at FDM. The onus is to the safety and wellbeing of the inhabitants living on Guam as opposed to FDM which is uninhabited by humans. These concerns must be addressed by the Navy and mitigated to ensure of the protection to the Ocean waters and living species are protected as much as is ultimately possible. The inhabitants both residential and tourists must remain protected as much as is ultimately possible in order for everyone living on and off base that	Stressors Under the Action Alternatives). No mortality or direct injury to any marine mammals is predicted. Public safety is also important to the Navy. Various means are used to communicate information to the public about areas restricted to public or commercial activities and are described in Section 3.13 (Public Health and Safety). As specified in Title 33 C.F.R. Subpart 72.01, Notices to Mariners, the U.S. Coast Guard issues information to the public concerning maritime navigation. There are three categories of notices to mariners: the Local Notice to Mariners, the Notice to Mariners, and the Marine Broadcast Notice to Mariners. Additionally, nautical charts issued by the National Oceanic and Atmospheric Administration include these federally designated zones and areas. Operators of recreational and commercial vessels have a duty to abide by maritime regulations administered by the U.S. Coast Guard. Waters around FDM within 3 NM from shore are permanently closed for safety reasons due to the potential presence of unexploded ordnance. A firing range is not part of the Proposed Action for this Supplemental EIS/OEIS; therefore, the development of alternatives did not consider a firing range on FDM. Alternatives carried forward were developed to meet the Navy's purpose and need and to ensure fulfilment of obligation under Title 10 of the United States Code. See Section 2.4 (Action Alternatives Development) for more detailed information on the development of alternatives.

	Comment	Navy Response
	make up our island environment and the quality of life remains safeguarded for all to enjoy.	
Gretchen Druliner (GD)		
GD-01	These islands are the heart and soul of the Chamorro people, these islands are our ancestors that have been and they are our ancestors that will be. These islands are our dreams and the dreams of our children, they are our existence. There are so many beautiful things to say about these islands, our islands, and the connectedness of the Chamorro people. But America only seems to recognize and understand the buying and selling of things. These islands are not things for sale. These islands are our collective memory and our imagination and our future. The US military chooses to deny the joint ecosystem of Guam and the CNMI, a connected ridge-line chain of islands, and reports two separate EISs for one continuous marine ecosystem. It is also one military relocation project as indicated by the name CJMT. There are many discrepancies the Military's EIS 's makes. They fail to recognize the physical and disorienting trauma of sonic blasts on marine life, they fail to recognize the toxic leaching from the weapons testing into the waters surrounding the islands, they fail to properly recognize the effects of such an increase in human presence on the ecosystems, they fail to recognize that we are island people who are an integral part of this ecosystem they want to come and bomb and occupy. Additionally, your EIS does not take into account the years of colonization, violence and displacement from globalization and wars, and the cumulative degradation from the global economy of accumulation these islands have weathered thus far. It does not take into account the losses we, as islands and people	Training and testing activities are proposed to occur at sea and on FDM. Tables 2.5-1 and 2.5-2 in Chapter 2 (Description of Proposed Action and Alternatives) in this Supplemental EIS/OEIS present current and proposed training and testing activities. The Proposed Action does not include Pagan.

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	have already endured, we are only a small piece of land in the pacific. With a strategic location. You want not to only utilize our beautiful Pagan, but to increase use and types of use on Tinian and the waters of the Marianas, an island and ecosystem we live, ranch, garden, fish, and drink the water from. I will quote from a paper because it is written clearly and I see no need to rewrite science: Commonly used military energetic compounds include the explosives 2,4,6-trinitrotoluene (TNT), hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX), and octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX) [1]. Nitroglycerin (NG), nitroguanidine (NQ), nitrocellulose (NC), 2,4-dinitrotoluene (DNT), and various perchlorate formulations are employed in missile, rocket, and gun propellants [2, 3]. As a result of military activities and due to improper management and disposal practices many energetic substances and their by-products have contaminated environments to levels that threaten the health of humans, livestock, wildlife, and ecosystems. In humans TNT is associated with abnormal liver function and anemia, and both TNT and RDX have been classified as potential human carcinogens [4, 5]. TNT toxicity has been demonstrated using earthworm reproduction tests [6], and studies with Vibrio fischeri have established TNT as being “very toxic” to aquatic organisms [7]. Mutagenicity studies have been carried out using TNT and its metabolites on Salmonella strains and mammalian cell lines [8–11]. TNT was found to be mutagenic, with some metabolites more so than the TNT itself.	

	Comment	Navy Response
	The effects of RDX on mammals are generally characterized by convulsions. Deaths in rats were associated with congestion in the gastrointestinal tract and lungs [12, 13] (oral rat LD50 = 0.07–0.12 g/kg) [14]. Factory employees in Europe and the US have suffered convulsions, unconsciousness, vertigo, and vomiting after RDX exposure [15]. Information is limited concerning health effects of HMX [16]. The USEPA has established lifetime exposure drinking water health advisory limits for TNT, RDX, and HMX at 2.0, 2.0, and 400 µg/L, respectively [17, 18]. Acute exposure to NG can cause headaches, nausea, convulsions, cyanosis, circulatory collapse, or death [19, 20]. Chronic exposure may result in severe headaches, hallucinations, and skin rashes [21]. Perchlorate adversely affects human health by interfering with iodine uptake in the thyroid gland [22]. Energetic compounds may enter the soil environment via numerous avenues including [23–28] the following: Distribution and Fate of Military Explosives and Propellants in Soil: A Review John Pichtel, 2012 Your assurance of transparency, safety and boundaries fall on deaf ears, we have seen the devastation so callously inflicted upon other island nations. We know the history of Bikini Atoll, we know the history or Runit Dome, the history of Enewetak Atoll, Kwajalein Atoll, Kiritimati and Malden Islands, Johnson Atoll…we know the insatiable appetite of military power, of colonialism and we are not assured. There	

	Comment	Navy Response
	is no assurance for our collective imagination, our future, our children's future, our existence, if our homeland is destroyed.	
Ned Pablo (NP)		
NP-01	Follow your EPA, NIPA regulations. Stop doing sonar testing and start listening to the marine biologists and experts that are turning in expert advice and testimonies contradicting and discrediting your experts and false information. Go practice somewhere else, leave the Marianas alone and the Chamoru people alone, also leave our natural resources and marine animals alone. Stop lying and killing our animals & marine resources please!!!!!	Marine life and marine habitat are important to the Navy. Using the latest science and technology, the Navy completed extensive analyses and computer-based modeling to determine impacts and develop science-based protective measures to reduce or avoid potential impacts on marine life. Potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practicable, procedural and geographic mitigation measures during its training and testing activities to reduce potential impacts on marine life. The Navy's analysis indicates that, with implementation of its protective mitigation measures, there would be no significant impacts on marine species. The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Juan Diego Tenorio Juan (JDTJ)		
JDTJ-01	Please stop bombing our islands. There are other places closer to the US mainland like the Aleutian Islands and other areas in Alaska you can use. Please, please, please stop destroying our islands. You are using some of our islands already for bombing practice. That is enough! I would like for my kids to be able to enjoy those islands in their lifetime. We do not want to be another Kahoolawe. You tore that place up and the people can no longer use it.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.

	Comment	Navy Response
Dolores Limes (DL)		
DL-01	NO to BOMBINGS in the CNMI	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Ana Celis (AC)		
AC-01	Dear Military officials. My name is Ana and I oppose the military usage of Tinian and Pagan Island for bombing practice. our islands are very small and our population is growing. I have three children and they also have a growing family. They have been on the waiting list for homestead for a long time and if these islands are going to be use as practice then my children and their children and the future children will not have any land for their own. The military is already using Farallon de Mendeniza for bombing practice, I think that is good enough already Save the other Island for our Children's future. The United States is already a very STRONG nation. It already take the following Northern Islands. Farallon de Paharous, Maug, Asuncion and Guguan and if Pagan Island is taken for bombing then the other island such as Agrigan and Alamagan will be affected as well because of the air and sea area restrictions. I understand the need to practice, but can it be done somewhere else where there will be no people going to stay. Hundred years from now I know the population will be more so where are they going to stay when the Islands are all destroyed and contaminated. Thank you for your understanding.	Training and testing activities are proposed to occur at sea and on FDM. Tables 2.5-1 and 2.5-2 in Chapter 2 (Description of Proposed Action and Alternatives) in this Supplemental EIS/OEIS present current and proposed training and testing activities. The Proposed Action does not include Pagan.

	Comment	Navy Response
Pamela Sypniewski (PS)		
PS-01	Please don't use Pagan as a bombing site. This is my friend's home island and I don't want to see it destroyed. Thank you for your time.	Training and testing activities are proposed to occur at sea and on FDM. Tables 2.5-1 and 2.5-2 in Chapter 2 (Description of Proposed Action and Alternatives) in this Supplemental EIS/OEIS present current and proposed training and testing activities. The Proposed Action does not include Pagan.
Juan Duenas (JuD)		
JuD-01	don'T TARNISH THE PARADICE...	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Macey Fujihira (MF)		
MF-01	I think that the proposed action should not be done to our islands because it could cause harm to our seawater environment or our land environment as well. It has important purposes but I believe they should conduct their experiments and testing at another place or create their own place for testing rather than use our islands. We must protect our resources and this is a way for us to protect it, one step at a time.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Nadine Sablan (NS)		
NS-01	Adding a CORRECTION to my previous comment. I meant SONAR TESTING, for research NOT Solar Testing! Thank you. Nadine Hamilton Sablan, Ph.D.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Nadine Sablan (NS)		
NS-02	Please Stop the destruction of our islands' land and sea resources. This is all we have to give to our children; generations to come. Stop the Solar testing as you are harming the Ocean's natural aura, sea animals' homes and volcanic island stability. Please go elsewhere where the land	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.

	Comment	Navy Response
	and sea resources are endless. May God guide you as you form a solid plan to satisfy your need for research. Thank you. Nadine Hamilton Sablan, Ph.D	
Guadalupe Borja (GB)		
GB-01	I am an indigenous Chamorro from the Northern Mariana Islands. We local people DO NOT WANT the U. S. military doing its exercises and tests in our islands and ocean waters. Our islands are small and our waters need to stay clean and unpolluted for us today and for future generations. You allege that you need to do military exercises and tests in our homeland. U. S. IMPERIALISM exists in the 21st century. Do your own exercises and tests in your own backyard.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Jude Lizama (JL)		
JL-01	The Navy is suggesting the potential impact on land, sea, and cultural resources as piecemeal consequences when in fact, these resources will be impacted cumulatively. These resources, both biological and physical, deteriorate simultaneously. Specifically, the effects of ordinance training on Farallon de Medinilla and Tinian will negatively affect the CNMI pelagic fish stocks since both islands are frequented fishing areas. Furthermore, if fish are caught from these areas, there will be increased risk to disease stemming from the decreased physical land and water quality. Tinian is a populated island that is 39 square miles. If two-	As described in Chapter 5 (Mitigation) of the EIS/OEIS (especially Section 5.2, Mitigation Development Process), the Navy evaluated the effectiveness and practicability of numerous potential mitigation measures. Note that Navy does not employ only visual monitoring, but also makes use of passive acoustic detection when available and appropriate. On Navy ships, hand-held binoculars are always available and pedestal mounted binoculars, very similar to those used in marine mammal surveys, are generally available to Navy Lookouts on board vessels over 60 feet. Also, like marine mammal observers, Navy Lookouts are trained to use a methodical combination of unaided eye and optics as they search the surface around a vessel. In addition to designated Lookouts, there are always additional bridge watch personnel observing the water around the vessel. Finally, the Navy's reliance on visual mitigation has been demonstrated to be

	Comment	Navy Response
	thirds of it will be used for ordinance and vehicle training, then surely there will be conventional pollution and noise pollution affecting residents. How will these pollutants affect residents living on the island and visitors travelling to the island? What will the Navy do to guarantee Tinian residents' quality of life? Vegetation is also still recuperating from damage dealt from the Battle of Tinian and has more new-growth forest than old growth forest. The proposed impact will adversely affect native and endemic avifauna that disperse seeds of flora that are not dispersed by wind. Farallon de Medinilla, even smaller than Tinian, is 0.326 square miles. If it is leased land, then why does bombing continue when damage dealt is irreversible? Active and passive sonar testing around the Marianas should not occur due to its effects on marine mammals. The Navy has suggested having spotters perform 360-degree observation scans from the deck of a vessel to identify marine mammals and sea turtles in test areas to ensure none are in the area during testing, but this is inadequate. This is especially so since these organisms can be subsurface for extended periods of time before requiring oxygen.	effective over years of monitoring associated with Navy training and testing at sea in publicly available reports submitted to NMFS since 2006 and accessible on the NMFS Office of Protected Resources website. In accordance with CEQ guidance, the cumulative impacts analysis focused on impacts that are truly meaningful. This was accomplished by reviewing the direct and indirect impacts that would occur on each resource under each of the alternatives. Key factors considered were the current status and sensitivity of the resource and the intensity, duration, and spatial extent of the impacts of each potential stressor. In general, long-term and widespread impacts were considered more likely to contribute to cumulative impacts than short-term and localized impacts. Those impacts on a resource that were considered to be negligible were not considered further in the analysis. The level of analysis for each resource was commensurate with the intensity of the impacts identified in Chapter 3 (Affected Environment and Environmental Consequences). Please refer to Section 4.1 (Principles of Cumulative Impacts Analysis) for a discussion of the approach to analysis for cumulative effects. Table 4.2-1 lists the other actions and other environmental considerations identified for the cumulative impact analysis. This includes non-Navy actions, which result in greater effects on marine resources than those the Navy is proposing. Use of islands within the CNMI, except FDM, is not proposed as part of the Proposed Action. Training and testing activities within this Supplemental EIS/OEIS are proposed to occur at sea and on FDM. Tables 2.5-1 and 2.5-2 in Chapter 2 (Description of Proposed Action and Alternatives) present the current and proposed training and testing activities.
David Kiyoshi Hosono (DKH)		
DKH-01	You bomb any of the northern islands, and the current will bring debris and fuck up the coral communities of the CNMI, who are you practicing for anyways?	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Patricia Hempey (PH)		
PH-01	I object to the continued bombing and use of sonar in the	The military is committed to protecting the terrestrial and marine environment

	Comment	Navy Response
	Mariana Islands.	during the conduct of its military training and testing activities.
Darwin Valenciano (DV)		
DV-01	1. Look into the unintended vulnerability on the part of the indigenous Marianas on the aspect of traditional fishing may arise due to the different activities involved. The cultural way of living as well as other day to day life activities can be indirectly altered and affected by the influx of population brought about by the series of activities included in the No Action Alternative, Alternative 1 and Alternative 2. 2. On the Socio-Economic aspect, discontinuing training and testing activities might have negative impacts in the No Alternative Action, while Alternative 1 and Alternative 2 will bring positive impacts on the socioeconomic resources of Guam and the CNMI, Gender Based Violence should be look upon as there are known cases or reports of said issue in US military bases and US military activities conducted in the Asia and Pacific specifically South Korea, Japan and the Philippines for the last five (5) years. 3. Being prone to HIV-AIDS incidence and to other communicable diseases must also be taken into consideration in the study areas considering influx of military personnel and their families as new inhabitants together with continuous tourist influx and migration will mix up with the increasing population in Guam and the CNMI. Given the very limited health facilities available to the public in the Marianas, there must be a clear mitigating action that can take a look on this very important health aspect. 4. On impact on Marine Habitats, a conduct of baseline	This Supplemental EIS/OEIS does not propose a change to the ocean areas currently used by both the Navy and the public. Restrictions on accessing areas of co-use would continue to be infrequent and short term, while other fishing sites in the Study Area would continue to be available to the public. The military is committed to continuing to work with the local community on issues that potentially affect the public, including access to fishing sites. Comments associated with item #2 are outside the scope of this Supplemental EIS/OEIS. The Navy strives to protect marine life and marine habitat. Using the latest science and technology, the Navy completed extensive analyses and computer-based modeling to determine impacts and develop science-based protective measures to reduce or avoid potential impacts on marine life. Potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation) of this Supplemental EIS/OEIS, the Navy implements to the maximum extent practicable, procedural and geographic mitigation measures during its training and testing activities to reduce potential impacts on marine life. The Navy's analysis indicates that, with implementation of its protective mitigation measures, there would be no significant impacts on marine species. The Navy strives to protect marine life and marine habitat. Using the latest science and technology, the Navy completed extensive analyses and computer-based modeling to determine impacts and develop science-based protective measures to reduce or avoid potential impacts on marine life. The health of biological resources around Farallon de Medinilla (FDM) is also important to the Navy. As discussed in Sections 3.8 (Marine Invertebrates) and 3.9 (Fishes), recent surveys conducted by the Navy (Smith and Marx, 2016) at

	Comment	Navy Response
	survey is recommended to define and identify extent of impact to the previously disturbed places in terms of sizes, and condition based on short- and long-term consequences to the marine population on each area. 5. Conduct of a periodic surveys of the islands coral reefs to determine impact of soil erosion coming from nearby islands of the study areas as well as periodic survey (every month or 2 months) to ensure previously disturbed areas are not expanding/ contained. 6. On impact to Marine Mammals, mitigating measures for stressor impacts should be defined in terms of what they need to apply as defined in the Marine Mammals Protection Act of 1972.	FDM found that coral fauna are healthy and robust, and the nearshore physical environment and basic habitat types at FDM would remain unchanged. These conclusions are based on (1) a limited amount of physical damage, (2) very low levels of partial mortality and disease (less than 1 percent of all species observed), (3) absence of excessive mucus production, (4) good coral recruitment, and (5) complete recovery by 2012 of the 2007 bleaching event. Smith and Marx (2016) also concluded that the health, abundance, and biomass of fishes, corals, and other marine resources at FDM are as good as, or better than, those in similar habitats elsewhere in the Mariana Archipelago. In addition, the Navy funded additional reef surveys in the nearshore areas of FDM in 2017. The results were approved for public release in September 2018, and available at https://apps.dtic.mil/dtic/tr/fulltext/u2/1069450.pdf. The 2017 survey found little evidence that training has affected coral reef communities at FDM. Only three relatively fresh ordnance items were observed, but no blast pits, craters, or significant areas of coral breakage were observed. The ordnance observed during the 2017 survey was almost exclusively old, encrusted in marine life, and had no discernable impact on surrounding communities. As discussed in Chapter 5 (Mitigation), the Navy would implement a robust suite of mitigation measures for marine mammals that are (1) designed to effect the least practicable adverse impact on marine mammal species or stocks and their habitat and have a negligible impact on marine mammal species and stocks (as required under the Marine Mammal Protection Act), and (2) ensure the Proposed Action does not jeopardize the continued existence of endangered or threatened species (as required under the Endangered Species Act). The Navy is consulting with NOAA under the MMPA and ESA for marine mammals. The consultations resulted in a Final Rule and a Letter of Authorization under MMPA and a Biological Opinion (containing an Incidental Take Permit) under ESA.
Diego Kaipat (DK)		
DK-01	Enough is enough! NO BOMBING OF TINIAN AND PAGAN ISLAND or Guam Once again the people on the Northern Marianas Islands are	The Navy is not proposing any geographic expansion of the training and testing area in this Supplemental EIS/OEIS. Proposed activities are similar to those conducted in the Study Area for decades.

	Comment	Navy Response
	being continuously lied too and mislead by the Navy. At all public and group meetings that I had attended there had been assurances that inputs and comments from everyone will be taken into considerations, however, as I saw clearly during this last public hearing there is a more bigger proposal by the Navy's planned MASSIVE MARIANAS BOMBING RANGE. The MBR consisting of the following training's will have a devastating effect within the following areas. 1.984,469 square nautical miles around the Marianas. 2. 2/3 of Tinian. 3. The entire Island of Pagan. 4. entire FDM. 5. Multiple areas on the island of Guam. All the MITTI propose expansion such as Aerial Bombardment, Shelling from Ships, Direct and Indirect firing range, Amphibious Beach assaults, Live fire maneuvering, Rockets, Missile, Mortar, Beach Landing will cause damages and irreparable harm to the environment and Native Plants and Animals. Also depriving the local population their freedom to live and enjoy the islands, the only Island that they have lived on for centuries. Lastly, Please explain to me Why is CHINA building Island in the pacific for its defenses purposes and the U.S. is instead planning to destroy the Islands that belong to the people of the Marianas?	Training and testing activities are proposed to occur at sea and on FDM. Tables 2.5-1 and 2.5-2 in Chapter 2 (Description of Proposed Action and Alternatives) in this Supplemental EIS/OEIS present current and proposed training and testing activities. The Proposed Action does not include Pagan.
Joseph Smith (JS)		
JS-01	Why is the US Navy and NMFS not using the definitions of "abandonment" or "significantly altered" as stated in the NDAA of 2004 conference report? This conference report specifically defined these two term as they apply to military readiness activities but these definitions have never been used in any U.S. Navy environmental impact statement. The	Thank you for your questions. Our response is as follows: Both the Navy and NMFS are acting consistently with all laws and regulations that apply to the Navy's activities in the MITT study area. The Navy and NMFS are aware of the legislative history referred to in the comment. The Navy and NMFS both addressed that due to the nature of behavioral response research to

	Comment	Navy Response
	specific wording of the conference report is as follows: "Specifically, the conference agreement would amend section 3(18) of the Marine Mammal Protection Act of 1972 (16 U.S.C. 1362(18)) by providing a new definition of "harassment'' applicable only to military readiness activities, as defined by section 315(f) of the National Defense Authorization Act for Fiscal Year 2003 (Public Law 107-314), and scientific research activities by or on behalf of the Federal Government, conducted pursuant to section 104(c)(3) of the Act (16 U.S.C. 1374(c)(3)). The new definition will provide greater clarity for the Department of Defense (DOD) and the regulatory agencies, and would properly focus authorization of military readiness and scientific research activities on biologically significant impacts to marine mammals, a science-based approach. Under the new definition for "Level B Harassment,'' behavioral patterns would be considered "abandoned'' if long-term cessation of behaviors and demographic consequences to reproduction or survivability of the species or stock were involved. In order for natural behavioral patterns to be considered "significantly altered,'' there must be demographic consequences to reproduction or survivability of the species." Questions: 1. Please answer why these very specific definitions have never been used for U.S. Navy environmental planning documents? 2. Also by not using these definitions the USN and NMFS are overstating the amount of behavioral take by vast amounts as they apply to military readiness activities. What is the purpose for overstating the amount of take associated with	date and the complexity and extent of factors influencing behavioral response, it is difficult to identify quantitative thresholds to precisely predict abandonment or significant alteration of a natural behavior pattern. NMFS addressed the application of the definition in light of the best available science in the Proposed Rule as follows on page 5832: Despite the quickly evolving science, there are still challenges in quantifying expected behavioral responses that qualify as take by Level B harassment, especially where the goal is to use one or two predictable indicators (e.g., received level and distance) to predict responses that are also driven by additional factors that cannot be easily incorporated into the thresholds (e.g., context). So, while the behavioral Level B harassment thresholds have been refined here to better consider the best available science (e.g., incorporating both received level and distance), they also still have some built-in conservative factors to address the challenge noted. For example, while duration of observed responses in the data are now considered in the thresholds, some of the responses that are informing take thresholds are of a very short duration, such that it is possible some of these responses might not always rise to the level of disrupting behavior patterns to a point where they are abandoned or significantly altered. We describe the application of this Level B harassment threshold as identifying the maximum number of instances in which marine mammals could be reasonably expected to experience a disruption in behavior patterns to a point where they are abandoned or significantly altered. In summary, we believe these behavioral Level B harassment thresholds are the most appropriate method for predicting behavioral Level B harassment given the best available science and the associated uncertainty. Further, from page 5833 of the Proposed Rule: ...[M]arine mammal responses to sound (some of which are considered disturbances that rise to the level of a take) are highly variable and context specific, i.e., they are affected by differences in acoustic conditions;

	Comment	Navy Response
	military readiness activities? 3. Why has NMFS not adopted the very specific definitions associated with military readiness activities that are clearly defined in the conference report for the NDAA of FY2004? 5. Why has this law not been implemented as written?	differences between species and populations; differences in gender, age, reproductive status, or social behavior; or other prior experience of the individuals. This means that there is support for considering alternative approaches for estimating Level B behavioral harassment. Although the statutory definition of Level B harassment for military readiness activities means that a natural behavior pattern of a marine mammal is significantly altered or abandoned, the current state of science for determining those thresholds is somewhat unsettled. In its analysis of impacts associated with sonar acoustic sources (which was coordinated with NMFS), the Navy used an updated conservative approach that likely overestimates the number of takes by Level B harassment due to behavioral disturbance and response. Many of the behavioral responses identified using the Navy's quantitative analysis are most likely to be of moderate severity as described in the Southall et al. (2007) behavioral response severity scale. These "moderate" severity responses were considered significant if they were sustained for the duration of the exposure or longer. Within the Navy's quantitative analysis, many reactions are predicted from exposure to sound that may exceed an animal's Level B behavioral harassment threshold for only a single exposure (a few seconds) to several minutes, and it is likely that some of the resulting estimated behavioral responses that are counted as Level B harassment would not constitute "significantly altering or abandoning natural behavioral patterns." The Navy and NMFS have used the best available science to address the challenging differentiation between significant and non-significant behavioral reactions (i.e., whether the behavior has been abandoned or significantly altered such that it qualifies as harassment), but have erred on the cautious side where uncertainty exists (e.g., counting these lower duration reactions as take), which likely results in some degree of overestimation of Level B behavioral harassment. We consider application of this Level B behavioral harassment threshold, therefore, as identifying the maximum number of instances in which marine mammals could be reasonably expected to experience a disruption in behavior patterns to a point where they are abandoned or significantly altered (i.e., Level B harassment). Because this is

	Comment	Navy Response
		the most appropriate method for estimating Level B harassment given the best available science and uncertainty on the topic, it is these numbers of Level B harassment by behavioral disturbance that are analyzed in the Preliminary Analysis and Negligible Impact Determination section and would be authorized. As the state of science in this area becomes more precise, the estimation of take will be adjusted to be more accurate, and it may be possible to determine with greater precision what responses constitute "abandonment" and "significant alteration" with respect to military activities.
Lincoln Budasi (LB)		
LB-01	The military is a threat to the environment. They continue to work on stolen land in Guåhan while simultaneously destroying native plants and animals. The Agent Orange issue and firing range debris are a couple examples of their destructive nature. Native animals and plant life are in danger of extinction; some native animals and plants have already been extinct and labeled as critically endangered. They have hurt our waters by using sonar technology, which has led to beaked whales washing up on shore (and do not try to claim that there is no correlation between the washed-up bodies of innocent animals and the military's destructive sonar technology because there most certainly is). The people of Guåhan DO NOT WANT THE MILITARY HERE. You continue to danger us. You continue to kill us. Your presence is not welcomed.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.

	Comment	Navy Response
Frank Rasa (FR)		
FR-01	I support military presence in the Marianas but I do not support any military training/bombing of any kind or form in the Commonwealth of the Northern Mariana Islands.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Sean Gunnell (SG)		
SG-01	Please don't go through with this. Let those billions in financial revenue for turning a large piece of land on Guam into a new military base be to diverted to helping aid in, for instance, the suicide prevention crisis on the island instead. So much of that money could be used to help stabilize Guam in a productive and healthy manner than for continuing to fuel the military industrial complex. Bring more electric and solar power, business, mental health physicians, and job opportunities that aren't just military occupations, since a substantial portion of the US military forces is made up of Guam citizens. This will negatively affect the ecosystem and environment in the long run. Don't fuel this unnecessary system and structure, but instead fuel life and lives and love and care. Thanks for reading.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
David Lotz (DL)		
DL-01	Please provide the annual reports required under the current MITT for endangered species that are submitted to USFWS and NOAA. Then should be part of the draft review.	Information on current monitoring projects, technical reports, conference presentations and data are available on the Navy's Marine Species Monitoring Program website at https://www.navymarinespeciesmonitoring.us/.
Dave Lotz (DL)		
DL-02	This is a complaint that at the public event on Guam, an opportunity was denied to make public comments. Further the personnel stationed about the room were not taking down public comments.	From past experience, the Navy has concluded that the open house style public meeting format used during the MITT Supplemental EIS/OEIS public meetings is the most conducive to effective dialogue. Open house style meetings allow a greater number of individuals to engage and interact with Navy team members

	Comment	Navy Response
		and ask questions of subject matter experts. At the public meetings (Tinian Public Library, March 14, 2019; Rota Mayor's Conference Hall, March 15, 2019; Saipan Kanoa Resort, March 18, 2019; and University of Guam, March 19, 2019), multiple comment opportunities were provided to the public. A stenographer was available to record verbal comments and written comments were accepted. The Navy accepted comments from the public, and individuals stationed at the posters were responsible for discussing the MITT Supplemental EIS/OEIS and responding to questions from the public.
David Lotz (DL)		
DL-03	Chapter 1, Purpose and need, provides absolutely no specific information on the threats that the training is designed to meet nor does the chapter provide a justification for this training to be in the area of the Mariana Islands.	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.
Joseph LeePan Guerrero (JLG)		
JLG-01	For over 30 plus years after the Covenant agreement with the United State of America, the CNMI was never a part of the US for so many factors. We are second class to everything not even considering our geographical locations. U.S. Military interest here in the CNMI is to harm our resources be it water, land and air. There is no other interest whatsoever. All the grant funding that the CNMI receive from the Federal Government are peanuts, but can spend billions on destroying our resources. What, why and how I need to know is, what is the beneficial aspect for the CNMI by allowing the Navy to continue destroying our water, land and air? Is it improving the quality of life here in CNMI and what does the Navy going to provide for the CNMI? Why does the Navy want to increase the size of the current needs and how does the Navy determine that no major impact or harm to our resources in our water, land and air? The CNMI does not have exclusive control of it water like other Territories which we have every rights to control our territorial waters.	The Navy is not proposing any geographic expansion of the training and testing area in this Supplemental EIS/OEIS. Proposed activities are similar to those conducted in the Study Area for decades. The Navy acknowledges that the information presented in this Supplemental EIS/OEIS is by necessity very complex. This Supplemental EIS/OEIS contains a rigorous scientific analysis of the potential impacts of the Navy's proposal and thoroughly explains the scientific analysis and findings. The Navy attempts to explain challenging concepts, methods, and the results of the analysis as clearly as possible and developed public informational materials for lay audiences. The Navy prepared project brochures, videos, a website, and posters, using layperson terms to enhance public understanding of the information presented in this Supplemental EIS/OEIS. Based on the demographics of the CNMI, a project fact sheet was also translated into Chamorro. The informational materials, including the translated fact sheet, were made available at all four public meetings and on the project website (www.mitt-eis.com).

	Comment	Navy Response
	The 3,000 pages report is not readable because it is purely written for the military to understand and comprehend all the hidden agendas plus all the military acronyms. One can say that we can have the best presenter speaking for us to understand the conceptual plans, but what is not mention is the concerns that we as a CNMI be really concern on. As a member of this community, I do not support any military expansion or continued use of our water, land or air. FDM will no longer be safe, because we basically allowed continuous bombing, now the Navy want to expand the usage of FDM. If the CNMI is so strategically important to the US for whatever reason(s), than the fair market value of the CNMI is priceless... Leave the CNMI so that we could make use of our water, land and air for future generation. Do not contaminate what is precious to our needs.	The Navy held four open house public meetings, one each on Tinian (Tinian Public Library, March 14, 2019), Rota (Mayor's Conference Hall, March 15, 2019), Saipan (Kanoa Resort, March 18, 2019), and Guam (University of Guam, March 19, 2019). The public meetings were an opportunity for the public to ask questions of Navy leadership, scientists, and other experts about the analysis documented in this Supplemental EIS/OEIS. The Navy encouraged the public to attend these meetings and broadly notified the public through the media, including paid newspaper advertisements and news releases, and direct mail, including letters, postcards, and emails. A voice recorder was provided for any member of the public that wanted to provide an oral comment in a language other than English. The Navy has received feedback from attendees that the open-house format is more conducive to promoting public understanding and constructive dialogue. Open house meetings allow a greater number of individuals to directly engage and interact with Navy team members and ask questions about this Supplemental EIS/OEIS, as well as provide comments on the document. The Navy provided the public 75 days to review and comment on the Draft Supplemental EIS/OEIS, 30 days longer than the minimum recommended time for review of NEPA documents.
ZAJI ZAJRADHARA (ZZ)		
ZZ-01	IT IS VERY SIMPLE...THE CNMI POLITICIANS, VARIOUS CNMI LAWYERS, AND 99% OF THE BUSINESS COMMUNITY> WHICH IS COMPRISED OF 98% FOREIGN SO-CALLED INVESTORS>95% OF THOSE ARE OF CHINESE ETHNIC BACKGROUND..CONTROL THE LOBBYING BODY AND THE SO-CALLED REPUBLICAN/DEMOCRATIC PARTIES... THE LOCAL POWERBROKERS DO NOT, I REPEAT DO NOT WANT THE U.S. MILITARY BOOTS ON THE GROUND BECAUSE OF THE INTELLIGENCE APPARATUS THAT COMES WITH MILITARY ALIGNMENTS...THE CHINESE ARE IN THE PROCESS OF	The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.

	Comment	Navy Response
	MAKING THESE ISLANDS CHINESE SATELLITE STATES, AND THE GOVERNOR, AND SO-CALLED CONGRESSMAN KIOLILI IS MORE THAN HAPPY TO ASSIST THE CHINESE IN EVERY WAY POSSIBLE...ALL THE WHILE FRAMING SAID ASSISSTANCE STABLIZING THE CNMI ECONOMY...BUT, WHICH IN ALL HONESTY A MONEY LAUNDERING / AMERICAN TAXPAYER MONIES LEAVING THESE ISLANDS FOR CHINESE AND THE PHILIPPINES- AND MORE RECENTLY BANGLADESH. I HUMBLY REQUEST THAT A BASE OF BOTH INTELLIGENCE AND MILITARY APPARATUS BE SET-UP HERE IN THE CNMI....Moreover, THE CHINESE FREE VISA WAVIER MUST BE CANCELLED...FOR CAUSE...CHINESE ILLEGAL WORKERS, BABY TOURISTS, AND OVERSTAYERS...ALL YOU NEED DO IS CHECK THE MORE THAN 350 AIR B&B ROOMS...ON ISLAND, THE INCUBATORS CALLED HOTELS/HOSTLES...AND RESEARCH ALL OF THE PROPERTIES THAT ARE BEING BOUGHT AND RESOLD TO OTHER CHINESE All under the guise of e2c/e5c "investment, while at the same time these "investors" are systematically not hiring U.S. CITIZENS...THOUGH, I AM NOT A GENIUS...I READ A LOT...WHICH I HAVE ATTACHED FOR YOUR PURVIEW.	
Juanita Mendiola (JM)		
JM-01	It is pure malice on your part that we, the Chamorro people of the Marianas Islands, United States of America, are continually placed under threat of destruction in guise to protect our islands and our people from threats created by countries, including our own, competing for domination over the world's resources. No great effort is placed on meaningful talk for peace to avoid the demise of human beings, because there exists	Training and testing activities are proposed to occur at sea and on FDM. Tables 2.5-1 and 2.5-2 in Chapter 2 (Description of Proposed Action and Alternatives) in this Supplemental EIS/OEIS present current and proposed training and testing activities. The Proposed Action does not include Pagan.

	Comment	Navy Response
	internal economic machination driving political policies to perpetuate the threat to lives under the semblance of protection. The unfortunate truth is that small colonized communities worldwide are used as testing and training grounds and deployment stations to threaten unfriendly countries. Of course, these training and testing activities are most assuredly tapered down so as not to directly endanger people's lives or create immediately visible environmental affects, but they provide information on the magnitude of destruction that can and will take place when used exponentially. Evidencing this statement is the fact that it was not enough to see the destruction in Hiroshima and Nagasaki, a bigger bomb was tested in Bikini and people were encouraged to watch the fireworks, exposing them to radiation poisoning. To this very day, each generation of children thereafter born I. the Marshall Islands and Japan still experience their latent effects while those who were stillborn were spared the agony of a life devoid of meaningful quality. It does not matter what studies are done to find out the impact of training and testing weaponry. There is no ground, water and air that survived destruction and no human being has been deemed healthy after exposure! The Tinian Mortar range was used since 1945 to 1995. The Site inspection report of August 2015 indicated the presence of MC and MEC to be above the PALs and recommended a	

	Comment	Navy Response
	Remedial Investigation to find out the extent of health and environmental hazards. To this day this area is merely cordoned off with a fence that was destroyed by Typhoon Yutu and is now open. Where is the mitigation planned for this? But, the most evil in all these is the duplicity involved in trying to convince people that all will be fine with mitigation plans in place. Repeatedly incomplete remediation leaches insidious toxins into the environment poisoning our web of life. Runit Dome and Enewetak Atoll and others have created a legacy of islands destroyed to a population experiencing some of the most extant losses The US has intentionally pocketed the Marianas in case of rejection of current militarization, this rejection with Japan and Guam has occurred. This cascade of rejections has left you to the CJMT which has included Pagan for a mere $66 million dollars and Tinian commercial airfield for $40 million. You all claim troop readiness to justify these proposals but what you are failing to include in your proposal is the futility of that readiness when you can't deploy them! What this all boils down to is you all just want a playground to maintain your presence in this region and divert threats away from CONUS. It is an insult and a mockery that we are continually subjected to defend our little resources, way of life and environment against our own country's desire to maintain world power through militarization while China is using the most effective tool - economic domination.	

	Comment	Navy Response
	I plead for transparency and implore on you all to stop treating us without value to our country and world communities. We may be small, but like your small bombs that you plan to test on our grounds, water and air, in the aggregate, will begin to eat away at your own existence. How powerful would we be then when faced with a threat bigger than your weapons? Look around you and see how the climate has changed and the devastations that it continues to bring with forces that are now phenomenal.	
Lynne Bruzzese (LB)		
LB-01	I am writing to express my opposition to the U.S. military's proposal to continue and to expand weapons testing on and around the island of the Farallon de Medinilla in the Northern Mariana Islands, where I lived and worked for many years. I also oppose the proposal to conduct bombing exercises on the island of Pagan. The expanded lease proposal for Farallon de Medinilla and the Navy's Mariana Islands Training and Testing Supplemental Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) are materially inadequate because there has not been a sufficiently thorough study of the impact of the proposed bombings and underwater testing (active sonar and explosives) on migratory birds or marine mammals. Unusual whale strandings already have been observed in the area following the increase in bombing exercises in the area starting a decade ago, indicating that more in-depth study needs to be conducted under the Endangered Species Act and the Marine Mammals Protection Act. Additionally, while the current lease requires the U.S. military to clean up Farallon de Medinilla when its training exercises	The Navy is not proposing any geographic expansion of the training and testing area in this Supplemental EIS/OEIS. Proposed activities are similar to those conducted in the Study Area for decades. Training and testing activities are proposed to occur at sea and on FDM. Tables 2.5-1 and 2.5-2 in Chapter 2 (Description of Proposed Action and Alternatives) in this Supplemental EIS/OEIS present current and proposed training and testing activities. The Proposed Action does not include Pagan.

	Comment	Navy Response
	conclude, the military's record is abysmal in this regard. For example, if the military determines that such clean-up prohibitively expensive, as it did not the former testing range of Kahoolawe in Hawai'i, or if the weapons and other testing so ravages the islands that they remain uninhabitable for the foreseeable future, as happened with Bikini atoll. Many of the Mariana Islands remain pristine and largely unspoiled by human activity. The American government has done more than sufficient damage to islands all over Micronesia, including but not limited to in the Mariana Islands, and this needs to stop now. The health and homes of the people in the area has been compromised by past testing, e.g., in the Marshall Islands, just has the health of U.S. mainlanders, and U.S. mainland flora and fauna, were compromised by atmospheric and underground nuclear testing in the 1940s - 70s. The people and natural resources of Micronesia in general, and the Mariana Islands in particular, are no less precious simply because they're located farther from Washington, D.C. and the Pentagon than the Lower 48 states are. Thank you for considering these comments in opposition to the Navy's plan.	
Lincoln Budasi (LiB)		
LiB-01	The military’s presence on Guam and other islands in the Marianas is detrimental to the existence of indigenous people. The United States continues to destroy the culture and land of CHamoru people, despite local people and organizations speaking out against them.	Training and testing activities are proposed to occur at sea and on FDM. Tables 2.5-1 and 2.5-2 in Chapter 2 (Description of Proposed Action and Alternatives) in this Supplemental EIS/OEIS present current and proposed training and testing activities.

	Comment	Navy Response
Kawena Phillips (KaP)		
KaP-01	Do not expand the testing area because you are killing whales and destroying land in the Marianas! You are destroying endangered forests! stop! do not expand anymore! in fact go back to America and leave the Pacific Islands alone! we have suffered enough under you	The Navy is not proposing any geographic expansion of the training and testing area in this Supplemental EIS/OEIS. Proposed activities are similar to those conducted in the Study Area for decades
Travis Wells (TW)		
TW-01	As a CHamoru and a community member I strongly oppose the proposed military action happening on Laguas yan Gani and throughout Oceania. US military presence on Guåhan, a UN recognizes dependency/colony of the US violates international law. The reckless and destructive actions by the US military by extending testing and operations in our homes threatens our safety, our environment, our livelihoods, and our future. The military needs to take a step back and acknowledge they sit on occupied and stolen land, and to treat the CHamoru people with the respect we deserve by stopping action that desecrates our islands and our indigenous ways of life.	The military is committed to protecting public health and safety and the terrestrial and marine environment while training and testing. Training and testing activities are proposed to occur at sea and on FDM. Tables 2.5-1 and 2.5-2 in Chapter 2 (Description of Proposed Action and Alternatives) in this Supplemental EIS/OEIS present current and proposed training and testing activities.
Dr. Amy Eisenberg (AE)		
AE-01	I worked in the Northern Marianas and experienced Super Typhoon Yutu REMOVE THE TOXIC PCBS ON ROTA ISLAND THAT THE U.S. BURIED IN 1970 NEAR TO WHERE NORTHERN MARIANAS COLLEGE, ROTA CAMPUS STANDS TODAY. MANY PEOPLE ON ROTA HAVE CANCER OR THEIR LOVED ONES HAVE CANCER OR HAVE DIED OF CANCER. SHAME ON THIS GOVERNMENT FOR CRIMES AGAINST HUMANITY. CHAMORU LIVES MATTER. RESPECT THE LAND AND THE FIRST PEOPLES.	The military is committed to protecting public health and safety and the terrestrial and marine environment while training and testing. Training and testing activities are proposed to occur at sea and on FDM. Tables 2.5-1 and 2.5-2 in Chapter 2 (Description of Proposed Action and Alternatives) in this Supplemental EIS/OEIS present current and proposed training and testing activities. The Navy analyzed land-based activities on Guam, Saipan, Tinian, and Rota in the 2015 MITT Final EIS/OEIS; the Navy did not reanalyze land-based activities in this Supplemental EIS/OEIS because there are no changes proposed to those land-based activities.

	Comment	Navy Response
	RESPONSIBLY REMOVE YOUR TOXINS FROM THIS COMMONWEALTH. IT IS YOUR RESPONSIBILITY THAT YOU ARE NOT FULFILLING. MY FATHER DIED OF CANCER DUE TO HIS EXPOSURE TO RADIATION AND ASBESTOS DURING WWII IN THE PACIFIC. YOU KILLED MY BELOVED DAD. HE WAS DEPLOYED TO NAGASAKI AFTER THE US DROPPED THE NUCLEAR BOMBS. HIS SHIP WAS LADEN WITH ASBESTOS AND MANY ON HIS SHIP DEVELOPED CANCER AND DIED OF CANCER. I WILL NEVER FORGIVE THIS. IMPEACH THE WARMONGER SEXUAL PREDATOR KIDNAPPER WEAPONS SALESMAN FOOL IN THE WHITE HOUSE RESPECT INDIGENOUS LANDS AND PEOPLE. RESPECT THE SACRED AND THEIR CULTURES. CHUMP DISGRACES U.S. GET OUT OF THE MARIANAS AND STOP KILLING RARE SPECIES. Dr. Amy Eisenberg The University of Arizona	
Tanielle Tokoro (TT)		
TT-01	How much more pain and suffering must we, the indigenous people to the land, the ecosystem, our oceans, and all animals must endure from the military? How can we live without our land, resources, and water? How does MITT benefit the indigenous people, and the environment in these space? We must never forget that we as all human being are responsible to these spaces for our future generations.	The military is committed to protecting public health and safety and the terrestrial and marine environment while training and testing.

	Comment	Navy Response
Desiree Pia (DP)		
DP-01	Aloha, I understand that this plan is designed to "test" new military equipment and strategies, but as a Native Hawaiian it pains me to imagine bombing and destroying yet another beautiful island even if it is uninhabited by people, just like our dear island of Kaho'olawe which is still recovering and uninhabitable from being bombed by the US military. I'm worried about the historic and culturally important sites that will be affected and destroyed. I feel sad because it's such a constant disappearance of native and indigenous' s people's culture and identity. Lastly, I'm also worried about the effect on not just the land but also marine life such as the coral reefs, fish, seals, whales, turtles, etc. What is flourishing now will surely disrupt and kill off the population of these creatures due to bombing and underwater sonar testing. Please consider this complaint, I'm an advocate for keeping our earth healthy for generations to come. Mahalo	The military is committed to protecting public health and safety and the terrestrial and marine environment while training and testing. This Supplemental EIS/OEIS analyzes effects of the Proposed Action on marine resources. This analysis is presented in Section 3.3 (Marine Habitats), Section 3.4 (Marine Mammals), Section 3.5 (Sea Turtles), Section 3.7 (Marine Vegetation), Section 3.8 (Marine Invertebrates), and Section 3.9 (Fishes). The analysis of cultural resources is presented in Section 3.11 (Cultural Resources).
Brenden Holland (BH)		
BH-01	Please cease live fire training on islands in US territories that harbor endangered species including Pagan Island and Tinian where some of the las repopulation of the humped tree snail Partula gibba. Pagan also has flying foxes and the rare megapode which's re also listed as endangered so damaging their habitat and or continuing activities that contribute to take of these species is illegal. In addition, species under the Marine Mammal Protection Act including the beaked whale also require protection under US law.	The military is committed to protecting public health and safety and the terrestrial and marine environment while training and testing. Training and testing activities are proposed to occur at sea and on FDM. Tables 2.5-1 and 2.5-2 in Chapter 2 (Description of Proposed Action and Alternatives) in this Supplemental EIS/OEIS present current and proposed training and testing activities. The Proposed Action does not include Pagan.

	Comment	Navy Response
Valerie Weiss (VW)		
VW-01	I oppose the Mariana Islands Training and Testing Supplemental EIS/OEIS for environmental reasons as well as for the safety of marine mammals. Please do not destroy parts of our environmental world with military occupation and war practice. There has to be a better way to train than sending loud, far traveling, sonar into the depths.	The military is committed to protecting public health and safety and the terrestrial and marine environment while training and testing.
Gary Chock (GC)		
GC-01	Since the US has so much money to spend on bombing other people's islands and lands, why don't you just build your own islands to bomb closer to your own country like off the east coast .would probably be cheaper than paying for a lease and clean up after you guys bomb the shit out of it .Why do you have to destroy other nations lands to protect your own asses	The military is committed to protecting public health and safety and the terrestrial and marine environment while training and testing.
Patricia Blair (PB)		
PB-01	I oppose any Navy training exercises by the Navy in Guam, Saipan, Marianas, Okinawa, Hawaii. These exercises displace people, harm the environment on land and sea, and in no way improve the USA's security. The USA Navy should focus on cleaning the ocean, looking at ways to live in peace with other countries by respecting their boundaries.	The military is committed to protecting public health and safety and the terrestrial and marine environment while training and testing.
Marcy Koltun-Crilley (MKC)		
MKC-01	I Oppose these testing and training measures, especially the bombings and sonar testing. Living in Hawaii I have seen how even after spending close to a quarter of a billion dollars, the island of Kahoolawe is still not cleaned up or safe. Research shows that this type of sonar is extremely harmful to marine mammals. No more destruction of our islands, oceans and wildlife!	The military is committed to protecting public health and safety and the terrestrial and marine environment while training and testing.

	Comment	Navy Response
	Thank you.	
Matilda Iwanaga (MI)		
MI-01	To Whom It May Concern, I am writing this letter today as an indigenous resident of Guam, born and raised on sacred land, and an advocate of Guam's land, water, air, biodiversity, and culture. Our island's wildlife has been a casualty of the US military's presence in several ways. First, the Navy proposes continued sonar use throughout the region's waters in your latest Environment Impact Statement despite an increase in beaked whales washing up on Guam's shores and research indicating sonar is correlated with such incidents. These recorded incidents are significant. Also thoroughly researched and documented is the military's accidental introduction of the brown tree snake in the 1940s and the devastating effect its introduction has had on the native bird population, and thereby the jungle ecosystem. Despite the cascading devastation, we have yet to see the military's assistance in neutralizing this very problem that you have caused. Furthermore, your planned live firing range next to the island's National Wildlife Refuge will further erode island biodiversity. Three hundred and fifteen acres of land will be cleared and among them, 89 acres of native limestone forest and 110 acres of disturbed limestone forest.	The military is committed to protecting public health and safety and the terrestrial and marine environment while training and testing.

	Comment	Navy Response
	Based on our history with the military and the decisions that are made about our land and waters, WITHOUT OUR INPUT, we have yet to see decisions that are made for the common good that benefit our people, our land, and our resources. Our elderly are still waiting on war reparations that were promised at the end of World War II. When is the US federal government going to act with integrity? When is the US federal government going to do right by the people of Guam? We still have CHamorro's waiting for their promised land, under the CHamorro Land Trust who has been waiting for over 24 years, why not return some of those properties back to the Government or original owners and let them decide on how they would make much better use with their land. Once again we are taken advantage of, and mistaken that we don't know anything. We are a large group of indigenous supporters who will continue to advocate for our island.	
Glenn Manglona (GM)		
GM-01	I am recommending that all printed materials including but not limited to the EIS, brochures and handouts shall be translated in Chamorro and Carolinian languages. Willing to help out in this area since this is my expertise.	The military is committed to protecting public health and safety and the terrestrial and marine environment while training and testing. The Navy acknowledges that the information presented in this Supplemental EIS/OEIS is by necessity very complex; however, the Navy attempts to explain challenging concepts, methods, and the results of the analysis as clearly as possible and developed public informational materials for lay audiences. The Navy prepared project brochures, videos, a website, and posters, using layperson terms to enhance public understanding of the information presented in this Supplemental EIS/OEIS. Based on the demographics of the CNMI, a project fact sheet was also translated into Chamorro. The informational materials,

	Comment	Navy Response
		including the translated fact sheet, were made available at all four public meetings and on the project website (www.mitt-eis.com)
Jay Castro (JC)		
JC-01	Please give the land back to the people of Guam. Please leave the ocean clean and free of toxins. Please do not bring more military to Guam, or any other Pacific nation. Please. You've done enough.	The military is committed to protecting public health and safety and the terrestrial and marine environment while training and testing.
Anthony Rinaldi (AR)		
AR-01	According to a 2017 assessment from the US Fish and Wildlife service, native limestone forest, which is the oldest forest on the island of Guam, has been reduced to about 10% of the island. The military buildup plans to bulldoze 1,000 acres of the remaining native limestone forest, reducing the forest's size to 8%. This will have a detrimental effect on the island's environment and wellbeing. Do not do this.	The military is committed to protecting public health and safety and the terrestrial and marine environment while training and testing. Training and testing activities are proposed to occur at sea and on FDM. Tables 2.5-1 and 2.5-2 in Chapter 2 (Description of Proposed Action and Alternatives) in this Supplemental EIS/OEIS present current and proposed training and testing activities.
Analyn Palugod (AP)		
AP-01	To Whom It May Concern, I am writing this letter today as a resident of Guam and an advocate of Guam's land, water, air and biodiversity. Our island's wildlife has been a casualty due to the military's presence. The navy proposes continued sonar use throughout the region's waters in your latest environmental impact statement despite an increase in beaked whales washing up on Guam's shores and research indicating sonar is correlated with such incidents. These recorded incidents are significant. It has also been documented of the military's accidental introduction of the brown tree snake in the 1940s and the devastating effect its introduction has had on the native bird population. Despite the devastation, we have yet to see the	The military is committed to protecting public health and safety and the terrestrial and marine environment while training and testing. Training and testing activities are proposed to occur at sea and on FDM. Tables 2.5-1 and 2.5-2 in Chapter 2 (Description of Proposed Action and Alternatives) in this Supplemental EIS/OEIS present current and proposed training and testing activities.

	Comment	Navy Response
	military's assistance in neutralizing this very problem that you have caused. Your planned live firing range next to the island's national wildlife refuge will also affect the existing biodiversity. Three hundred fifteen acres of land will be cleared and among them, 89 acres of native limestone forest and 110 acres of disturbed limestone forest. Based on our history with the military and the decisions that are made in our land and our waters, we have yet to see decisions that are made for the common good that benefit our people, our land, and our resources.	
NATASHA THOMPSON (NT)		
NT-01	STOP WITH THE SONAR CRAP! OMG!!! QUIT IGNORING AND DENYING THAT MARINE LIFE IS BEING IMPACTED!!! STOP ALREADY!!!!!	The military is committed to protecting public health and safety and the terrestrial and marine environment while training and testing.
Daisy Demapan (DD)		
DD-01	This proposed action still continues to ignore the adverse environmental impacts to the islands and surrounding waters. There are no feasible alternatives because active sonar and explosives will be detrimental to sea life and cost insurmountable damage for future generations. There is documented evidence of the impact of these military activities and exercises and the military's outright refusal to correct, restore, and/or compensate for damages to indigenous lands, waters, and natural resources around the world.	The military is committed to protecting public health and safety and the terrestrial and marine environment while training and testing.
Lei Teno (LT)		
LT-01	"Training and testing activities have the potential to temporarily limit access to areas of the ocean, which has the potential to impact commercial transportation and shipping,	The military is committed to protecting public health and safety and the terrestrial and marine environment while training and testing.

	Comment	Navy Response
	commercial recreation and fishing, traditional fishing practices, and tourism in the Study Area" (Supplemental MITT, pg. 3.12-16) Our island people have been working hard & diligently to relocate families back to Pagan & other northern islands. Many people enjoy outdoor activities on our northern islands, especially during summer months. Our local wildlife staff have been relocating many local native species to our northern islands to repopulate & thrive. Our northern islands hold the biggest of our fish stock as stock around our main islands are quickly deteriorating. Tinian island is home to countless WWII historically significant sites as well as our endangered native bird species, the Tinian Monarch. Any destruction to our islands & it's surrounding waters is a permanent negative impact to our people & our native species. As a small island chain, all land is precious land. We don't have much of it to begin with & it's only getting smaller with ocean tides rising as a result of global warming. Limiting access and bombing/destruction to Pagan/Tinian & other northern islands is simply unacceptable. There is surely an alternative practice range for the military. There is definitely no alternative island/waters for our people & species.	Training and testing activities are proposed to occur at sea and on FDM. Tables 2.5-1 and 2.5-2 in Chapter 2 (Description of Proposed Action and Alternatives) in this Supplemental EIS/OEIS present current and proposed training and testing activities. The Proposed Action does not include Pagan.
Gregory Woodward (GW)		
GW-01	Top of the morning, I hope I have the right office....quick question please---Are the Marines still planning to build an expanded urban guerrilla training complex and grenade range at the old South Andy Air Force Housing Area here on Guam? We live about a mile downwind of this area, and have frequently experienced the sound of small arms fire, stun grenades, and even window rattling explosions on occasion, not to mention low level HSCS-25 HH-60 helos	Training and testing activities are proposed to occur at sea and on FDM. Tables 2.5-1 and 2.5-2 in Chapter 2 (Description of Proposed Action and Alternatives) in this Supplemental EIS/OEIS present current and proposed training and testing activities.

	Comment	Navy Response
	flying directly overhead--all this from the current, relatively small-scale training operation being conducted there. Quality and safety of life are genuine concerns, and I have to wonder, why not co-locate the proposed South Andy complex and grenade range out at Northwest field, where all the rest of the live fire range training will be conducted? Northwest Field is far from heavily populated areas like the Latte Heights/Plantation area where I live. In addition, South Andy could revert to being a peaceful, quiet, military housing area, like it used to be before. Thanks for reviewing my concerns, and I look forward to hearing from you soon... Cheers!	
Susan Tuck (ST)		
ST-01	Whales in the area- stop your sonar testing!	The military is committed to protecting public health and safety and the terrestrial and marine environment while training and testing.
Ayse Demirkan (AD)		
AD-01	Stop it. Damaging ecosystem is the biggest crime.	The military is committed to protecting public health and safety and the terrestrial and marine environment while training and testing.
Katri Langel (KL)		
KL-01	There is no need for this kind of testing. It is absolutely fatal for the sea animals, so cruel!	The military is committed to protecting public health and safety and the terrestrial and marine environment while training and testing.
Alex Poulos (AP)		
AP-01	We need to stop treating our oceans and it's inhabitants as our property. That they just need to deal with the things we do there. This planet is NOTHING without our oceans, we must stop torturing cetaceans with these unnecessary tests.	The military is committed to protecting public health and safety and the terrestrial and marine environment while training and testing.

	Comment	Navy Response
	It is literally killing them. If the situation was turned, we'd consider these tests terrorist attacks.	
Julieann Lujan (JL)		
JL-01	Hafa Adai, I am born and raised in California nearing my 60th birthday. I have lived on this Island approximately 30 years as a state side hire to fell in love with the people, quality of life and especially the ocean. I am proud to be an American and support the military cause coming from a very military oriented family. My father was the first nutritionist and one of the first chief petty officers on Guam. I appreciate the efforts of our country to continue protecting and safeguarding. Unfortunately, the perception by Islanders is that our voice like many other islands and territories is not being heard or acknowledged. My concern is with the environmental impact to our marine life - most recently with dying beached whales that slowly but surely wash up on our shores. And this is just the start of our marine downfall. The research and example conducted in Spain where a dozen beached whales died within 2 years then ceased once sonar testing was banned is not proof enough? Many issues are at stake but mostly our opinion to be heard and to make a difference in the continued exploitation of our tiny, non-voting colony that is a U.S. territory. Maybe you cannot treasure earths greatness as we do here but please give us the opportunity to protect what was once originally ours....	The military is committed to protecting public health and safety and the terrestrial and marine environment while training and testing. Marine life is important to the Navy. Using the latest science and technology, the Navy completed extensive analyses and computer-based modeling to determine impacts and develop science-based protective measures to reduce or avoid potential impacts on marine life. As explained in the Navy's technical report on marine mammal strandings (*Marine Mammal Strandings Associated with U.S. Navy Sonar Activities*, 2017 [www.mitt-eis.com]), marine mammal strandings have been a historic and ongoing occurrence attributed to a variety of causes, both natural and anthropogenic. Over the last 50 years, increased awareness and reporting has led to more information about species affected and raised concerns about anthropogenic sources of stranding. While there have been limited numbers of marine mammal mortalities potentially associated with U.S. Navy activities, the root causes are not clear in most cases. NMFS, as the regulator, maintains the authoritative National Stranding Database. In addition, Section 3.4.2.1.1.6 (Stranding) has been expanded to include additional information about strandings of beaked whales in the Mariana Islands and the Navy's support of efforts to better understand the causes of marine mammal strandings.

	Comment	Navy Response
	Respectfully...	
Jenna Miles (JM)		
JM-01	There is simply no logic in continuing practices that are known to be harmful to wildlife.	The military is committed to protecting public health and safety and the terrestrial and marine environment while training and testing.
William Fife (WF)		
WF-01	NO MILITARY BOMBING OF PAGAN!!!! A supporting statement of this includes the horrendous historical track record of environmental devastation wherever the US military has bombed before, including Hawaii, and most significantly the Marshall Islands. Uninhabitable islands, cultural devastation as well as environmental, on several islands. Destroying Pagan's environmental beauty should be a crime, and not supported by any government. How can the US military "prove" or "promise" that Pagan will not become an environmental wasteland? They cannot, and if they do, they are not being honest. And from what I've read, the move to Guam from Okinawa did not include environmental impacts on the CNMI--what else do you need to know to convince you that this is a bad idea and does not have the local people's best interest in mind?	Training and testing activities are proposed to occur at sea and on FDM. Tables 2.5-1 and 2.5-2 in Chapter 2 (Description of Proposed Action and Alternatives) in this Supplemental EIS/OEIS present current and proposed training and testing activities. The Proposed Action does not include Pagan.
Molly Caccia (MoC)		
MoC-01	Your sonar and explosive training and testing will be so deafening that it will raise whales to abandon their normal feeding grounds and migration patterns, and will destroy their hearing to the point of hemorrhage. Whales are integral to the health of the marine ecosystem, and without them your testing is useless because there will be nothing and no one left in the world once the oceans are compromised. Marine life has declined by 49% since 1970. Please think of marine life, without which we cannot survive. Do not conduct this training and testing.	The military is committed to protecting public health and safety and the terrestrial and marine environment while training and testing. Research cited in this Supplemental EIS/OEIS and in the 2015 MITT Final EIS/OEIS indicates that behavioral changes are temporary and not necessarily repeated. Given the range of possible responses and variability in the type and severity of behavioral responses observed in marine mammals, potential long-term or population-level impacts are unlikely. The Navy has addressed recent research on possible long-term effects in Section 3.4.2.1.1.7 (Long-Term Consequences) in

	Comment	Navy Response
		this Supplemental EIS/OEIS and in Section 3.4.3.1.3 (Long-Term Consequences to the Individual and the Population) in the 2015 MITT Final EIS/OEIS. Marine life and marine habitat are important to the Navy. Using the latest science and technology, the Navy completed extensive analyses and computer-based modeling to determine impacts and develop science-based protective measures to reduce or avoid potential impacts on marine life. Potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practicable, procedural and geographic mitigation measures during its training and testing activities to reduce potential impacts on marine life. The Navy's analysis indicates that, with implementation of its protective mitigation measures, there would be no significant impacts on marine species. Activities using underwater explosives were modeled to estimate impacts on marine mammals from explosives. No mortalities of any marine mammals are predicted. Mitigation measures specifically for mine countermeasure activities are presented Section 5.3.3.7 (Explosive Mine Countermeasure and Neutralization Activities). The Navy is formally consulting with NMFS concerning potential impacts of the proposed training and testing activities on all marine mammals protected under the MMPA and known to occur in the MITT Study Area. The Navy has updated this Supplemental EIS/OEIS based on section 7 consultation and will incorporate all reasonable and prudent measures, and terms and conditions that are set forth in the Biological Opinion, in the Record of Decision.
Margaret Doran (MaD)		
MaD-01	PLEASE DO NOT IMPLEMENT THE USE OF SOLAR/EXPLOSIVES FOR THE AT-SEA TRAINING AND TESTING. The benefits of doing so will not outweigh the harm it will inflict on marine life. Please reconsider this proposal.	The military is committed to protecting public health and safety and the terrestrial and marine environment while training and testing. The military is committed to protecting the terrestrial and marine environment during the conduct of its military training and testing activities.

	Comment	Navy Response
Toni Morga (TM)		
TM-01	With all due respect, what you are doing is wrong. Not only are you wasting tax dollars on unnecessary expansion of obsolete military practices, you are also destroying an endangered habitat of people who have already been oppressed enough by the federal government. The people of Guam have already given 25% of their island for the military with the promise of reparations that they will likely never see. As a veteran, I suggest you turn your attention to more immediate security concerns, as well as learning more about the environment and people you wish to further burden. The island infrastructure will not be able to handle your build-up demands, nor should you expect them to. The federal government should be helping the people of Guam work towards self-sovereignty and sustainability, but instead, you are more concern with unrealistic imperialistic ideologies and ignoring the clear and present danger of reduced cyber and national security. From comments gathered on your previous attempts at this endeavor, you'll see nothing has changed in the affected resources. The following expansive list from the PDN (2/5/2019) details all the damage you will cause with your pointless MITT: "Marine mammals Marine mammals have an extensive list of potential consequences due to training and testing activities in the document.	The Navy is not proposing any geographic expansion of the training and testing area in this Supplemental EIS/OEIS. Proposed activities are similar to those conducted in the Study Area for decades. Marine Mammals Response: The stressors listed in the comment are all analyzed in Section 3.4 (Marine Mammals) of this Supplemental EIS/OEIS. The potential impacts from in-water electromagnetic devices, high-energy lasers, vessels, in-water devices, military expended materials, seafloor devices, cables, wires, parachutes are unlikely to have a substantial effect on individual marine mammals or populations of marine mammals in the MITT Study Area. Section 3.0.4.4 (Physical Disturbance and Strike Stressors) presents the analysis of the individual sub-stressors, including the use of vessels and in-water devices, military expended materials, and seafloor devices. The analysis indicates that items having the highest potential to affect marine mammals (other than sonar or explosives) have decreased in comparison to the 2015 MITT Final EIS/OEIS (Tables 3.0-12 through 3.0-18). Section 3.8 (Marine Invertebrates) includes an analysis of potential impacts on coral. A detailed analysis of potential impacts on coral around FDM is also provided. Based on the analysis, coral fauna are healthy and robust, and the nearshore physical environment and basic habitat types at FDM would remain unchanged. These conclusions are based on (1) a limited amount of physical damage, (2) very low levels of partial mortality and disease (less than one percent of all species observed), (3) absence of excessive mucus production, (4) good coral recruitment, and (5) complete recovery by 2012 of the 2007 bleaching events. Smith and Marx (2016) also concluded that the health, abundance, and biomass of fishes, corals, and other marine resources at FDM are as good as, or better than, those in similar habitats elsewhere in the Mariana Archipelago. The Navy funded additional reef surveys in the nearshore areas of FDM in 2017. The results were approved for public release in September 2018 and are available at https://apps.dtic.mil/dtic/tr/fulltext/u2/1069450.pdf. The 2017 survey found little evidence that training has affected coral reef communities at FDM. Only three relatively fresh ordnance items were observed,

	Comment	Navy Response
	The use of sonar and other transducers, munitions at or near the water, in-water electromagnetic devices, high-energy lasers, vessels, in-water devices, military expended materials, seafloor devices, cables, wires, parachutes all present a risk to marine mammals in the areas of training and testing. These risks range from temporary affects to death. Marine habitats According to the Navy's analysis, most of the military explosions would detonate at or near the water surface, minimizing effects on marine habitats. However, the document states that training activities that include bottom-laid in-water explosions would affect marine habitat structures, but that "these activities would occur in areas that have been previously disturbed, and impacts would be localized." Sea floor resources that could be affected are shallow-water coral reefs, live hard bottom, artificial reefs and submerged cultural resources. Sea turtles The use of sonar, transducers, explosives, in-water electromagnetic devices, vessels, in-water devices, weapons, military expended materials, seafloor devices, cables and wires may cause short to long-term disturbances to sea turtles, the document states. Marine vegetation	but no blast pits, craters, or significant areas of coral breakage were observed. The ordnance observed during the 2017 survey was almost exclusively old, encrusted in marine life, and had no discernable impact on surrounding communities. The military understands that fishing is an important socioeconomic and cultural resource for the people of the CNMI and will continue to work with the fishing community to enable safe access to fishing areas around FDM. The military is committed to continuing to work with the local community on issues that potentially affect the public, including access to fishing sites.

	Comment	Navy Response
	Physical disturbances and strikes from the use of in-water explosives may destroy plants, or damage parts of plants, the document states. However, "no detectable changes are expected in marine vegetation growth, survival, propagation or population-level impacts." Fish Fish may be affected by the use of sonar and other transducers, explosives, in-water electromagnetic devices, vessels, in-water devices, aircraft, weapons, military expended materials, seafloor devices, cables, wires and parachutes, according to the document, however, effects are expected to be temporary and infrequent. More severe impacts such as mortality or injury could lead to permanent or long-term consequences for individuals, but, overall, long-term consequences for fish populations are not expected, the document states. Socioeconomic resources and environmental justice Training and testing may have on commercial and recreational fishing, traditional fishing practices or tourism when areas of co-use are temporarily inaccessible to ensure public safety during training and testing activities, the document states. This is one of the primary concerns regarding the recent proposed surface danger zone in the Finegayan area, which was initially addressed in the 2015 Marianas Training and Testing document."	

	Comment	Navy Response
Tasi Ada (TA)		
TA-01	As a Chamorro, born and raised on the island Guam, I am firmly against the proposed military activities that have been openly acknowledged by the U.S. military to be detrimental to the island's environment and the inhabiting animals. Guam has limited access to resources for the island's local residents to engage in self-sustainable practices and keep the carbon footprint at a minimum. Military activities would further limit these resources, contribute to the endangerment of animals unique to the Marianas archipelago, and further our dependency on the military presence. Globally, the loss of marine life is recognized to be a significant concern to the ecosystem, as a whole, having left negative impacts that affect all who populate the Earth. The "takes" by military activity directly contribute to this global issue and have an immediate impact on Guam's marine life and the local residents in turn. Guam continues to be used and treated unjustly; a place of not only with unique biodiversity both on land and at sea, but an island rich with culture and history that dates thousands and thousands of years ago as well. These "takes" are not justifiable, not necessary, and not right. The U.S. military activities do not benefit the local residents in the way that respects the people, the environment, the animal inhabitants; instead, it only perpetuates the unfortunate realities that the U.S. military is willing to benefit at the cost of Guam's land and people. That I cannot be for in any way.	The military is committed to protecting public health and safety and the terrestrial and marine environment while training and testing. Training and testing activities are proposed to occur at sea and on FDM. Tables 2.5-1 and 2.5-2 in Chapter 2 (Description of Proposed Action and Alternatives) in this Supplemental EIS/OEIS present current and proposed training and testing activities.
Shawna Bamba (SB)		
SB-01	Testing should not be done at marianas because it endangers the marine ecosystem that the islands depend on. By conducting these tests, it damages corals and sea creatures while contributing to the noise pollution. I understand these trainings and tests must be conducted in order to support the	The military is committed to protecting public health and safety and the terrestrial and marine environment while training and testing.

	Comment	Navy Response
	needs of the training, but aren't their alternatives that do not harm an environment. We live in a time where technology is rapidly evolving, I suggest we find an alternative way that is not at the expense of the environment and the community.	
Paige Reyes (PR)		
PR-01	This proposed action is not only unsafe for our oceans that support us, including the beaked whale population that is endangered because these activities, but because the Navy has failed to conduct enough long term research to warrant these kinds of harmful and disruptive sonar exercises. Marine mammals, sea turtles and marine vegetation may be harmed as the Navy continues, and increases, its training and testing activities, as detailed in the Navy's supplemental environmental impact statement: Marine mammals: Marine mammals have an extensive list of potential consequences due to training and testing activities in the document. The use of sonar and other transducers, munitions at or near the water, in-water electromagnetic devices, high-energy lasers, vessels, in-water devices, military expended materials, seafloor devices, cables, wires, parachutes all present a risk to marine mammals in the areas of training and testing. These risks range from temporary affects to death. Marine habitats: According to the Navy's analysis, most of the military explosions would detonate at or near the water surface,	Marine Mammals Response: The stressors listed in the comment are all analyzed in Section 3.4 (Marine Mammals) of this Supplemental EIS/OEIS. The potential impacts from in-water electromagnetic devices, high-energy lasers, vessels, in-water devices, military expended materials, seafloor devices, cables, wires, parachutes are unlikely to have a substantial effect on individual marine mammals or populations of marine mammals in the Study Area. Section 3.0.4.4 (Physical Disturbance and Strike Stressors) presents the analysis of the individual sub-stressors, including the use of vessels and in-water devices, military expended materials, and seafloor devices. The analysis indicates that items having the highest potential to affect marine mammals (other than sonar or explosives) have decreased in comparison to the 2015 MITT Final EIS/OEIS (Tables 3.0-12 through 3.0-17 and Table 3.0-19). Marine life is also important to the Navy. Using the latest science and technology, the Navy completed extensive analyses and computer-based modeling to determine impacts and develop science-based protective measures to reduce or avoid potential impacts on marine life. Potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. Also, as described in Chapter 5 (Mitigation), the Navy implements, to the maximum extent practicable, procedural and geographic mitigation measures during its training and testing activities to reduce potential impacts on marine life. The Navy's analysis indicates that, with implementation of its protective mitigation measures, there would be no significant impacts on marine species. Activities using sonar and activities using underwater explosives were modeled to estimate impacts on marine mammals. For the seven-year LOA period being requested, the Navy's quantitative analysis for acoustic and explosive sources in

	Comment	Navy Response
	minimizing effects on marine habitats. However, the document states that training activities that include bottom-laid in-water explosions would affect marine habitat structures, but that "these activities would occur in areas that have been previously disturbed, and impacts would be localized." Sea floor resources that could be affected are shallow-water coral reefs, live hard bottom, artificial reefs and submerged cultural resources. Sea turtles: The use of sonar, transducers, explosives, in-water electromagnetic devices, vessels, in-water devices, weapons, military expended materials, seafloor devices, cables and wires may cause short to long-term disturbances to sea turtles, the document states. Marine vegetation: Physical disturbances and strikes from the use of in-water explosives may destroy plants, or damage parts of plants, the document states. However, "no detectable changes are expected in marine vegetation growth, survival, propagation or population-level impacts." Fish: Fish may be affected by the use of sonar and other transducers, explosives, in-water electromagnetic devices, vessels, in-water devices, aircraft, weapons, military expended materials, seafloor devices, cables, wires and	the MITT Study Area estimates zero mortalities, 367 Level A exposures, and 377,091 Level B exposures (see Section 5)." The Navy is formally consulting with NMFS concerning potential impacts of the proposed training and testing activities on all marine mammals protected under the MMPA and known to occur in the MITT Study Area. The Navy has updated this Supplemental EIS/OEIS based on section 7 consultation and will incorporate all reasonable and prudent measures, and terms and conditions that are set forth in the Biological Opinion, in the Record of Decision. The military understands that fishing is an important socioeconomic and cultural resource for the people of the CNMI and will continue to work with the fishing community to enable safe access to fishing areas around FDM. The military is committed to continuing to work with the local community on issues that potentially affect the public, including access to fishing sites.

	Comment	Navy Response
	parachutes, according to the document, however, effects are expected to be temporary and infrequent. More severe impacts such as mortality or injury could lead to permanent or long-term consequences for individuals, but, overall, long-term consequences for fish populations are not expected, the document states. Socioeconomic resources and environmental justice: Training and testing may have on commercial and recreational fishing, traditional fishing practices or tourism when areas of co-use are temporarily inaccessible to ensure public safety during training and testing activities, the document states. This is one of the primary concerns regarding the recent proposed surface danger zone in the Finegayan area, which was initially addressed in the 2015 Marianas Training and Testing document. The extent of the harm that has occurred and will continue to be incurred by these Naval activities have not been adequately examined enough to warrant the safety and necessity of these practices. Furthermore, the connection to the ocean and responsibility we have to protect it is far more important, deserves more respect, and demands thorough research and follow-through on the long-term effects than the Navy has shown.	
Mary Aquiningoc (MA)		
MA-01	Please do not mistreat the land and sea around the Marianas, sonar and missile testing are very negatively ecologically impactful. It can actually decimate species considered	The military is committed to protecting public health and safety and the terrestrial and marine environment while training and testing.

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	cornerstone species to the food chain, and even the use of sonar in the waters of the proposed area will drastically hurt the beak nose whale population which is barely starting up again and already contends with naval sonar pollution. It's a fragile and incredibly important ecosystem that affects the greater Pacific and thus the world. It's also incredibly disrespectful and dangerous to people dependent on the Pacific and the CNMI ecosystem to tamper in this way. Please consult ecological organizations in the marianas, and scientists like those at University of Guam, NOAA, and the US Fish and Wildlife Service in Guam to minimize negative impact!	
Kristine Klar (KK)		
KK-01	Please include the new information recently released regarding how beaked whales, particularly Cuvier's, get so scared by naval sonar that they change their diving pattern so severely to escape the sonar that they essentially get the bends and die. https://www.france24.com/en/20190130-whales-sonar-may-provoke-suicidal-behaviour-study Our marine animals are faced with growing uncertainty every day because of climate change. Let's not make things any more difficult for them by inundating them with sonar that kills them.	The Navy relied on best available science to conduct its impact assessment. The article cited by the commenter refers to a paper published by de Quiros et al. (2019), which summarizes the outcome of a workshop convened to focus on decompression sickness and its role in atypical mass stranding events involving beaked whales. The information reviewed in that summary paper was also considered in the Navy's assessment of potential impacts on marine mammals in the EIS. Please see Section 3.4.2.2.1.1 (Injury) and Section 3.4.2.2.1.6 (Stranding) for additional information.
CJ Paulino (CJP)		
CJP-01	How what is the longterm timeframe of the DoD's "one-for-one" reforestation plan? How do they plan on mimmicking the successional patterns of Guam's limestone forests? What plant species do they plan on utilizing for the early succession of the reforested plot? How long will they be maintained? Another question I have is why the DoD sees it necessary to	The military is committed to protecting public health and safety and the terrestrial and marine environment while training and testing. Training and testing activities are proposed to occur at sea and on FDM. Tables 2.5-1 and 2.5-2 in Chapter 2 (Description of Proposed Action and Alternatives) in

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	claim and develop older, more pristine plots of limestone forests and not recently disturbed forests? Research from Dr. Haldre Rogers has shown that the lack of birds on the island greatly reduces the forest community's succession and function. This coupled with habitat loss and other stresses makes our pristine forests more fragile than ever. Restoring disturbed sites are the least sustainable option, both financially and environmentally. Limiting our overall impact on all forest ecosystems as a whole is important, but preserving the dwindling old growth forests should be paramount.	this Supplemental EIS/OEIS present current and proposed training and testing activities.
Jesse Torres (JeT)		
JeT-01	Your firing ranges proposed for Ritidian and Pagan should be stopped. It is not necessary to destroy those places for training purposes. The military is supposed to protect our lands not destroy them.	The military is committed to protecting public health and safety and the terrestrial and marine environment while training and testing. Training and testing activities are proposed to occur at sea and on FDM. Tables 2.5-1 and 2.5-2 in Chapter 2 (Description of Proposed Action and Alternatives) in this Supplemental EIS/OEIS present current and proposed training and testing activities. The Proposed Action does not include Pagan.
No name provided		
NNP-03	Please consider holding more hearings at schools or other public venues to encourage public participation. Hyperlinking references in the document would help with review. Color coding actions expected to increase and decrease in Appendix A, similar to Appendix F would be helpful. Substantially, I would be interested in seeing more opportunities for community engagement in resource monitoring and ongoing management activities such as these highlighted on the videos displayed at this event. More locally supported monitoring will help provide better data and better environmental outcomes.	The military is committed to protecting public health and safety and the terrestrial and marine environment while training and testing.

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Tino Aquon (TiA)		
TiA-01	Please send one of hard copy.	A copy of the Draft Supplemental EIS/OEIS was mailed and delivered to the commenter.
John C. Borja (TCB)		
TCB-01	–Does not fully explained waste management storage impacts on the acquirer or possible contaminants into surface water (watersheds). - Volume + handling of hazardous waste materials; spoilage and or intentional release as mission detects.	Training and testing activities within this Supplemental EIS/OEIS are proposed to occur at sea and on FDM. For land-based activities, the Navy manages solid waste, both non-hazardous or hazardous, in accordance with Navy policies and compliance with federal regulations. The Navy analyzed land-based activities on Guam, Saipan, Tinian, and Rota in the 2015 MITT Final EIS/OEIS; the Navy did not reanalyze land-based activities in this Supplemental EIS/OEIS because no changes are proposed to those land-based activities. The Guam Waterworks Authority reviewed the proposed planned military activity and in their submitted comment determined that the MITT Supplemental EIS/OEIS will not have an impact to the ability for Guam Waterworks Authority to provide safe drinking water to its customers and ensure that wastewater discharge is conducted in appropriate manner.
No Name Provided (NNP)		
NNP-04	Thank you for the opportunity to provide comments on the MITT draft Supplemental EIS/OEIS. I provide this brief comment on behalf of the people of Tinian and the Tinian Leadership. I'm here today to express my appreciation of the Navy's need to train and conduct testing to ensure that the different branches of our Armed Services meet their respective missions and that they maintain combat readiness. With that said, we believe that training activities conducted within out waters, land, air and see must consider the long-term impact of these activities on the environment and the people. Today, I reiterate the concerns which have previously been expressed by the Municipality with regards to underwater testing activities using sonars and explosives. A recent article published in the Pacific Daily News reported	As explained in the Navy's technical report on marine mammal strandings (*Marine Mammal Strandings Associated with U.S. Navy Sonar Activities*, 2017 [www.mitt-eis.com]), marine mammal strandings have been a historic and ongoing occurrence attributed to a variety of causes, both natural and anthropogenic. Over the last 50 years, increased awareness and reporting has led to more information about species affected and raised concerns about anthropogenic sources of stranding. While there have been limited numbers of marine mammal mortalities potentially associated with U.S. Navy activities, the root causes are not clear in most cases. NMFS, as the regulator, maintains the authoritative National Stranding Database. The Center for Naval Analysis (CNA) recently conducted a statistical study of correlation of beaked whale strandings around the Mariana Islands with the use of U.S. Navy sonar, finding that insufficient evidence of a correlation exists. The CNA study used the complete record of all U.S. Navy sonar use between 2007 and 2019, including major

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	another beaked whale off the waters of Agat on Jan 17 of this year. The whale's stranding coincided with the Navy's anti-submarine warfare training. According to the same article, the first documented incident of a beaked whale washing ashore in Micronesia was in the Marshall Islands in 1975. The next stranding was not until 2007 in Piti, 35 years later. And just within these last 10 years whale strandings went from 1 in 35 years, to 6 in years which some has linked to the increase in military activities in our oceans. Right now, we do not have enough information to determine whether these strandings are a result of these increased activities. What we do know is that strandings have increased with the increase of military training activities in our waters. Many of our people rely on the ocean to not only supplement their income but to feed their families. There is a lot we do not know or understand yet about how all these activities will impact our marine ecosystem in the long run and I'm concerned about long-term impacts not just on marine mammals but on fish stock and pollution in our waters as a result of these activities. I thank you for providing this supplemental study but I want the record to reflect that the concerns of the Municipality remain the same.	training events, joint exercises, and unit level training/testing. The analysis also included the complete beaked whale stranding record for the Mariana Islands through 2019. Following the methods in Simonis et al. (2020), the CNA analysis found insufficient evidence of a correlation between sonar use and beaked whale strandings when considering the complete sonar use record. The CNA finding is in contrast to the finding in Simonis et al. (2020), which depicted a significant correlation between beaked whale strandings and Navy sonar use. However, the Simonis et al. (2020) result relied on substantially incomplete or inaccurate assumptions about U.S. Navy sonar use around the Mariana Islands. CNA also conducted statistical analyses specific to each island where beaked whale strandings have been observed in the Mariana Islands, similarly finding insufficient evidence of a correlation to sonar use. Additional information on the findings of the CNA analysis are presented in Section 3.4.2.1.1.6 (Stranding) in Chapter 3.4 (Marine Mammals). Section 3.4.2.1.1.6 (Stranding) has been expanded to include additional information about strandings of beaked whales in the Mariana Islands and the Navy's support of efforts to better understand the causes of marine mammal strandings.
Leon Guererro (LeG)		
LeG-01	Page 1 of 17; Section 3.5.2.2.1.6 1. Long Term Consequences of Exploding Munitions The Auditory impact of exploding munitions has not been studied according to the MITT-SEIS document. The sea turtles could be hurt. Little is known about how turtles use sound in the environment – the MITT states "sound thresholds for sea turtles not suggested because auditory effects not studied." We should know how explosions effects sea turtles and	This Supplemental EIS/OEIS includes an update to the 2015 Final EIS/OEIS in the methods used to assess potential impacts on sea turtles from explosions. Based on these methods, and the peer-reviewed literature on what is known about sea turtle hearing and how sound pressure waves from explosions move through the water, the Navy presents the best available science to assess impacts on sea turtles. The potential effects of sonar and explosives on marine mammals are quantitatively estimated using the Navy's Acoustic Effects Model (see the technical report, *Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing*, available on the project website, for details on the quantitative methodology).

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	whether they are being damages & behaviors adversely changed. Auditory study on the sea turtle is needed. Page 2 of 17; Section 3.8.1.1 2. Sound Sensing & Productions New studies show invertebrates have receptors connected to their central nervous system that feels vibrations. Yet despite these new studies, the MITT does not reflect that corals can sense vibrations. Does sound alter coral reproductive systems? What level does sound have to reach to hurt coral? We should know this. Climate change is already making corals stressed and sound damage is on top of that – Extra stress on already stressed corals – Is there a study that considers sound on climate effected corals? Page 3 of 17; Sections 3.8.1.3 3. Endangered Species Act NMFS has determined 7 species of clams should be listed as ESA, according to the MITT-SEIS. A colony of clams exists on the Spanish steps at the tip of the Chote Peninsula and at Dadi Beach. The clams' status is under review – We should have this information – What will be the effect of the MITT activities on the Clams? What happens if they are ESA determined after the comment period closes? What is the process then? Page 4 of 17; Section 3.8.2.2 4. Explosive Stressors	This Supplemental EIS/OEIS also includes updated density estimates for sea turtles in nearshore waters of Guam and the CNMI. This information has been used to improve the Navy's impact assessment methods and to identify mitigation measures to avoid high density sea turtle areas. This information has been shared with NMFS Office of Protected Resources, as per the Navy's requirements to consult with NMFS on potential effects on ESA-listed species. As part of the Navy's Proposed Action, the Navy has designed standard operating procedures and procedural mitigation measures to reduce potential impacts on sea turtle species. Additional information regarding the Navy's standard operating procedures is provided in Section 2.3.3 (Standard Operating Procedures) and Chapter 5 (Mitigation). As described in Section 3.8.1.1 (Sound Sensing and Production), new studies on particle motion detection by Roberts et al. (2016) reinforces the finding that mechanical receptors on some invertebrates are found on various body parts. In addition, these structures are connected to the central nervous system and can detect some movements or vibrations that are transmitted through substrate (Edmonds et al., 2016). The 2015 MITT Final EIS/OEIS stated that invertebrate species detect sounds through particle motion, which diminishes rapidly from the sound source. Most activities using sonar or other active acoustic sources would be conducted in deepwater, offshore areas of the Study Area and are not likely to affect invertebrates. Furthermore, invertebrate species have their best hearing sensitivity below 1 kHz and would not be capable of detecting the majority of sonars and other acoustic sources used in the Study Area. As stated in Section 3.8.1.3 (Endangered Species Act-Listed Species), NMFS determined that seven species of giant clam (*Hippopus, H. porcellanus, Tridacna costata, T. derasa, T. gigas, T. squamosa, and T. tevoroa*) were candidates that may warrant listing under the ESA (82 Federal Register 28946). A status review is currently being done for these species. Two species, *H. hippopus and T. gigas*, have historically been found in the Study Area, but are believed to have been locally extirpated (Meadows, 2016).

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	Some explosions could occur close to corals and could kill or injure them according to the MITT-SEIS. Also explosions near the sea floor or in the water column may harm corals. Are we informed of explosions that damage coral? Do divers assess damage after explosive event and share damage data? Page 5 of 17; Section 5.4.1 5. Mitigation Measures for Sea Floor Resources According to the MITT-SEIS, the Navy will use observers before sinking a ship on torpedo events. The Look-outs will be looking for jelly-fish aggregations, whales, dolphins & schools of fish. Can their observances be documented and shared to verify marine mortality events? Page 6 of 17; Section 3.8.2.4.1 6. Impacts from Physical Disturbances and Strike Stressors According to the MITT-SEIS, marine amphibious training activities will require combat swimmers to run across reef flats and near shore areas damaging coral. How many U.S. and allied forces will be running across coral while undergoing amphibious training? Combined consequences of all physical disturbances and stressors could degrade habitat at some locations. Knowing this, are there plans to mitigate coral elsewhere? Page 7 of 17; Section 3.8.2.5.1 7. Impacts from Entanglement Stressors	Pursuant with section 7 of the ESA, the Navy is obligated to consult on listed species and will consult on clam species if they are listed as ESA species. The Navy analyzed potential impacts on marine invertebrates in nearshore and offshore environments in the 2015 MITT Final EIS/OEIS. Based on a literature review, the Navy has determined that conditions have not changed that would warrant modifying the analysis for marine invertebrates. As stated in Section 3.8.2.2 (Explosive Stressors), although the vast majority of explosions occur at distances greater than 3 NM from shore (where water depths are greater than the depths where shallow-water coral species occur), some explosions may occur close to marine invertebrates that could kill or injure those invertebrates. Explosions near the seafloor and very large explosions in the water column may impact shallow-water corals of any life stage, hard-bottom habitat and associated marine invertebrates, and deep-water corals. Effects could include physical disturbance, fragmentation, or mortality to sessile organisms and pelagic larvae. Energy from an explosion at the surface would dissipate below detectable levels before reaching the seafloor and would not injure or otherwise impact deep-water, benthic marine invertebrates. Section 5.4.1 (Mitigation Areas for Seafloor Resources) presents mitigation measures the Navy would implement to avoid or reduce impacts from explosives on seafloor resources in mitigation areas throughout the Study Area. For example, the Navy will not conduct explosive mine countermeasure and neutralization activities within a specified distance of shallow-water coral reefs, live hard bottom, artificial reefs, and shipwrecks. Mitigation measures would also help avoid or reduce potential impacts on invertebrates that inhabit these areas. Marine mammal monitoring documentation for sinking exercises is recorded and reported via annual exercise reports for the associated study area. Reports are available on the Navy's marine species monitoring program website <https://www.navymarinespeciesmonitoring.us/>.

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	According to the MITT-SEIS there will be cable guidance wires and parachutes that will be jettisoned into the ocean ecosystem during training missions. These entanglements become marine debris that damages corals and swimming fish, whales and sea turtles. Can the lookouts count what goes into the water and efforts to retrieve that number of entanglements? What is the plan to retrieve entanglements? Page 8 of 17; Section 2.3.3.2 8. Sea Space and Airspace Deconfliction The MITT-SEIS says efforts will be taken to avoid FAD's and concentrations of testing areas – What is the plan for how to avoid disrupting recreational and commercial uses of Apia Harbor during amphibious training and explosive events? We have many businesses that rely on access to Apia Harbor – We also have many recreational uses that could be sadly effected by warfare training. Is there a commercial-recreational water use plan for Apia being developed? Page 9 of 17; Section 2.3.3.6 9. Sonic Booms According to the MITT-SEIS DOD can authorize sonic booms below 30,000 ft. and over inhabited areas. What kind of damage can sonic booms do? We hear of broken windows but are there other adverse impacts of sonic booms? How do we know what kind of damage they can cause and how is that damage redressed? Page 10 of 17; Section 5.1.2.2.1.1	As stated in Section 3.8.2.4 (Physical Disturbance and Strike Stressors) of this Supplemental EIS/OEIS, activities involving vessels and in-water devices are not intended to contact the seafloor. Benthic invertebrates of the reef crest or flat, such as crabs, clams, and polychaete worms within the disturbed area could be displaced, injured, or killed during amphibious operations. As is current practice, coral and other hard bottom habitats would continue to be avoided to the greatest extent practical under the Proposed Action. The Navy has reviewed and incorporated the best available science to support the impact analysis and conclusions for the coral reef communities. The Navy is consulting with NMFS under the ESA for potential effects on coral and received a Biological Opinion. Mitigation measures and monitoring requirements specified in the Biological Opinion are presented in Chapter 5 (Mitigation). Mitigation measures in the Biological Opinion will also be reflected in the ROD. This Supplemental EIS/OEIS analyzed potential impacts on different marine organisms from military expended materials (such as cables, guidance wires, and parachutes). These items are expended in offshore training areas, sink, and degrade rapidly in the ocean environment and, once on the seafloor, will likely be encrusted with marine life and incorporated into the benthic habitats. While these items are either floating on the surface or sinking through the water column, the Navy acknowledges that some items may pose an entanglement risk. It is important to note that, unlike derelict fishing gear, military expended items are not designed to ensnare fish or other marine life. Rather, there is low tensile strength to materials. The Navy has assessed entanglement risk in section 7(a)(2) consultations with NMFS. In various Biological Opinions provided to NMFS, ESA-listed species (corals, fishes, sea turtles, and marine mammals) are at low risk of entanglement. NMFS has concluded that adverse effects associated with entanglement is so low as to be discountable. The Navy is consulting again with NMFS for the Proposed Action, as described in this Supplemental EIS/OEIS, and included an analysis of entanglement stressors. The Navy's Final

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	10. Adaptive Management Navy's adaptive management review process includes Navy, NMFS, the Marine Mammal Commission and other experts in the scientific community. What role does Guam's scientific community have in this review process? It's important that we all share our knowledge with one another. Page 11 of 17; Section 5.1.2.2.1.2 11. Integrated Comprehensive Monitoring Program According to the MITT-SEIS, the Navy in 2011 established a scientific comprehensive Integrated Monitoring Program with a scientific advisory group. Who is on this advisory group? I think Guam scientists and resource managers should be included so we can share knowledge. Page 12 of 17; Section 5.1.2.2.2 12. The Navy created a repository of Sonar Positional Reporting System – This is to maintain a record of all sonar events during training activities. This info is only shared with NMFS. Why isn't it shared with Guamanian scientific community and our natural resource managers? We should share our knowledge. Can help us verify marine mammal beachings and deaths and understand the use of sonar and effects on our marine fatalities. Page 13 of 17; Section 3.8.2.2 13. Explosive Stressors	Supplemental EIS/OEIS includes updates from this consultation regarding entanglement. The military has been conducting training and testing activities within the Study Area for decades, and has taken and will continue to take measures to prevent interruption of commercial and recreational fishing activities. Various means are used to communicate information to the public about areas restricted to public or commercial activities and are described in Section 3.13 (Public Health and Safety). As specified in Title 33 C.F.R. Subpart 72.01, Notices to Mariners, the U.S. Coast Guard issues information to the public concerning maritime navigation. There are three categories of notices to mariners: the Local Notice to Mariners, the Notice to Mariners, and the Marine Broadcast Notice to Mariners. Additionally, nautical charts issued by the National Oceanic and Atmospheric Administration include these federally designated zones and areas. Operators of recreational and commercial vessels have a duty to abide by maritime regulations administered by the U.S. Coast Guard. Waters around FDM within 3 NM from shore are permanently closed for safety reasons due to the potential presence of unexploded ordnance. As a general policy, aircraft do not intentionally generate sonic booms below 30,000 feet of altitude unless over water and more than 30 miles from inhabited land areas or islands. The military may authorize deviations from this policy for tactical missions, phases of formal training syllabus flights, or research, test, and operational suitability test flights. The standard operating procedures for sonic booms benefit public health and safety by reducing the potential for exposure to sonic booms. The Integrated Comprehensive Monitoring Program (U.S. Department of the Navy, 2010, 2013a), provides the overarching framework for coordination of the Navy's marine species research and monitoring efforts and serves as a planning tool to focus Navy monitoring priorities pursuant to ESA and MMPA requirements. The purpose of the Integrated Comprehensive Monitoring Program is to coordinate monitoring efforts across all regions and to allocate the

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	Some explosives will be close to corals and will injure or kill the coral. Our coral is already weakened by climate change events such as coral bleaching. When studies are conducted on effect of explosions on coral, do scientists consider cumulative effects with climate change factors? Our corals are stressed to begin with before additional training events. Page 14 of 17; Section 3.0.4.7.5 14. Behavioral Reactions An animal alters its natural behavior because it is avoiding sound stress then uses all its energy to avoid the sound producing activity. Some severe behavioral reactions can lead to stranding of whales, dolphins and alter a fruit bat's feeding, breeding, sheltering and migrating behaviors between Guam and Rota. What type of data is collected that can help us know what sound decibel levels are being emitted and where? What plans exist to protect animals from behavior altering sound activities? Page 15 of 17; Section 3.4.1.4 15. Habitat Use "Bryde's whales and Omura's Whales are thought to be within the study area year round." If they are known to be year round in the area, what else is known about these whales? How many are there? Is there data that can show us how healthy the whales are? What has been the impacts on their population after years of proximity to military training? Page 16 of 17; 3.4-129	most appropriate level and type of monitoring effort for each range complex based on a set of standardized objectives, regional expertise, and resource availability. Although the Integrated Comprehensive Monitoring Program does not identify specific field work or individual projects, it is designed to provide a flexible, scalable, and adaptable framework using adaptive management and strategic planning processes that periodically assess progress and reevaluate objectives. The adaptive management is anticipated to continue between the Navy, NMFS, and the Marine Mammal Commission through technical review meetings and ongoing discussions. As part of the collaborative effort, local partners in Guam and the CNMI are also invited to engage in collaborative research efforts. The most recent collaborative research effort was sea turtle tagging in the Mariana Islands Range Complex (Martin, S. L., A. R. Gaos, and T. T. Jones. (2019). In addition, while outside the current scope of this Supplemental EIS/OEIS, the military satisfies their Sikes Act obligations through the development and implementation of the Joint Region Marianas Integrated Natural Resource Management Plan (INRMP). The 2019 Joint Region Marianas INRMP includes monitoring programs throughout the Mariana Islands. Guam and the CNMI are signatories and participating members to the 2019 Joint Region Marianas INRMP which details natural resource management and monitoring programs. The Navy will continue to coordinate with Guam and the CNMI as part of the INRMP implementation, which allows for data sharing between the Navy, Guam and the CNMI. The adaptive management group only includes Navy and NMFS (Headquarters Marine Mammal Protection Act and Endangered Species Act) staff. The adaptive management program is an internal opportunity for Navy and NMFS to jointly review the preceding year's monitoring for a given range complex in the Pacific (including the Mariana Islands Range Complex) and see if monitoring priorities

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	16. Odontocetes "Some beached whales can experience significant behavioral reactions at distances of up to 50 km from the sound source." What type of studies have been done on the range of sound disturbance on beached whales knowing they can be harmed 50 km from the sound source? Maybe past whale strandings in other islands are connected training done on Guam or CNMI. Could this be the case? Page 17 of 17; Section 3.4 – 132 17. Beached Whales "NMFS and the Navy will determine the appropriate way to proceed in the event that a causal relationship were to be found between Navy activities and a future stranding." What is the role of Guamanian scientific community in their process if a causal relationship is determined? Does the Navy have to come back for public involvement if determined sound activities hurts whales? Would hurting whales deter military training activities?	need adjusting. The results of the Navy's monitoring are posted annually and are available on the Navy's public website www.navymarinespeciesmonitoring.us. Information from the Sonar Positional Reporting System is classified in nature and is shared only with NMFS personnel who maintain a security clearance. The Navy collaborates with scientists and funds research to study acoustic effects on marine mammals in both the Pacific and Atlantic oceans and has done so for years. This includes providing unclassified information from the Sonar Positional Reporting System. See, for example, Simonis et al. (2016), which uses data from the system for a study conducted in the Marianas (Simonis, A., Thayre, B., Oleson, E., & Baumann-Pickering, S. (2016). Mid-frequency active sonar and beaked whale acoustic activity in the Northern Mariana Islands. The Journal of the Acoustical Society of America, 140(4), 3413-3413.) Section 4.4.8.5 (Cumulative Impacts on Marine Invertebrates) of this Supplemental EIS/OEIS states most of the proposed activities would occur over dispersed, deep water areas where marine invertebrates are more sparsely distributed but not at the same specific point each time and, therefore, would be unlikely to affect the same individual invertebrates. In addition, the Navy would not conduct certain activities within a specified distance of shallow coral reefs, live hard bottom, artificial reefs, or submerged cultural resources such as shipwrecks (except designated locations, where these resources will be avoided to the maximum extent practicable). Underwater detonations that would occur in the nearshore areas are only conducted in designated locations and away from known seafloor resources such as shallow coral reefs, live hard bottom, artificial reefs, or submerged cultural resources such as shipwrecks, to the maximum extent practicable. This Supplemental EIS/OEIS provides a discussion on how marine mammals use sound (see Section 3.4.1.6, Hearing and Vocalization) and how noise generally may impact marine mammal communication (see Section 3.4.1.7.5, Noise). Both of these sections cite numerous publications reporting both recent research and well-established findings that describe how marine mammals hear and use

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		sound and what other types of sounds in the ocean can interfere with marine mammal behavior. Section 3.4.2.1 (Acoustic Stressors) goes into detail on how underwater sounds may affect marine mammals, including the association with stranding events. While sounds from a variety of natural and anthropogenic stressors can affect marine mammal behavior, the analysis in this Supplemental EIS/OEIS shows that behavioral responses to Navy sonar will likely be a result of the animal's behavioral state and prior experience rather than external variables such as ship proximity. If significant behavioral responses occur, they will likely be short term, and no significant behavioral responses such as panic, stranding, or other severe reactions have been observed during monitoring of actual training exercises (see Section 3.4.2.1.1.5, Behavioral Reactions). Behavioral responses to Navy sonar will vary across species, populations, and individuals, however, they are not likely to lead to long-term consequences or population-level effects. Information on the populations of Bryde's whales is provided in Section 3.4.1.9 (Bryde's Whale [*Balaenoptera edeni*]) and Omura's whales in Section 3.4.1.13 (Omura's Whale [*Balaenoptera omurai*]) and in the publications cited in each section. The sections include information on abundance in the Study Area and status of the population, if available. There are no data on how proximity to military training has affected individuals or populations of Bryde's whales or Omura's whales specifically. The Navy's acoustic effects model predicts a small number of temporary effects on hearing and behavioral responses for some individuals of both species due to training and testing activities using sonar and explosives (see Section 3.4.2.1.2.3, Impacts from Sonar and Other Transducers Under the Action Alternatives, and 3.4.2.2.2.3 Impacts from Explosive Stressors Under the Action Alternatives). A number of studies have been conducted observing behavioral responses of beaked whales exposed to sonar and similar sound sources, often in coordination with Navy training and testing. Refer to Section 3.4.2.1.1.5 (Behavioral Reactions) and specifically to text under the subheading for

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		"Odontocetes" for a list of studies analyzing behavioral responses of beaked whales to active and simulated sonar sound sources. Co-occurrence in time between Navy training and beaked whale stranding does not necessarily infer causation. As the Navy points out in response to comment #220 (Anne Simonis), while there have been some beaked whale strandings at time of Navy sonar use, there have been just as many strandings at times the Navy was not present, and significantly more Navy events in which no stranding occurred. The Center for Naval Analysis (CNA) recently conducted a statistical study of correlation of beaked whale strandings around the Mariana Islands with the use of U.S. Navy sonar, finding that insufficient evidence of a correlation exists. The CNA study used the complete record of all U.S. Navy sonar use between 2007 and 2019, including major training events, joint exercises, and unit level training/testing. The analysis also included the complete beaked whale stranding record for the Mariana Islands through 2019. Following the methods in Simonis et al. (2020), the CNA analysis found insufficient evidence of a correlation between sonar use and beaked whale strandings when considering the complete sonar use record. The CNA finding is in contrast to the finding in Simonis et al. (2020), which depicted a significant correlation between beaked whale strandings and Navy sonar use. However, the Simonis et al. (2020) result relied on substantially incomplete or inaccurate assumptions about U.S. Navy sonar use around the Mariana Islands. CNA also conducted statistical analyses specific to each island where beaked whale strandings have been observed in the Mariana Islands, similarly finding insufficient evidence of a correlation to sonar use. Additional information on the findings of the CNA analysis are presented in Section 3.4.2.1.1.6 (Stranding) in Chapter 3.4 (Marine Mammals). The Navy provides contributory funds to the stranding scientists affiliated with NMFS' Pacific Islands Fisheries Science Center Stranding Program, which covers Hawaii and the Mariana Islands. Several of the beaked whales that stranded at the times of Navy sonar use and were necropsied by NMFS-affiliated scientists showed no signs of acoustic trauma. The issue of sound causing harm to beaked whales is complex because this species is susceptible to behavior reactions to commercial shipping transits and other anthropogenic sound. However, in this

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		case, the strandings do not appear to have been connected to anthropogenic sound. Other anthropogenic causes of beaked whale mortalities include plastic ingestion. Factoring in natural causes of mortality (disease, predation, foraging success, etc.), determining direct causal relationships is complex for any species of marine mammals. Through the Marine Mammal Protection Act and Endangered Species Act permitting processes, the Navy updates marine mammal Stranding Response Plans in coordination with the National Marine Fisheries Service Office of Protected Resources, as needed. The Stranding Response Plans specify the Navy's requirements for reporting marine mammal strandings and assisting with post stranding data collection in association with major training exercises. The Navy also funds extensive marine species monitoring in the Mariana Islands. The Navy and NMFS are jointly funding a large-scale survey across large areas in the Mariana Islands, with a scheduled start of spring/summer of 2021. This survey will deploy several types of acoustic monitoring devices to improve the understanding of beaked whale occurrence in the area. Guam's scientific community can participate in the process by providing new information on beaked whales. If that information is made available to the Navy and NMFS Office of Protected Resources, it can be considered during the annual adaptive management meetings. During those meetings, the Navy and NMFS review new information from Navy-funded monitoring in the Mariana Islands, new published literature on impacts if available, and any new unpublished information that is provided to them. As described in Section 5.1.2.2.1 (Marine Species Research and Monitoring Programs), for this Final Supplemental EIS/OEIS, the Navy agreed to several additional research and monitoring initiatives designed to help advance the understanding of beaked whales and strandings in the MITT Study Area. The Navy will co-fund the Pacific Marine Assessment Program for Protected Species (PACMAPPS) Mariana Islands survey in spring-summer 2021 and future studies starting in 2022 to help document beaked whale occurrence, abundance, and distribution in the Mariana Islands. The Navy will also fund additional stranding response and necropsy analyses for the Pacific Islands region, and research on a framework to improve statistical stranding analysis. Collaboratively with NMFS, the Navy will fund and organize an expert panel to provide recommendations on

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		scientific data gaps and uncertainties for further protective measure consideration to minimize potential impacts of Navy training and testing activities on beaked whales in the Mariana Islands.
Victoria C Miller (VcM)		
VcM-01	Para ma Prutehi I Manaotao Pacifico For the Protection of the Pacific Peoples Victoria Miller 14 March 2019 In regards to the proposition of at-sea training and testing within the Northern Marianas, this comment serves to refute the Navy's defense of their argument. According to the Coastal Zone Management Act (CZMA) the nation's coast is expected to be managed. to "preserve, protect, develop, and where possible, to restore or enhance the resources of the nation's coastal zone" (CZMA, 1972). However, with the testing of sonar and explosive devices proposed by the Navy, this goal is no longer feasible. The Navy's blatant disregard for the purpose of the CZMA with their actions degrade these values to little more than idealistic suggestions. The easiest route is often favored over the virtuous despite the wake of consequences it leaves behind. Countless times the Navy chooses to do this, not just in the Northern Marianas but in the United States as well: The National Resources Defense Council suit, filed this week, accuses the National Marine Fisheries Service of violating multiple federal laws by allowing the Navy to ramp up sonar and live-fire training in Hawaii and California during the next five years. The action calls for the Northern California U.S. District Court to halt the training, which began in December (Slavin, 2014).	The Navy is committed to protecting the terrestrial and marine environment while training and testing. All potential effects from Navy training and testing activities were analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Supplemental EIS/OEIS. As described in Chapter 5 (Mitigation), the Navy implements procedural and geographic mitigation measures during its training and testing activities to avoid or reduce potential impacts on biological and cultural resources. This science-based analysis indicates, with implementation of the Navy's protective mitigation measures, there is not a significant impact on biological and cultural resources. The Navy submitted a Consistency Determination (CD) to the Bureau of Statistics and Plans (BSP) in December 2019 addressing proposed military training and testing activities that may affect Guam's coastal zone and coastal uses. The consistency determination was prepared in accordance with Guam's Procedures Guide for Achieving Federal Consistency with the Guam Coastal Management Program (Bureau of Statistics and Plans May 2011). BSP's response to the Navy's CD (dated March 6, 2020) can be found in Appendix C (Agency Correspondence). The Navy is in discussions with BSP in order resolve any differences and reach an agreement regarding the Navy's compliance with Guam's Coastal Management Program to the maximum extent practicable. In addition, The Navy submitted a Consistency Determination to the CNMI Division of Coastal Resources Management (DCRM) in December 2019 addressing proposed military training and testing activities that may affect the CNMI's coastal zone and coastal uses. DCRM's response to the Navy's CD (dated March 9, 2020) can be found in Appendix C (Agency Correspondence). The Navy is in discussions with DCRM in order resolve any differences and reach an agreement regarding the Navy's compliance with CNMI's Coastal Management Program to the maximum extent practicable. The outcome of these discussions will be included in the ROD.

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	The low frequency active (LFA) sonar used during these testings threaten the marine life within these waters. The Navy proposes the testing, not out of fear of another military power. but possibly from ignorance of the consequences of their actions. However, it seems unlikely that such a influential military branch of a nation, regarded as one of the most powerful leaders of the free world, would be oblivious to the effects of their actions on the environment. In a cultural perspective, the marine wildlife plays a crucial role in the lives of the indigenous people in the Pacific. A recurring theme amongst Pacific Island cultures is the interrelatedness of the ocean with the notion of life. This ideology is in part due to the ocean's ability to connect the people of Pan-Pacific. The other half is the resources and life that is within the ocean itself. Within the Maori culture, the culture of the indigenous peoples of New Zealand, whales are regarded as high status beings. "In Pacific cultures, whales are granted the status of older siblings or cousins; they can also be guardians, spirits, ancestors and taniwha" (O'Brien, 2017). Perhaps this adoration for these creatures is the same reason tourists are enthralled by the appearance of whales far off the coast; they are a milestone in lite that one has experienced true unbreakable beauty. The preservation of culture is an argument enough to stop the proposition of testing. From a quantitative point of view, the use of LFA sonar testing is estimated to "kill some 170,000 marine mammals and cause permanent injury to more than 500 whales, not to mention temporary deafness for at least 8,000 others" (EarthTalk, 2019). With a number as substantial as this, there is no choice but to annul the testing. According to the Marine Mammal Protection Act (MMPA) the Navy must prioritize the preservation of marine life within the marianas during their	The Navy has engaged with the DCRM throughout the development of this Supplemental EIS/OEIS, including meeting with staff during the scoping phase and providing notification when the Draft Supplemental EIS/OEIS was made available for public review and comment. The potential effects of sonar and explosives on marine mammals are quantitatively estimated using the Navy's Acoustics Effects Model (see the technical report *Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing*, available on the project website, for details on the quantitative methodology). Predicted effects from sonar on marine mammals are presented by species in Section 3.4.2.1.2.3 (Impacts from Sonar and Other Transducers Under the Action Alternatives) and from explosives in Section 3.4.2.2.2.3 (Impacts from Explosive Stressors Under the Action Alternatives). No mortality or direct injury to any marine mammals is predicted. The settlement agreement for the 2015 Hawaii-Southern California Training and Testing EIS/OEIS has no bearing on the MITT Supplemental EIS/OEIS. The Navy has been conducting training and testing activities in the Study Area for decades, and this supplement to the 2015 MITT Final EIS/OEIS supports the continuation of that training and testing. The activities analyzed in this Supplemental EIS/OEIS are largely a continuation of the ongoing training and testing activities that were analyzed in the 2015 MITT Final EIS/OEIS, 2010 MIRC EIS/OEIS, 1999 Military Training in the Marianas Final EIS, and other environmental compliance documents. Proposed training and testing activities are needed to achieve and maintain military readiness within the Study Area. This Supplemental EIS/OEIS furthers the Navy's and other military services' execution of their roles and responsibilities under 10 U.S.C. section 8062. Surveillance Towed Array Sensor System (SURTASS) Low Frequency Active (LFA) sonar is not part of our Proposed Action. However, it has been addressed in Section 4.0 (Cumulative Impacts) of this Supplemental EIS/OEIS. Information pertaining to the SURTASS LFA action can be found at http://www.surtass-lfa-eis.com/.

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	operations (The Marine Mammal Center, 2019). This act includes that the Navy must find a method that will impact the marine life in the most miniscule scale possible. Therefore, under the sanctity of law and the observation of the US law itself, the Navy must not conduct at-sea training and testing of their sonar and explosive devices, and any harming equipment for that matter, within the Northern Marianas. References Carter, H. C. (2007). WHALES in the South Pacific. Wellington, New Zealand: Dept. of Conservation. EarthTalk. (2019). Does Military Sonar Kill Marine Wildlife? NOAA Office for Coastal Management ADS Group. (2019, February 15). Coastal Zone Management Act. NRDC v. Pritzker, Justia US Law 35 (US District Court for the Northern District of California July 15, 2016). NRDC: California. (2016, July 18). Federal Court: Navy Must Limit Long-Range Sonar Use to Protect Marine Mammal. O'Brien, G. (2017, July 1). Whale of a tale. Slavin, E. (2014). Suit to stop Navy training in Pacific cites impact on marine life. Stars and Stripes. The Marine Mammal Center. (2019). Marine Mammal Protection Act. Retrieved from http://www.marinemammalcenter.org/what-we-do/rescue/marine-mammal-protection-act.html	