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MINUTES FROM THE 18 JULY 2017 RESTORATION ADVISORY BOARD MEETING NAS KEY WEST FL

07/18/2017

TETRA TECH, INC.

NAS KEY WEST RESTORATION ADVISORY BOARD

18 JULY 2017 MEETING SUMMARY

LOCATION: Florida Keys Eco-Discovery Center, Key West, Florida

RESTORATION ADVISORY BOARD MEMBERS

Bob Eadie	RAB Community Member, Monroe County Health Department	305-809-5610 Bob.Eadie@flhealth.gov
Mimi Stafford	RAB Community Member, Community Co-Chair, Citizen	305-296-5947 mlbstafford@gmail.com
Ron Demes	NAS Key West, Community Co-Chair	305-293-2886 Ron.Demes@navy.mil
Margaret Romero	RAB Community Member, City Commissioner District 5	305-809-3844 keywestquestions@yahoo.com
* John Jones	RAB Community Member, Citizen	305-797-0484 John.Jones0815@yahoo.com
Mark Songer	RAB Community Member, Citizen	305-394-3807 MarkSonger72@gmail.com
* Mike Petro	RAB Community Member, Citizen	305-896-7300 mike@mikepetrorealestate.com
Ed Russell	NAS Key West Installation Restoration Manager	305-797-4461 Edward.O.Russell@navy.mil
Tracie Vaught	FDEP	850-245-8998 Tracie.Vaught@dep.state.fl.us
* John Dolan-Heitlinger	RAB Community Member, Citizen	305-292-1208 john@dolan-heitlinger.com

* Absent

OTHER PARTICIPANTS/COMMUNITY ATTENDEES

Ed Barham	NAS Key West Environmental Director	305-293-2911 Edward.Barham@navy.mil
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Jim Bouquet	Key West City Engineer	305-809-3962 jbouquet@cityofkeywest-fl.gov
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CDR Greg Brotherton	Executive Officer NASKW	Gregory.K.Brotheron@navy.mil

These minutes are a summary based on informal notes taken at the meeting. They are not intended as a verbatim transcript and may not have captured everything that was discussed.

NAS KEY WEST RESTORATION ADVISORY BOARD

18 JULY 2017 MEETING SUMMARY

LOCATION: Florida Keys Eco-Discovery Center, Key West, Florida

Liam McCue	CG Sector Key West	Liam.P.McCue@uscg.mil
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CDR Edwin Dupont	NAS Key West	Edwin.Dupont@navy.mil
Jack Dupont	Key West Citizen	

WELCOME AND INTRODUCTIONS

Ron Demes brought the meeting to order at 6:00 PM with the Pledge of Allegiance. The Restoration Advisory Board (RAB) members introduced themselves. Ron asked that the presenters be allowed to give their presentation without interruption. After which, the RAB members will be invited to ask their questions followed by questions from the general audience.

A map of all of the Installation Restoration sites was available for meeting attendees.

REVIEW OF LAST MEETING

Ron asked if there were any corrections to the minutes. There was a motion to approve the 2016 RAB meeting minutes, and the motion carried.

INSTALLATION UPDATE, ED BARHAM, NAS KEY WEST

The presentation started with a history of the Navy in the Keys.

1823: Commodore David Porter arrives with the Mosquito Fleet to combat piracy. Naval Base Key West established at what is now Truman Waterfront
1898: Battleship Maine sails from Key West to Havana Harbor where it exploded, sparking the Spanish-American War
1943: Navy acquires Boca Chica Field
1945: All airfields combined into NAS Key West
1962: NAS Key West plays a major role in Cuban Missile Crisis – airfield support in blockade and reconnaissance missions
1974: Naval Station decommissioned
1990: Base Realignment and Closure (BRAC)

The presentation continued with facts about NAS Key West today and demographic information.

- Premier location for training tactical aviation squadrons and special operations
- Close proximity to unencumbered air/surface ranges
- Ideal weather
- Tactical Combat Training System (TCTS) to track, control, record, and debrief aerial engagements (remember TOPGUN?)

The NAS Key West environmental overview includes the following:

- 9 Staff Positions in Environmental Division
- Environmental Programs:
  - Installation Restoration / Munitions Response
  - National Environmental Policy Act (NEPA)

- Solid Waste / Recycling / Air
  - Solid Waste
    - waste tires, construction and demolition debris, trash
  - Recycling
    - office materials, used oil, batteries
  - Air
    - Emergency Planning Community Right to Know Act (EPCRA)
      - hazardous substance use/storage
      - ozone depleting substances (ODS) – refrigerants
- Storage Tanks / Spill Prevention and Response
  - Storage Tanks
    - 95 Storage Tanks
    - Four Bulk Storage Tanks – 988,000 gallons
    - 1.2 million gallons (Boca Chica)
    - 5.7 million gallons (Trumbo Point)
  - Spill Prevention, Control, and Countermeasure (SPCC) Plan
  - Facility Response Plan
  - Spill Drills
    - Navy/USCG/FDEP/Contractor Joint Exercise
- Hazardous Waste / Pollution Prevention
  - Permitted Part B Treatment, Storage and Disposal (TSD) Facility
    - Storage Only prior to shipment for final disposal
  - Work Center Waste Stream Identification and Waste Storage Areas
  - Hazardous Waste Awareness Training
- Wastewater / Stormwater / Drinking Water

  Wastewater / Drinking Water
  - Both programs "privatized":
    - October 2015 the Navy entered into a contract with Florida Keys Aqueduct Authority (FKAA) to provide wastewater utility service for NAS Key West. FKAA has ownership and responsibility for the waste water utility systems and treatment plant.
    - January 2008 the Navy entered into a contract with FKAA to transfer ownership and operation of the NAS Key West drinking water system to FKAA. FKAA operates the drinking water system including performing all testing, monitoring and repairs of the system.

  Stormwater
  - Stormwater Pollution Prevention Plan (SWPPP)
    - Identify sources of pollution potentially affecting the quality of stormwater discharges from the facility associated with industrial activity
    - Describe and ensure implementation of practices to minimize and control pollutants in stormwater discharges from the facility associated with industrial activity
    - Ensure compliance with the terms and conditions of the Station's stormwater permit (Multi Section General Permit).
- Natural Resources / Cultural Resources / Pest Management
  - Integrated Natural Resources Management Plan (INRMP).
    - Identifies 21 federally listed species on NAS Key West property including 12 animals and 9 plants
    - Provides a conservation benefit to staghorn and elkhorn corals and loggerhead sea turtles. NOAA and NMFS determined that a critical habitat exclusion for these species is warranted for the nearshore waters controlled by NAS Key West
    - The endangered Lower Keys marsh rabbit (LKMR) is endemic to the Lower Florida Keys
      - The U.S. Fish and Wildlife Service estimates there are only 2,116 acres of suitable habitat to support LKMR.

- NAS Key West supports an estimated 60% of the total Lower Keys marsh rabbit population, in only 15% of the total habitat area.

Mr. Barham also spoke about the threatened and endangered species surveys (turtle nesting and sawfish) in Key West and habitat enhancement (Roseate Tern nesting boxes and Shorebird nesting platforms) provided by NAS Key West personnel.

Community projects and public events sponsored by NAS Key West include work with the Sigsbee Charter School, beach cleanups, Earth Day, and National public lands day.

Ron Demes acknowledged that the first commanding officer at Key West was a member of the Coast Guard.

There were no questions from the RAB members or the community.

INSTALLATION RESTORATION PROGRAM UPDATES – SITES ANTICIPATED TO CLOSE ON OR BEFORE 2018, ED RUSSELL, NAS KEY WEST

Four sites are anticipated to be closed by end of Fiscal Year 2018. Each site is discussed below. The sites are to be closed under Risk Management Option (RMO) Option II – No further action with institution controls and/or engineering controls.

SWMU 9 – Jet Engine Test Cell

1969:	Jet Engine Test Cell, associated with building A-969, was used for the testing of repaired jet engines.
1987-1995:	Jet engines were fueled from a bermed 5,000-gallon aboveground storage tank (AST) containing JP-5 fuel.
1989:	A leak resulted in the release of approximately 700 gallons of JP-5 from the AST. Approximately 600 gallons were recovered and 10 cubic yards of contaminated soil were excavated and removed from the spill site.
1992:	An overturned oil drum and stained soil were observed.
1994:	Contamination Assessment Report (CAR) identifying Dichloroethene (DCE) and benzene plumes in the eastern part of the site.
1995:	Groundwater evaluation conducted at the site. Subsequently, a pump and treat system was installed. The system operated for one year, but did not recover any free product.
1996:	Supplemental RCRA Facility Investigation (RFI)/Remedial Investigation (RI) completed.
1999:	Corrective Measures Study (CMS) completed.
2000:	Baseline sampling conducted and the Enhanced Biodegradation Treatability Study Work Plan was prepared.
2001:	Oxygen Release Compound (ORC) and Hydrogen Release Compound (HRC) injections performed to treat benzene and DCE plumes. Groundwater contaminant and natural attenuation quarterly monitoring began in July 2001 and were completed in April 2002 to determine the success of the ORC and HRC injections.
2003:	Annual contaminant and natural attenuation monitoring took place at SWMU 9 in January 2003.
2004:	A Work Plan was prepared to perform additional delineation of soil and groundwater contamination. The Five-Year Review Report was also prepared and concluded that additional remediation was necessary at the site because the existing remedy is not protective of human health and the environment.
2008:	During November 2008, an investigation was conducted to determine if the site was still suitable for Monitored Natural Attenuation (MNA) as a long-term remediation strategy.

2010: A sampling event was conducted during August 2010, and it was determine that two new wells were needed to bound the northern section of the plume. The two new wells were installed in December 2010 and sampled. Additional sampling was recommended to confirm northern delineation.
2013: Investigations determined contamination was confined to less than ¼ acre. Natural breakdown was still occurring.
2016: Installation of two deep wells for vertical delineation. Site sampled and vertical delineation confirmed.
2017: First of two semiannual monitoring events conducted. Second event scheduled for July 2017.

Closure is anticipated at the end of calendar year 2017 (First quarter of Fiscal Year 2018) with Groundwater Land Use Controls.

Boca Chica Flying Club – UST 9

The Boca Chica Flying Club is located along the northwestern boundary of Taxiway "H", south of Building A-133 at Boca Chica Field. The Flying Club is the former site of four ASTs and associated dispensers and piping, which reportedly contained aviation gas (AVGAS). The Boca Chica Flying Club was in operation until the late 1960s. Overfilling of the ASTs is the suspected cause of petroleum contamination at the site.

1992: The ASTs, fuel dispensers, and associated piping were removed from the site.
1994: Contamination Assessment Report (CAR).
1997: Remedial Action Plan (RAP).
1998: An Interim Remedial Action (IRA) was performed removing 983 cubic yards of soil from the site.
1999: Quarterly monitoring was implemented to ensure the IRA was successful.
2001: A more aggressive approach was recommended because contaminant levels did not seem to be attenuating. Air Sparging (AS)/Soil Vapor Extraction (SVE) Treatability Study Work Plan prepared.
2002: AS/SVE system installed. The system operated successfully from June 2002 through January 2003.
2003: Quarterly sampling resumed in May 2003 and continued through May 2004.
2004: A Supplemental Site Assessment was recommended because petroleum constituent concentrations began increasing in a perimeter well following completion of the treatability study. Supplemental Site activities began in July 2004. A direct push technology (DPT) investigation was performed and additional monitoring wells were installed to delineate contamination.
2006: Eight monitoring wells were installed. Quarterly groundwater sampling was conducted between August 2006 and May 2007. Groundwater and chemical data demonstrated that the monitoring well network configuration did not provide for vertical or lateral delineation of the dissolved-phase hydrocarbon plumes.
2008: Nine shallow monitoring wells were installed to define the nature and extent of contamination. Two deep wells were also installed to define the vertical extent of contamination. Eighteen monitoring wells were sampled. Results were presented in the 1st Quarter Monitored Natural Attenuation Report. It was recommended that additional monitoring be performed to determine if contamination was attenuating at the site.
2008: A total of 23 monitoring wells were closed in the vicinity of the Site. These wells were located around Building A126 and Building A133 and were on both the eastern and western sides of the chain link fence separating these service buildings from the aircraft parking area. An odor of hydrocarbons was detected in the monitoring wells that were extracted in the immediate vicinity of the Hazardous Substances Storage Area, Building A126A.
2009: Eighteen monitoring wells sampled. Results were presented in the 2nd Quarter Monitored Natural Attenuation Report (February 2009) and recommended that monitoring be continued to determine

if contamination was attenuating and if seasonal or tidal influences were affecting the dissolved-phase chemical concentrations.

2010: Two new shallow monitoring wells and the previous 18 monitoring wells were sampled. The results were presented in the 3rd Quarter Monitored Natural Attenuation Report (August 2010).

2013: Additional monitoring wells were installed to delineate the contaminant plume, and groundwater sampling was conducted.

2016: Soil samples collected to determine if any contamination was present in upper 3 feet of the site. Wells were also sampled for first quarter semiannual event. Current sampling results demonstrate remaining contamination has been delineated and is confined to less than ¼ acre within site boundary.

2017: Second quarter semiannual sampling event is scheduled for September 2017.

The site is anticipated to close under RMO-II by the second quarter of fiscal year 2018.

Trumbo Annex BOQ (TPBOQ) – Site 29

Trumbo Point is a 140-acre filled area created in 1908 to provide land for the tracks and warehouses needed for a major shipping port. A 1,000-gallon JP-5 AST with secondary containment, used to fuel the water heaters for the TPBOQ, is currently located near the southwestern corner of the loading dock (see red arrow). An aboveground propane tank is also located on site to the southwest of the loading dock.

1998: An underground free-phase petroleum plume was first discovered adjacent to the AST. Approximately 55 cubic yards of contaminated soil and approximately 10 gallons of free product were removed from the vicinity of the valve pit. Due to the proximity of the building and an active propane gas supply line, excavation of the entire extent of impacted soils was not possible. A Source Removal Report was subsequently submitted to the Florida Department of Environmental Protection (FDEP).

1999: A site assessment was subsequently conducted and a site assessment report (SAR) was submitted to FDEP. This SAR concluded that diesel fuel free product probably remained on site, and that dissolved phase groundwater petroleum hydrocarbon concentrations exceeded the Groundwater Cleanup Target Levels (GCTLs). Soil contamination was present in excess of the SCTLs. The FDEP approved the SAR, concurring with the recommendation to prepare a Remedial Action Plan (RAP).

2002: The RAP prepared for the site recommended conducting several short-term multi-phase extraction events until free product was no longer present in any of the monitoring wells. Multi-phase extraction technology proved to be ineffective.

2003 – 2008: Sampling events to monitor the level of groundwater contamination at the TPBOQ were conducted in May 2003, November 2006, and November 2008.

2007 – 2008: During July 2007 through March 2008, an initial treatability study was performed to evaluate the effectiveness of various technologies for the extraction of free product from the soils. During the 160 day treatability study, 35 gallons of free-phase product were removed from recovery well TPBOQ-MW-15.

2008 – 2009: A second treatability study was performed from August 2008 through August 2009 to further evaluate recommendations. During the 12-month period of the treatability study, 3.1 gallons of free-phase product were recovered from recovery well TPBOQ-MW-15.

2009 – 2010: A third treatability study was performed from August 2009 through August 2010. During the 12-month period of the treatability study, slightly less than two gallons of free-phase product were recovered from recovery well TPBOQ-MW-15.

2010 – 2011: A fourth treatability study was performed from August 2010 through August 2011. During the 12-month period of the treatability study, less than one gallon of free-phase product were recovered from recovery well TPBOQ-MW-15.

2011 – 2012: A final treatability study was conducted from August 2011 through August 2012. During this 12-month period, 13 free product recovery events were performed at the well, and a total of 0.02 gallon of free product were recovered. Based on the results, it was recommended to discontinue use of the PIG® Monitoring Well Skimming Sock due to limited quantifiable free product recovery. Additional sampling of the dissolved-phase constituents previously detected in groundwater was recommended.

2013: The FDEP concurred with recommendation to prepare a new sampling plan.

2016 - 2017: Six additional monthly Treatability Study events were conducted resulting in limited quantifiable free product recovery. Six additional Quarterly Treatability Study events were initiated starting in June 2017.

2017 – 2018: This site is being evaluated for closure under RMO II(a). (1) Free product is not present and no fire or explosive hazard exists as a result of a release of non-aqueous phase liquids, or (2) Free product removal is not technologically feasible or cost-effective; and (3) Free product is not migrating and does not pose a risk to human health, public safety or the environment.

Closure is anticipated at the end of calendar year 2018 with Groundwater Land Use Controls.

Geiger Key Hawk Missile Site – Site 22

The former Geiger Key Army Hawk Missile Site (AHMS) is approximately 12 acres. It was built on salt ponds filled by the U.S. Army in order to adapt the area for use as a missile site. Work on the facility began in 1965 in support of the Cuban Missile Crisis and continued for several years thereafter. It was used for coastal defense until 1979, at which time the Army units demobilized from all of the Hawk Missile batteries in the Florida Keys.

1996: The site has a 2,000-gallon AST and a 300-gallon AST, previously used to store diesel fuel for emergency generators, both closed in place 1996. The Closure Report indicated that soil and groundwater near the 2,000-gallon AST showed signs of petroleum hydrocarbons. It was recommended that a Contamination Assessment be performed.

2001: The contamination assessment showed the Total Recoverable Petroleum Hydrocarbons (TRPH) concentration was greater than the FDEP Soil Cleanup Target Levels (SCTLs) at a soil sample location less than 20 feet south of the closed 2,000-gallon AST. The groundwater analytical results indicated that several petroleum hydrocarbons were detected in two monitoring wells at concentrations greater than the GCTLs.

2002: The FDEP approved a Site Assessment Report (SAR) and concurred with the recommendation to continue further field investigation to delineate the extent of impact from the petroleum hydrocarbons.

2003: Supplemental site assessment work was conducted. TRPH was detected, but at concentrations less than the residential SCTL. Concentrations in several groundwater samples collected exceeded the GCTLs for TRPH and Polycyclic Aromatic Hydrocarbons (PAHs).

2004: Five additional shallow monitoring wells and one additional deep monitoring well were installed.

2005: A Treatability Study Work Plan for AHMS Geiger Key was developed.

2006: During the implementation of the Treatability Study, it was noted that the volume of free product had increased; therefore, passive free product recovery was no longer an appropriate remedial option.

2010: Site Investigation (SI) completed. Metal concentrations in groundwater were detected above GCTLs. Pesticides concentrations in groundwater exceeded criteria at two locations. One groundwater sample exceeded the TRPH criteria and free-product was observed in monitoring well G01-MW-11. No Volatile Organic Compounds (VOCs) or Semivolatile Organic Compounds (SVOCs) were detected above regulatory limits. An expanded SI was recommended for confirmatory sampling.

2013: Confirmatory groundwater sampling during May 2013.
2015: Additional monitoring wells installed for horizontal delineation. Contamination delineated and confined to less than ¼-acre within site boundary.
2016: First of two semiannual groundwater sampling events was conducted.
2017: The second monitoring event is scheduled for late 2017.

This site is expected to close using RMO-II with Groundwater Land Use Controls in 2018.

***Questions, Answers, and Comments**:*

Q: Mimi Stafford, RAB Member. What is the anticipation for the last site? Is there an expectation for utilization for anything else?
A: Ed R., NAS Key West. It is an historic site and has to be preserved.
A: Ron Demes, RAB Member. Three of the sites could be reused, but 1 needs to be kept for historic preservation. This site is in the most original condition and has been reserved for preservation.

Q: Bob Eadie, RAB Member. Is that why the tanks are still there?
A: Ed R., NAS Key West. There are two options allowed in Florida Regulations: remove the tank or close it in place. The option here appears to have been to close them in place.

Q: Bob Eadie., RAB Member. Is there any water in the tanks?
A: Ed R., NAS Key West. The tanks have been compromised as part of the closure to prevent them from being used and are rusted and the bottoms are probably equally compromised; so there should not be any water. Ed offered to verify and provide follow-up if desired.

Q: Mark Songer, RAB Member. Site 29, BOQ – How was it concluded that there was no migration?
A: Ed R, NAS Key West. There is a series of monitoring wells at the site. Only three of these wells have very nominal sheen. The rest of the monitoring wells demonstrate the confines of the contamination.

Q: Adam Linhardt, Key West Citizen Reporter. Is it fair to say the Trumbo Annex BOQ is the Navy Fly Building?
A: Ed R., NAS Key West. It is the same building.

Q: Jack DuPont, Boy Scouts of American. How deep are the monitoring wells?
A: Ed R., NAS Key West and Todd Haverkost, EnSafe. The wells are probably 12 to 15 feet deep, but vary depending on the site.

SOLID WASTE MANAGEMENT UNIT (SWMU) 2, TREAD KISSAM, NAVAL FACILITIES ENGINEERING COMMAND SOUTHEAST (NAVFAC SE)

SWMU 2 is the Boca Chica DDT Mixing Area. The site is within the active NAS Key West airstrip and is surrounded by runway and taxiways. The site was used for storage and mixing of pesticides at Former Building 915 and contained 2 ASTs. Operations ceased in the 1970s and the site structures were demolished in 1985. The site boundary expanded after Hurricane Wilma in 2005. Airfield programed clear the mangroves along the flight lines (including SWMU 2).

Site investigations in the 1990s found pesticides in sediment. Human health and ecological risk assessments were performed with samples collected in January 1996 and concluded there were potential risks to ecological receptors from pesticides in sediment and surface water. Interim remedial action in April 1996 excavated contaminated soil/sediment and filtered surface water. A Corrective Measures

Study in 1998 determined the most appropriate long-term remedy would be land use controls with monitoring. Land use controls were implemented to limit potential exposure to the remaining contaminants and routine monitoring of soil, sediment, groundwater, local fish, and ecological began in 2000. Quarterly monitoring was performed through 2001, then annual monitoring through 2014. Based on the 2004 Five-Year Review Report, biological monitoring discontinued. The site boundary was expanded based on a 2006 storm surge investigation. The 2016 Five-Year Review Report indicated the remedy is protective of human health and environment, land use controls should remain, and monitoring should be reduced to quinquennial; however, in October 2016, the FDEP requested an additional ecological risk assessment.

The most recent annual sampling was conducted in January and March 2017, and the report is currently being prepared. An Ecological Risk Assessment, which will include the expanded site boundary, is planned for late 2017.

***Questions, Answers, and Comments**:*

Q: Bob Eadie, RAB Member. Why was the area expanded?
A: Tread Kissam, NAVFAC SE. Due to an investigation after Hurricane Wilma.

BOCA CHICA TRUCK FILL STAND – SITE 31 (PETROLEUM SITE), TREAD KISSAM, NAVFAC SE

Several large JP-5 fuel spills documented since 1986. Product recovery, excavation, and assessments since documented releases included the following:

- Most recent sampling: soil (2010), sediment and surface water (2012), and groundwater (April 2013)
- Free product last measured in 2000 at MW-01 (1.9 inches)
- Water table near ground surface to 3 feet below ground surface; groundwater flow direction shifts due to tidal influences, but often radially to the north, south, and west
- With water levels generally at the ground surface, and minimal unsaturated zone soil, any contaminant releases would have been readily absorbed from surface soil to groundwater
- Potential exposure to ecological receptors within West Wetland from contaminants migrating from shallow groundwater

Previous site assessments included the following:

Soil: Collected 596 soil samples via direct push points in 2010 and assessed for petroleum compounds. Limited petroleum contamination was identified, but was concluded to be an indication of groundwater impacts not soil; assessment concluded no significant source areas in soil and no further investigation of soil necessary (Tetra Tech, 2011).

Sediment sampling in 2012: PAHs exceeded applicable screening levels in the West Wetland.

Groundwater (most recent data from 2009 and 2013):
- Perimeter wells bordering West Wetland exceeded Marine Surface Water Cleanup Target Levels (SWCTLs) for PAHs, total PAHs, and TRPH
- Source area wells exceeded GCTLs for PAHs and TRPH
- Eastern Navy wells last sampled in 2009 exceeded GCTLs for benzo(b)fluoranthene
- Deep well MW-08D in source area did not exceed GCTLs

Surface Water (most recent data from 2010 and 2012):
- Sample from East Wetland did not exceed Marine SWCTLs
- Samples from West Wetland exceeded Marine SWCTLs for total PAHs

Goals of Expanded Site Assessment in 2017

- The primary goal is to complete a comprehensive site assessment.
- Assess current groundwater concentrations and extent.
- Complete an Ecological Risk Assessment to assess the potential effect of groundwater to surface discharges on ecological receptors in the West Wetland including sediment, surface water, and pore water sampling.

Scope of Expanded Site Assessment in 2017

- Sample all groundwater monitoring wells on a quarterly basis for one year. Install new wells, if necessary, to delineate extent of any impacts.
- Sample sediment, surface water, and pore water in the West Wetland to confirm prior impacts and delineate if necessary.
- Perform an Ecological Survey and Checklist.
- Compare data to Florida's applicable screening levels and present findings in an Expanded Site Assessment and Ecological Risk Assessment Report.

***Questions, Answers, and Comments**:*

Q: Bob Eadie, RAB Member. Is there a way to know how deep the contamination goes?
A: Tread Kissam, NAVFAC SE. When the groundwater is sampled, deeper wells will be installed to get under the contamination. Most of the monitoring wells are shallow, but there are deep wells that go below the water cleanup criteria.

Q: Mimi Stafford, RAB Member. There is not direct tidal flushing?
A: Tread Kissam, NAVFAC SE. The flushing does not go into this area unless there is a large storm event. Because of the type of contamination, there is not the same concern as if pesticides.

Ed R. clarified that the Truck Fill Stand and truck parking area all have a containment system. Over the years, the site has gone through a number of changes. Some of the problems in the past with spills should be less of an issue now with containment structures and best management practices that have been implemented over the years.

MUNITIONS RESPONSE PROGRAM (MRP) UPDATE, TODD HAVERKOST, RESOLUTION CONSULTANTS

<u>UXO 1 – Fleming Key Dredge Spoils</u>

The dredge spoil area is a 42-acre site that was created prior to World War II (WWII). The focus is a 27-acre portion of the site that was last used in 2003/2004 during dredging of the Federal Channel and Truman Harbor. Two munitions items were discovered during the dredging activities (7.2-inch Hedgehog [WWII era anti-submarine munition] and a 76 millimeter [mm] artillery shell).

The Naval Ordnance Safety and Security Activity (NOSSA) performed a Technical Assistance Visit in 2009 that led to site inclusion in the MRP.

MRP investigation activities to date include a Preliminary Assessment that was completed in 2010, a Limited Site Inspection performed in 2012, and a visual survey with a hand held magnetometer. No munitions and explosives of concern (MEC) or material potentially presenting an explosive hazard (MPPEH) was found, but a high density of shallow, subsurface metallic anomalies were detected that

included expended small arms casings and cultural debris (manhole cover, fencing, etc.) found scattered on the ground surface.

An Expanded Site Inspection was completed in 2013 using digital geophysical mapping (DGM) and advanced geophysical classification (AGC). More than 1900 DGM anomalies detected, and 562 were further assessed using AGC.

Field activities included site preparation (surveying, vegetation removal, anomaly relocation) and sampling and field documentation. One surface and 401 subsurface anomalies were investigated to a depth of 4 feet below land surface. Geophysical readings were taken before and after the metal removal. Documentation (description, dimensions, etc.) of the anomalies were recorded. Three near surface soil samples were collected for munitions constituent (MC) analysis.

Summary of Findings

- Surface Findings:
  - Munitions Debris: (1) Deteriorated 37-mm round; (1) 20-mm casing; and (1) 50-caliber casing
- Subsurface Findings:
  - MEC/MPPEH: None found
  - Cultural Debris: various items including pipes, fittings, cables, anchors, etc.
- Soil Sample Analysis Findings:
  - No organic explosives compounds detected
  - Metals were detected, but none are believed to be munitions related

The next steps include submittal of the Confirmatory Sampling Report to the FDEP for review and then to determine what, if any, additional investigation is needed.

<u>UXO 3 – Trumbo Point Temporary Staging Area</u>

This area is the former location of Storage Tank D-3, a 563,000-gallon “cut and cover” tank constructed in 1942 and abandoned in the mid-1990s. In 2008, it was prepared for use as a temporary parking lot. Approximately 3 feet of fill material was used to level the area. Fill material was obtained from the Fleming Key Dredge Spoil Area. NOSSA conducted a Technical Assistance Visit in 2009, and one expended 20-mm casing was observed. Because the origin of the fill material was the Fleming Key Dredge Spoil Area, it was recommended use of the area be discontinued until an appropriate munitions response was performed.

A Preliminary Assessment was completed in 2010 and a Limited Site Inspection in 2012 that included a visual survey with a hand held magnetometer. No MEC or MPPEH was found, but a high density of shallow, subsurface metallic anomalies were detected.

Recently, the Geophysical Classification for Munitions Response Sampling and Analysis Plan and the Munitions and Explosives of Concern Sampling and Analysis Plan were submitted to the FDEP for review.

Geophysical surveys including digital geophysical mapping and advanced classification geophysics will be conducted. The results will be used to scope a removal action to remove dredge spoil fill that originated from Fleming Key.

<u>UXO 4 – A950 Spoils Pile, A22 Drainage Ditch, Dead 8 Spoils Pile, and Vegetation Conversion Areas (VCA) 8 and 22</u>

2012 Munitions Discovery
- ✓ Contractor discovery at ditch
- ✓ Explosives Safety Officer discovery at the Spoils Pile

2015 Non-Time-Critical Removal Action Results
- A950 Spoils Pile
  - ✓ Removed 24 MEC/MPPEH items
- A22 Drainage Ditch
  - ✓ No MEC/MPPEH items encountered
  - ✓

Recovered Munitions and Cultural Debris
- A950 Spoils Pile Mag and Flag / Manual Removal
  - ✓ Removed ~ 900 pounds of munitions debris
  - ✓ Removed ~ 30 pounds of small arms ammunition
  - ✓ Removed ~ 11,000 pounds of cultural debris
- A22 Drainage Ditch Mag and Flag / Manual Removal
  - ✓ Removed ~ 140 pounds of munitions debris
  - ✓ Removed ~ 15 pounds of small arms ammunition
  - ✓ Removed ~ 400 pounds of cultural debris
- Mechanical Screening (both sites)
  - ✓ Removed ~ 900 pounds of munitions debris
  - ✓ Removed ~ 450 pounds of small arms ammunition
  - ✓ Removed ~ 28,000 pounds of cultural debris

2015 MC Sampling
- Composite samples collected from screened soils
- Metals and explosives analysis
- No explosive compounds were found in the stockpile

The scope was expanded in 2016 to include the following maintenance and survey activities at the Dead 8 Spoils Piles and VCAs 8 and 22:

- Remove and limit future vegetative growth on the Dead 8 piles that could impair airfield visibility.
- Install temporary fencing and warning signs to secure the Dead 8 piles that may contain MEC/MPPEH.
- Perform instrument aided surface sweeps to remove any exposed MEC/MPPEH and metallic debris within VCAs 8 and 22.
- Perform DGM surveys within VCAs 8 and 22.
- Aerial survey using optical and Light Detection and Ranging sensors to obtain a volumetric estimate of the Dead 8 piles. The piles are 15 to 20 feet tall.

<u>UXO 6 – North Boca Chica Pistol and Skeet Ranges</u>

Previous assessments included a Preliminary Assessment that was completed in 2010 that included archival research and a limited visual inspection, Limited Site Inspection performed in 2010, field activities in 2010, XRF field screening for lead, and soils and sediment sampling and analysis.

Primary MC at the skeet range consists of inorganics from shot (primarily lead and fractional antimony, arsenic, copper, tin, zinc, and iron), nitroglycerin from smokeless powder at the firing line, and PAHs from clay targets/skeet.

2010 sampling showed no lead above screening criteria in soil or sediment at the skeet range.

Soil exceedances at the pistol range include antimony, arsenic, copper, and lead.

The primary focus of work planned includes data gap sampling at both the skeet range and the pistol range.

***Questions, Answers, and Comments**:*

Q: Bob Eadie, RAB Member. Do you have any concerns that there are any unexploded munitions when your people are digging?
A: Todd Haverkost, EnSafe. Yes, we do. But using the advanced technology, we are able to determine the dimensions and characteristics that indicate if a piece of pipe may be an explosive. Unexploded ordnance technicians are employed to handle the material. There is a lot of planning and safety precautions that are in place.

Q: Mark Songer, RAB Member. There is limited number of shell casings found on the surface. Is there a working theory of why this is only on the surface and not buried?
A: Todd Haverkost, EnSafe. A lot of it has to do that we are looking at a smaller subset of the site and have gone through algorithms to prioritize the larger items in the area. We are looking for 20-mm and larger items. Some of the pipes excavated were the size of 105 rounds. Prioritization had to be done to look for the larger items.

Q: Mark Songer, RAB Member. Is the soil screened?
A: Todd Haverkost, EnSafe. The area is dug and the metal is sifted by hand.

Q: Lucy Page, Citizen. Can you detect aluminum?
A: Todd Haverkost, EnSafe. For the most part the instruments are looking for iron-type items.

POTENTIAL TOPICS FOR NEXT MEETING (JULY 2018), RON DEMES

The potential topics requested by the public and RAB members for the next meeting included the following:

- Update on site closures, Ed Russell
- MRP Update, Todd Haverkost
- Any active sites of concern? Ron does not know of any. Ed Russell stated that the UXO sites are the main focus at this time. There should be more information on UXO 1, UXO 3, and the VCA sites. As part of the Five-Year Review, sampling was conducted at the end of 2016, and the next sampling events would be around the 2021 timeframe. There may be some ecological data to update.
- Sun setting and termination of the RAB, Ron Demes
- Showcase and celebration of the restoration work performed (visual of efforts), Bob Eadie. Ed Russell said that information is being gathered to determine if the amount of money being spent can be reduced.

The next RAB meeting is potentially scheduled for July 18, 2018.

MEETING ADJOURNMENT

Ron reminded the attendees that contact information is included in the minutes, and the community can contact RAB members if they have questions that pertain to the topics in this meeting and for other questions feel free to contact the NAS Key West Public Affairs Officer, Ms. Trice Denny.

If a community member would like to see a site, they can contact Ed Russell at NAS Key West.

Information about the cleanup and other activities can be found at the following websites: http://cnic.navy.mil/regions/cnrse/installations/nas_key_west.html or http://go.usa.gov/KSDJ.

Ron Demes thanked everyone for coming to the meeting. The meeting was adjourned at 7:40 PM.

An informal question and answer period was conducted after the meeting concluded.

Naval Air Station Key West

Installation Update

2017 Restoration Advisory Board Public Meeting

Edward Russell
Installation Restoration / Munitions Response
Program Manager, NAS Key West

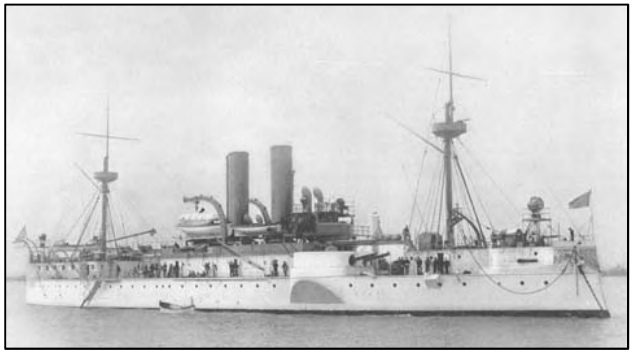
July 18, 2017

Navy History in the Keys

1823: Commodore David Porter arrives with the Mosquito Fleet to combat piracy. Naval Base Key West established at what is now Truman Waterfront

1898: Battleship Maine sails from Key West to Havana Harbor where it exploded, sparking the Spanish-American War

1943: Navy acquires Boca Chica Field



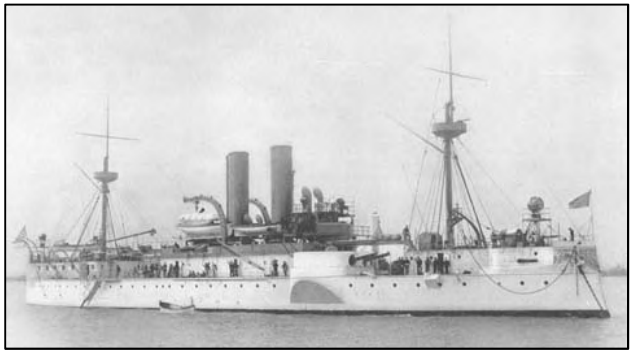
Navy History in the Keys

1945: All airfields combined into NAS Key West

1962: NAS Key West plays a major role in Cuban Missile Crisis – airfield support in blockade and reconnaissance missions

1974: Naval Station decommissioned

1990: Base Realignment and Closure (BRAC)



NAS Key West Today

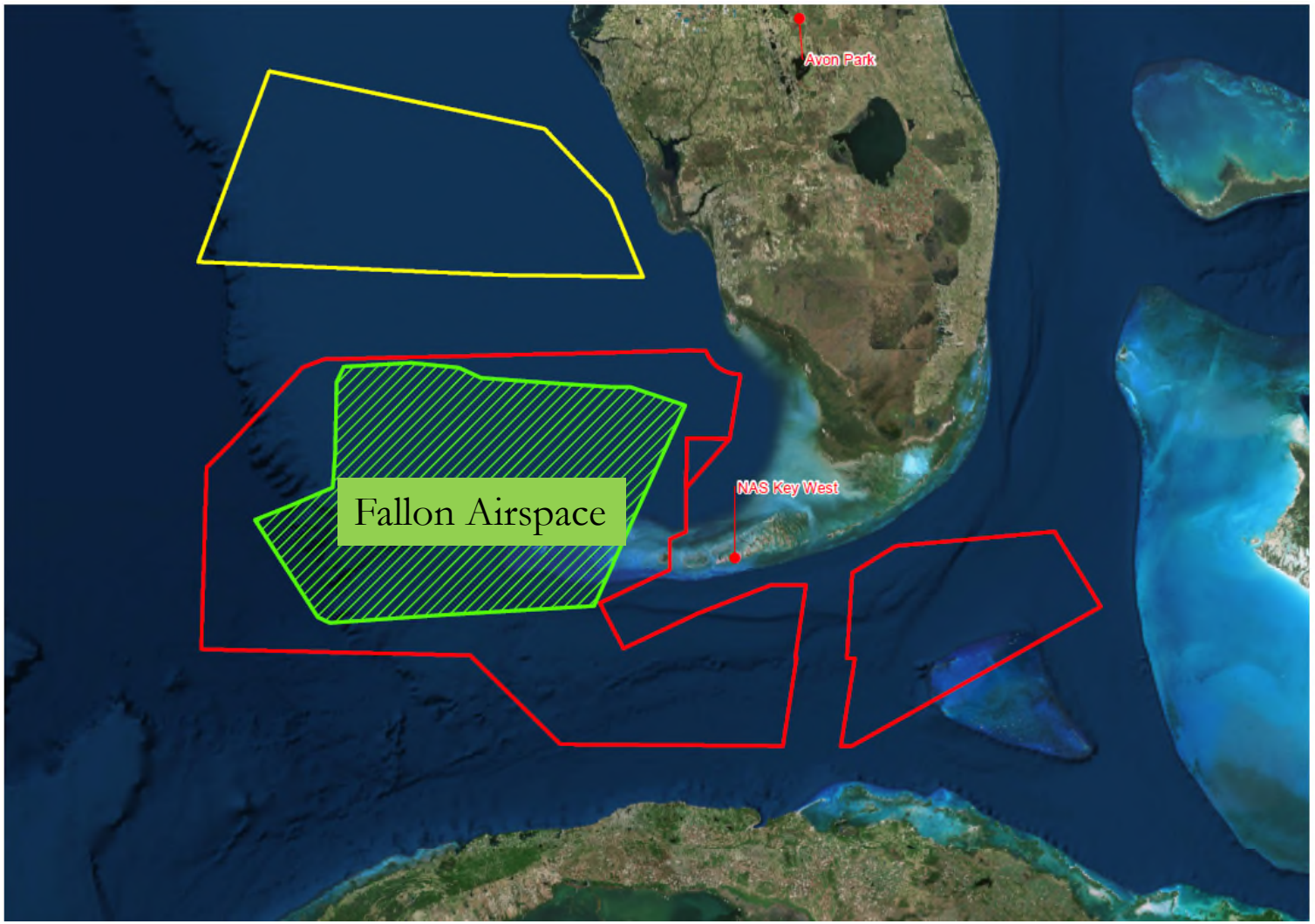
NAS Key West Mission

SUPPORT OPERATIONAL
AND READINESS REQUIREMENTS
FOR DoD, DHS, NATIONAL GUARD,
FEDERAL AGENCIES AND ALLIED FORCES

NAS Key West Today

- Premier location for training tactical aviation squadrons and special operations
- Close proximity to unencumbered air/surface ranges
- Ideal weather
- Tactical Combat Training System (TCTS) to track, control, record and debrief aerial engagements, (remember TOPGUN?)

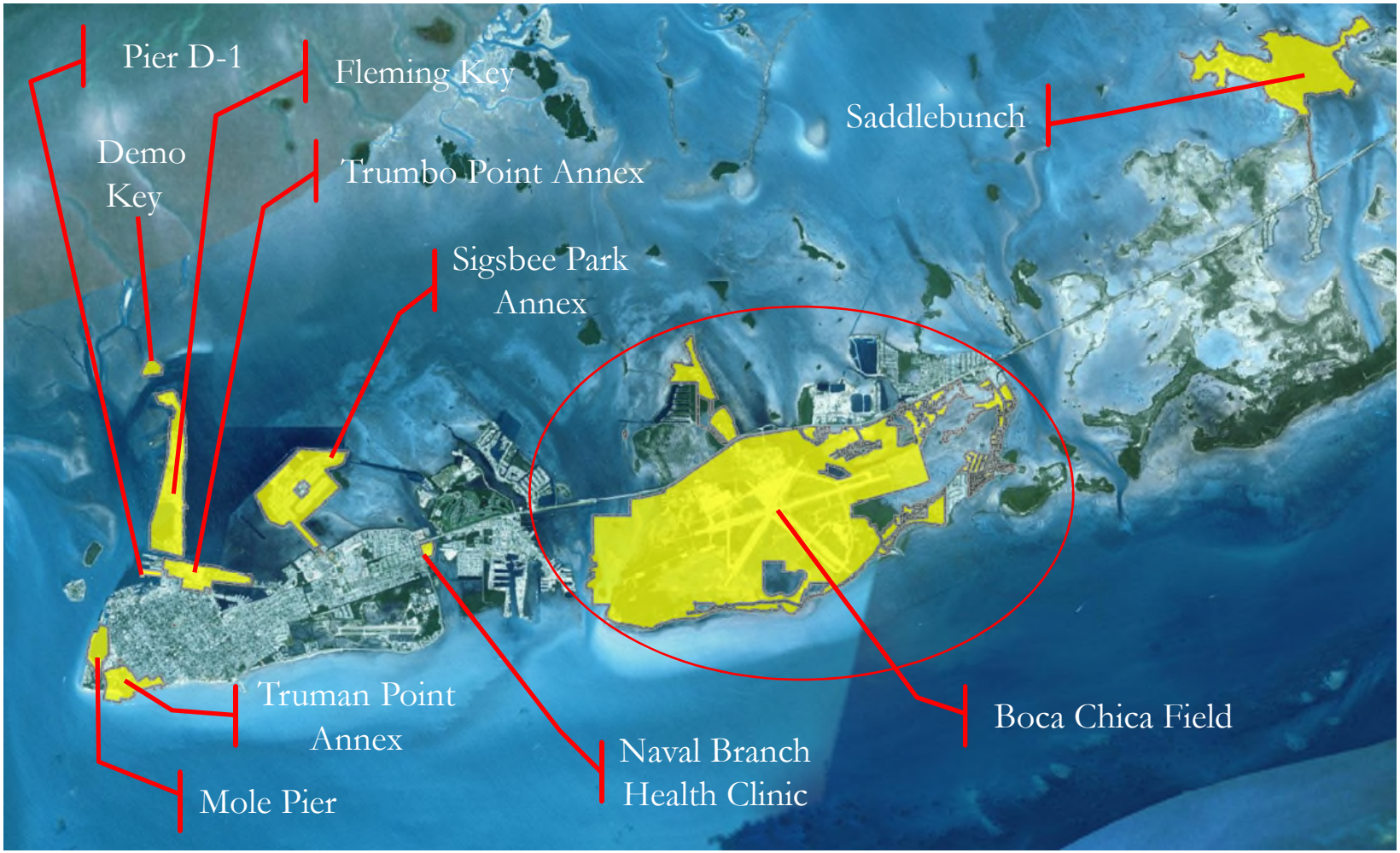
NAS Key West Today



NAS Key West Demographics

- NAS Key West & Tenants:
  - ~1,600 Military
  - ~1,000 DoD Civilians
  - ~700 Contractors
  - ~5,500 total people (incl. dependents)
- Funding:
  - $38M annually to operate
  - Plant Replacement Value: ~$2B
- Facilities:
  - Structures (non-housing): 263
  - Piers: 3 with 5 berths
  - Runways: 1 – 10,000’ & 2 - 7,000’

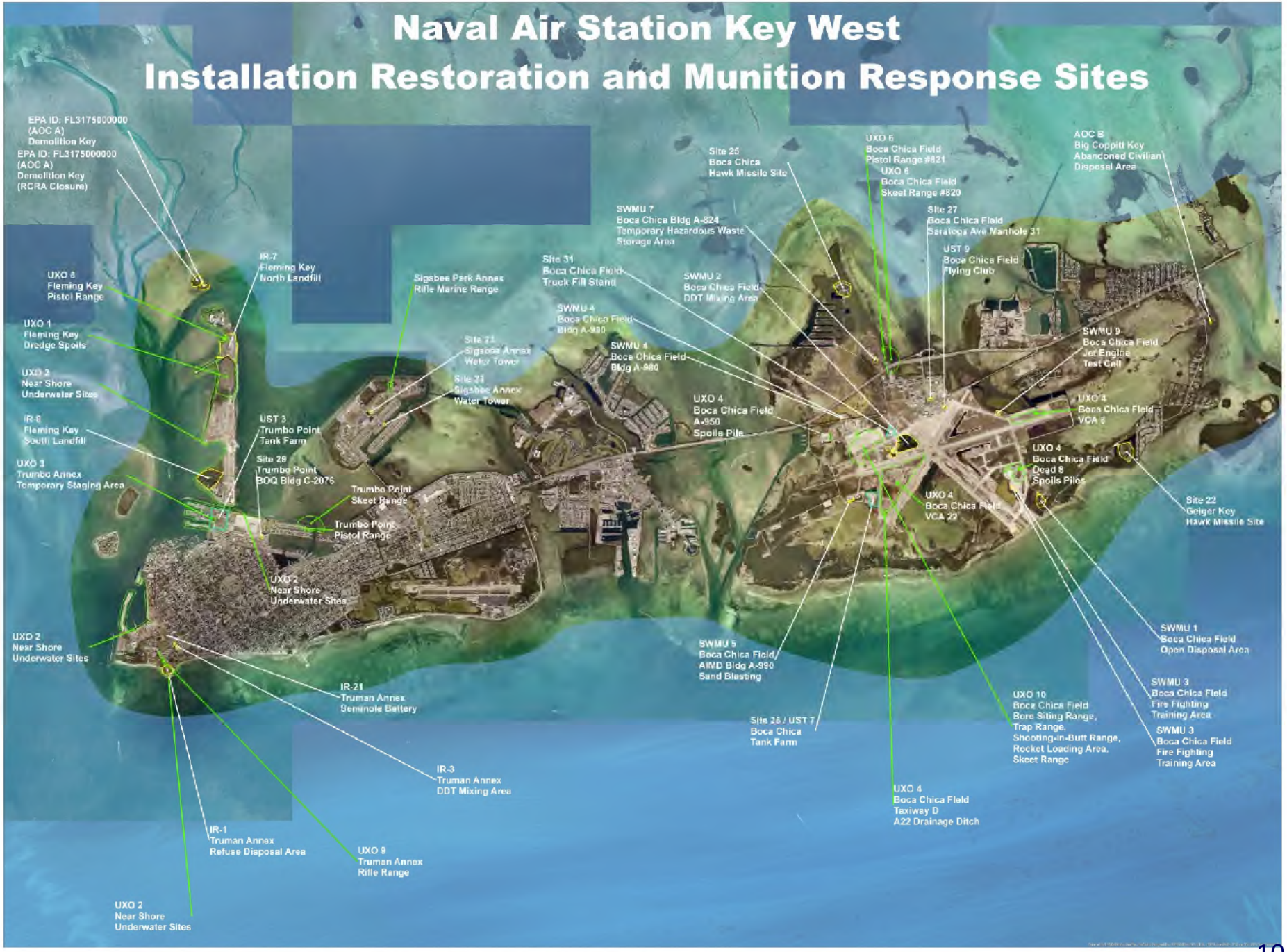
NAS Key West Overview



Area of Responsibility – 5,800 acres / 4,700 acres at Boca Chica Field

NAS Key West
Environmental Program Overview

- 9 Staff Positions in Environmental Division
- Environmental Programs:
    - Installation Restoration / Munitions Response
    - National Environmental Policy Act (NEPA)
    - Solid Waste / Recycling / Air
    - Storage Tanks / Spill Prevention and Response
    - Hazardous Waste / Pollution Prevention
    - Wastewater / Stormwater / Drinking Water
    - Natural Resources / Cultural Resources / Pest Management


Naval Air Station Key West
Installation Restoration and Munition Response Sites
EPA ID: FL3175000000
(AOC A)
Demolition Key
EPA ID: FL3175000000
(AOC A)
Demolition Key
(RCRA Closure)
UXO 8
Fleming Key
Pistol Range
UXO 1
Fleming Key
Dredge Spoils
UXO 2
Near Shore
Underwater Sites
IR-8
Fleming Key
South Landfill
UXO 3
Trumbo Annex
Temporary Staging Area
IR-7
Fleming Key
North Landfill
Sigsbee Park Annex
Rifle Marine Range
Site 23
Sigsbee Annex
Water Tower
Site 24
Sigsbee Annex
Water Tower
UST 3
Trumbo Point
Tank Farm
Site 29
Trumbo Point
BOQ Bldg C-2076
Trumbo Point
Skeet Range
Trumbo Point
Pistol Range
UXO 2
Near Shore
Underwater Sites
UXO 2
Near Shore
Underwater Sites
IR-21
Truman Annex
Seminole Battery
IR-3
Truman Annex
DDT Mixing Area
IR-1
Truman Annex
Refuse Disposal Area
UXO 9
Truman Annex
Rifle Range
UXO 2
Near Shore
Underwater Sites
Site 31
Boca Chica Field
Truck Fill Stand
SWMU 4
Boca Chica Field
Bldg A-990
SWMU 4
Boca Chica Field
Bldg A-990
SWMU 2
Boca Chica Field
DDT Mixing Area
SWMU 7
Boca Chica Bldg A-824
Temporary Hazardous Waste
Storage Area
Site 25
Boca Chica
Hawk Missile Site
UXO 4
Boca Chica Field
A-950
Spoils Pile
SWMU 5
Boca Chica Field
AIMD Bldg A-990
Sand Blasting
Site 28 / UST 7
Boca Chica
Tank Farm
UXO 6
Boca Chica Field
Pistol Range #821
UXO 6
Boca Chica Field
Skeet Range #820
Site 27
Boca Chica Field
Saratoga Ave Manhole 31
UST 9
Boca Chica Field
Flying Club
UXO 4
Boca Chica Field
VCA 22
UXO 4
Boca Chica Field
Taxiway D
A22 Drainage Ditch
AOC B
Big Coppitt Key
Abandoned Civilian
Disposal Area
SWMU 9
Boca Chica Field
Jet Engine
Test Cell
UXO 4
Boca Chica Field
VCA 8
UXO 4
Boca Chica Field
Dead 8
Spoils Piles
Site 22
Geiger Key
Hawk Missile Site
SWMU 1
Boca Chica Field
Open Disposal Area
SWMU 3
Boca Chica Field
Fire Fighting
Training Area
SWMU 3
Boca Chica Field
Fire Fighting
Training Area
UXO 10
Boca Chica Field
Bore Siting Range,
Trap Range,
Shooting-in-Butt Range,
Rocket Loading Area,
Skeet Range

NAS Key West
Environmental Program Overview

Solid Waste / Recycling / Air

- Solid Waste
  - waste tires, construction and demolition debris, trash
- Recycling
  - office materials, used oil, batteries
- Air
  - Emergency Planning Community Right to Know Act (EPCRA)
    - hazardous substance use/storage,
    - ozone depleting substances (ODS) - refrigerants

NAS Key West
Environmental Program Overview

Storage Tanks / Spill Prevention and Response

- Storage Tanks
  - 95 Storage Tanks
  - Four Bulk Storage Tanks – 988,000 gallons
  - 1.2M gallons
- Spill Prevention, Control, and Countermeasure (SPCC) Plan
- Facility Response Plan
- Spill Drills
  - Navy/USCG/FDEP/Contractor Joint Exercise

NAS Key West
Environmental Program Overview

Hazardous Waste / Pollution Prevention

- Permitted Part B Treatment, Storage and Disposal (TSD) Facility
  - Storage Only prior to shipment for final disposal
- Work Center Waste Stream Identification & Waste Storage Areas
- Hazardous Waste Awareness Training

NAS Key West
Environmental Program Overview

Wastewater / Drinking Water

- Both programs “privatized”:
  - October 2015 the Navy entered into a contract with Florida Keys Aqueduct Authority (FKAA) to provide wastewater utility service for NASKW. FKAA has ownership and responsibility for the waste water utility systems and treatment plant.
  - January 2008 the Navy entered into a contract with FKAA to transfer ownership and operation of the NASKW drinking water system to FKAA. FKAA operates the drinking water system including performing all testing, monitoring and repairs of the system.

NAS Key West
Environmental Program Overview

Storm Water

- Storm Water Pollution Prevention Plan (SWPPP)
  - Identify sources of pollution potentially affecting the quality of storm water discharges from the facility associated with industrial activity
  - Describe and ensure implementation of practices to minimize and control pollutants in storm water discharges from the facility associated with industrial activity
  - Ensure compliance with the terms and conditions of the Station's stormwater permit (MSGP).

NAS Key West
Environmental Program Overview

Natural Resources

- Integrated Natural Resources Management Plan (INRMP).
  - Identifies 21 federally listed species on NAS Key West property including 12 animals and nine plants
  - Provides a conservation benefit to staghorn and elkhorn corals and loggerhead sea turtles. NOAA and NMFS determined that a critical habitat exclusion for these species is warranted for the nearshore waters controlled by NAS Key West
  - The endangered Lower Keys marsh rabbit (LKMR) is endemic to the Lower Florida Keys
    - The U.S. Fish & Wildlife Service estimates there are only 2,116 acres of suitable habitat to support LKMR
    - NAS Key West supports an estimated 60% of the total Lower Keys marsh rabbit population, in only 15% of the total habitat area

NAS Key West
Environmental Program Overview

- May 2015 Public Meeting, the USFWS presented data showing the Boca Chica meta-population of Lower Keys marsh rabbits increasing while two other populations in the Lower Keys were declining

NAS Key West
Environmental Program Overview

- Threatened and Endangered Species Surveys

Turtle Nesting Surveys

Swordfish Surveys

NAS Key West
Environmental Program Overview

- Habitat Enhancement



Roseate Tern Nesting Boxes / Shorebird Nesting Platform


Community Involvement

- Sigsbee Charter School
- Beach Cleanups
- Earth Day
- National Public Lands Day








Questions?

Naval Facilities Engineering Command

Naval Air Station Key West

Installation Restoration Program Updates

Sites Anticipated to Close on or before 2018

Information provided by:

Edward Russell, NAVFAC SE NASKW

Edward.O.Russell@navy.mil

305-797-4461

7/18/2017

Installation Restoration Program Updates

Four Sites are anticipated to be closed by end of Fiscal Year 2018

- **SWMU 9 – Jet Engine Test Cell**
  - **Anticipated to using Risk Management Option II (RMO-II)**
- **Boca Chica Flying Club – UST 9**
  - **Anticipated to close using RMO-II**
- **Trumbo Annex BOQ – Site 29**
  - **Anticipated to close using RMO-II**
- **Geiger Key Hawk Missile Site – Site 22**
  - **Anticipated to close using RMO-II**

Installation Restoration Program Updates

Florida Administrative Code Rule 62-780.680 No Further Action and No Further Action with Controls provides for the following closure options:

- **Risk Management Option I (RMO-I)**
  - **Clean-closure without institutional or institutional/engineering controls required.**
- **Risk Management Option II (RMO-II)**
  - **No Further Action with institutional controls and/or engineering controls.**

SWMU 9 – Jet Engine Test Cell

1969: **Jet Engine Test Cell, associated with building A-969, used for the testing of repaired jet engines**

1987-1995: Jet engines were fueled from a bermed 5,000 gallon above ground storage tank (AST) containing JP-5 fuel

SWMU 9 – Jet Engine Test Cell

1989: A leak resulted in the release of approximately 700 gallons of JP-5 from the AST. Approximately 600 gallons were recovered and 10 cubic yards of contaminated soil were excavated and removed from the spill site.

1992: An overturned oil drum and stained soil were observed.

1994: Contamination Assessment Report (CAR) identifying Dichloroethene (DCE) and benzene plumes in the eastern part of the site.

1995: Groundwater evaluation conducted at the site. Subsequently, a pump and treat system was installed. The system operated for one year, but did not recover any free product.

SWMU 9 – Jet Engine Test Cell

1996: Supplemental RCRA Facility Investigation (RFI)/Remedial Investigation (RI) completed.

1999: Corrective Measures Study (CMS) completed.

2000: Baseline sampling conducted and the Enhanced Biodegradation Treatability Study Work Plan was prepared.

2001: Oxygen Release Compound (ORC) and Hydrogen Release Compound (HRC) injections performed to treat benzene and DCE plumes. Groundwater contaminant and natural attenuation quarterly monitoring began in July 2001 and were completed in April 2002 to determine the success of the ORC and HRC injections.

2003: Annual contaminant and natural attenuation monitoring took place at SWMU 9 in January 2003.

Dichloroethene (DCE)

SWMU 9 – Jet Engine Test Cell

2004: A Work Plan was prepared to perform additional delineation of soil and groundwater contamination. The Five Year Review Report was also prepared and concluded that additional remediation was necessary at the site because the existing remedy is not protective of human health and the environment.

2008: During November 2008, an investigation was conducted to determine if the site was still suitable for Monitored Natural Attenuation (MNA) as a long term remediation strategy.

SWMU 9 – Jet Engine Test Cell

2010: A sampling event was conducted during August 2010 and it was determined that two new wells were needed to bound the northern section of the plume. The two new wells were installed In December 2010 and sampled. Additional sampling was recommended to confirm northern delineation.

2013: Investigations determined contamination was confined to less than ¼ acre. Natural breakdown was still occurring.

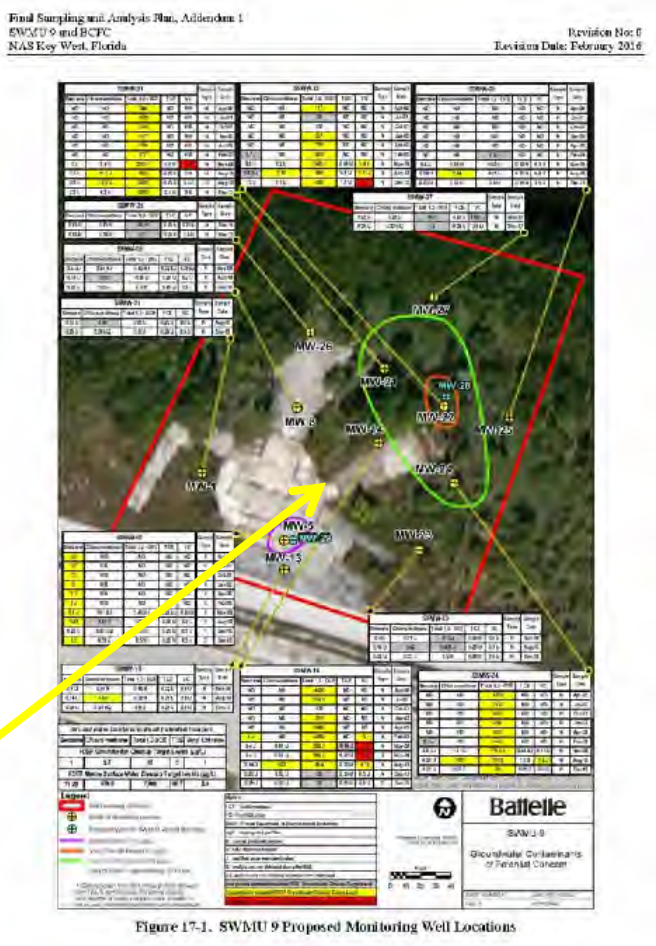


Figure from 2016
Sampling and Analysis Plan

SWMU 9 – Jet Engine Test Cell

2016: Installation of two deep wells for vertical delineation. Site sampled and vertical delineation confirmed.

2017: First of two semi-annual monitoring events conducted first part of 2017. Second event scheduled for September 2017.

Closure anticipated end for second quarter of Fiscal Year 2018 with Groundwater Land Use Controls.

Boca Chica Flying Club – UST 9

Boca Chica Flying Club – UST 9

The Boca Chica Flying Club is located along the northwest boundary of Taxiway "H", south of Building A-133 at Boca Chica Field. The Flying Club is the former site of four ASTs and associated dispensers and piping, which reportedly contained aviation gas (AVGAS). The Boca Chica Flying Club was in operation until the late 1960s. Overfilling of the ASTs is the suspected cause of petroleum contamination at the site.

3-18-2017 Google Earth Image

Boca Chica Flying Club – UST 9

1992: The ASTs, fuel dispensers, and associated piping were removed from the site.

1994: Contamination Assessment Report (CAR).

1997: Remedial Action Plan (RAP).

1998: An Interim Remedial Action (IRA) was performed removing 983 cubic yards of soil from the site.

1999: Quarterly monitoring was implemented to ensure the IRA was successful.

Boca Chica Flying Club – UST 9

2001: A more aggressive approach was recommended because contaminant levels did not seem to be attenuating. Air Sparging (AS)/Soil Vapor Extraction (SVE) Treatability Study Work Plan prepared.

2002: AS/SVE system installed . The system operated successfully from June 2002 through January 2003.

2003: Quarterly sampling resumed in May 2003 and continued through May 2004.

2004: A Supplemental Site Assessment was recommended because petroleum constituent concentrations began increasing in a perimeter well following completion of the treatability study. Supplemental Site activities began in July 2004. A Direct Push Technologies (DPT) investigation was performed and additional monitoring wells were installed to delineate contamination.

Boca Chica Flying Club – UST 9

2006: Eight monitoring wells were installed. Quarterly groundwater sampling was conducted between August 2006 and May 2007.

Groundwater and chemical data demonstrated that the monitoring well network configuration did not provide for vertical or lateral delineation of the dissolved-phase hydrocarbon plumes.

2008: Nine shallow monitoring wells were installed to define the nature and extent of contamination. Two deep wells were also installed to define the vertical extent of contamination. Eighteen monitoring wells were sampled. Results were presented in the 1st Quarter Monitored Natural Attenuation Report. It was recommended that additional monitoring be performed to determine if contamination was attenuating at the site.

Boca Chica Flying Club – UST 9

2008: **A total of 23 monitoring wells were closed in the vicinity of the Site. These wells were located around Building A126 and Building A133 and were on both the east and west sides of the chain link fence separating these service buildings from the aircraft parking area. An odor of hydrocarbons was detected in the monitoring wells that were extracted in the immediate vicinity of the Hazardous Substances Storage Area, Building A126A.**

Wells remaining after abandonment

Boca Chica Flying Club – UST 9

2009: Eighteen monitoring wells sampled. Results were presented in the 2nd Quarter Monitored Natural Attenuation Report (February 2009) and recommended that monitoring be continued to determine if contamination was attenuating and if seasonal or tidal influences were affecting the dissolved-phase chemical concentrations.

2010: Two new shallow monitoring wells and the previous 18 monitoring wells were sampled. The results were presented in the 3rd Quarter Monitored Natural Attenuation Report (August 2010).

Boca Chica Flying Club – UST 9

2013: **Additional monitoring wells were installed to delineate the contaminant plume and groundwater sampling was conducted.**

Figure 17-2. Boca Chica Flying Club Proposed Soil Sampling Locations

Figure from 2016 Sampling and Analysis Plan

Boca Chica Flying Club – UST 9

2016: **Soil samples collected to determine if any contamination was present in upper three feet of the site. Wells were also sampled for first quarter semi-annual. Current sampling results demonstrate remaining contamination has been delineated and is confined to less than ¼ acre within site boundary.**

2017: **Second quarter semi-annual sampling scheduled for September 2017.**

Boca Chica Flying Club – UST 9

Site is anticipated to close under RMO-II by second quarter fiscal year 2018.

Site as of 2017

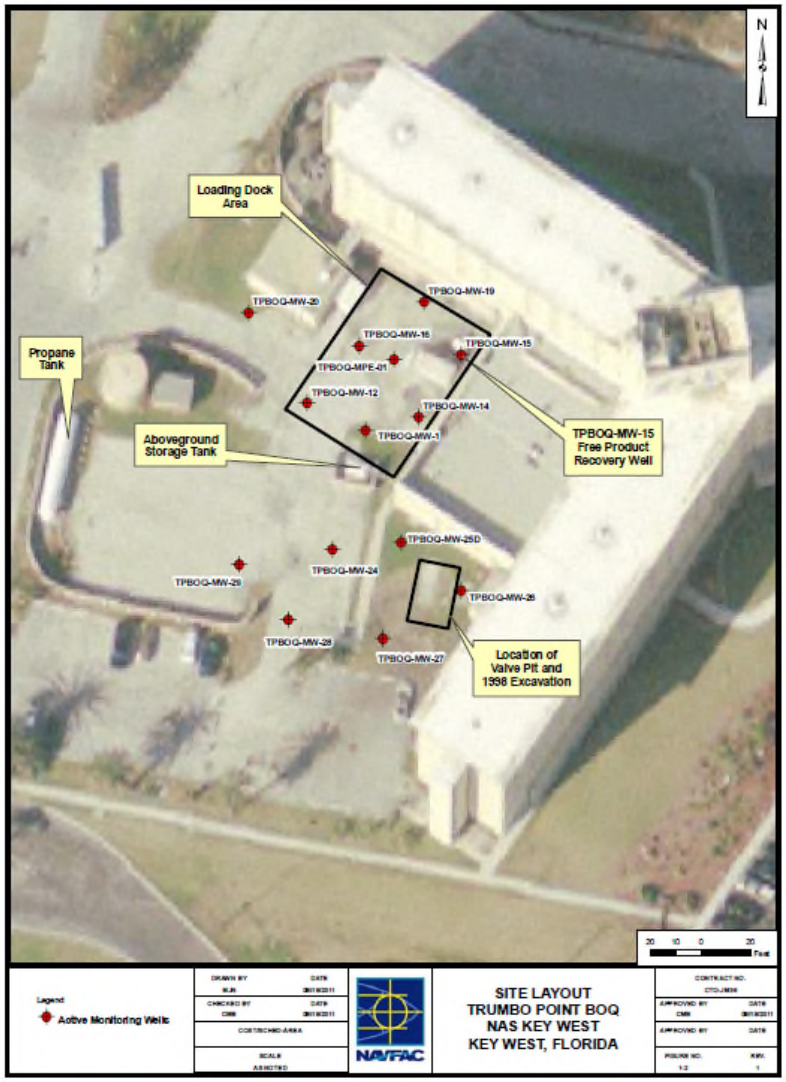
Trumbo Annex BOQ (TPBOQ) – Site 29

- (Historical) Trumbo Point is a 140-acre filled area created in 1908 to provide land for the tracks and warehouses needed for a major shipping port.
- A 1,000-gallon JP-5 AST with secondary containment, used to fuel the water heaters for the TPBOQ, is currently located near the southwest corner of the loading dock (see arrow). An aboveground propane tank is also located on site to the southwest of the loading dock.

3-18-2017 Google Earth Image

Trumbo Annex BOQ – Site 29

1998: An underground free-phase petroleum plume was first discovered adjacent to the AST. Approximately 55 cubic yards of contaminated soil and approximately 10 gallons of free product were removed from the vicinity of the valve pit. Due to the proximity of the building and an active propane gas supply line, excavation of the entire extent of impacted soils was not possible. A Source Removal Report was subsequently submitted to the FDEP.



NIRIS Doc # 001498

Trumbo Annex BOQ – Site 29

1999: A site assessment was subsequently conducted and a site assessment report (SAR) was submitted to FDEP. This SAR concluded that diesel fuel free product probably remained on site, and that dissolved phase groundwater petroleum hydrocarbon concentrations exceeded the GCTLs. Soil contamination was present in excess of the SCTLs. FDEP approved the SAR, concurring with the recommendation to prepare a Remedial Action Plan (RAP).

GCTL: Groundwater Cleanup Target Levels
SCTL: Soil Cleanup Target Levels

Trumbo Annex BOQ – Site 29

2002: The RAP prepared for the site recommended conducting several short-term multi-phase extraction events until free product was no longer present in any of the monitoring wells. Multi-phase extraction technology proved to be ineffective.

2003 – 2008: Sampling events to monitor the level of groundwater contamination at the TPBOQ were conducted in May 2003, November 2006, and November 2008.

Trumbo Annex BOQ – Site 29

2007 – 2008: During July 2007 through March 2008, an initial treatability study was performed to evaluate the effectiveness of various technologies for the extraction of free product from the soils. During the 160 day treatability study, 35 gallons of free-phase product were removed from recovery well TPBOQ-MW-15.

2008 – 2009: A second treatability study was performed from August 2008, through August 2009, to further evaluate recommendations. During the 12-month period of the treatability study, 3.1 gallons of free-phase product were recovered from recovery well TPBOQ-MW-15.

2009 – 2010: A third treatability study was performed from August 2009, through August 2010. During the 12-month period of the treatability study, slightly less than two gallons of free-phase product were recovered from recovery well TPBOQ-MW-15.

Trumbo Annex BOQ – Site 29

2010 – 2011: A fourth treatability study was performed from August 25, 2010, through August 11, 2011. During the 12-month period of the treatability study, less than one gallon of free-phase product were recovered from recovery well TPBOQ-MW-15.

2011 – 2012: A final treatability study was conducted from August 12, 2011, through August 20, 2012. During this 12-month period, 13 free product recovery events were performed at the well, and a total of 0.02 gallons of free product were recovered. Based on the results, it was recommended to discontinue use of the PIG® Monitoring Well Skimming Sock due to limited quantifiable free product recovery. Additional sampling of the dissolved-phase constituents previously detected in groundwater was recommended.

Trumbo Annex BOQ – Site 29

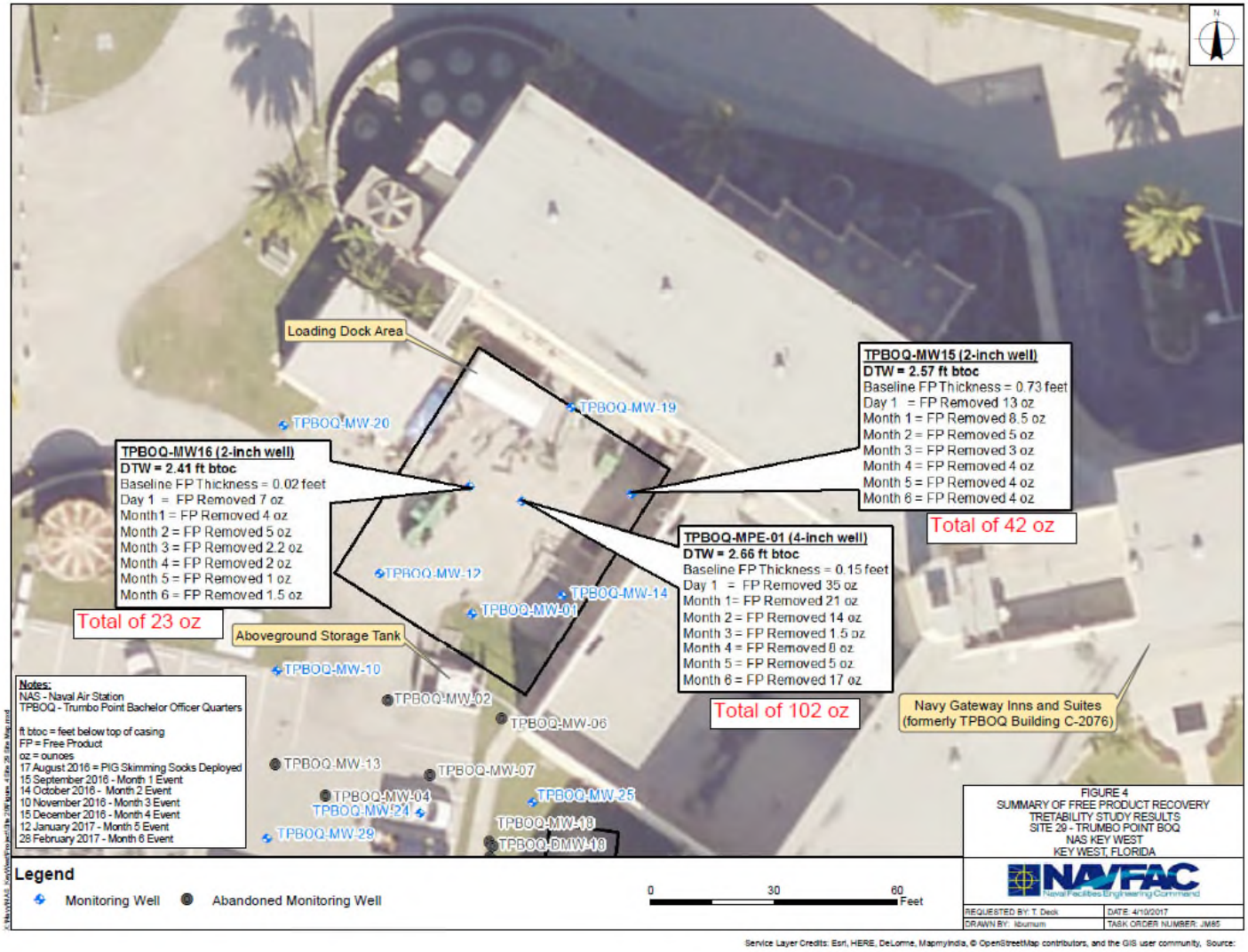
2013: FDEP concurred with recommendation to prepare a new sampling plan.

2016 - 2017: Six additional monthly Treatability Study events were conducted resulting in limited quantifiable free product recovery. Six additional Quarterly Treatability Study events were initiated starting in June 2017.

2017 – 2018: This site is being evaluated for closure under RMO II(a)

(1)Free product is not present and no fire or explosive hazard exists as a result of a release of non-aqueous phase liquids, or (2) Free product removal is not technologically feasible or cost-effective; and, (3) Free product is not migrating and does not pose a risk to human health, public safety or the environment.

Trumbo Annex BOQ – Site 29



2016 / 2017 Treatability Study Preliminary Data

Trumbo Annex BOQ – Site 29

Closure anticipated end of calendar year 2018 with Groundwater Land Use Controls.

Approximate locations of three treatability study wells – Site as of 2017

Geiger Key Hawk Missile Site – Site 22

- **The former Geiger Key Army Hawk Missile Site (AHMS) is approximately 12 acres.**
  - **Built on salt ponds filled by the U.S. Army in order to adapt the area for use as a missile site.**
  - **Work on the facility began in 1965 in support of the Cuban Missile Crisis, and continued for several years thereafter.**
  - **It was used for coastal defense until 1979, at which time the Army units demobilized from all of the Hawk Missile batteries in the Florida Keys.**

3-18-2017 Google Earth Image

Geiger Key Hawk Missile Site – Site 22

1996: The Site has a 2,000-gallon AST and a 300-gallon AST, previously used to store diesel fuel for emergency generators, both closed in place 1996. The Closure Report indicated that soil and groundwater near the 2,000-gallon AST showed signs of petroleum hydrocarbons. It was recommended that a Contamination Assessment be performed.

2,000-gallon AST

300-gallon AST

Geiger Key Hawk Missile Site – Site 22

2001: Contamination Assessment showed the Total Recoverable Petroleum Hydrocarbons (TRPH) concentration was greater than the FDEP Soil Cleanup Target Levels (SCTL) at a soil sample location less than 20 feet south of the closed 2,000-gallon AST. The groundwater analytical results indicated that several petroleum hydrocarbons were detected in two monitoring wells at concentrations greater than the Groundwater Concentration Target Levels (GCTLs).

Geiger Key Hawk Missile Site – Site 22

2002: FDEP approved a Site Assessment Report (SAR) and concurred with the recommendation to continue further field investigation to delineate the extent of impact from the petroleum hydrocarbons.

2003: Supplemental Site Assessment Work was conducted. TRPH was detected, but at concentrations less than the residential SCTL. Concentrations in several groundwater samples collected exceeded the GCTLs for TRPH and Polycyclic Aromatic Hydrocarbons (PAHs).

2004: Five additional shallow monitoring wells and one additional deep monitoring well were installed.

2005: A Treatability Study Work Plan for AHMS Geiger Key was developed.

Geiger Key Hawk Missile Site – Site 22

2006: During the implementation of the Treatability Study it was noted that the volume of free product had increased; therefore, passive free product recovery was no longer an appropriate remedial option.

2010: Site Investigation (SI) completed.

Metal concentrations in groundwater were detected above GCTLs. Pesticides concentrations in groundwater exceeded criteria at two locations. One groundwater sample exceeded the TRPH criteria and free-product was observed in monitoring well G01-MW-11. No Volatile Organic Compounds (VOCs) or Semi- volatile Organic Compounds (SVOCs) were detected above regulatory limits. An expanded SI was recommended for confirmatory sampling.

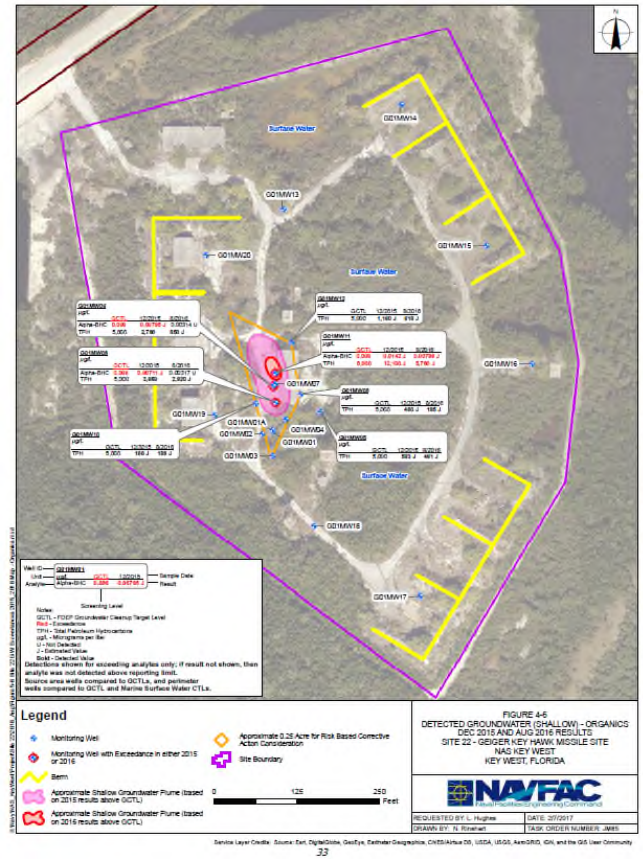
2013: Confirmatory groundwater sampling during May 2013.

Geiger Key Hawk Missile Site – Site 22

2015: Additional monitoring wells installed for horizontal delineation. Contamination delineated and confined to less than ¼ acre within site boundary.

2016: First of two semi-annual groundwater sampling events conducted.

2017: The second monitoring event is scheduled for late 2017.



Draft Expanded Site Inspection Report
Site 22 — Geiger Key Hawk Missile Site
February 2017

Geiger Key Hawk Missile Site – Site 22

This Site is expected to close using RMO-II with groundwater land use controls in 2018.

Comments & Discussion

Solid Waste Management Unit 2
Boca Chica DDT Mixing Area

Naval Air Station Key West
Key West, Florida

Site Location

Site Layout and Historical Use

- Site is within the active NAS KW airstrip and surrounded by runway and taxiways
- Former storage and mixing of pesticides at Former Building 915
- Formerly two above ground storage tanks
- Operations ceased in 1970s
- Site structures demolished in 1985 BKACNLE6
- Site boundary expanded after Hurricane Wilma in 2005
- Airfield programs clear mangroves along flight lines including SWMU 2.

BKACNLE6 according to 2013 Annual Performance Monitoring Report the structures were demolished in 1982.
Bowers, Kenneth A CIV NAVFAC LANT, EV, 7/14/2017

Investigation History

- Site investigations in 1990s found pesticides in sediment.
- Human health and ecological risk assessment performed with samples collected in January 1996 concluded there were potential risks to ecological receptors from pesticides in sediment and surface water.
- Interim remedial action in April 1996 excavated contaminated soil/sediment and filtered surface water.
- Corrective Measures Study in 1998 determined the most appropriate long term remedy would be land use controls with monitoring
- Land use controls were implemented to limit potential exposure to the remaining contaminants and routine monitoring of soil, groundwater, and local fish, crabs, and vegetation began in 2000.
- Quarterly monitoring was performed through 2001, then annual monitoring through 2014.
- Based on the 2004 Five Year Review Report, biological monitoring discontinued.
- Site boundary was expanded after a 2006 storm surge investigation indicated storm surge from Hurricane Wilma migrated contaminates beyond the original boundary.
- 2016 Five Year Review Report indicated the remedy is protective of human health and environment, LUCs should remain, and monitoring should be reduced to quinquennial.

Slide 4

BKACNLE2 It would be more accurate to say a large portion of contaminated sediment was removed but not everything. Original contaminated sediment remains on site.
Bowers, Kenneth A CIV NAVFAC LANT, EV, 7/14/2017

BKACNLE3 I do not believe that soil was part of ongoing monitoring. rather than say fish and crabs i think we should just say biomonitoring...it is my understanding that is was only fish tissue.

We should add surface water.
Bowers, Kenneth A CIV NAVFAC LANT, EV, 7/14/2017

BKACNLE4 suggest we use "ecological monitoring" - that language should include both fish tissue and vegetation.
Bowers, Kenneth A CIV NAVFAC LANT, EV, 7/14/2017

Current and Upcoming Activities

- **Most recent annual sampling conducted in January BKACNLE5ch 2017. Report currently being prepared.**

- **An Ecological Risk Assessment is planned for late 2017, which will include the expanded site boundary.**

Slide 5

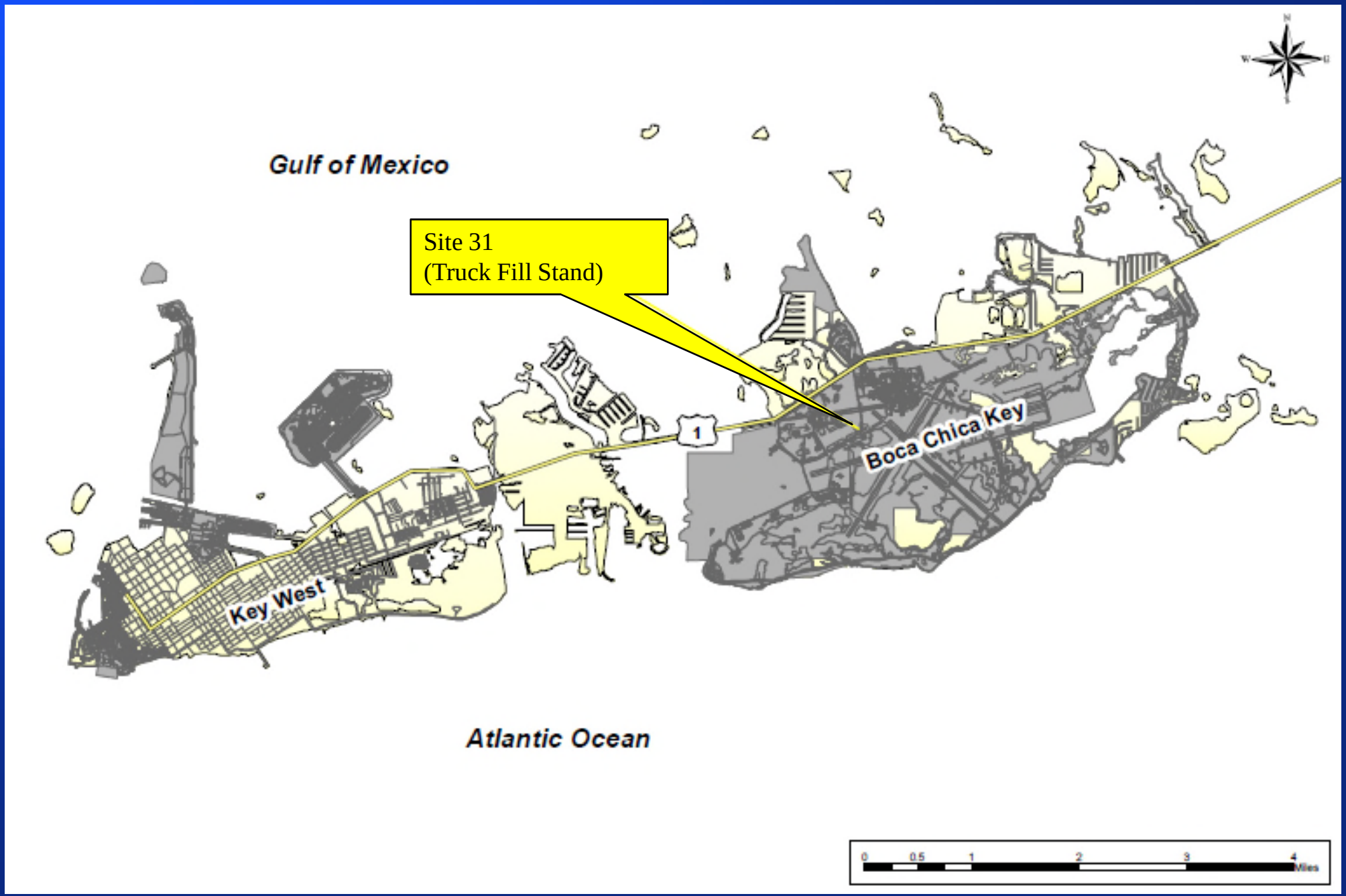
BKACNLE5 this sounds like two seperate sampling events took place - is that correct?
Bowers, Kenneth A CIV NAVFAC LANT, EV, 7/14/2017

QUESTIONS?

Site 31- Boca Chica Truck Fill Stand Expanded Site Assessment Overview

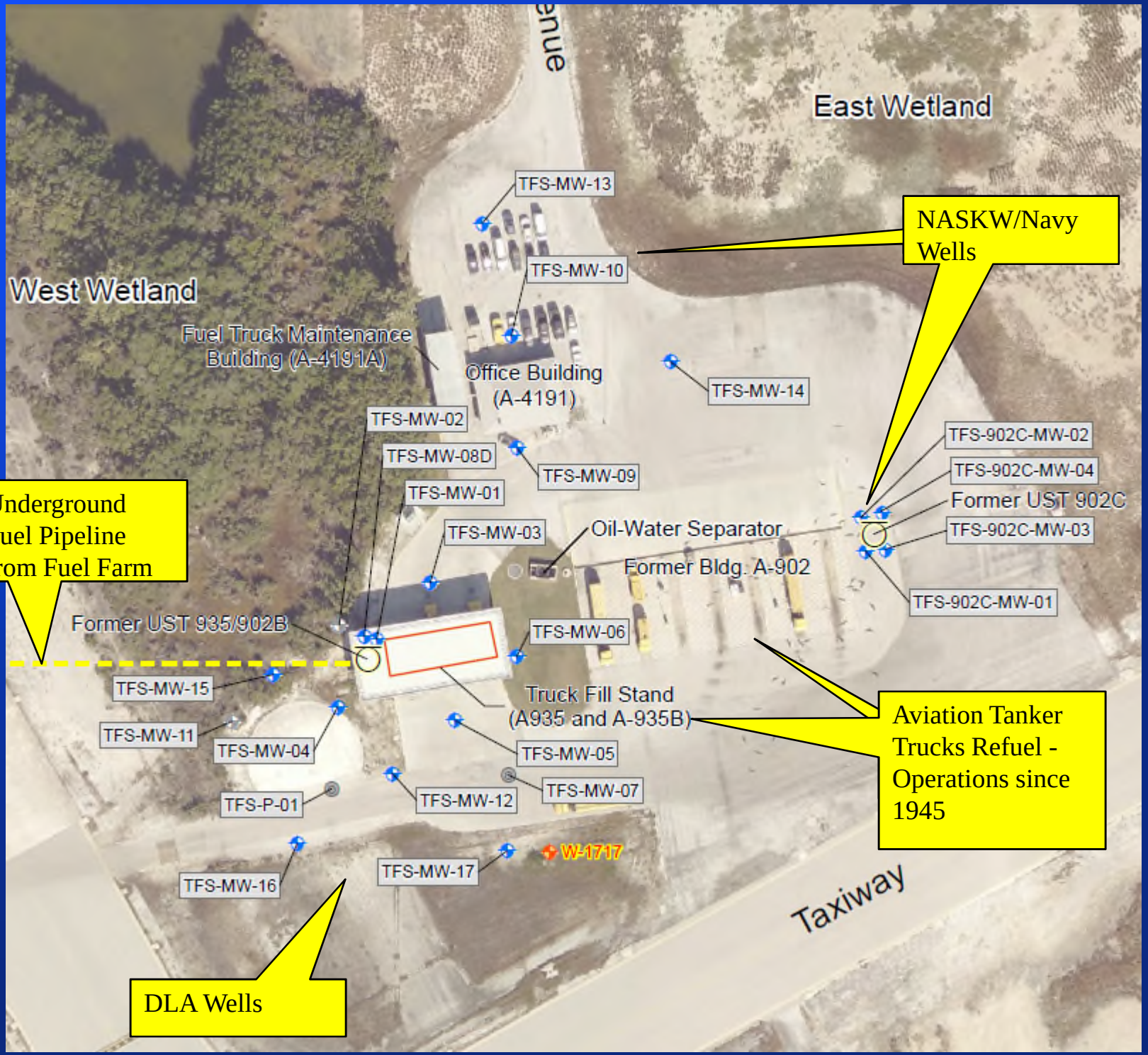
Naval Air Station Key West
Key West, Florida

Site Location



Site Location

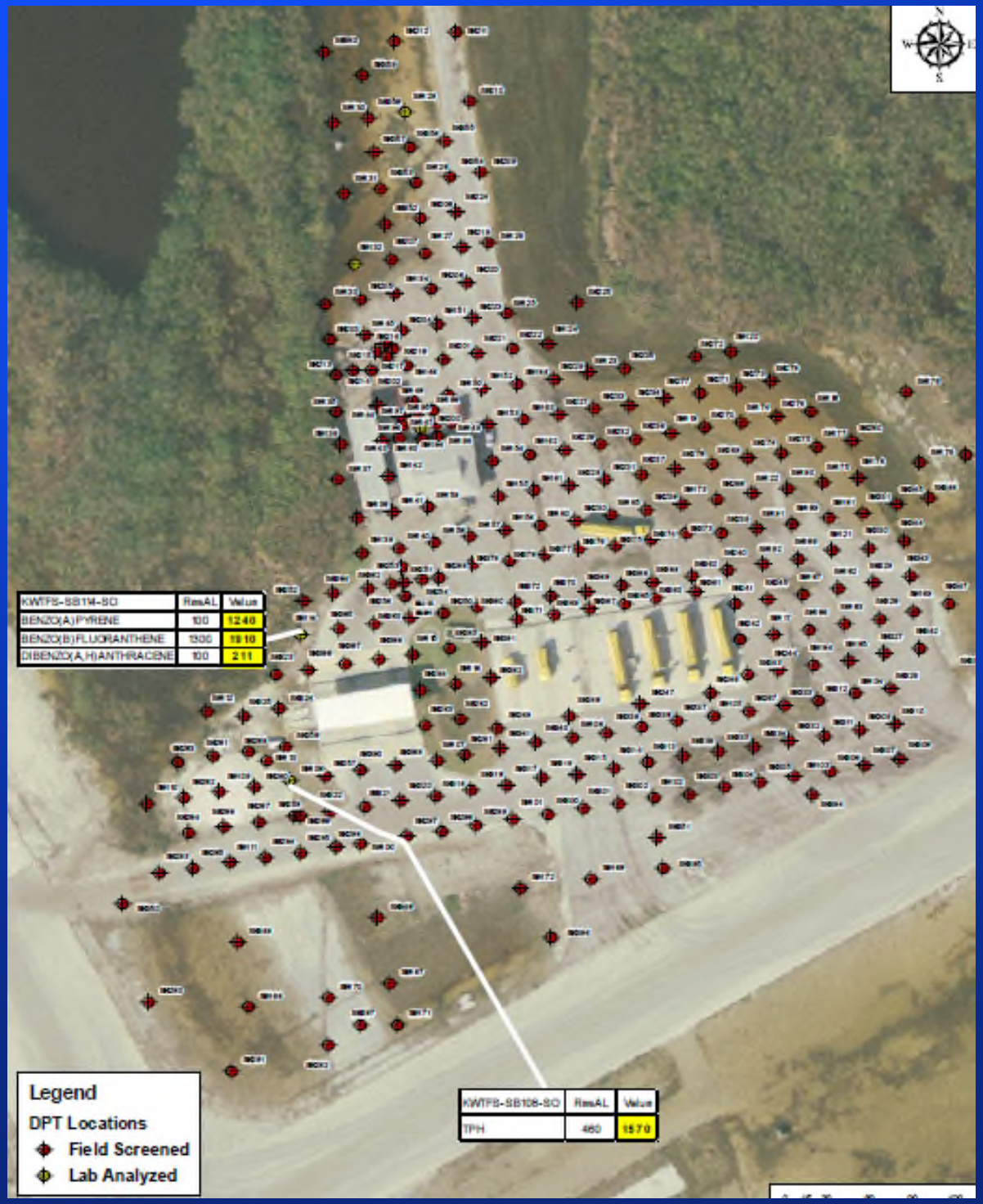
Layout and Historical Operations



Site History

- Several 3,000+ gallon JP-5 fuel spills documented: 1986 and three in 2000
- Product recovery, excavation and assessments since documented releases
- Most recent sampling: soil (2010), sediment and surface water (2012), and groundwater (April 2013)
- Free product last measured in 2000 at MW-01 (1.9 inches)
- Water table near ground surface to 3 feet bgs; groundwater flow direction shifts due to tidal influences, but often radially to the north, south and west
- With water levels generally at the ground surface, and minimal unsaturated zone soil, any contaminant releases would have been readily absorbed from surface soil to groundwater
- Potential exposure to ecological receptors within West Wetland from contaminants migrating from shallow groundwater

Previous Site Assessments

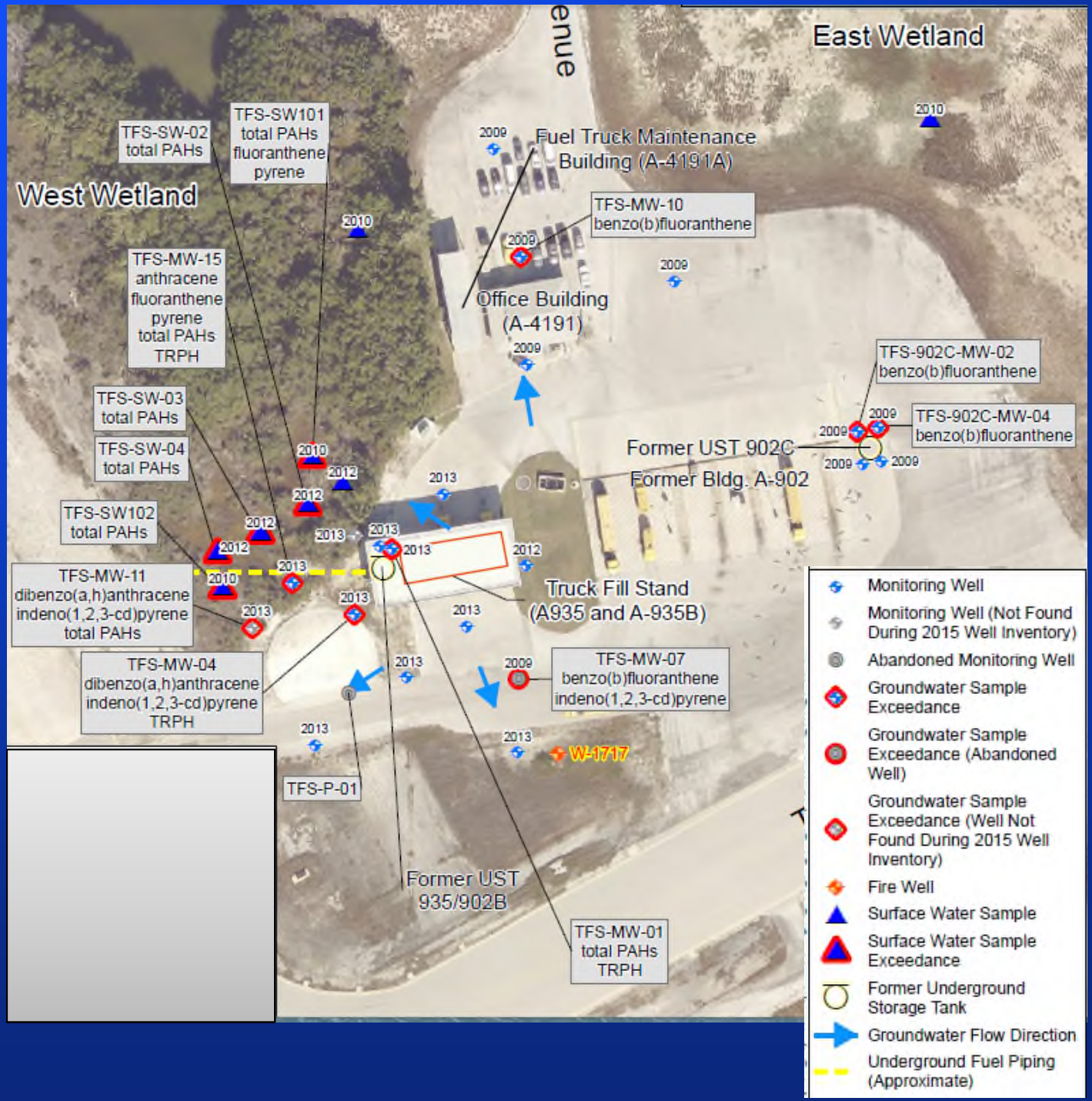


<u>Soil</u>: Collected 596 soil samples via direct push points in 2010, and assessed for petroleum compounds. Limited petroleum contamination was identified, but was concluded to be an indication of groundwater impacts not soil- assessment concluded no significant source areas in soil and no further investigation of soil necessary (Tetra Tech 2011).

Previous Site Assessments

<u>Sediment sampling in 2012</u>: PAHs exceeded applicable screening levels in West Wetland

Previous Site Assessments



Groundwater (most recent data from 2009 and 2013):

- **Perimeter wells bordering West Wetland exceeded Marine SWCTLs for PAHs, total PAHs, and TRPH**
- **Source area wells exceeded GCTLs for PAHs and TRPH**
- **Eastern Navy wells last sampled in 2009 exceeded GCTLs for benzo(b)fluoranthene**
- **Deep well MW-08D in source area did not exceed GCTLs**

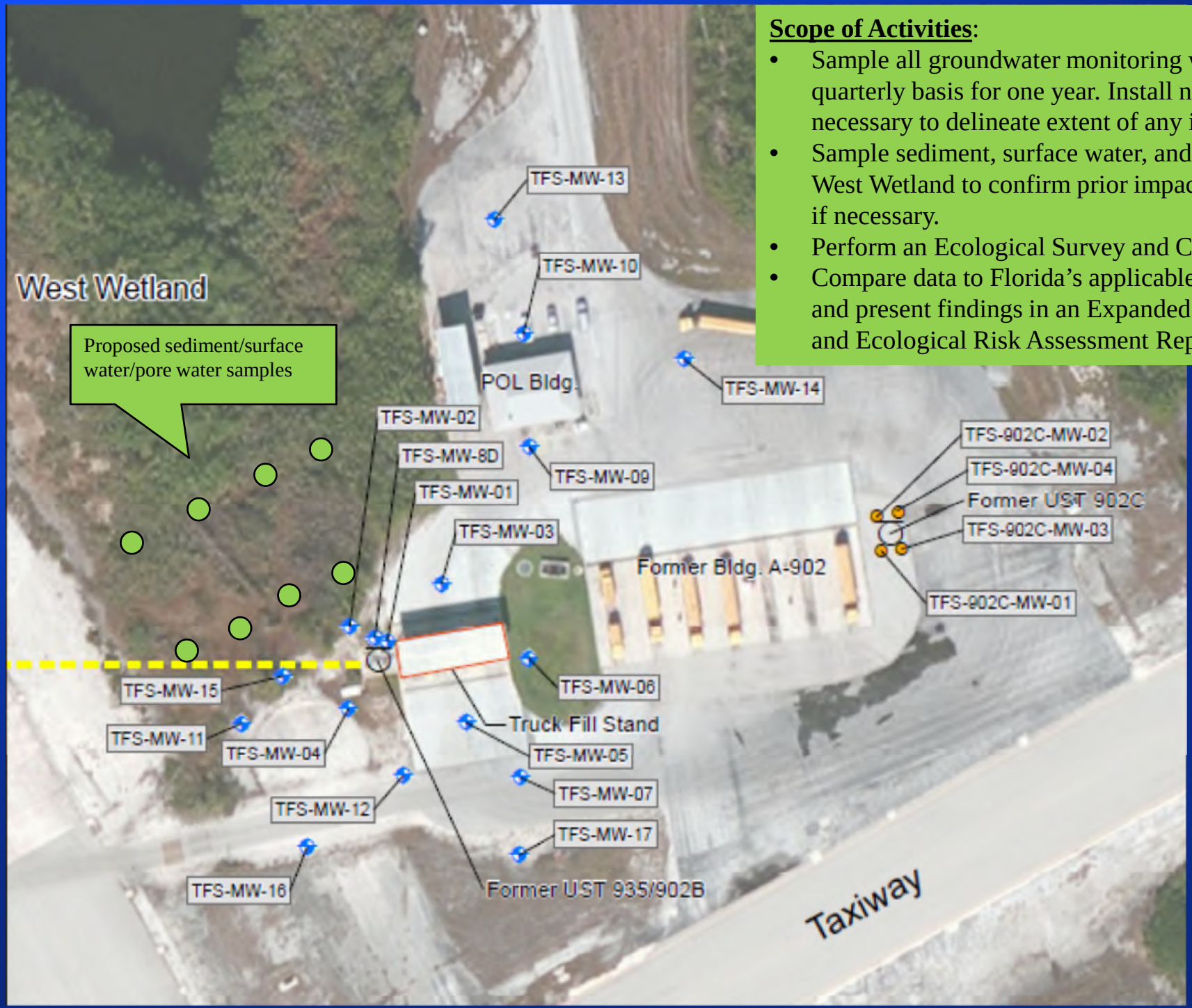
Surface Water (most recent data from 2010 and 2012):

- **Sample from East Wetland did not exceed Marine SWCTLs**
- **Samples from West Wetland exceeded Marine SWCTLs for total PAHs**

Goals of Expanded Site Assessment in 2017

- Site assessment activities in recent years have been subdivided based on funding sources. Primary goal is to complete a holistic site assessment.
- Continue groundwater monitoring per the *Monitoring Only Plan for Truck Fill Stand* (CH2M Hill 2013)
- Determine current groundwater concentrations across the portion of the site not covered by the aforementioned Monitoring Only Plan.
- Complete an Ecological Risk Assessment to assess the potential effect of groundwater to surface discharges on ecological receptors in the West Wetland, including sediment, surface water, and pore water sampling.

Scope of Expanded Site Assessment in 2017



Scope of Activities:

- Sample all groundwater monitoring wells on a quarterly basis for one year. Install new wells if necessary to delineate extent of any impacts.
- Sample sediment, surface water, and pore water in the West Wetland to confirm prior impacts and delineate if necessary.
- Perform an Ecological Survey and Checklist
- Compare data to Florida's applicable screening levels and present findings in an Expanded Site Assessment and Ecological Risk Assessment Report.

QUESTIONS?

NAS Key West
Munitions Response Program (MRP) Update

July 2017 RAB Meeting
Key West, Florida

Todd Haverkost

Resolution Consultants

MRP Sites

- UXO 1 Fleming Key Dredge Spoil Area
- UXO 3 Trumbo Point Temporary Staging Area
- UXO 4 A950 Spoils Pile, A22 Drainage Ditch, Dead 8 Spoils Pile, and Vegetation Conversion Areas (VCA) 8 and 22
- UXO 6 North Boca Chica Pistol and Skeet Ranges

UXO 1
Fleming Key Dredge Spoils Area

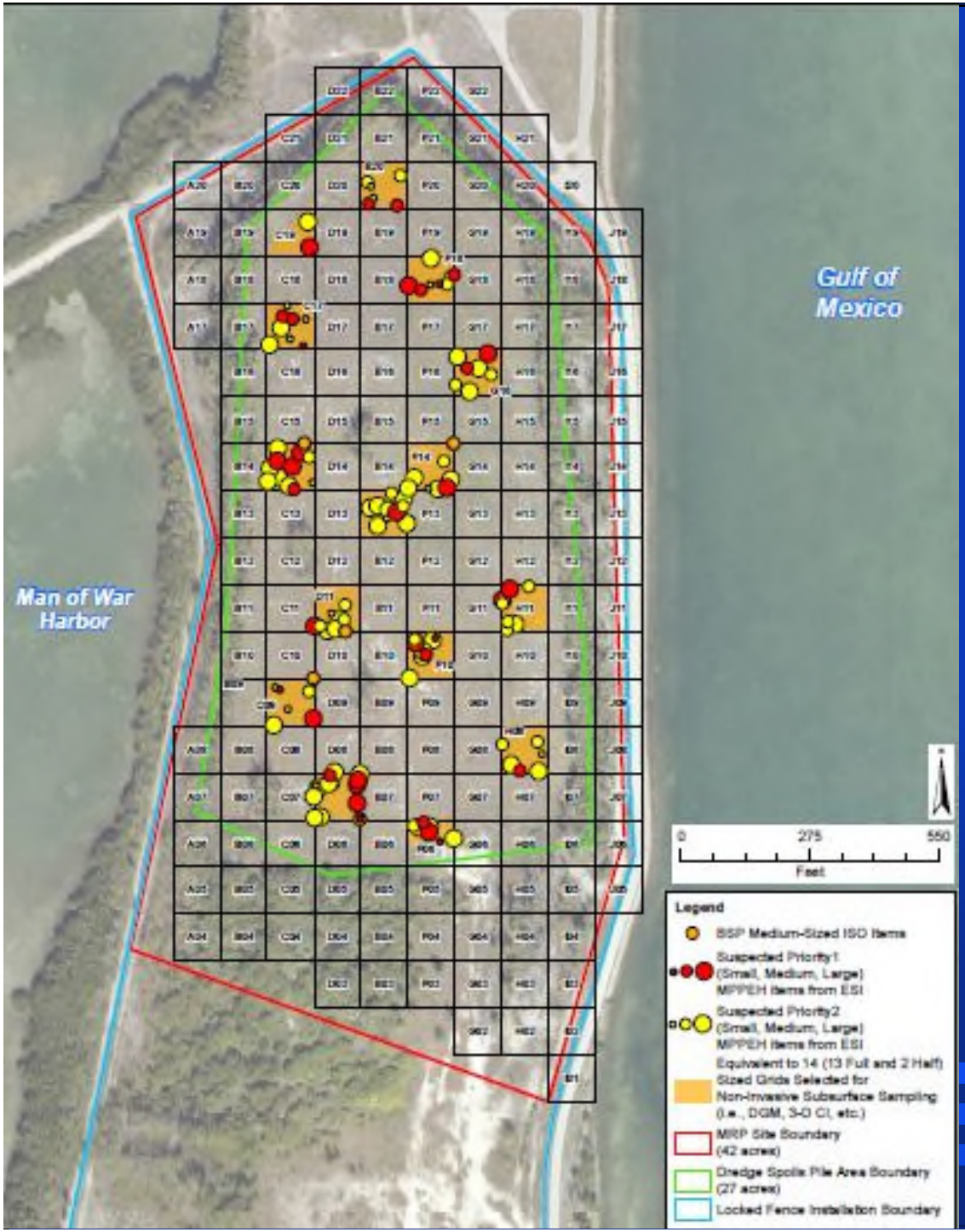
NAVAL AIR STATION KEY WEST ★ FLORIDA

Background

- Dredge spoil area is a 42 acre site created prior to WWII
- The focus is a 27 acre portion of the site was last used in 2003/2004 during dredging of the Federal Channel and Truman Harbor
- Two munitions items were discovered during the dredging activities
  - 7.2 inch Hedgehog (WWII era anti-submarine munition)
  - 76 mm artillery shell
- Naval Ordnance Safety and Security Activity (NOSSA) performed a Technical Assistance Visit in 2009 that led to site inclusion in the MRP

MRP Investigation Activities to Date

- Preliminary Assessment Completed in 2010
- Limited Site Inspection Performed in 2012
  - Visual-Survey w/ hand held magnetometer
  - No MEC or MPPEH was found but a high density of shallow, subsurface metallic anomalies were detected
  - Expended small arms casings and cultural debris (manhole cover, fencing, etc.) found scattered on the ground surface
- Expanded Site Inspection Completed in 2013
  - Digital geophysical mapping (DGM) and Advanced Geophysical Classification (AGC) completed
  - More than 1900 DGM anomalies detected and 562 were further assessed using AGC



2016 Confirmatory Sampling Field Work

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Field Activities Completed

- Site Prep: surveying, vegetation removal, anomaly relocation
- Sampling and Field Documentation:
  - 1 surface/401 subsurface anomalies investigated
  - Investigated to a maximum depth of 4 feet
  - Geophysical readings before / after metal removed
  - Documented description, dimensions, etc. of anomalies
  - 3 near surface soil samples collected for munitions constituent analysis

Summary of Findings

- **Surface Findings:**
  - Munitions Debris: (1) Deteriorated 37-mm round; (1) 20-mm casing; and (1) 50-cal casing
- **Subsurface Findings:**
  - MEC/MPPEH: None found
  - Cultural Debris: various items including plumbing pipes and fittings, anchors, weights, etc.
- **Soil Sample Analysis Findings:**
  - No explosives compounds detected
  - Metals were detected but none are believed to be munitions related

Next Step

- **Submit the Confirmatory Sampling Report to FDEP for review**
- **Determine what, if any, additional investigations measures are needed**

UXO 3
Trumbo Point
Temporary
Staging Area

NAVAL AIR STATION
KEY WEST ★ FLORIDA

Background

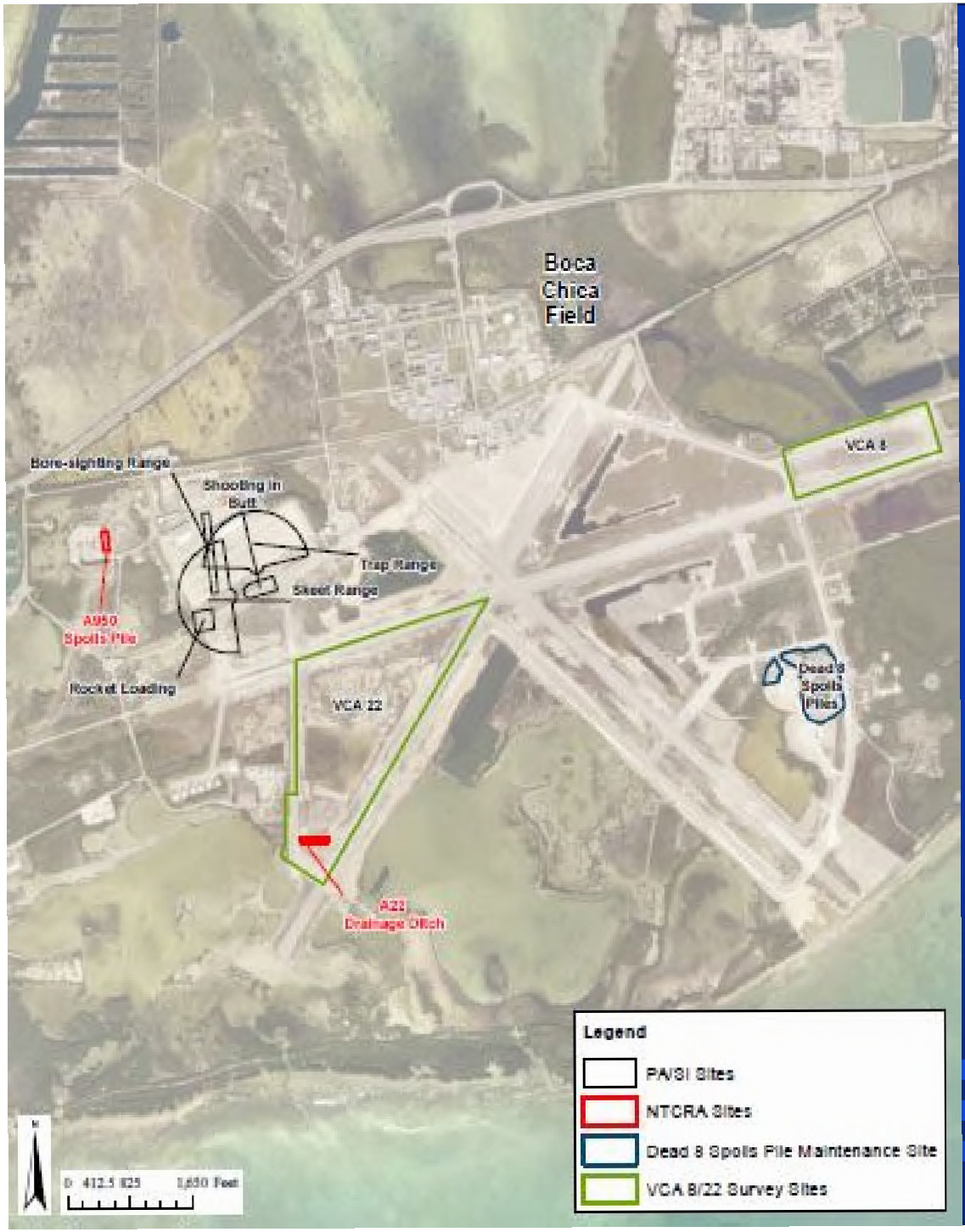
- Former Location of storage tank D-3, a 563,000 gallon “cut and cover” tank constructed in 1942 and abandoned in the mid-1990s
- In 2008 prepared for parking lot use
  - Approximately 3 feet of fill material was used to level the area
  - Fill material was obtained from the Fleming Key Dredge Spoil Area
- NOSSA Technical Assistance Visit in 2009
  - One expended 20 mm casing was observed
  - Because the origin of the fill material was the Fleming Key Dredge Spoil Area, it was recommended use of the area be discontinued until an appropriate munitions response was performed

MRP Investigation Activities to Date

- Preliminary Assessment Completed in 2010
- Limited Site Inspection Performed in 2012
  - Visual-Survey w/ hand held magnetometer
  - No MEC or MPPEH was found but a high density of shallow, subsurface metallic anomalies were detected

Planned Activities

- Recently submitted two planning documents to FDEP for review:
  - Geophsyical Classification for Munitions Response Sampling and Analysis Plan
  - Munitions and Explosives of Concern Sampling and Analysis Plan
- Geophysical Surveys
  - Digital geophysical mapping
  - Advanced classification geophysics
- Results will be used to scope a removal action to remove dredge spoil fill that originated from Fleming Key.



UXO 4
A950 Spoils Pile
A22 Drainage Ditch
Dead 8 Spoils Piles
VCA 8 & 22

NAVAL AIR STATION
KEY WEST ★ FLORIDA

Background

2012 Munitions Discovery

- ✓ Contractor discovery at ditch
- ✓ Explosives Safety Officer discovery at Spoils Pile

A22 Drainage Ditch

Arrow marks the approx. location of suspect UXO in water in the drainage ditch on west side of Taxiway D.

A950 Spoils Pile

Photo 2 of suspect UXO on top of excavated material in lay down area.

Photo of suspect bullet on south side of drainage ditch, west side of Taxiway D.

Bullets on ground at the base of the pile of excavated material in lay down area.

NTCRA Process

Removal Action Process - Overview

Mobilization / Site Prep →

Manual Removal of Large Munitions (18” lifts) →

Armored Equipment Excavation/ Transport of Material →

Screening Plant Removal of Small Munitions →

Munitions Constituent Sampling

NTCRA Field Operations

June – October 2015

2015 NTCRA Results

Recovered MEC/MPPEH

- **A950 Spoils Pile**
  - ✓ Removed 24 MEC/MPPEH items

Date Found	Qty	MEC Item
7/24/2015	1	AN-MK 23 Practice Bomb, 3 LB
7/30/2015	4	5" HVAR Warhead, MK1
7/31/2015	1	5" HVAR Warhead, MK1
8/3/2015	1	5" HVAR Warhead, MK1
8/7/2015	1	5" HVAR Warhead, MK1
8/10/2015	1	5" HVAR Warhead, MK1
8/14/2015	9	20MM Projectile
8/14/2015	2	5" HVAR Warhead, MK1
8/17/2015	1	Mk 76 Practice Bomb / MK4 Cartridge
8/25/2015	2	AN-MK 23 Practice Bomb, 3 LB
9/11/2015	1	5" HVAR Warhead, MK1

- **A22 Drainage Ditch**
  - ✓ No MEC/MPPEH items encountered

2015 NTCRA Results

Recovered Munitions and Cultural Debris

- **A950 Spoils Pile Mag & Flag / Manual Removal**
  - ✓ Removed ~ 900 lbs of munitions debris
  - ✓ Removed ~ 30 lbs of small arms ammunition
  - ✓ Removed ~ 11,000 lbs of cultural debris
- **A22 Drainage Ditch Mag & Flag / Manual Removal**
  - ✓ Removed ~ 140 lbs of munitions debris
  - ✓ Removed ~ 15 lbs of small arms ammunition
  - ✓ Removed ~ 400 lbs of cultural debris

2015 NTCRA Results

Recovered Munitions and Cultural Debris (cont.)

- **Mechanical Screening (both sites)**
  - ✓ Removed ~ 900 lbs of munitions debris
  - ✓ Removed ~ 450 lbs of small arms ammunition
  - ✓ Removed ~ 28,000 lbs of cultural debris

2015 Sampling

Munitions Constituents (MC) Sampling

- Composite samples collected from screened soils
- Metals and explosives analysis

Recently Expanded Activities

- Scope expanded in 2016 to include maintenance and survey activities at the Dead 8 Spoils Piles and VCA 8/22
  - Remove and limit future vegetative growth on the Dead 8 piles that could impair airfield visibility
  - Install temporary fencing and warning signs to secure the Dead 8 piles which may contain MEC/MPPEH
  - Perform instrument aided surface sweeps to remove any exposed MEC/MPPEH and metallic debris within VCA 8/22
  - Perform DGM surveys within VCA 8/22
  - Volumetric surveys of the Dead 8 piles using drones equipped with optical and Light Detection and Ranging sensors

Dead 8 Spoils Piles

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VCA 8

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VCA 22

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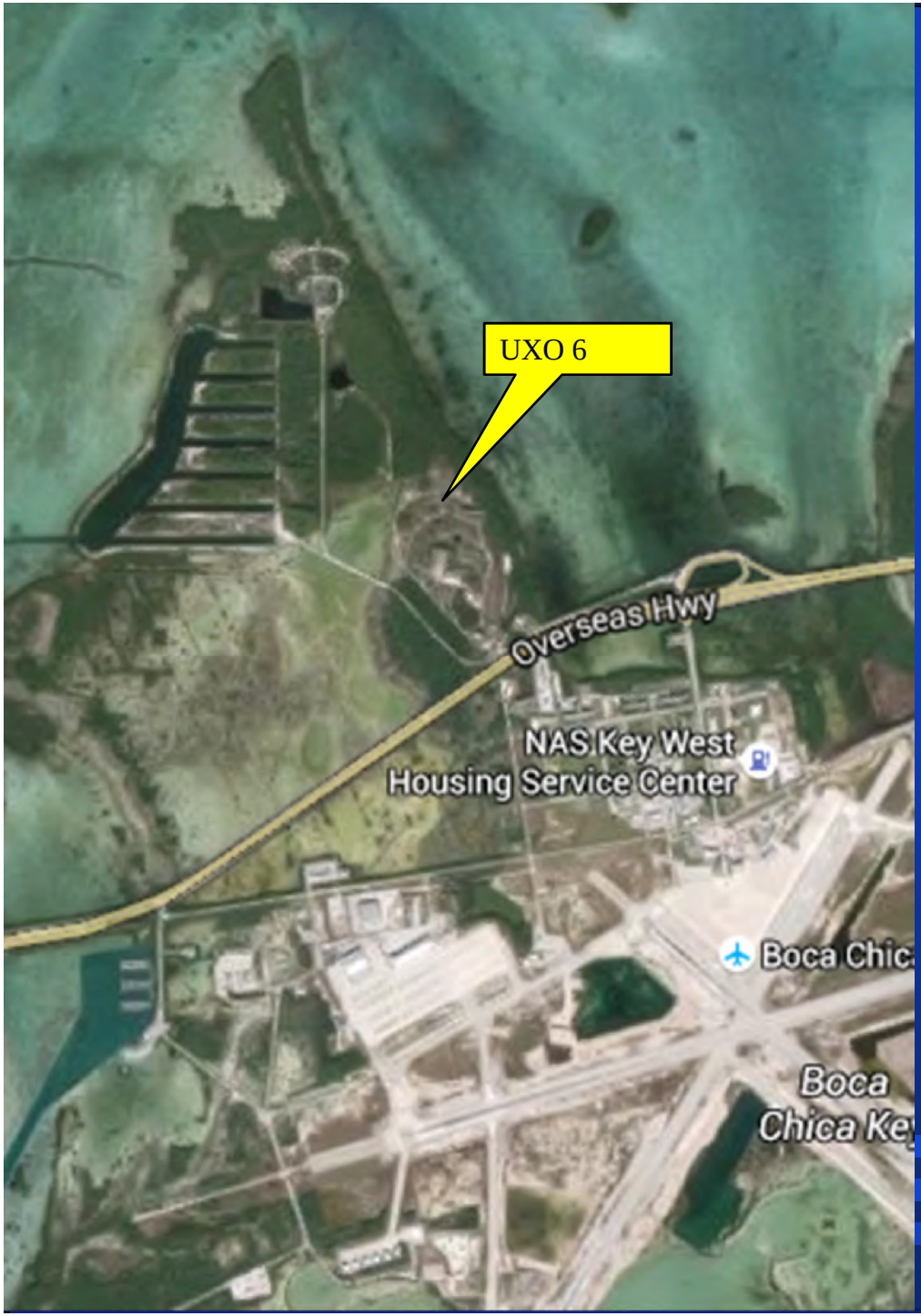
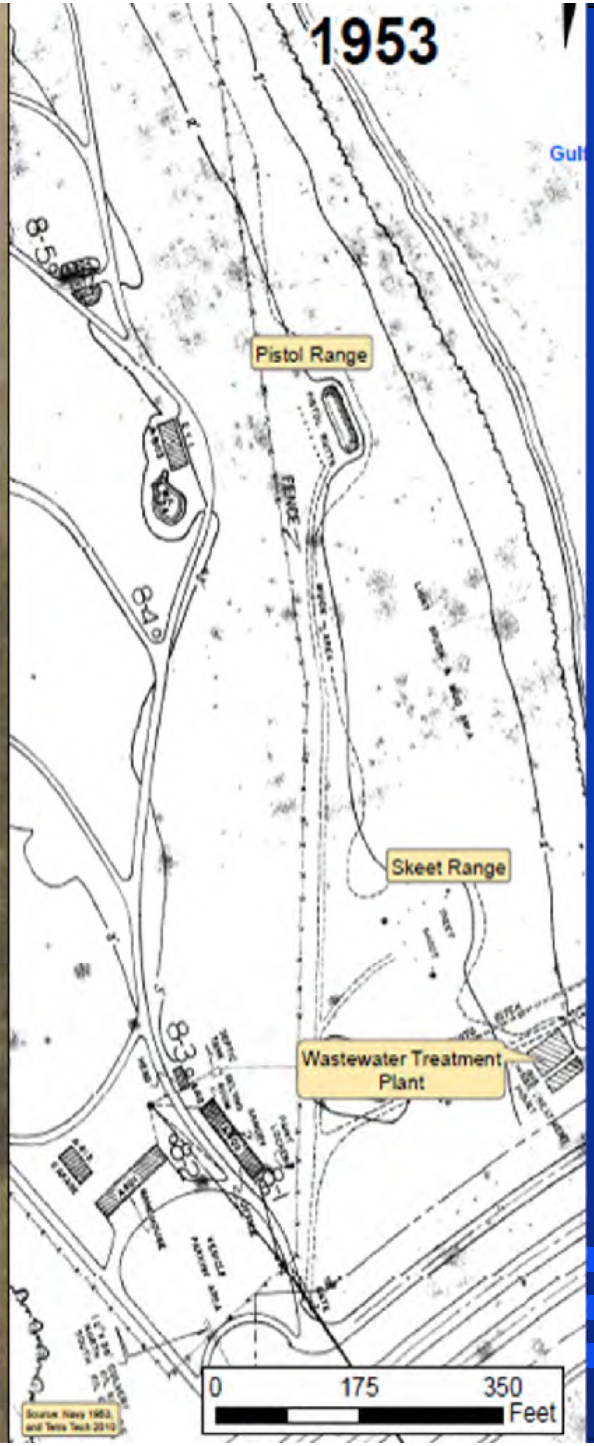


UXO 6
North Boca Chica Pistol and Skeet Ranges



Historical Aerial and Installation Map

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KEY WEST ★ FLORIDA

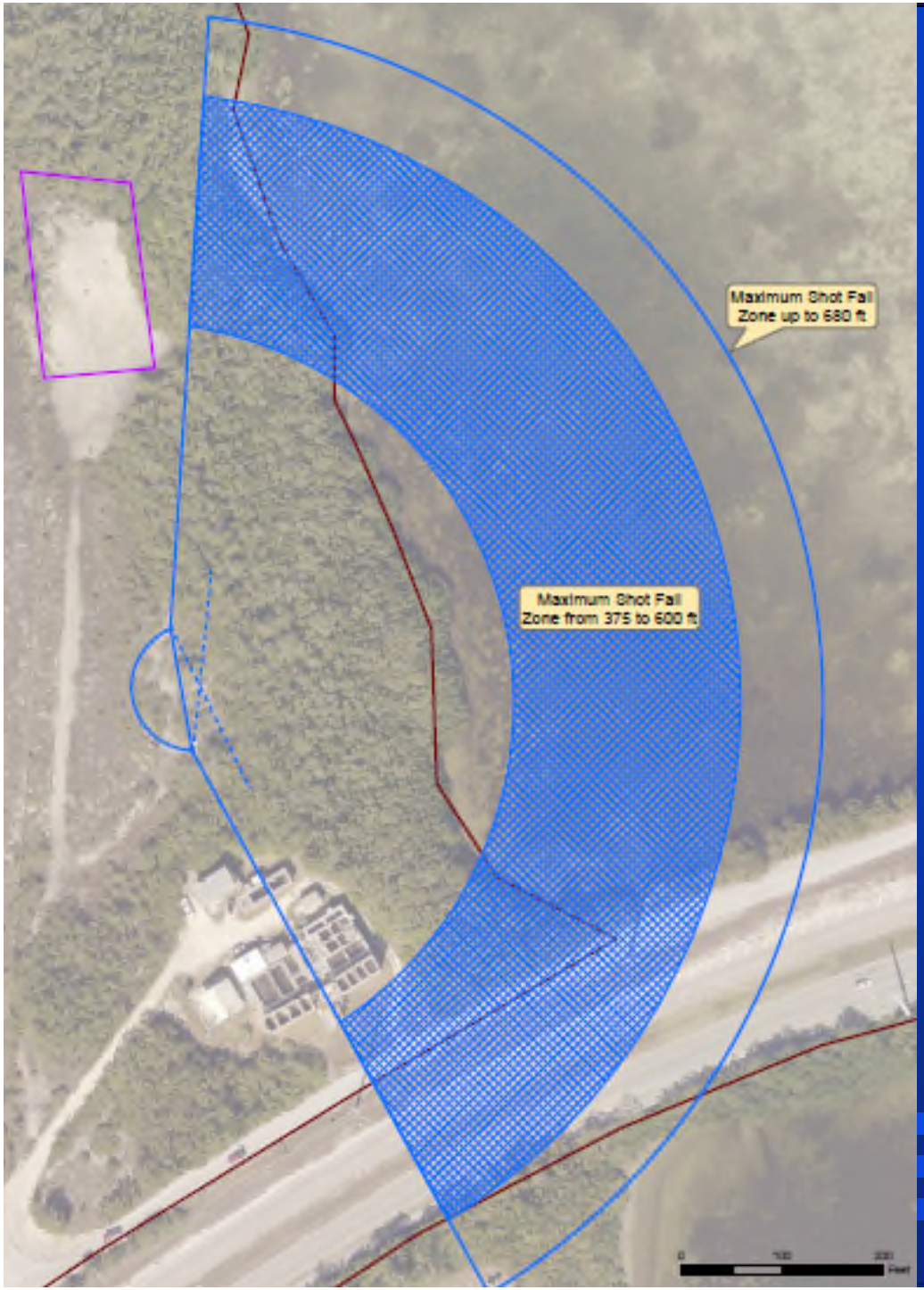
Current Site Conditions

WWTP

Previous Assessments

- Preliminary Assessment Completed in 2010
  - Archival research and limited visual inspection
- Limited Site Inspection Performed in 2012
  - Field activities in 2010
  - XRF field screening for lead
  - Soil and sediment sampling/analysis

North Boca Chica Skeet Range

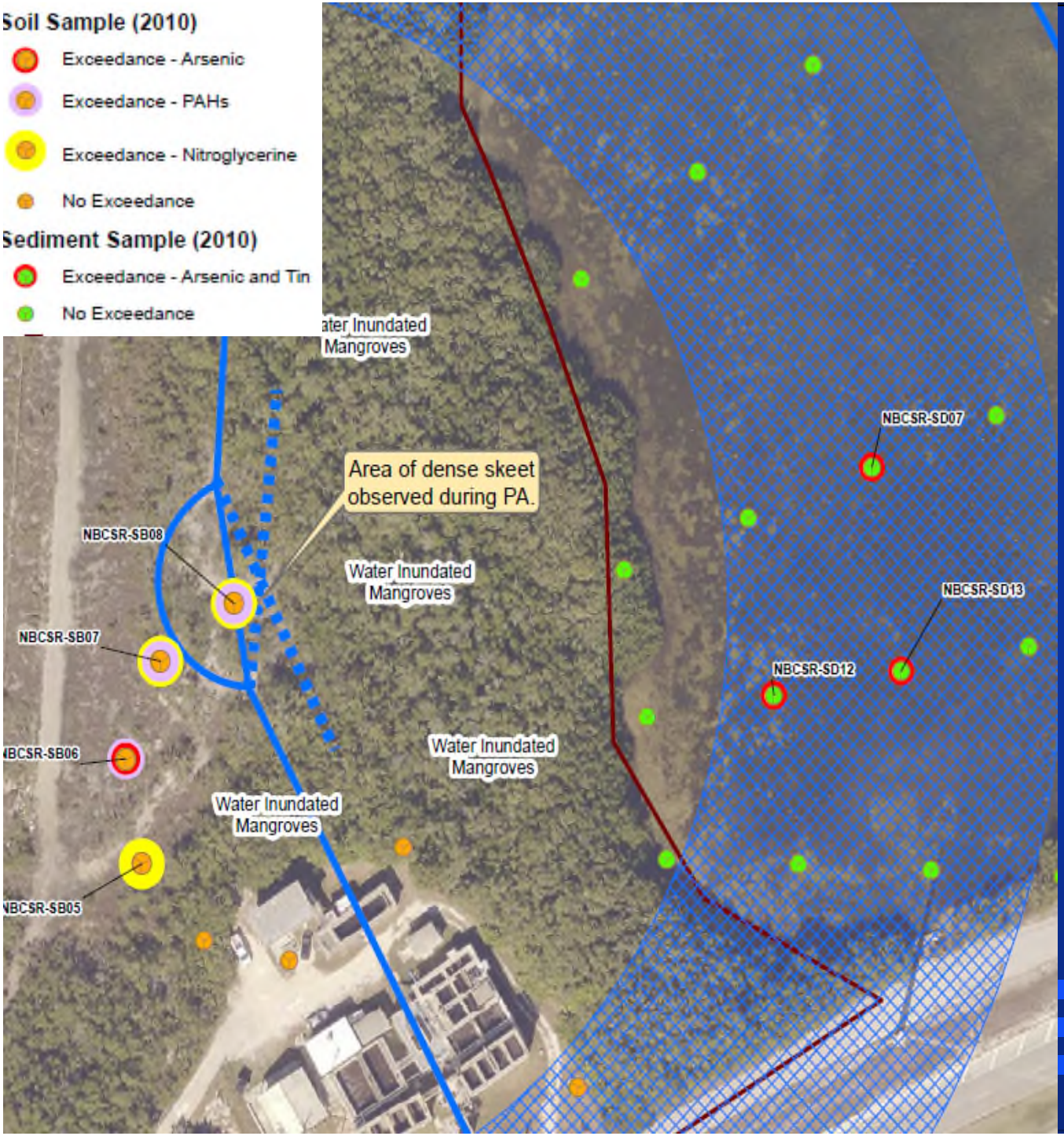


Site Layout
and
Expected Shot Fall Zone

NAVAL AIR STATION
KEY WEST ★ FLORIDA

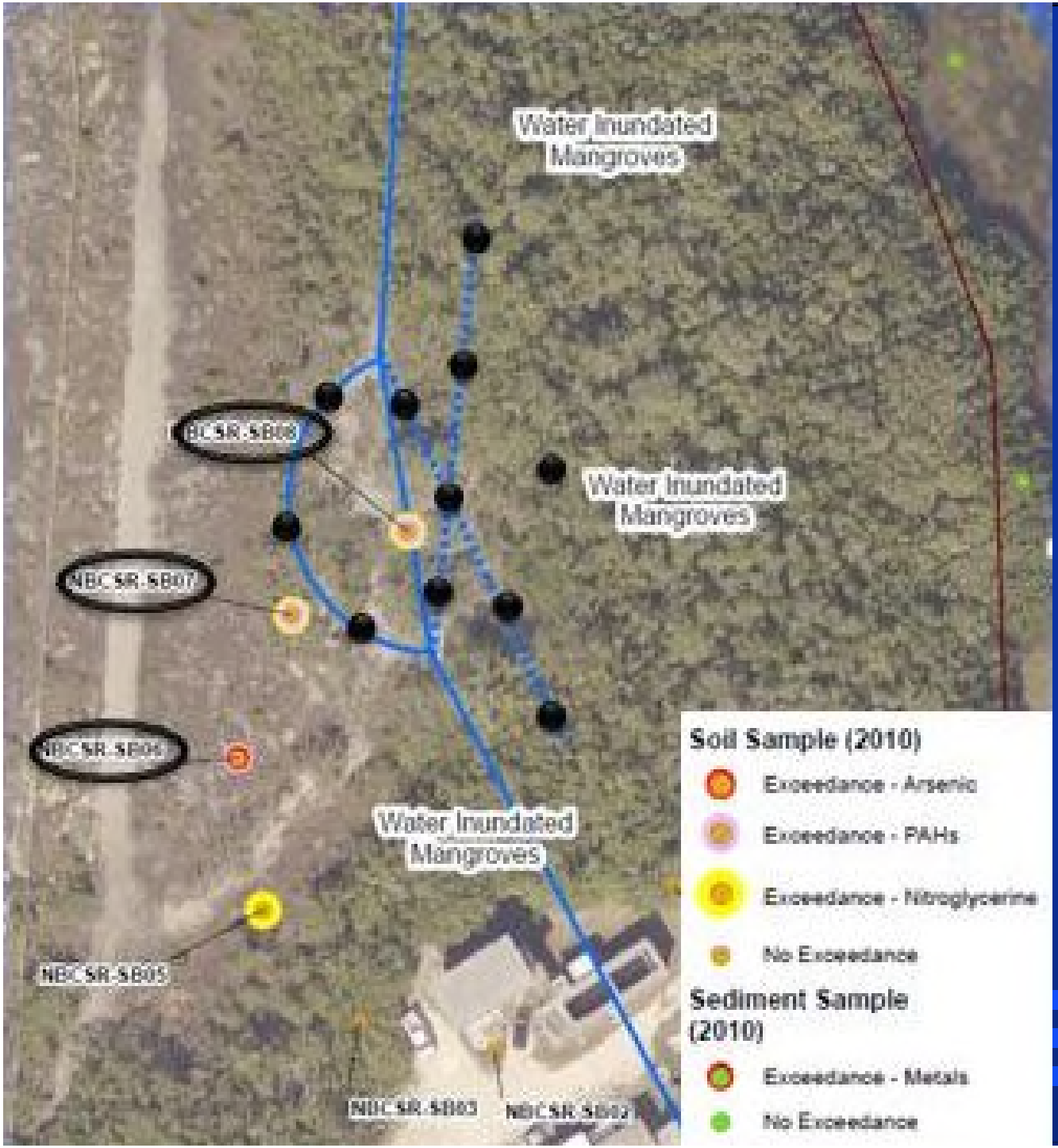
Munition Constituents (MC)

- Primary Munitions Constituents (MC) at Skeet Ranges consist of:
  - Inorganics from shot
    - Primarily lead
    - Fractional antimony, arsenic, copper, tin, zinc and iron
  - Nitroglycerin (NG) from smokeless powder at firing line
  - Polycyclic aromatic hydrocarbons (PAHs) from clay targets/skeet



2010 Results Summary

- No lead reported above screening criteria in soil or sediment
- Soil Exceedances:
  - Arsenic
  - PAHs
  - NG > Leachability SCTLs
- Sediment Exceedances:
  - Arsenic
  - Tin



Data Gap Sampling

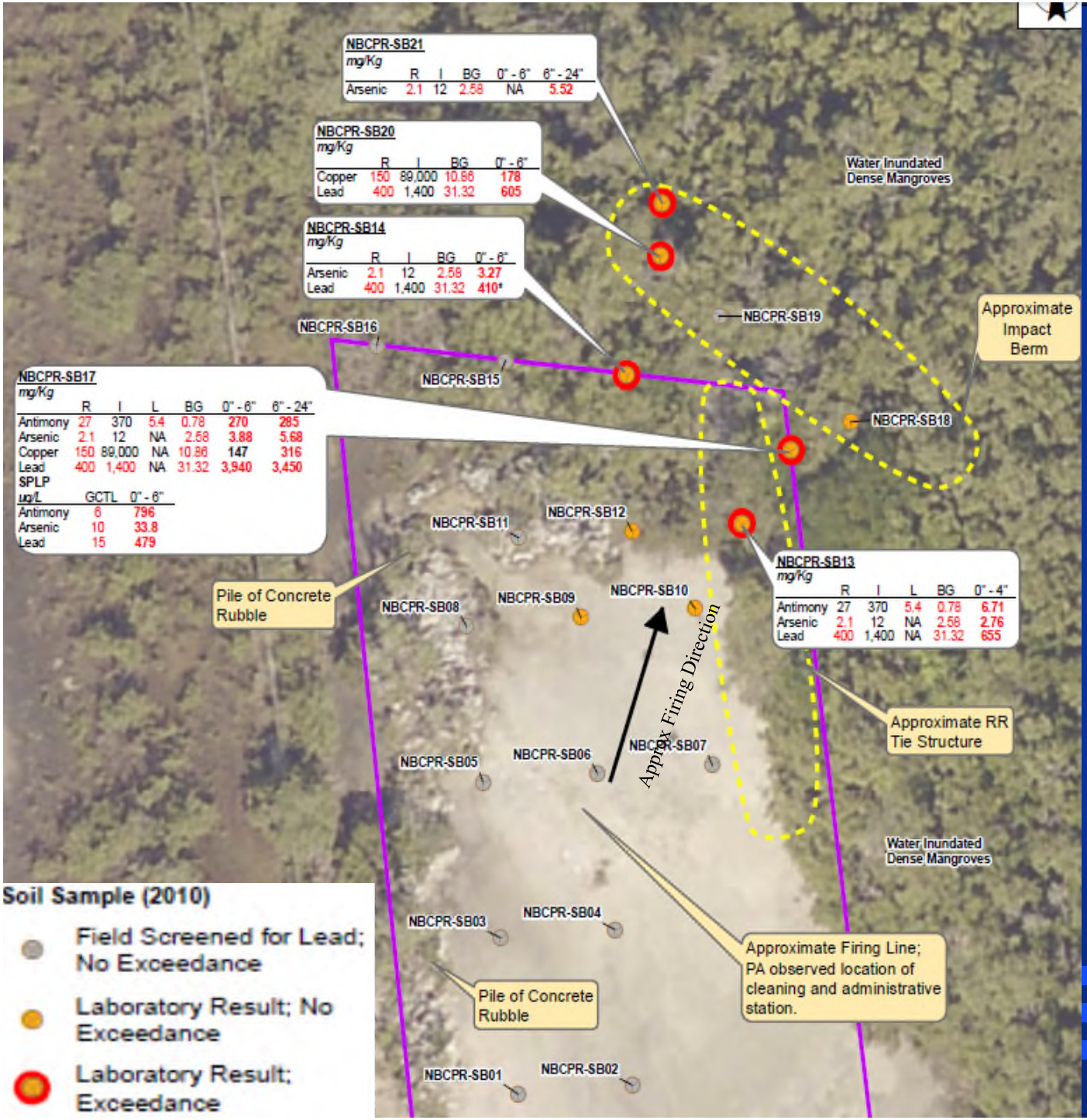
- Soil along firing line and skeet flight path
- Resample soil at SB06, 7, and 8, and analyze for PAHs
- Analyze saturated sediment samples for total organic carbon and acid volatile sulfide simultaneously extracted metal (AVS/SEM)
- Need for monitoring wells contingent upon sampling results

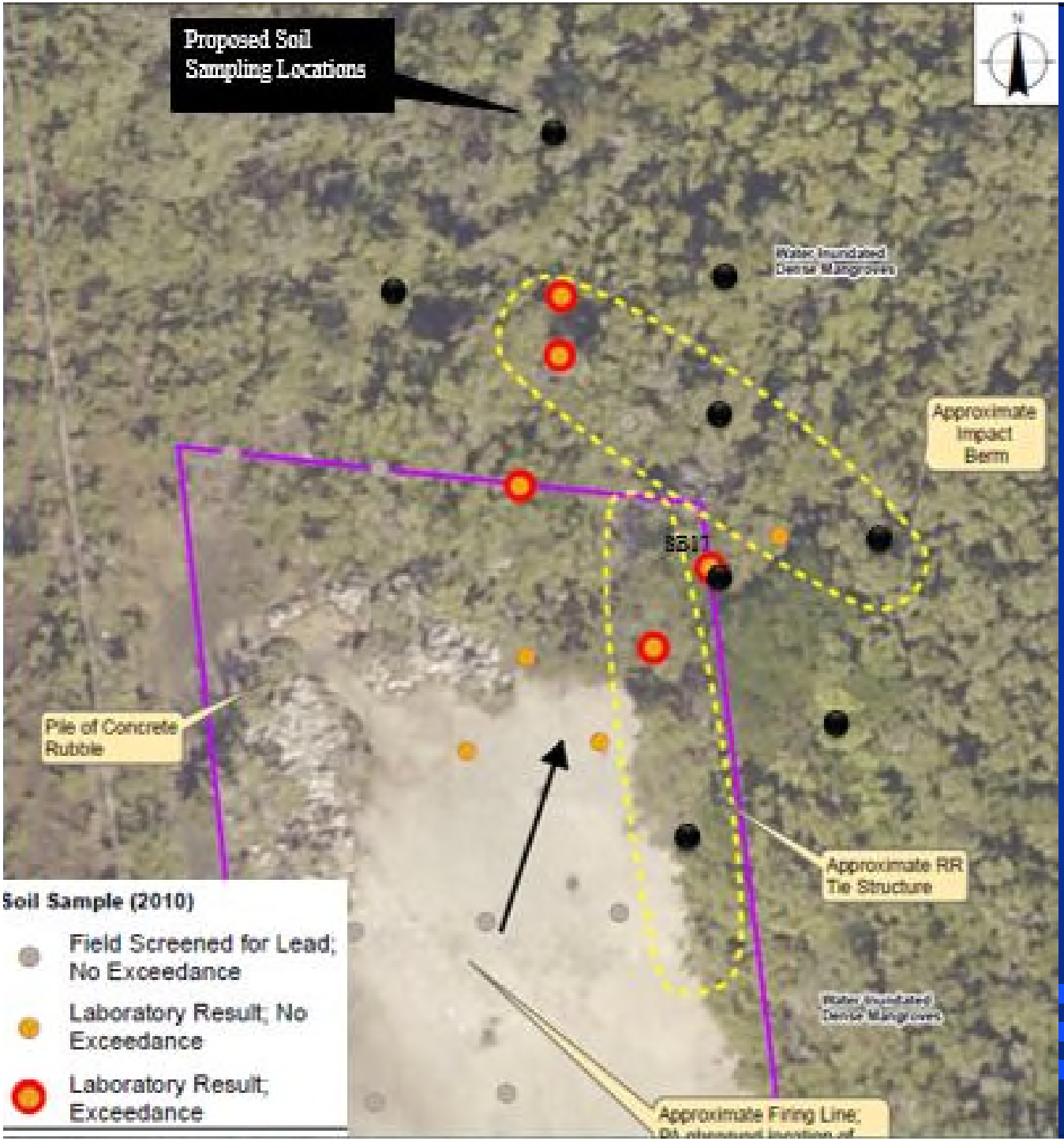
NAVAL AIR STATION KEY WEST ★ FLORIDA

North Boca Chica Pistol Range

2010 Results Summary

- Soil Exceedances:
  - Antimony
  - Arsenic
  - Copper
  - Lead





Data Gap Sampling

- Survey of impact berm and railroad tie structure
- Resample SB17 to confirm 2010 results.
- Additional soil samples to determine lateral extent.
- Need for monitoring wells contingent upon sampling results

NAVAL AIR STATION KEY WEST ★ FLORIDA

Questions?