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FINAL HISTORICAL RADIOLOGICAL ASSESSMENT HISTORY OF THE USE OF GENERAL  
RADIOACTIVE MATERIALS FROM 1943 TO 2011 NAS BRUNSWICK ME  
3/1/2014  
NAVSEA YORKTOWN

***Naval Air Station Brunswick  
Brunswick, Maine***

**FINAL  
HISTORICAL  
RADIOLOGICAL ASSESSMENT**

**History of the Use of General Radioactive Materials  
1943 to 2011**



**March 2014**

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### Abbreviations, Acronyms, and Symbols

ADMIN	Administrative or Administration
AEC	Atomic Energy Commission
AFS	Air Force Station
AIMD	Aircraft Intermediate Maintenance Department
Am-241	Americium-241
AR	Air Reconnaissance
AUW	Advanced Undersea Weapons/Anti-Submarine Underwater Warfare
BACSE	Brunswick Area Citizens for a Safe Environment
BFE	Base Flood Elevations
Bgs	below ground surface
BRAC	Base Realignment and Closure
BUAER	Bureau of Aeronautics
BUMED	Bureau of Medicine and Surgery
BUORD	Bureau of Ordnance
BUSHIPS	Bureau of Ships
BUWEPS	Bureau of Weapons
CAE	Committee on Atomic Energy
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR	Code of Federal Regulations
Ci	Curie
CNO	Chief of Naval Operations
Co-60	Cobalt-60
CPO	Chief Petty Officer
Cs-137	Cesium-137
DERP	Defense Environmental Restoration Program
DHHS	Department of Health and Human Services
DLA	Defense Logistics Agency
DoD	US Department of Defense

DOE	US Department of Energy
DON	US Department of the Navy
DPDO	Defense Property Disposal Office
DRMO	Defense Reutilization and Marketing Office
DU	Depleted Uranium
EPA	US Environmental Protection Agency
ERDA	US Energy Research and Development Administration
°F	degrees Fahrenheit
FEMA	Federal Emergency Management Administration
FSS	Final Status Survey
GCA	Ground Control Approach
G-RAM	General Radioactive Material
GSEM	Ground Support Electronics Maintenance Shop
H-3	Hydrogen-3 or tritium
HRA	Historical Radiological Assessment
HRS	Hazard Ranking System
HSA	Historical Site Assessment
IAS	Initial Assessment Study
IBIS	Helicopter In-flight Blade Inspection System
IR	Installation Restoration
IRDS	Infrared detection system
Kr-85	Krypton-85
LLRW	Low-level radioactive waste
mph	miles per hour
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MEDEP	Maine Department of Environmental Protection
MWR	Morale, Welfare and Recreation
NACIP	Naval Assessment and Control of Installation Pollutants
NARA	National Archives and Records Administration
NAS	Naval Air Station
NASB	Naval Air Station Brunswick

NAVAIR	Naval Air Systems Command
NAVELEX	Naval Electronics Systems Command
NAVSEA	Naval Sea Systems Command
NAVSUP	Naval Supply Systems and Command
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NERP	Navy Environmental Restoration Program
Ni-63	Nickel-63
NMCB	Naval Reserve Cold Weather Mobile Construction Battalion
NNPP	Naval Nuclear Propulsion Program
NOAA	National Oceanic and Atmospheric Administration
NPL	National Priorities List
NRC	US Nuclear Regulatory Commission
NRMP	Naval Radioactive Materials Permit
NRSC	Naval Radiation Safety Committee
Pb-210	Lead-210
Pm-147	Promethium-147
Pu-239	Plutonium-239
Ra-226	Radium-226
RAB	Restoration Advisory Board
RASO	Radiological Affairs Support Office
RASP	Radiological Affairs Support Program
RCP	Radiological Control Program
rem	röntgen (roentgen) equivalent in man
ROC	radionuclide of concern
ROD	Record of Decision
RPM	Remedial Project Manager
RSO	Radiation Safety Officer
SAGE	Semi-Automatic Ground Environment
SARA	Superfund Amendments and Reauthorization Act of 1986
SERE	Survival, Evasion, Resistance and Escape
Sr-90	Strontium-90

Th-232	Thorium-232
Tl-204	Thallium-204
U-234	Uranium-234
U-235	Uranium-235
U-238	Uranium-238
UWT	Undersea Warfare Technology
VP	Patrol Squadron
VPB	Navy Patrol Bombing Squadron
VPU	Patrol Squadron Special Unit
WWII	World War II

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## Glossary

**AEC:** Atomic Energy Commission. Federal agency created in 1946 to manage the development, use, and control of nuclear energy for military and civilian applications. Agency was succeeded by the Energy Research and Development Administration (now part of the US Department of Energy) and the US Nuclear Regulatory Commission.

**Air:** Atmosphere that may become a migration pathway for resuspension and disposal of radioactive contamination and contaminated media.

**Alpha particle:** A positively charged particle ejected spontaneously from the nuclei of some radioactive elements. Alpha particles can be stopped by a thin sheet of paper.

**Aquifer:** An underground layer of permeable rock, sand, or gravel that yields water.

**Background Radiation:** Ionizing radiation constantly present in the environment which is emitted by natural and artificial sources.

**Base Closure and Realignment Act of 1990:** The Defense Base Closure and Realignment Act of 1990, as amended (Public Law 101-510), was enacted by the US Congress to provide a fair process that will result in timely closure and realignment of military installations in the United States. Navy uses the BRAC Program to comply with this Act.

**Base Realignment and Closure (BRAC) Program:** A formal Navy program managed by the Naval Facilities Engineering Command that was created in 1993 to dispose of excess Navy and Marine Corps properties, designated for closure or realignment by the US Congress, by transfer to the local communities for reuse and economic revitalization.

**Beta particle:** A charged particle emitted from a nucleus during radioactive decay with a mass equal to 1/1837 that of a proton. Negatively charged beta particles are electrons, and positively charged particles are positrons. Beta particles can be stopped by a thin sheet of plastic.

**BUAER:** Navy Bureau of Aeronautics. BUAER was responsible for the Navy's material support organization for Naval Aviation from 1921 to 1959.

**BUMED:** Navy Bureau of Medicine and Surgery. BUMED is responsible for the Navy's Radiation Health Program.

**BUSHIPS:** Navy Bureau of Ships. Until 1966, was responsible for design, construction, procurement, maintenance, and repair of the Navy's vessels. BUSHIPS was succeeded by the Naval Ship Systems Command, now known as the Naval Sea Systems Command or NAVSEA.

**CERCLA:** This law established the federal Superfund for response to uncontrolled releases of hazardous substances to the environment.

**Characterization Survey:** Site assessments generally taken after radioactive contamination has been confirmed in an impacted site by a scoping survey. The survey determines the extent of contamination and identifies and defines the extent of radionuclides of concern. These surveys include in-depth surveys, sampling, monitoring, and analysis necessary to develop, analyze, and select appropriate cleanup techniques.

**Class 1 area (based on the Multi-Agency Radiation Survey and Site Investigation Manual [MARSSIM]):** An area having the highest potential for radioactive contamination. Examples of Class 1 areas include (1) areas previously subject to remedial actions, (2) locations where leaks or spills are known to have occurred, (3) former burial or disposal sites, (4) waste storage sites, and (5) areas containing contaminants in discrete solid pieces of material with high specific activity.

**Class 2 area (based on MARSSIM):** An area having a moderate potential for radioactive contamination. Examples of areas that might be classified as Class 2 include (1) locations where radioactive materials were present in an unsealed form, (2) potential contaminated transport routes, (3) areas downwind from stack release points, (4) upper walls and ceilings of buildings or rooms subjected to airborne radioactivity, (5) areas handling low concentrations of radioactive materials, and (6) areas on the perimeter of former contamination control areas.

**Class 3 area (based on MARSSIM):** An area having little or no potential for radioactive contamination. Examples of areas that might be classified as Class 3 include buffer zones around Class 1 and Class 2 areas and areas with very low potential for residual contamination but insufficient information to justify a non-impacted classification.

**Class 1 survey:** Survey of an impacted site that has a high potential for radioactive contamination, is known to have contamination, or had a prior remediation to remove radioactive contamination. This includes areas with contamination in excess of release limits based on a scoping or Characterization Survey or areas where previous Class 2 or 3 surveys found contamination above the release limits. Class 1 surveys cover 100 percent of the site.

**Class 2 survey:** Survey of an impacted site recognized as having a potential for radioactive contamination that is not expected to exceed release limits. This includes areas known to contain minor isolated areas of contamination with low potential for exposure, buffer zones around Class 1 areas, or areas where previous Class 3 surveys found contamination. Class 2 surveys can cover 10 to 100 percent of the site.

**Class 3 survey:** Survey of an impacted site that is not expected to contain residual contamination exceeding the release limit. This includes buffer zones around Class 1 or 2 areas or previously decontaminated and surveyed areas. The percentage of the site covered by Class 3 surveys is not standardized, and surveys may be conducted randomly.

**Commodity Item:** An item that could be bought or sold.

**Contaminated media:** Materials at an impacted site that contain, or are suspected of containing, radioactive contamination or to which radioactive contamination may have migrated.

**Contaminated media assessment:** A rating of the potential contamination of media or migration of contaminated media at an impacted site.

**Contamination potential:** The possibility for residual radioactive contamination at an impacted site that has been determined through a professional evaluation of historical information, previous survey results, and site reconnaissance.

**Curie:** Abbreviated Ci. A unit of measure of the amount of radioactivity equal to  $3.7 \times 10^{10}$  disintegrations per second or  $2.22 \times 10^{12}$  disintegrations per minute (dpm).

**Decontamination:** The reduction or removal of radioactive material from a structure, object, or person. Accomplished by treating the surface to remove or decrease the contamination or by letting the material decrease as a result of radioactive decay.

**Dose:** The amount of energy absorbed by a person exposed to radiation.

**Drainage system:** Sanitary drains, facility storm drains, or septic systems and leach fields. This category can include bay sediments where drainage to the bay occurs.

**Defense Logistics Agency (DLA) Disposition Services:** Formerly known as Defense Property Disposal Office (DPDO) then later as Defense Reutilization and Marketing Office (DRMO), disposes of excess property received from the military services.

**Defense Property Disposal Office (DPDO):** Precursor to former Defense Reutilization and Marketing Office (DRMO) and the current Defense Logistics Agency (DLA) Disposition Services, disposed of excess property received from the military services.

**Defense Reutilization and Marketing Office (DRMO):** Formally known as Defense Property Disposal Office (DPDO). DRMOs are now part of the Defense Logistics Agency (DLA) Disposition Services and dispose of excess property received from the military services.

**EPA:** US Environmental Protection Agency. The lead federal regulatory agency under CERCLA for cleanup of hazardous waste sites on the National Priorities List (NPL).

**Fauna:** Animals of a particular region or period considered as a group.

**Final Status Survey (FSS):** Assessment taken after historical documentation or previous investigations or remediations indicate radioactive contamination has been removed from an impacted site. The survey verifies that an impacted site complies with applicable release criteria by taking appropriate samples and measurements that will define the radiological condition of a site.

**G-RAM:** All general radioactive materials used by the Navy or Marine Corps that are not associated with the Naval Nuclear Propulsion Program (NNPP).

**Gamma radiation:** High-energy, short-wave length electromagnetic radiation emitted from the nucleus of an atom. Gamma radiation frequently accompanies the emission of alpha and beta particles and always accompanies fission. Gamma rays are stopped by shielding with heavy materials such as lead.

**Groundwater:** Waters contained in subsurface materials and aquifers.

**Half-life:** Time required for a population of atoms of a given radionuclide to decrease through radioactive decay to exactly one-half of the original number of atoms. No operation, either chemical or physical, can change the decay rate of a radioactive substance. Half-lives range from much less than 1 microsecond to more than 1 billion years. The longer the half-life, the more stable the nuclide. After one half-life, half of the original atoms will remain; after two half-lives, one fourth (or 1/2 of 1/2) will remain; and so on.

**Hazardous material:** Any substance or material that could adversely affect the safety of the public, handlers or carriers.

**Hazardous substance:** Any material that poses a threat to human health and/or the environment. Typical hazardous substances are toxic, corrosive, ignitable, explosive, or chemically reactive.

**High (assessment rating):** Contaminated assessment indicating that evidence of contamination in the media or migration pathway has been identified.

**HRA:** Historical Radiological Assessment. A detailed investigation to collect historical radiological information and data derived from environmental monitoring for a particular site and its surroundings where radioactive materials were used. The HRA is comparable to the Historical Site Assessment as defined in MARSSIM.

**HSA:** Historical Site Assessment. MARSSIM terminology used to describe a document equivalent to a historical radiological assessment. See HRA above.

**Impacted area:** An area that has, or historically had, a potential for G-RAM contamination based on the site operating history or known contamination detected during previous radiation surveys. Impacted areas include sites where radioactive materials were used or stored; sites where known spills, discharges, or other instances involving radioactive materials have occurred; or sites where radioactive materials might have been disposed of or buried. Impacted areas are ranked as Class 1, 2, or 3 based on MARSSIM guidance.

**Investigation:** The gathering of data or information to identify potential radiation areas.

**Known-Continued Access Contamination Potential:** Low levels of contamination exist, but the contamination is contained in system, fixed on building surfaces, or is in generally inaccessible areas.

**Known-Restricted Access Contamination Potential:** Radioactive contamination is known to exist at levels that could be hazardous without protective clothing, respiratory protection, or radiation monitoring.

**Likely (contamination potential):** Residual radioactive contamination is expected but has not been confirmed.

**Low (assessment rating):** Assessment of contaminated media or migration pathway indicating that the contamination potential is remote.

**MARSSIM:** Multi-Agency Radiation Survey and Site Investigation Manual.

**MEDEP:** Maine Department of Environmental Protection.

**Media:** Types of materials at an impacted site that may contain or are suspected of containing radioactive contamination or to which radioactive contamination may migrate.

**Micro:** Abbreviated  $\mu$ . A prefix used to denote one-millionth ( $10^{-6}$ ).

**Migration pathway:** Media or transport mechanisms that allow radioactive contamination to spread in the immediate vicinity of the contaminated media.

**Milli:** Abbreviated m. A prefix used to denote one-thousandth ( $10^{-3}$ ).

**Moderate (assessment rating)** Assessment of contamination media or migration pathway that indicates the potential for contamination exists but has not been fully assessed.

**Mudflat:** An intertidal (or periodically exposed) expanse of mud characterized by mobile fine sediments and typically rich in fauna.

**NAVSEA:** Naval Sea Systems Command. Senior Navy command assigned responsibility for controlling the use of radioactive materials by the Navy, including the Marine Corps. NAVSEA

provides oversight and regulatory guidance to the Navy Nuclear Propulsion Program (NNPP), Nuclear Weapons Radiological Controls program, and G-RAM programs.

**NAVSUP:** Naval Supply Systems and Command. Senior Navy command assigned responsibility for providing the Navy with supplies and services.

**NCP:** National Oil and Hazardous Substances Pollution Contingency Plan. More commonly called the National Contingency Plan or NCP; it is the federal government's plan for responding to both oil spills and releases of hazardous substances (including radioactive materials). The NCP is part of the National Response System, under which federal departments and agencies help state and local officials protect public health and the environment during hazardous materials emergencies.

**NERP:** Navy Environmental Restoration Program. NERP replaced the Navy /Marine Corps Installation Restoration Program. The program reduces the risk to human health and the environment from legacy waste disposal operations and hazardous substance spills at active and BRAC installations.

**NNPP:** Naval Nuclear Propulsion Program. A joint Navy and US Department of Energy program to design, build, operate, maintain, and oversee operation of naval nuclear-powered ships and associated support facilities.

**Non-destructive inspection (NDI)/Non-destructive testing (NDT):** An inspection technique that involves examining the structure of materials without destruction or physical change to the materials being examined. Industrial radiography using an ionizing radiation source to inspect metals and welds to ensure integrity and structure is one type of NDI. Machine sources of ionizing radiation (x-ray machines) may also be used to perform NDI.

**None (assessment rating):** Assessment of potentially contaminated media or migration pathway that indicates evidence of contamination has not been found or known contamination has been removed and surveys indicate that the media or migration pathway meets release criteria.

**Non-impacted area:** An area having no reasonable possibility of residual G-RAM contamination from site operations based on historical documents.

**NPL:** National Priorities List. A list of sites where releases and potential releases of hazardous substances, pollutants, and contaminants appear to pose the greatest threat to public health, welfare, and the environment under the Superfund program,.

**NRC:** US Nuclear Regulatory Commission. The federal agency that oversees and authorizes the use of byproduct, source, and special nuclear materials.

**NRMP:** Naval Radioactive Materials Permit. Site-specific or broad-scope Navy authorization for the use of byproduct, source, or special nuclear materials that are issued by the Naval Radiation Safety Committee (NRSC) under the authority of the Master Materials License granted to the Navy by the NRC.

**NRSC:** Naval Radiation Safety Committee. Navy organization providing administrative control of all NRC-licensed radioactive material used by the Navy and US Marine Corps.

**Nuclide:** Any known isotope, either stable or unstable, of any element. A single element can have isotopes, but when referring to isotopes of more than one element, the proper term is nuclide.

**NUREG:** A Nuclear Regulatory Commission's implementation guidance document.

**Pico:** Abbreviated p. A prefix used to denote one-trillionth ( $10^{-12}$ ).

**Radiography:** The process of examining a person, animal, object, or structure below the surface without injury or incursion using a radioactive source or a machine source of ionizing radiation.

**Radioisotope:** An unstable isotope of an element that decays or disintegrates spontaneously, emitting radiation. These elements have the same number of protons but different numbers of neutrons in their nuclei. Approximately 3,700 natural and artificial radioisotopes have been identified.

**Radiologically impacted:** An area, building, or piece of equipment that, under professional interpretation, has the distinct possibility of having residual radioactive material.

**Radioluminescence:** Luminescence produced by the bombardment of radiant energy such as x-rays, radioactive waves, or alpha particles on a material such as a phosphor.

**Radioluminescent device:** An item containing radioluminescent material that allows the device to be seen in the dark. These devices were commonly used by the Navy and sometimes contained radium-226, strontium-90, tritium, or promethium-147.

**Radioluminescent paint:** A paint containing a radioisotope that interacts with a phosphor to produce radioluminescence. The paint was commonly applied to devices that needed to be seen in areas without natural or artificial lighting.

**Radionuclide:** An unstable nuclide or isotope.

**Radium:** A radioactive metallic element with atomic number 88. As found in nature, the most common isotope has a mass number of 226. It occurs in minute quantities associated with uranium in pitchblende, camotite, and other minerals.

**RASO:** The Naval Sea Systems Command Detachment, Radiological Affairs Support Office, located in Yorktown, Virginia. RASO provides technical support to the Navy for management and control of G-RAM.

**RASP:** Radiological Affairs Support Program: Established by NAVSEA to implement the responsibilities for G-RAM.

**Record of Decision:** A public document that contains site history, site description, site characteristics, community participation, enforcement activities, past and present activities, contaminated media, the contaminants present, scope and role of response action and the remedy selected for cleanup of a Superfund site.

**Reference background area:** A reference area with similar physical chemical, geological, radiological, and biological characteristics as the area to be surveyed that has not been potentially contaminated by site activities. Readings are taken in this area to use for comparison with readings taken during radiological surveys.

**Release criterion:** A regulatory limit established for decontamination of residual radioactive contamination. The term may be expressed as a quantification of radioactivity, dose, or exposure risk.

**rem:** Roentgen equivalent man. A measure of radiation dose that is an estimate of the potential biological damage resulting from radiation exposure.

**Roentgen:** A unit of exposure for x-rays or gamma rays.

**SARA:** The Superfund Amendments and Reauthorization Act (SARA) amended the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) on October 17, 1986. SARA reflected EPA's experience in administering the complex Superfund program during its first six years and made several important changes and additions to the program. SARA also required EPA to revise the Hazard Ranking System (HRS) to ensure that it accurately assessed the relative degree of risk to human health and the environment posed by uncontrolled hazardous waste sites that may be placed on the National Priorities List (NPL).

**Scoping Survey:** A survey to identify radionuclide contaminants; relative radionuclide ratios and general radiation levels; and extent of contamination. These surveys usually include minimal surface scans, sampling, and dose rate assessments.

**Source:** A small device containing radioactive material. The device may be used in research and industrial processes and may be sealed or unsealed. Sealed sources are often part of specialized industrial devices that measure quantities such as the moisture content of soil or the density or thickness of materials (radiography or NDT). Sources are usually enclosed in a housing that prevents the escape of the radioactive materials. Sources are often referred to as “radioactive sources” or “sealed sources.”

**Structure:** Something built or constructed above the surface or contained within subsurface media.

**Subsurface soil and media:** Solid materials and media found below the surface soils.

**Surface soil:** The top layer of soil (6 inches below ground surface), fill, gravel, waste piles, concrete, or asphalt that is available for direct exposure, growing plants, resuspension of particles for inhalation, and mixing from human disturbances.

**Surface water:** Waters found in streams, rivers, lakes, and oceans as well as coastal tidal waters.

**Swipe sample:** Type of sample collected to measure removable contamination on surfaces by alpha and beta particles.

**Tritium:** A radioactive isotope of hydrogen. Because it is chemically identical to natural hydrogen, tritium can easily be taken into the body by any ingestion path. It decays by emitting beta particles and has a half-life of about 12.5 years.

**Unknown (contamination potential):** Residual radioactive contamination potentially exists but no clear indication of possible contamination levels or contaminants has been established.

**Unlikely (contamination potential):** Residual radioactive contamination is not expected but investigation is warranted.

**Wetland:** A type of sensitive environment sufficiently inundated or saturated by surface water or groundwater to support vegetation adapted for life under saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

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## 1.0 EXECUTIVE SUMMARY

### 1.1 PURPOSE

This Historical Radiological Assessment (HRA) presents a comprehensive history of the Navy's use of general radioactive material (G-RAM) at the Naval Air Station Brunswick (NAS Brunswick), in Brunswick, Maine. To prepare the HRA, the Navy examined historical activities involving the use of G-RAM at NAS Brunswick.

For the purposes of this document, G-RAM is defined as any radioactive material, not associated with the Naval Nuclear Propulsion Program (NNPP), used by the United States (US) Department of the Navy (DON) (including the Marine Corps) or DON contractors. No NNPP activities were conducted at NAS Brunswick. The HRA designates sites as impacted or non-impacted by the use or disposal of G-RAM; identifies potential, likely, or known sources of radioactive materials, contamination, and areas of use; assesses the likelihood of residual contamination and contamination migration; identifies sites that need further action; and provides recommendations for future radiological investigations and remediation processes.

This document has been prepared pursuant to the DON's Environmental Restoration Program to fulfill the requirements for a preliminary assessment in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). The format and content are consistent with the guidance for a Historical Site Assessment (HSA) as set forth in the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) ([HRA-0168](#)).

### 1.2 SITE BACKGROUND

NAS Brunswick is located in Cumberland County, Maine, about 25 miles north of Portland, Maine and 31 miles south of Augusta, Maine. The Main Station lies between the Androscoggin River to the north and Casco Bay to the south and encompasses approximately 3,200 acres. It is bordered by City of Brunswick to the east and west. The facility includes six principal areas: the Main Station, the Topsham Annex, the McKeen Street Housing Complex, the

former East Brunswick Remote Radio Transmitter Site, and Rake Stations 1 and 2, This HRA evaluates all six properties.

This HRA covers the history of G-RAM use at NAS Brunswick from April 15, 1943 through May 31, 2011. NAS Brunswick historically supported several anti-submarine patrol squadrons and weapons operation support functions, with the dual 8,000-foot runways being the largest single land use. Many NAS Brunswick facilities have been transferred outside of Navy control. The remainder of the facilities and property will be transferred in accordance with approved redevelopment plans. All military personnel and squadrons have been removed from the Station, but civilian personnel will continue to be present at the station until all Navy property has been transferred.

Details of the history of G-RAM at NAS Brunswick are provided in [Section 6.0](#) of this HRA. Examples of historical G-RAM operations include:

- Repair, use, and disposal of radioluminescent commodity items (e.g., dials, gauges and personnel markers)
- Handling, storage, repair, and disposal of aircraft components containing radioactive material (e.g., depleted uranium (DU) counterweights, ice detector probes)
- Storage and handling of commodity items containing radioactive material (e.g. exit signs, smoke detectors)
- On-site disposal of radioactive materials
- Handling and disposal of radioactive materials by shipment to off-site vendors or waste disposal sites
- Storage and maintenance of ammunition and weapons

### **1.3 HRA METHODOLOGY**

The primary purpose of the HRA is to designate sites as impacted or non-impacted. An “impacted” site is one that has the potential for radioactive contamination based on historical information, or one that is known to contain or have contained radioactive contamination. In many instances, designation as impacted does not confirm that radioactive contamination is

present, only that the possibility exists and must be investigated. Once a site is designated as impacted, it retains this designation even if residual contamination is removed and/or a radiological survey indicates that no residual radioactivity is present.

A “non-impacted” site is one where, based on historical documentation or results of previous radiological survey information, there is no reasonable possibility for residual radioactive contamination. If new historical information becomes available or contamination is found at a non-impacted site, the site would be re-designated as impacted. For a site to be designated as impacted, the HRA must 1) define the extent of past radiological operations, 2) assess the likelihood of potential contamination and potential contamination migration pathways, and 3) recommend future actions. This information can also be used to support removal actions within the context of the CERCLA process.

The DON researched multiple federal and local archives in the course of preparing this HRA. In an effort to find and interview personnel with knowledge of radiological operations at NAS Brunswick, the DON placed a public notice and factsheet announcing the HRA in the local newspapers. The factsheet was intended to solicit public input from local former civilian employees and military veterans. The DON gathered information from former NAS Brunswick employees and the DON’s Radiological Affairs Support Office (RASO) having working knowledge of radiological activities at NAS Brunswick. The DON also established a toll-free telephone hotline and a dedicated e-mail location for input and information from personnel with knowledge of operations involving radioactive material at NAS Brunswick. Limited useful information was developed from these sources and while all information was reviewed and considered, some information that was obtained was not used in this HRA because it could not be verified or because it was not applicable to the scope of this HRA. The DON compared historical information to evaluations made during several site reconnaissance visits to determine whether sites were impacted. The results were compiled and are provided in this HRA.

#### **1.4 REGULATORY INVOLVEMENT**

The US Nuclear Regulatory Commission (NRC) and its predecessor agency, the Atomic Energy Commission (AEC), exercised licensing and regulatory authority over some of the radioactive materials used at NAS Brunswick. Although NAS Brunswick did not possess any

AEC/NRC licenses, the DON held AEC/NRC licenses that allowed for the possession, use and distribution, within the DON, of many of the items containing radioactive by-product materials used in US Navy aircraft.

In 1987, the NRC granted a Master Material License to the DON which allowed the DON to issue Naval Radioactive Materials Permits (NRMPs) in lieu of the NRC issuing individual licenses to Navy and Marine Corps commands ([HRA-0337](#)). The NRMP program is administered by RASO for the Chief of Naval Operations. No NRMPs were ever issued to NAS Brunswick. However, radioactive commodity items authorized by NRMPs issued to other Navy commands were used at NAS Brunswick. The only known licenses or permits held by DOD tenants of the DON that were used at NAS Brunswick was an NRC license held by the Marine Reserves for very low energy sealed devices used at the Topsham Annex, which is discussed in [Section 6.4.3](#).

## **1.5 ASSESSMENT SUMMARY**

After review of the use of G-RAM by the Navy and their tenants at the NAS Brunswick Main Station and Remote Properties, the buildings, structures, and open areas with a history of storage, use or distribution of materials that have a potential to contain radioactive material have been designated by the DON as “impacted sites.” MARSSIM defines area site as any installation, facility, or discrete, physically separate parcel of land, or any building or structure, or portion thereof, being considered for survey and investigation ([HRA-0168](#)). The designation as impacted does not confirm the presence of radioactive material, only that there is a possibility for residual radioactive contamination. An assessment of contamination potential and contamination migration potential is provided for each of these buildings and areas along with recommendations for future actions.

In summary, this HRA has concluded that:

- There is a low potential for residual radioactive contamination at 18 impacted facilities/structures/sites and medium potential for residual radioactive contamination at one impacted facility.
- Scoping surveys are recommended for all 19 facilities/structures/sites.

- To date, no historical information about radiological operations or previous radiological surveys at any of the impacted sites presents a level of concern that would require any emergency action.
- To date, no documentation of high-level radioactive contamination has been found at NAS Brunswick.
- To date, no impacted sites have required restricted access due to known levels of radioactive contamination.
- To date, no evidence of potential airborne radioactive contamination has been found.
- To date, no evidence of a pathway for potential radioactive contamination to migrate off NAS Brunswick has been identified.

## **1.6 CONCLUSIONS**

Radioactive materials were used and stored at NAS Brunswick. A total of 19 facilities/structures/sites are considered impacted from these activities. This HRA has not confirmed that actual radioactive contamination is present at these sites; however, further investigations are recommended.

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## **2.0 INTRODUCTION**

### **2.1 SCOPE**

This HRA presents a comprehensive history of the use of G-RAM at NAS Brunswick. The HRA designates sites as impacted or non-impacted from the use or disposal of G-RAM; identifies potential, likely, or known sources of radioactive materials, and areas of use; assesses the likelihood of residual contamination and contamination migration; and provides recommendations for future radiological investigations.

### **2.2 HRA PURPOSE**

The primary purpose of the HRA is to designate areas as impacted or non-impacted based on previous operations or investigations. An “impacted” site is one that has the potential for radioactive contamination based on historical information, or one that is known to contain or have contained radioactive contamination. Once a site is designated as impacted, it retains this designation even if contamination is removed and/or a radiological survey indicates that no residual radioactivity is present. Designation as impacted does not confirm that radioactive contamination is present, only that the possibility exists and must be investigated. At impacted sites, further investigation is recommended to determine if there is residual radioactive contamination at levels exceeding release criteria and to ensure that the site meets current release standards. Documentation of further investigation and/or remediation of impacted sites will be presented separately from this HRA in site specific reports. A non-impacted site is one where, based on historical documentation or results of previous radiological survey information, there is no reasonable possibility for residual radioactive contamination. If new historical information becomes available or contamination is found at a non-impacted site, the site would be re-designated as impacted. To designate a site as impacted or non-impacted, the HRA defines the extent of past radiological operations, assesses the likelihood of potential contamination and potential contamination migration pathways, and recommends future actions. This information can also be used to support removal actions within the context of the CERCLA process.

The DON researched multiple federal and public sources to obtain information for preparation of this HRA, including the following sources.

- National Archives and Records Administration documents were researched for any historical information applicable to NAS Brunswick.
- The Air Force was contacted to obtain information about radioactive materials use or disposal at the Topsham Annex.
- RASO records were searched and information was gathered from RASO personnel knowledgeable of NAS Brunswick activities.
- The DON solicited input and information from personnel with knowledge of radiological operations at NAS Brunswick and any other interested party by placing a public notice in the local newspaper along with a factsheet announcing the HRA, issuing a press release, and establishing routes for contact from individuals (toll-free telephone hotline and dedicated e-mail location) ([Appendix B](#)).
- Information was gathered from employees at NAS Brunswick who had working knowledge of radiological activities at Brunswick.

The DON compared historical information to evaluations made during several site reconnaissance visits to determine whether a site is impacted. The results were compiled and are provided in this HRA.

This HRA meets the protocol for a preliminary assessment, as defined by CERCLA and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 Code of Federal Regulations [CFR] Part 300), and can be used to support removal actions within the CERCLA process. An HRA is comparable to the HSA as determined by the MARSSIM ([HRA-0168](#)).

## **2.3 HISTORY**

Details of the radiological history of NAS Brunswick are provided in [Section 6.0](#) of this HRA. Examples of historical G-RAM operations included:

- Repair, use, and disposal of radioluminescent commodity items (e.g., dials, gauges and personnel markers)
- Handling, storage, repair, and disposal of aircraft components containing radioactive material (e.g., depleted uranium [DU] counterweights, ice detector probes)
- Storage and handling of commodity items containing radioactive material
- On-site disposal of radioactive materials
- Handling and disposal of radioactive materials by shipment to off-site vendors or waste disposal sites
- Storage and maintenance of ammunition and weapons

## **2.4 REGULATORY BACKGROUND**

The information in this HRA is presented pursuant to the DON's Installation Restoration (IR) Program. Specific to military facilities, the IR Program identifies, investigates, and restores sites with hazardous substances to reduce the risk to human health and the environment. The IR Program functions in accordance with CERCLA and the Superfund Amendments and Reauthorization Act of 1986 (SARA) as directed by Executive Order 12316 of August 20, 1981, which requires the US Department of Defense (DoD) to comply with CERCLA.

The DON instituted the Navy Assessment and Control of Installation Pollutants (NACIP) Program in the mid-1980s to ensure compliance with CERCLA. The first step in the NACIP Program is to conduct an initial assessment study (IAS) of a facility to assess potential contamination by hazardous materials, including radioactivity. The NAS Brunswick IAS was completed in 1983 ([HRA-0004](#)). NAS Brunswick's Main Station was placed on the National Priorities List (NPL) in 1984. Per Executive Order 12580, the DoD is delegated as the lead agency responsible for compliance with CERCLA and SARA when it is the sole or co-contributor to contamination on or off its properties.

Under the authority of CERCLA, DoD has undertaken the assessment of radioactive materials at NAS Brunswick by conforming to the requirements of the NCP, Title 40 of the CFR, Part 300. Because CERCLA defines radionuclides as hazardous substances, radionuclides are included in the CERCLA process to investigate, characterize, and remediate contamination. [Appendix B](#) to Title 40, Part 302.4 of the Code of Federal Regulations lists the radionuclides defined as CERCLA hazardous substances. The radionuclides of concern (ROCs) for NAS Brunswick are included on this list.

Developed collaboratively by the Environmental Protection Agency (EPA), DoD, the US Department of Energy (DOE), and the NRC, MARSSIM provides guidance for investigation of surface contamination at radiologically impacted sites ([HRA-0168](#)). Developed to be consistent with CERCLA, MARSSIM uses a multi-phased approach to address radioactive contamination issues similar to CERCLA's multi-phased approach. Once the presence of radioactive material has been identified and remediated at impacted sites, MARSSIM recommends a Final Status Survey (FSS) for radiological release of a site for unrestricted use to fulfill the CERCLA closure and post-closure process. [Section 8.0](#) provides the current status of each impacted site with the appropriate recommendation to comply with MARSSIM.

## **2.5 REPORT ORGANIZATION**

This HRA is organized to present the history of the use of G-RAM at NAS Brunswick from 1943, when NAS Brunswick was commissioned, to disestablishment in 2011 by providing the following information, as appropriate:

- Potential, likely, or known sources of G-RAM
- Potential, likely, and known areas of G-RAM use or disposal
- History of G-RAM operations, investigations, remediations, and surveys
- Classification of an area as impacted by radiological operations
- Identification of potential contamination migration pathways
- Information useful to radiological scoping and characterization surveys
- Recommendations for future radiological investigations and remediation processes

The basic organization of the report is presented below. Individual tables, figures, and appendices are not included here but are listed in the Table of Contents. Tables and figures are included after their respective section in the order they are first mentioned in the text. [Section 10.0](#) lists the reference documents used to prepare this HRA. References are cited in text in parentheses beginning with “HRA-” and followed by a number for the source listed in [Section 10.0](#). The actual reference documents are organized and provided electronically in a separate folder included on the CD-ROM titled as [Appendix D](#). The Historical Maps and Photographs are also organized and provided electronically in a separate folder and titled as [Appendix E](#) on the CD-ROM. Appendices A, B, and C are included after [Section 10.0](#).

- [Abbreviations, Acronyms, and Symbols](#)
- [Glossary](#)
- [Section 1.0](#) – Executive Summary
- [Section 2.0](#) – Introduction
- [Section 3.0](#) – Site Identification and Description
- [Section 4.0](#) – HRA Methodology
- [Section 5.0](#) – Regulatory Involvement
- [Section 6.0](#) – History
- [Section 7.0](#) – Assessment of Impacted Sites
- [Section 8.0](#) – Findings and Recommendations
- [Section 9.0](#) – Conclusions
- [Section 10.0](#) – References
- Appendices

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### 3.0 SITE IDENTIFICATION AND DESCRIPTION

NAS Brunswick was an active Naval Air Station located in Cumberland County, Maine (Figure 3-1). This section describes the area's geology, water resources, climate, and land use, and presents information on environmentally sensitive areas in the vicinity of the installation.

#### 3.1 SITE DESCRIPTION

The US Navy property known as NAS Brunswick Main Station consists of approximately 3,200 acres. The Main Station property is located 25 miles northeast of Portland, Maine and 31 miles south of Augusta, Maine. The Main Station is situated northeast of the town center of Brunswick which lies between the Androscoggin River and Casco Bay, both of which flow into the Atlantic Ocean approximately 5 miles away. It is bordered by Route 123 on the west and Route 24 on the north and east sides (HRA-0077).

Adjacent to a commercial area of Brunswick, entrance to the station is gained through the main gate at the intersection of Fitch Avenue and Bath Road (Route 24). NAS Brunswick is easily identified by the large runways south of Bath Road and parallel to Harpswell Road (Route 123).

For purposes of CERCLA, NAS Brunswick is referred to as:

Brunswick Navy Air Station, Brunswick, Maine

EPA Region I CERCLA Information System Identification Number ME8170022018

NAS Brunswick is comprised of the Main Station and five remote properties listed below and shown in Figures 3-2 and 3-3.

- McKeen Street Housing Complex, located in Brunswick, approximately 3 miles from the Main Station, which consists of approximately 70 acres of land and improvements (HRA-0077);
- Former East Brunswick Remote Radio Transmitter Site, located in Brunswick, approximately 3.2 miles northeast of the Main Station, which consists of approximately 66 acres of land (HRA-0077);

- Topsham Annex located in the Town of Topsham, approximately 4 miles north of the Main Station, which consists of approximately 74 acres of land and facilities. Originally, Topsham Annex consisted of 125 acres; however, approximately 45 acres were transferred by the Navy to the Maine Administrative School District in 1999 and approximately 7 acres were transferred to Central Topsham Associates in 2003 ([HRA-0102](#));
- Sabino Hill Rake Station No. 1, approximately 0.23 acre of land located near Phippsburg, approximately 14 miles southeast of the Main Station ([HRA-0077](#));
- Small Point Rake Station No. 2, approximately 0.23 acre of land located near Phippsburg, approximately 14 miles southeast of the Main Station ([HRA-0077](#)).

NAS Brunswick was constructed in in a rural area outside of Brunswick, Maine 1943. This was in close proximity to the Bath Steel Iron Works and commissioned as an outpost for the US Navy's anti-submarine warfare operations. In the 1950s, NAS Brunswick was expanded to include the tidal marshes and estuaries of Harpswell Cove to the south, which increased the station's size from 1,487 acres to approximately 3,200 acres.

### **3.2 GEOLOGY**

During the latest Ice Age, the entire state of Maine was covered by a continental glacier known as the late Wisconsinan Laurentide ice sheet. The weight and density of this continental glacier depressed the Earth's bedrock crust by several hundred feet. Due to this deep depression of the bedrock, most of the low areas of southern Maine were flooded during the regression of the glacier and transgression of the sea levels.

The results of the marine transgression and subsequent regression caused an emergence or isostatic rebound which led to the formation of the Brunswick sand plain between the Androscoggin River and Casco Bay ([HRA-0284](#)). The geology of Brunswick, Maine is a classic example of glacial deposits reflecting the advance and retreat of massive ice sheets. The area has a thin sedimentary stratigraphic column which records the transition from marine to near-shore conditions due to the late-glacial isostatic emergence.

The surficial geology overlies a sand and silt zone. Beneath the sand deposits, a thick glaciomarine mud overlies another layer of sand and till which in turns lies on top of bedrock. The remaining geology of NAS Brunswick is that of a marine nearshore deposit, thin-drift areas, stream alluvium, freshwater wetlands and saltmarsh wetlands associated with the Presumpscot Formation which overlies the bedrock with silty clay in depressions and includes sand deposits in marine and submarine fans.

The bedrock under NAS Brunswick Main Station is composed of two primary bedrock formations, the Cushing Formation and the Cape Elizabeth Formation. Both bedrock formations at the installation are characterized by very limited primary porosity, generally in the saprolite or weathered zone. The bedrock under Topsham Annex is composed primarily of Mount Ararat Formation material which is a thin interlayer of quartz and gneiss. The bedrock underlying the Former East Brunswick Remote Transmitter Site is that of Sebascodegan Formation, a thin-bedded quartz with some rust zones. The bedrock underlying the McKeen Housing Complex is that of the Nehumkeag Pond Formation, another quartz and gneiss formation.

NAS Brunswick Main Station property includes portions of or is adjacent to two coves, Harpswell Cove and Buttermilk Cove. Harpswell Cove and Buttermilk Cove have been classified as low coastal bluffs and potential landslide areas. The most recent landslide detected by the Maine Geological Survey occurred along the east shore of Buttermilk Cove in Brunswick, Maine in April 2007. The area had evidence of prior slope failure and subsidence with cracking and subsidence in the adjacent home and shoreline property ([HRA-0288](#)).

### **3.3 HYDROLOGY**

#### **3.3.1 Surface Water**

The surface water hydrology at NAS Brunswick and the remote properties consists of four drainage basins, two small streams and several smaller streams. According to the Maine Geological Survey, the four drainage basins discharge to the Androscoggin River, Mere Brook/Harpswell Cove, Middle Bay Cove and Buttermilk Cove, all of which converge on NAS Brunswick. Approximately 74 percent of NAS Brunswick is associated with the Mere Brook/Harpswell Cove drainage basin, which encompasses the majority of the runways and

southern portion of the station. Harpswell Cove is a tidal estuary with extensive salt marsh and mudflat habitat. Approximately 9 percent of NAS Brunswick (mostly housing units) lies within the Buttermilk Cove drainage basin. Buttermilk Cove is a tidal estuary which is steep-sided with narrow fringing salt marshes or exposed mudflats or rock outcrops. Approximately 4 percent of NAS Brunswick runoff flows to the Middle Bay Cove drainage basin, which is separated by a northeast-trending ridge from Harpswell Cove. The remaining 13 percent of NAS Brunswick lies within the Androscoggin drainage basin and includes the northern portion of NAS Brunswick. **(HRA-0102)**

Mere Brook and Merriconeag Stream are the major natural surface water bodies that flow through NAS Brunswick; a series of smaller unnamed streams flow into either Mere Brook or the Androscoggin River from NAS Brunswick (**Figure 3-4**). The Androscoggin River flows east along the northern boundary of the town of Brunswick and joins the Kennebec River which empties into the Atlantic Ocean near Small Point, Maine. Mere Brook enters NAS Brunswick at the northwestern boundary and flows in its natural streambed for about a half mile then moves under the operations area in a conduit. Merriconeag Stream enters the station along the eastern boundary and flows into the Picnic Pond, from which it continues to flow south and join Mere Brook. Mere Brook continues to flow south through the southern boundary of the station and becomes tidally influenced as it merges with Harpswell Cove. **(HRA-0290)**

Three areas of NAS Brunswick would be inundated during a 100-year flood as identified by the Federal Emergency Management Administration (FEMA) (**Figure 3-4**).

- Mere Brook in the western side of NAS Brunswick
- Mere Brook in the southern portion of NAS Brunswick continuing into Harpswell Cove
- Buttermilk Cove along the southeast corner of NAS Brunswick

FEMA has identified Base Flood Elevations (BFEs) for the Buttermilk Cove area and the southern portion of Mere Brook, but has not established a BFE for the western portion of Mere Brook.

### **3.3.2 Groundwater**

There are two aquifers beneath NAS Brunswick, a bedrock aquifer and an overburden aquifer. The bedrock aquifer produces limited amounts of groundwater because of a semi-continuous confining layer of clay overlying the bedrock. Shallow overburden groundwater might still enter the bedrock where the bedrock is close to the ground surface or where there is no clay layer. Groundwater movement within the bedrock unit is controlled by the presence of fractures and joints and is highly variable, therefore not easily mapped.

The overburden, or sand and gravel aquifer, is composed of three units (a sand layer, a transition layer, and a low-permeability clay layer) that are capable of yielding more water than the bedrock aquifer. Groundwater in the overburden is encountered under unconfined conditions at about 10 to 80 feet below ground surface (bgs) and generally flows towards the Gulf of Maine. The primary source of drinking water for NAS Brunswick is the Brunswick/Topsham Water District municipal water supply, which is drawn from the overburden aquifer. ([HRA-0290](#))

## **3.4 CLIMATE AND METEOROLOGY**

The State of Maine is divided into three major climatic divisions; NAS Brunswick is located in the Coastal Division, which is strongly influenced by its proximity to the Atlantic Ocean to the east and the White Mountains to the northwest. The Atlantic Ocean moderates extremes in temperature and increases the amount of precipitation received by the area. The White Mountains keep considerable snow from reaching the area from the northwest and also moderates temperatures.

Average temperatures range from 20.8 degrees Fahrenheit (°F) in January to 68.6°F in July, with an annual average of 45.4°F ([HRA-0291](#)). Mean daily maximum and minimum temperatures of 78.8°F in July and 12.4°F in January have been recorded. During extreme conditions, a daily maximum of 99°F in July and a daily minimum of minus 26°F in January have been recorded. There are, on average, 13 days of zero or subzero temperatures per year.

The annual average precipitation is 44.34 inches, with monthly averages as high as 5.17 inches in the fall and as low as 2.87 inches in the summer ([HRA-0291](#)). The annual average relative humidity ranges from 65 and 77 percent. The mean seasonal snowfall is 70.9 inches.

Because of the proximity to the Atlantic Ocean, winter precipitation in southern mid-coastal Maine is often in the form of rain or wet snow. Fog occurs frequently along the Maine coast at all times during the year except in winter. On average, there are 57 days with heavy fog, defined as visibility less than one-fourth of a mile. Days with the possibility of sunshine range from 48 percent in November to 64 percent in August; the annual percentage of days with sunshine is 57.

Prevailing winds are from the south from April to September, from the north in November and December, and from the west to northwest for the remainder of the year. The annual average wind speed is approximately 9 miles per hour (mph), with monthly average wind speeds not varying considerably (7.7 mph in the summer to 10.1 mph in the spring). Strong winds in the winter, generated by coastal storms, can produce abnormally high wind-driven tides. Regional diurnal and seasonal variations may moderately influence wind directions and wind speeds. ([HRA-0291](#))

### **3.5 ADJACENT POPULATION**

The US Census Bureau in 2000 reported 1,274,923 people in Maine, with more than 849,306 residing in counties at least partially within a 50-mile radius of NAS Brunswick. The metropolitan areas of Androscoggin, Cumberland, Kennebec, and York Counties contain most of this population. The distribution of this population is shown in [Table 3-1](#).

Commercial retail, residential, and public recreation areas surround NAS Brunswick, with the majority of Brunswick's retail inventory situated immediately adjacent to the NAS Brunswick main entrance. Located directly adjacent to the Main Station are two Brunswick housing projects. The western boundary of NAS Brunswick is adjacent to residential areas, while the eastern boundary is adjacent to forested areas. [Table 3-2](#) shows population of cities and towns within a 10-mile radius of NAS Brunswick. [Table 3-3](#) lists the schools located within one mile of NAS Brunswick and the reported age ranges of the students.

### **3.6 CURRENT AND FUTURE LAND USE**

NAS Brunswick was the last active-duty DoD airfield in New England. It was formerly home to six air patrol squadrons and one reserve patrol squadron that flew the Lockheed P-3

Orion, along with one reserve transport squadron that flew Lockheed C-130 Hercules Airlifters. NAS Brunswick was used continuously by Navy Reservists from across the Northeastern United States from 1943 to 2011. [Appendix F](#) identifies buildings and structures which are currently and were formerly located on NAS Brunswick, with their former uses over time, beginning in 1946 and ending in 2011.

Future uses for NAS Brunswick, as proposed by the Brunswick Naval Air Station Master Reuse Plan, include a proposed land use program to convert 1,630 acres to aviation-related businesses, professional offices, and community mixed use, business and technology industries, education and residential development ([HRA-0292](#)). The remaining acreage will be dedicated to a variety of active and passive areas for recreation, open space, and natural areas ([HRA-0292](#)). The future land uses proposed for the Topsham Annex separate the property into residential, business and community use, and parks and recreation use ([HRA-0294](#)). The McKean Street Housing Complex is proposed to continue to be residential; while the East Brunswick Transmitter Site will be divided between recreation/open space and natural areas ([HRA-0292](#)). The Sabino Point Rake Station will be returned to the heirs of the previous owners and the Small Point Rake Station will be given to the Town of Phippsburg. [Figures 3-6](#) and [3-7](#) show the proposed future reuse of land included in NAS Brunswick and Topsham Annex.

### **3.7 ADJACENT LAND USE**

The existing land uses within a mile surrounding NAS Brunswick include general zoning categories of residential (residential, country, and town residential), commercial and highway commercial, college use, farm forest, coastal protection, and mixed use. The McKean Street Housing Complex is in an area that is zoned residential and the East Brunswick Transmitter Site is zoned country residential. According to the Town of Brunswick Comprehensive Plan, updated for 2008, the areas surrounding NAS Brunswick are within the Growth Zone for the town of Brunswick. This zone is a focal point in which to increase commercial business, housing and infrastructure for the residents of Brunswick. Directly northwest of the station is Cook's Corner, a large area of commercial business that has grown and expanded to provide services to NAS Brunswick residents and the large residential housing area east of NAS Brunswick. A largely

rural area lies directly east and south of NAS Brunswick, and according to the Comprehensive Plan, this area would remain rural with undisturbed forest and natural areas ([HRA-0293](#)).

### **3.8 ENVIRONMENTALLY SENSITIVE AREAS**

Environmentally sensitive areas are located on and in the vicinity of NAS Brunswick. Sensitive areas on NAS Brunswick Main Station include estuarine wetlands, palustrine wetlands, coastal zone areas, essential fish habitat, and rare communities.

There are approximately 443 acres of wetlands at NAS Brunswick which are either estuarine or palustrine systems. Estuarine wetlands include deep water tidal habitats and adjacent tidal wetlands that are usually semi-enclosed by land but have open, partly-obstructed, or intermittent access to the open ocean, and in which ocean water is at least occasionally diluted by freshwater runoff from the land. Approximately 116 acres of estuarine wetlands have been mapped, most of which are located around Harpswell Cove. The remaining estuarine wetlands are located along the station's boundary that abuts Buttermilk Cove. Approximately 327 acres are palustrine wetlands that include non-tidal wetlands dominated by trees, shrubs, persistent emergents, mosses, or lichens. Palustrine wetlands are also known as marshes, swamps, bogs, fens, prairies, and ponds. The majority of palustrine wetlands on NAS Brunswick are associated with the Mere Brook/Harpswell Cove drainage basin. The Topsham Annex also has two wetland areas. The first is a well-developed, mixed-class, emergent-scrub/shrub wetland located in the northeastern portion of the recreation area; while the second is mostly open water and is located at the southern end of the property. There are no known wetlands at the remaining remote properties. ([HRA-0102](#))

NAS Brunswick is included in the Maine Department of Environmental Protection's (MEDEP) Coastal Zone Management Program, which incorporates regulations regarding development and use of the coastal zone (i.e. point-source discharges, land use, solid waste management, air quality, stream alteration, and spill prevention and control). All of NAS Brunswick lies within the Coastal Zone. The golf course and picnic area on the Main Station lie in a 250-foot natural resource protection zone around the coastal wetlands of Harpswell Cove. These recreational areas appear to have had no effect on the wetlands.

The estuaries of Harpswell and Buttermilk Coves typically contain abundant and diverse fish populations. In addition to the resident species, these estuaries serve as feeding, spawning, or nursery grounds for several anadromous fish species ([HRA-0004](#)). According to National Oceanic and Atmospheric Administration (NOAA), the following species of fish and shellfish have Essential Fish Habitat within portions of Casco Bay, which include Harpswell Cove and Buttermilk Cove: Atlantic salmon (*Salmo salar*), Atlantic cod (*Gadus morhua*), pollock (*Pollachius virens*), whiting (aka silver hake) (*Merluccius bilinearis*), red hake (*Urophycis chuss*), white hake (*Urophycis tenuis*), winter flounder (*Pleuronectes americanus*), yellowtail flounder (*Pleuronectes ferruginea*), windowpane flounder (*Scopthalmus aquosus*), American plaice (*Hippoglossoides platessoides*), ocean pout (*Macrozoarces americanus*), Atlantic halibut (*Hippoglossus hippoglossus*), Atlantic sea scallop (*Placopecten magellanicus*), Atlantic sea herring (*Clupea harengus*), bluefish (*Pomatomus saltatrix*), Atlantic mackerel (*Scomber scombrus*), and bluefin tuna (*Thunnus thynnus*).

The Maine Natural Areas Program has identified a number of “natural communities” that have “rare” status within the state. The two rare communities found in the vicinity and within NAS Brunswick property are the Pitch Pine - Heath Barren community and the Little Bluestem - Blueberry Sandplain Grassland community. Both natural communities are in the northwest portion of the station. The Blueberry Sandplain Grassland is used by the state-endangered grasshopper sparrow (*Ammodramus savannarum*) as regular breeding grounds. The grasshopper sparrow prefers open grassy and weedy meadows, pastures, and hayfields in breeding season and open country during migration. This particular grassland on NAS Brunswick is also used for breeding by the state-threatened, upland sandpiper (*Bartramia longicauda*). Its distribution in Maine is generally restricted to open lands and barrens in the coastal zone. It occupies similar habitats as the grasshopper sparrow, but with lower blueberry shrub cover and scattered patches of open ground. Also, one state-endangered plant, the clothed sedge (*Carex vestita*), occurs on NAS Brunswick. This plant has also been documented in Cumberland and York Counties in Maine. The clothed sedge is found in dry, semi-open areas and may exist in the station’s grassland habitats. ([HRA-0102](#))

**TABLE 3-1  
 POPULATION OF COUNTIES ALL OR  
 PARTIALLY WITHIN A 50-MILE RADIUS OF  
 NAS BRUNSWICK**

<b>County</b>	<b>1990 Population</b>	<b>2000 Population</b>
Androscoggin	105,259	103,793
Cumberland	243,135	265,612
Franklin*	29,008	29,467
Kennebec*	115,904	117,114
Knox*	36,310	39,618
Lincoln	30,357	33,616
Oxford*	52,602	54,755
Sagadahoc	33,535	35,214
Somerset*	49,767	50,888
Waldo*	33,018	36,280
York*	164,587	186,742
<b>Total Population</b>	<b>788,223</b>	<b>849,306</b>

\* Only portions of the county are within 50-mile radius of NAS Brunswick.

**TABLE 3-2  
 POPULATION OF CITIES WITHIN  
 A 10-MILE RADIUS OF NAS BRUNSWICK**

<b>County</b>	<b>1990 Population</b>	<b>2000 Population</b>
Bath	9,799	9,266
Brunswick	20,906	21,172
Freeport	6,905	7,800
Lisbon Falls	4,674	4,420
Topsham	8,746	9,100
<b>Total Population</b>	<b>51,030</b>	<b>51,758</b>

**TABLE 3-3  
 SCHOOLS LOCATED WITHIN A 1-MILE RADIUS OF NAS  
 BRUNSWICK**

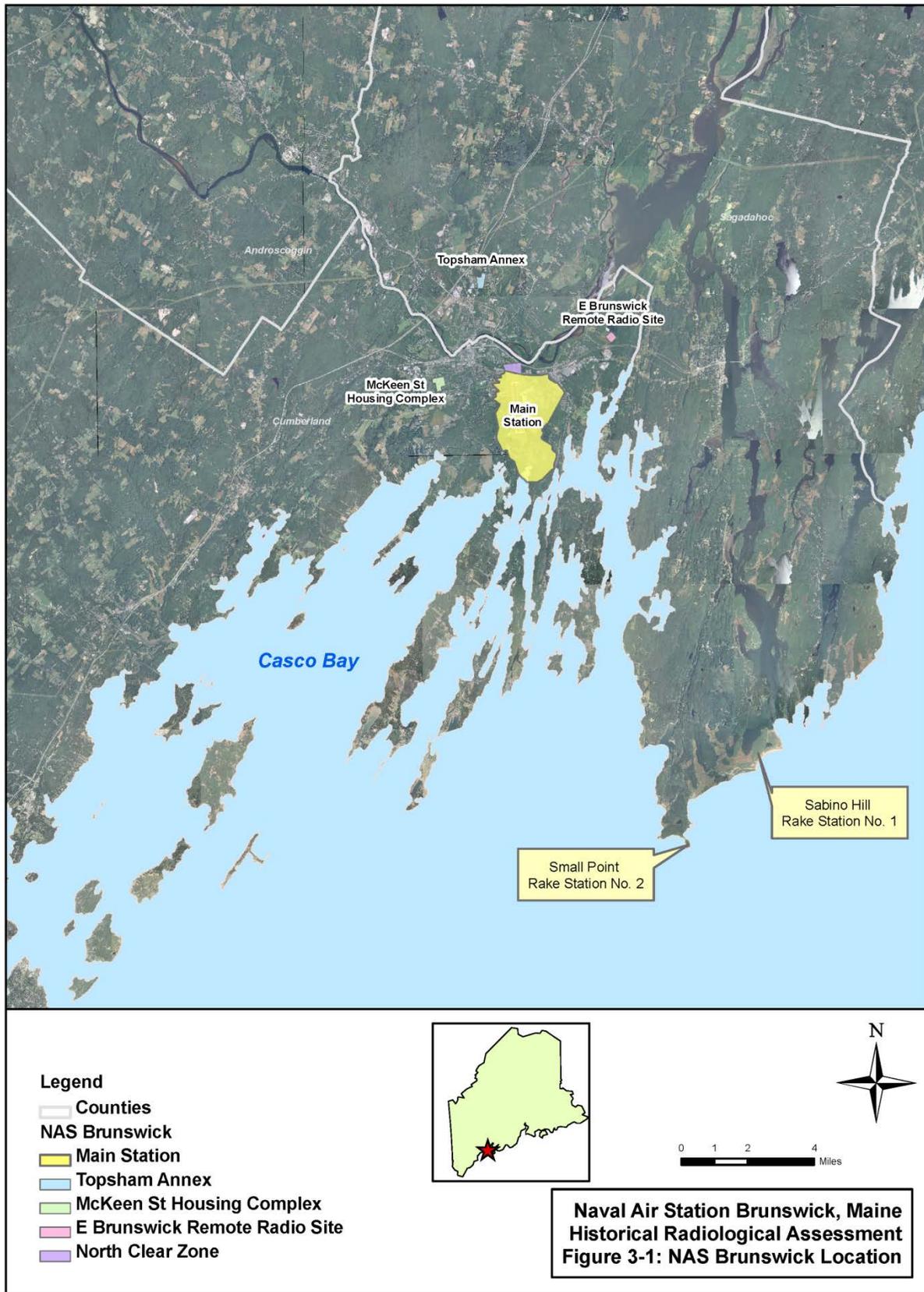
School	Address and Telephone No.	Age Range (Years)	Program Times	Students in Program
Bowdoin College	5700 College Station (207) 725-3000	Adult	Full Day	1716
Coffins School	20 Barrows Street (207) 319-1950	5 to 10	AM K; 8:40-11:25 PM K; 12:25-3:10 Grades 1-5; 8:40-3:10	465
Compass Point Day Care	58 Wildwood (207) 443-1300	4 to 5	6:30-5:30	3
Embry-Riddle Aeronautical University (Satellite Location)	1000 Burbank Avenue (207) 721-0664	Adult	8:30-5:30	65
Hawthorne School	46 Federal Street (207) 319-1960	6 to 10	8:40-3:10	111
Jordon Acres School	75 Jordan Avenue (207) 319-1970	5 to 10	AM K; 8:40-11:20 PM K; 12:40-3:10 Grades 1-5; 8:40-3:10	484
Longfellow School-Brunswick	21 Longfellow Avenue (207) 319-1980	5 to 10	AM K; 8:40-11:25 PM K; 12:25-3:10 Grades 1-5; 8:40-3:10	349
St. John's Catholic School	37 Pleasant Street (207) 725-5507	4 to 13	7:40-2:20	190
Southern New Hampshire University (Satellite Location)	10 Tibbetts Dr. (207) 725-6486	Adult	8:30-10:30	450
The Three Little Bears Nursery School	4 Riverview Drive (207) 725-7180	3 to 5	8:30-12:00/ 12:45-4:15	3

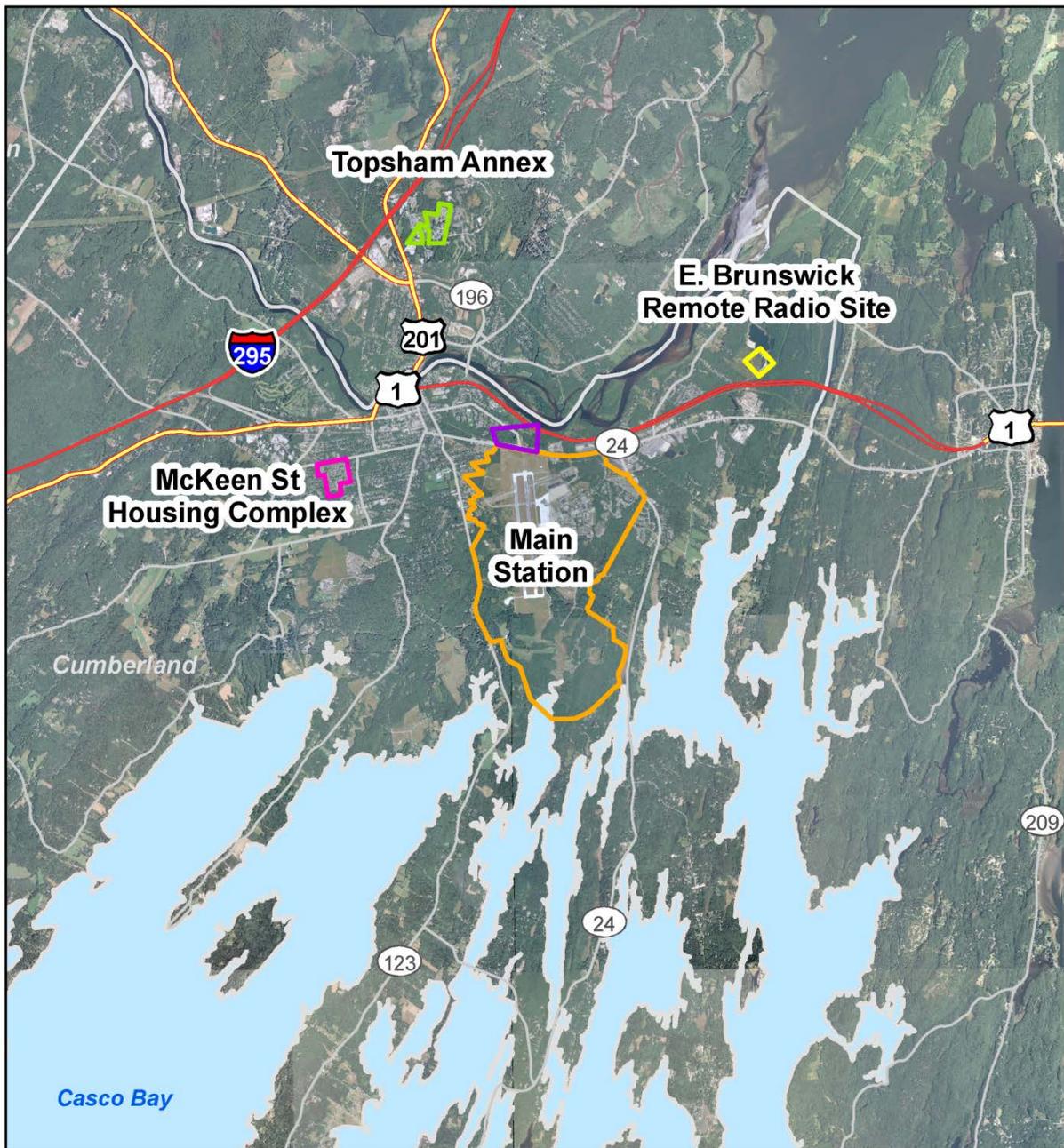
**TABLE 3-4  
 WEAPONS MAINTENANCE AND STORAGE BUNKERS AT  
 NAS BRUNSWICK**

<b>Built</b>	<b>Building</b>	<b>Description</b>	<b>Location</b>	<b>Reference</b>
<b>1943</b>	9	Electronics & Ordnance Shop / Advanced Undersea Weapons	Orion Street	<a href="#">HRA-0091</a>
	44	Inert Ordnance Storage	Avenue B	<a href="#">HRA-0091</a>
	52	Inert Ordnance Storage	Orion Street	<a href="#">HRA-0091</a>
	53_c	Small Arms Magazine	Ordnance Rd 1	<a href="#">HRA-0091</a>
	54_b	Small Arms Magazine	Ordnance Rd 1	<a href="#">HRA-0091</a>
	55_b	Pyrotechnic Magazine	Ordnance Rd 1	<a href="#">HRA-0091</a>
	56_c	High Explosives Magazine	Ordnance Rd 2	<a href="#">HRA-0091</a>
	57	High Explosives Magazine	Ordnance Rd 3	<a href="#">HRA-0091</a>
	58	High Explosives Magazine	Ordnance Rd 3	<a href="#">HRA-0091</a>
	59	High Explosives Magazine	Ordnance Rd 3	<a href="#">HRA-0091</a>
	60	Inert / High Explosives Magazine	Ordnance Rd 3	<a href="#">HRA-0091</a>
	62	High Explosives Magazine	Ordnance Rd 3	<a href="#">HRA-0091</a>
	63	High Explosives Magazine	Ordnance Rd 3	<a href="#">HRA-0091</a>
	64	Incendiary Magazine	Ordnance Rd 3	<a href="#">HRA-0091</a>
	69	Ready Magazine / Ammunition Storage	Orion Street	<a href="#">HRA-0091</a>
71	Ready Magazine / Weapons / Ordnance Storage	Orion Street	<a href="#">HRA-0091</a>	
<b>1945</b>	73	Ready Magazine	Seahawk Avenue	<a href="#">HRA-0091</a>
	75	Ammunition Belting Shed	Seahawk Avenue	<a href="#">HRA-0091</a>
<b>Pre-1946</b>	34	Armory	Avenue D	<a href="#">HRA-0298</a>
	61	High Explosives Magazine	Ordnance Rd 3	<a href="#">HRA-0298</a>
	65_b	Fuse & Detonator Magazine	Ordnance Rd 4	<a href="#">HRA-0298</a>
	66	Fuse & Detonator Magazine	Ordnance Rd 4	<a href="#">HRA-0298</a>
	67	Fuse & Detonator Magazine	Ordnance Rd 4	<a href="#">HRA-0298</a>
	70	Fusing & Arming Building	Orion Street	<a href="#">HRA-0298</a>
	72_b	Ready Magazine	Orion Street	<a href="#">HRA-0298</a>
	79_b	Rocket Propellant Fusing & Arming Building	Orion Street	<a href="#">HRA-0298</a>

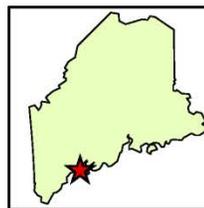
**TABLE 3-4  
 WEAPONS MAINTENANCE AND STORAGE BUNKERS AT  
 NAS BRUNSWICK (CONT'D)**

<b>Built</b>	<b>Building</b>	<b>Description</b>	<b>Location</b>	<b>Reference</b>
<b>1953</b>	223	Advanced Undersea Weapons / Mine Shop / Armory & Explosive Ordnance Disposal	Seahawk Avenue	<a href="#">HRA-0091</a>
<b>1956</b>	285	High Explosives / Weapons / Ordnance / Ammo Storage Facility	Ordnance Road	<a href="#">HRA-0091</a>
	286	High Explosives / Weapons / Ordnance / Ammo Storage Facility	Ordnance Road	<a href="#">HRA-0091</a>
	287	High Explosives / Ordnance Storage Facility	Ordnance Road	<a href="#">HRA-0091</a>
	288	High Explosives / Weapons / Ordnance / Ammo Storage Facility	Ordnance Road	<a href="#">HRA-0091</a>
	289	High Explosives / Weapons / Ordnance / Ammo Storage Facility	Ordnance Road	<a href="#">HRA-0091</a>
	290	High Explosives / Weapons / Ordnance Storage Facility	Ordnance Road	<a href="#">HRA-0091</a>
	291	High Explosives / Weapons / Storage Facility	Ordnance Road	<a href="#">HRA-0091</a>
<b>1958</b>	539	Advanced Undersea Weapons Shop / Air Reconnaissance & Undersea Warfare Technology Weapons Shop / Ammo and Explosives Maintenance / Armory	Weapons Compound	<a href="#">HRA-0091</a>
	543	High Explosives / Weapons / Ordnance Storage Facility	Ordnance Road	<a href="#">HRA-0091</a>
	544	High Explosives / Weapons / Ordnance Storage Facility	Ordnance Road	<a href="#">HRA-0091</a>
<b>1959</b>	548	High Explosives / Weapons / Ordnance Storage Facility	Ordnance Road	<a href="#">HRA-0091</a>
	549	High Explosives / Weapons / Ordnance Storage Facility	Ordnance Road	<a href="#">HRA-0091</a>
<b>1973</b>	626 A,B,C	AUW Building/Weapons / Inert Storage	Weapons Compound	<a href="#">HRA-0091</a>
<b>1976</b>	22	Explosive Ordnance Disposal	Burbank Avenue	<a href="#">HRA-0091</a>
<b>1981</b>	83	Ordnance Disposal Site (18 Acre)	Princes Point Road	<a href="#">HRA-0305</a>
<b>1983</b>	126_b	Weapons / Ordnance Storage / Nat. Guard Magazine	Ordnance Road	<a href="#">HRA-0091</a>
	127	Weapons / Ordnance Storage / Nat. Guard Magazine	Ordnance Road	<a href="#">HRA-0091</a>
	128	Weapons / Ordnance Storage / Nat. Guard Magazine	Ordnance Road	<a href="#">HRA-0091</a>
<b>1993</b>	77	Weapons Build-Up Facility	Merriconeag Road	<a href="#">HRA-0305</a>



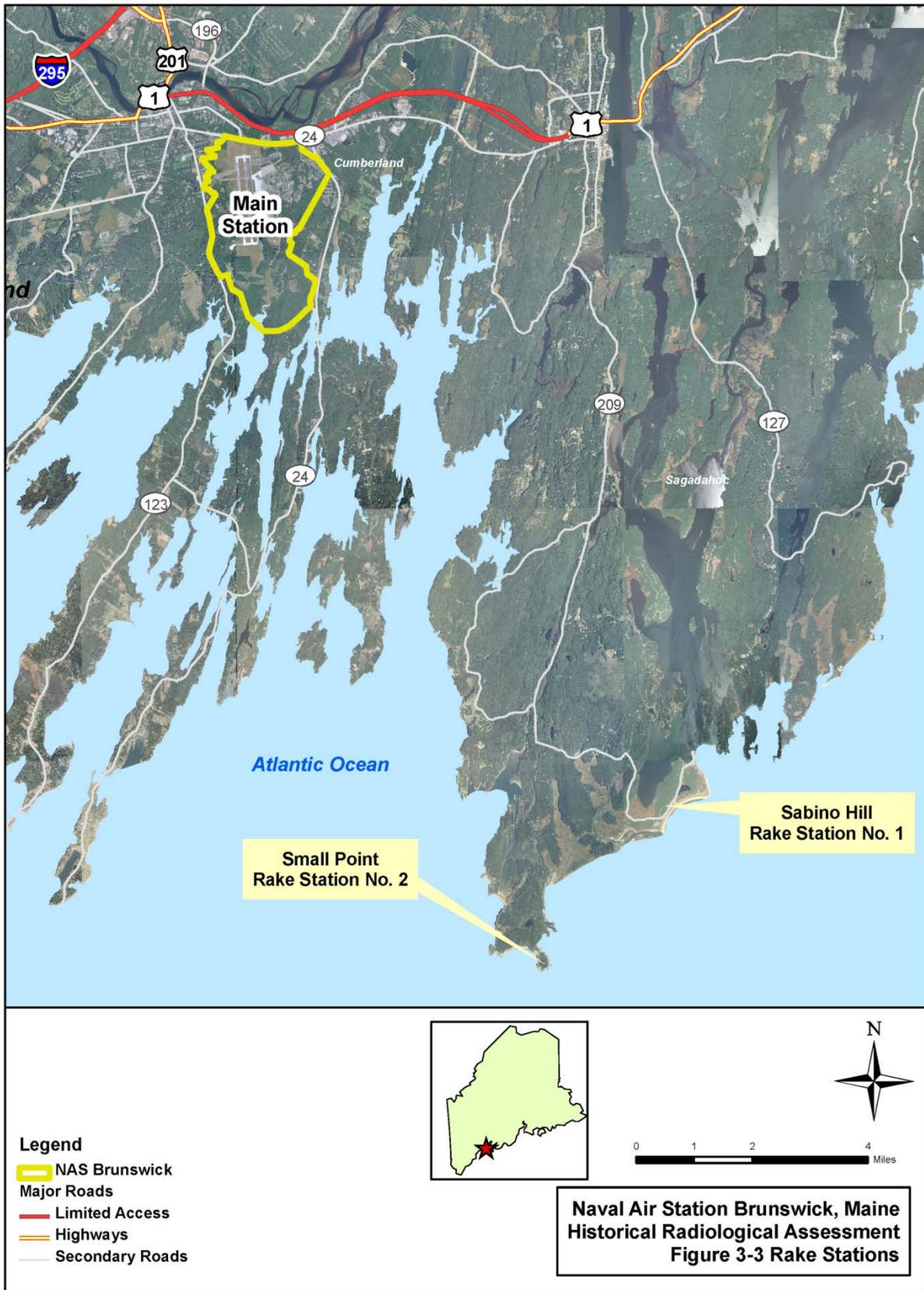


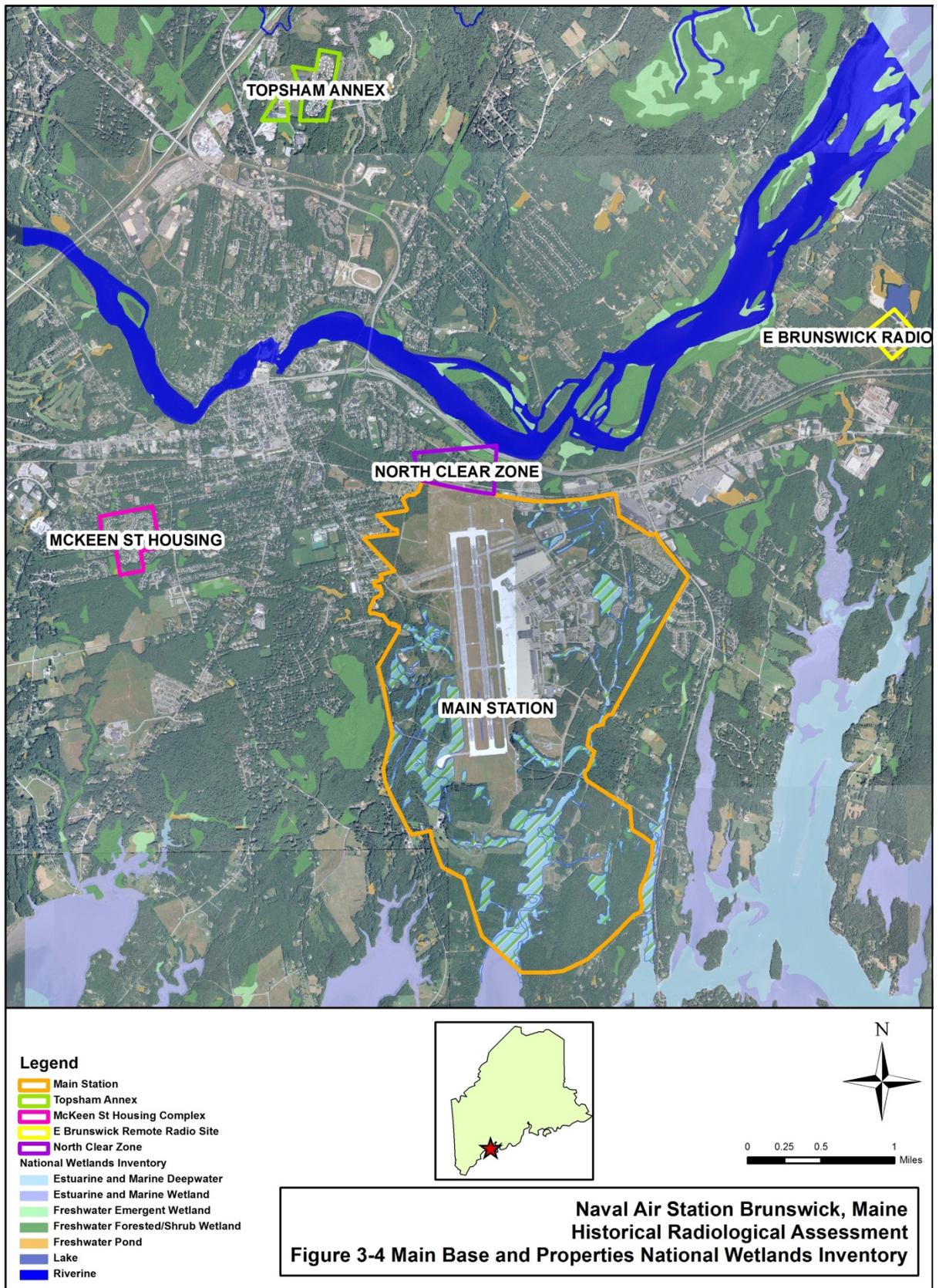
- Legend**
- NAS Brunswick
    - Main Station
    - Topsham Annex
    - McKean St Housing Complex
    - E Brunswick Remote Radio Site
    - North Clear Zone
  - Major Roads
    - Limited Access
    - Highways
    - Secondary Roads
    - Counties

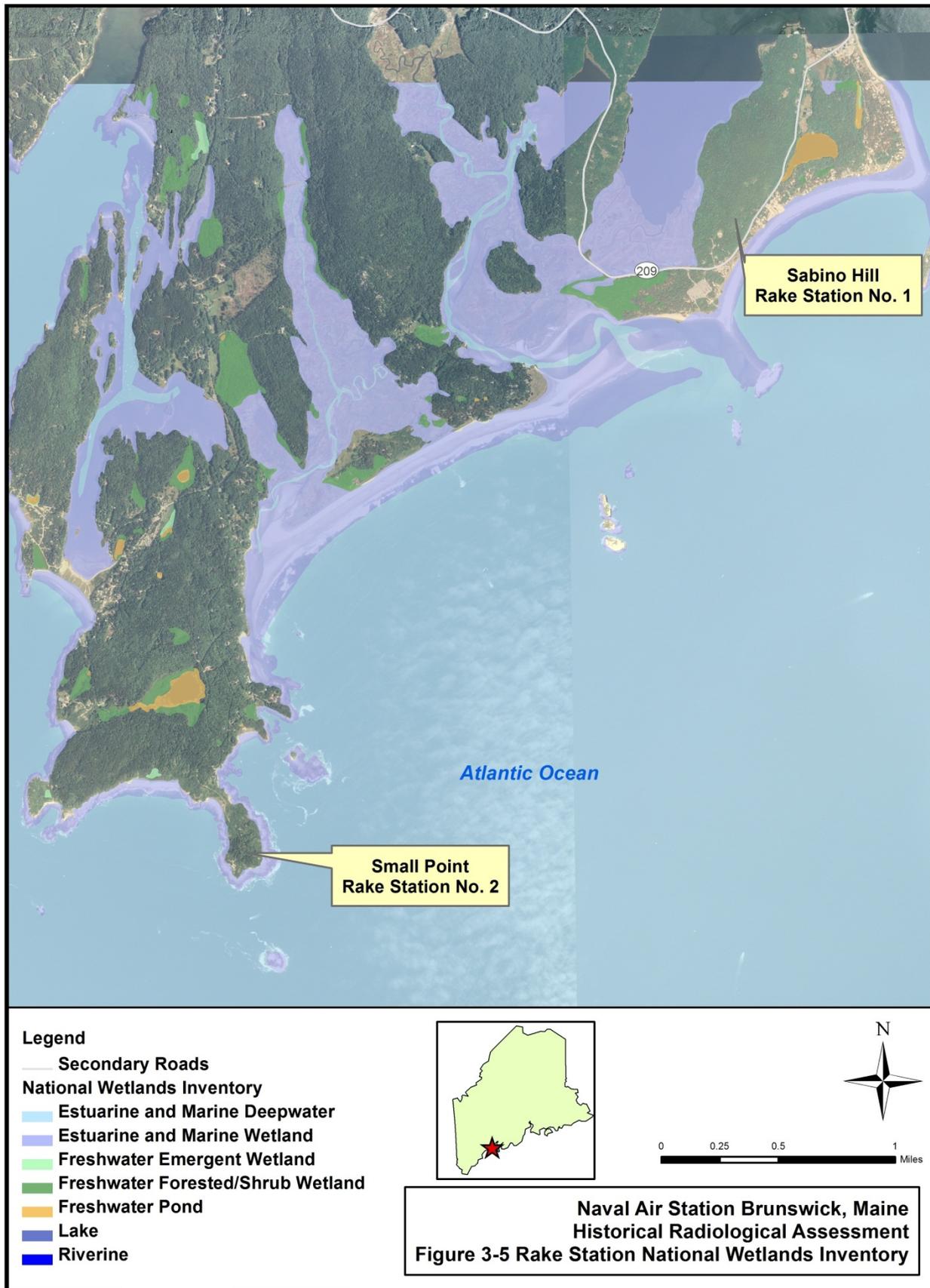


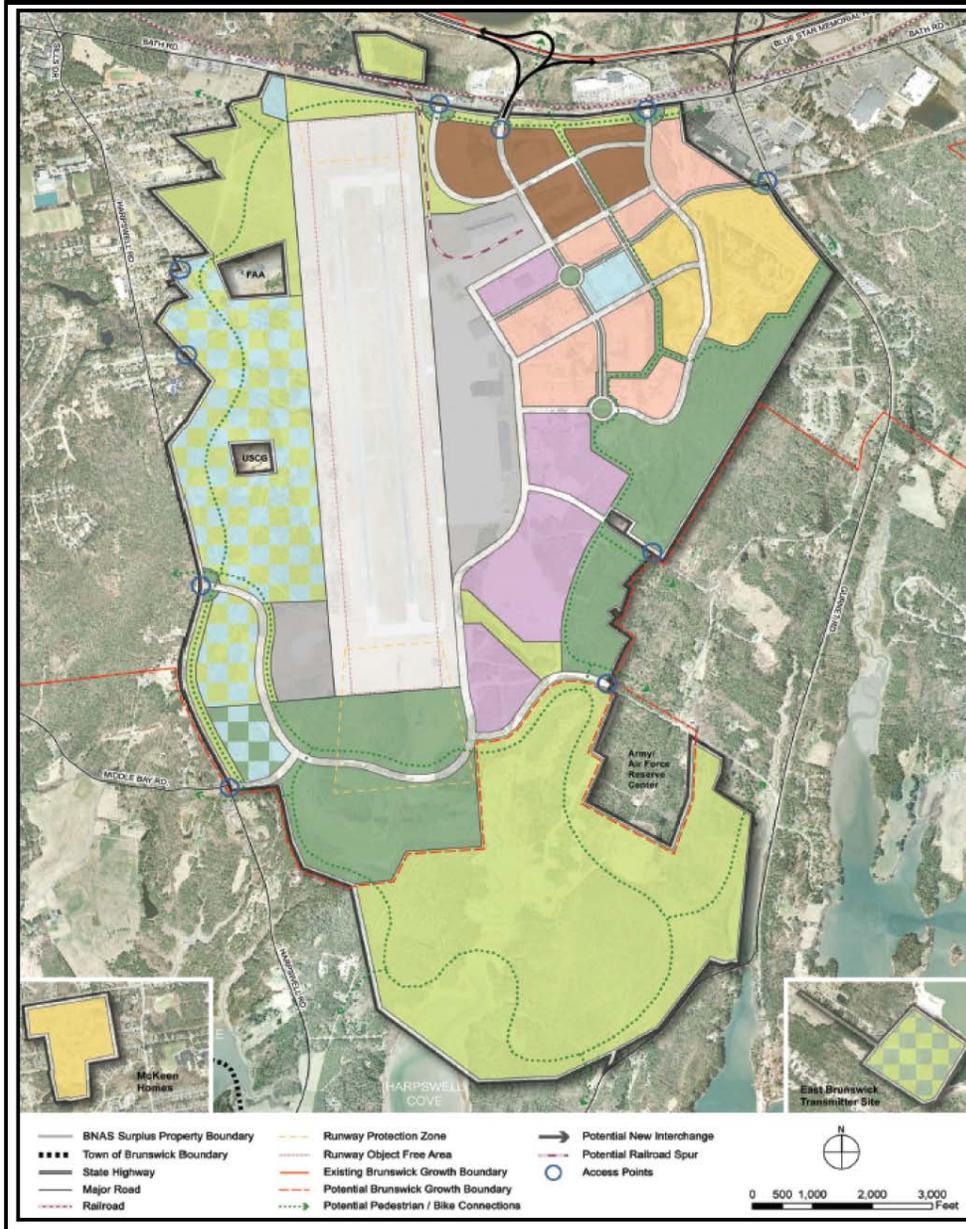
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Naval Air Station Brunswick, Maine  
 Historical Radiological Assessment  
 Figure 3-2: Main Base and Properties



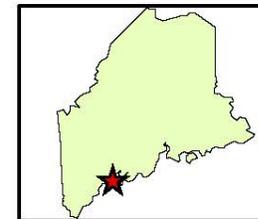




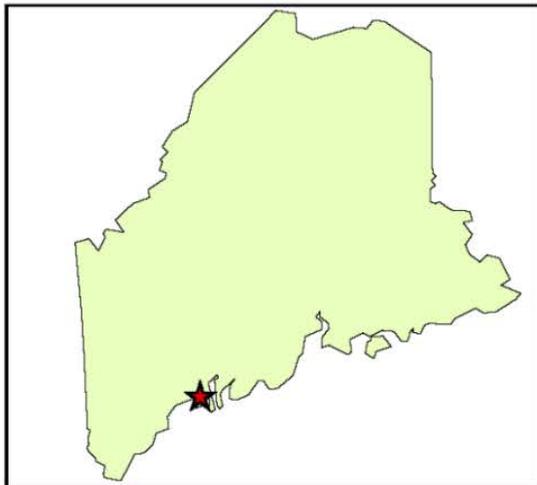


	LAND USE DISTRICTS	SURPLUS ACRES	PERCENT OF TOTAL
Land Development	Airport Operations	500	16%
	Aviation-Related Business	230	7%
	Professional Office	120	4%
	Community Mixed Use	175	5%
	Business and Technology Industries	190	6%
	Education	200	6%
	Residential	215	7%
	<b>SUBTOTAL</b>	<b>1,630</b>	<b>51%</b>
Open Space	Recreation / Open Space	510	16%
	Natural Areas	1,060	33%
	<b>SUBTOTAL</b>	<b>1,570</b>	<b>49%</b>
	<b>GRAND TOTAL</b>	<b>3,200</b>	<b>100%</b>

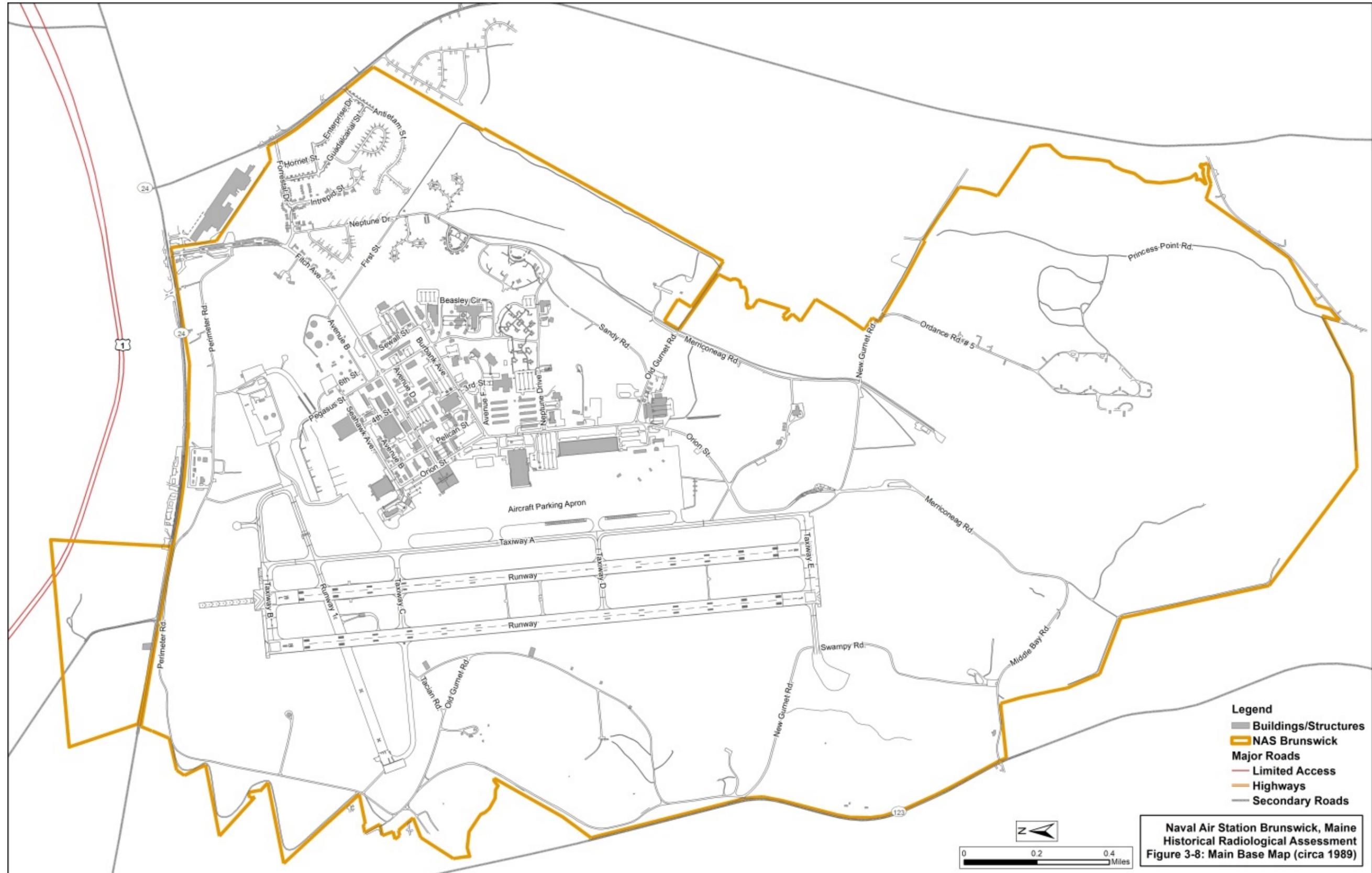
- 
 1. Checkered blue-light green area totals 320 acres, of which an undefined 175 acres have been assigned in the table above to Education and 145 acres to Natural Areas.
- 
 2. Checkered blue-dark green area totals 30 acres, all of which has been assigned in the table above to Recreation/Open Space, however, Education would be an allowed use, if needed.
- 
 3. Checkered light green-dark green (East Brunswick Transmitter Site) area totals 70 acres, of which an undefined 35 acres have been assigned in the table above to Recreation/Open Space and 35 acres to Natural Areas.



Naval Air Station Brunswick, Maine  
Historical Radiological Assessment  
Figure 3-6: NAS Brunswick Master Reuse Plan



Naval Air Station Brunswick, Maine  
Historical Radiological Assessment  
Figure 3-7: Topsham Annex Master Reuse Plan



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## 4.0 HRA METHODOLOGY

An HRA is a tool used by the Navy to provide a comprehensive review and assessment of the impact of historical uses or disposal of G-RAM at its installations. This section describes the processes used by the DON to prepare an HRA.

### 4.1 HRA OVERVIEW

Documentation of operations involving radioactive materials, regulatory controls of these operations, and closeout surveys following the operations are vital to the future uses of current and former Navy and Marine Corps installations. The DON uses an HRA to document historical radiological operations at an installation and to recommend future actions. This gives DON management a critical tool to properly control, investigate, and/or release property. This HRA generally follows the guidance in MARSSIM for preparation of a Historical Site Assessment and provides information in a format similar to that used by the EPA in the CERCLA process ([HRA-0168](#)).

An HRA provides historical documentation of uses or disposal of G-RAM for a specified period. Since NAS Brunswick is in transition after closure for transfer as the result of the Base Realignment Closure (BRAC) Program, this HRA documents radiological usage from establishment of NAS Brunswick as a Navy facility through May 2011.

### 4.2 PURPOSE

The purpose of this HRA is to document uses or disposal of G-RAM at NAS Brunswick, including the following:

- General use of low-activity radioactive sources, not subject to licensing, used for performing operational checks of radiation detection instrumentation.
- Potential storage of weapons in magazines and maintenance of these weapons.
- Potential storage and use of radioluminescent devices
- General use of depleted uranium in aircraft and ammunition

- General use of non-licensed radioactive commodity items (e.g., smoke detectors, watches)

In general, this HRA provides the following information about radioactive material use and storage:

- History of buildings, structures, and outdoor areas impacted by use of items containing radioactive material
- Potential, likely, or known sources of radioactive material and radioactive contamination
- Previous investigation results
- Contamination migration assessments
- Recommended future actions

### **4.3 MARSSIM GUIDANCE**

This section describes MARSSIM guidance and how it applies to the NAS Brunswick HRA.

#### **4.3.1 Historical Site Assessment**

Preparation of a Historical Site Assessment is the first step in following MARSSIM guidance for evaluating the effects of past radiological operations. This assessment has been entitled a HRA to clarify the hazard that is being assessed to individuals that are unfamiliar with the MARSSIM document; however, the assessment process is the same as a Historical Site Assessment.

Per MARSSIM guidance, this HRA will:

- Identify potential, likely, or known sources of radioactive material and radioactive contamination based on existing or derived information
- Provide initial classification of the area or survey unit as impacted or non-impacted

- Identify sites that need further action as opposed to those posing no risk to human health or the environment from radiological operations
- Provide an assessment of the likelihood of contamination migration
- Provide information useful in scoping and characterization surveys
- Provide recommendations for future actions, if necessary.

#### 4.3.2 Historical Research

MARSSIM recommends that historical information be collected by:

- Reviewing site evaluations; Federal, state, and local investigations; and emergency actions
- Reviewing radiological data in licenses, site permits, authorizations, and operating records
- Interviewing former employees or individuals with knowledge of radiological activities at the site
- Performing site reconnaissance by reviewing maps and blueprints and conducting a physical inspection of facilities using professional judgment

#### 4.3.3 Non-Impacted and Impacted Sites

After review of the information obtained during historical research, MARSSIM recommends assigning a preliminary classification of “non-impacted” or “impacted” to all areas at the site ([HRA-0168](#)). Non-impacted areas are those with no history of radiological operations or those that have no reasonable potential for residual contamination, such as residential or administrative buildings. Areas with only standard safety devices that contain generally licensed radioactive material, such as smoke detectors or exit signs, are classified as non-impacted if the site has no other radiological history. Non-impacted areas are not considered for radiological investigation because there is no reasonable potential for radioactive material to be present. Should information become available that identifies radiological operations associated with a non-impacted area, the area is reclassified as impacted. Discovery of minimal radioactivity attributable to natural background radiation or fallout from weapons testing is not, in itself, cause for designation of an area as impacted. Areas containing machines that produced ionizing

radiation (such as x-ray machines) are not classified as impacted based solely on the use of the machines.

Impacted areas are generally those with a history of radiological operations and, therefore, have the potential for residual radioactive contamination. Examples include locations where leaks or spills are known to have occurred, former burial or disposal sites, areas where radioactive decontamination was performed, or facilities where commodities containing radioactive material or radioluminescents were maintained, used, or stored. Although an impacted site may be remediated and released as free from residual contamination, the site is not generally reclassified as non-impacted.

#### **4.3.4 Potentially Contaminated Media**

Once an area is classified as impacted, the next step is the identification of potentially contaminated media within the area. While MARSSIM focuses on surface soils and building surfaces, it also provides preliminary guidance on other media types, including:

**Surface Media** – A term used to describe the top layer of soil, fill, gravel, waste piles, concrete, or asphalt that is available for direct exposure, growing plants, or resuspension of particles for inhalation, and mixing from human disturbances.

**Subsurface Media** – A term used to describe solid materials below the surface medium.

**Surface Water** – A term used to describe waters from streams, rivers, lakes, estuarine tidal waters, and oceans.

**Groundwater** – A term used to describe the waters contained in subsurface materials and aquifers.

**Air** – A term used to describe a potential pathway for resuspension and dispersal of contaminated media in the atmosphere.

**Structures** – A term used to describe man-made surfaces that are above or below the ground surface, such as buildings and dry-docks.

### 4.3.5 Survey Classifications

MARSSIM classifies survey requirements for impacted areas as Class 1, 2, or 3, depending upon the potential for residual contamination ([HRA-0168](#)). The classification of a building, structure, or site is a critical step in the survey design process and ensures that areas with higher potential for contamination receive a higher degree of survey effort, with Class 1 areas having the greatest potential for contamination.

The criteria used for designating an area as Class 1, 2, or 3 are usually described in the survey or site work plan. As surveys progress and data are analyzed, areas may be reclassified based on newly acquired survey data. For example, if contamination is found in a Class 3 area, it is typically reclassified as Class 1 or Class 2, depending on the results of the survey. These same categories will be applied to any recommended actions listed in [Section 8.0](#). The three classifications are described in more detail below.

#### 4.3.5.1 *Class 1 Areas*

An impacted area that is recognized as having a high potential for radioactive contamination, is known to have contamination, or had a prior remediation to remove radioactive contamination is usually designated as a Class 1 area. This would include any area known to contain contamination in excess of release limits based on a scoping or Characterization Survey. For NAS Brunswick, examples of Class 1 areas include locations where leaks or spills are known to have occurred; radioluminescent instrumentation repair locations; former burial or disposal sites; and areas previously designated as Class 2 or 3 where contamination above the release limits has been found.

Class 1 areas require 100 percent systematic surveys. To conduct these surveys, each area is divided into survey units to facilitate the survey process and analysis of the survey data. The maximum area of a Class 1 survey unit is 100 square meters for floor area of buildings and 2,000 square meters for open land areas. Sizes of the survey units depend on the type and dimensions of the building, structure, or area.

#### **4.3.5.2      *Class 2 Areas***

An impacted area that is recognized as having a potential for radioactive contamination but is not expected to exceed the release limit is usually designated as a Class 2 area. This would include any area known to contain minor isolated areas of contamination with low potential for exposure or buffer zones around Class 1 areas. For NAS Brunswick, examples of Class 2 areas include waste processing, packaging, and storage sites; radioluminescent device and check source storage areas; and Class 3 areas where minimal contamination was found.

Class 2 areas require systematic surveys over 10 to 100 percent of the area. The area is divided into survey units to facilitate the survey process and analysis of the survey data. The maximum area of a Class 2 survey unit is 1,000 square meters for floor areas of buildings and 10,000 square meters for open land areas. Sizes of the survey units depend on the type and dimensions of the building, structure, or area.

#### **4.3.5.3      *Class 3 Areas***

An impacted area that is not expected to contain residual contamination exceeding the release limit is usually designated as a Class 3 area. This could include buffer zones around Class 1 or 2 areas. For NAS Brunswick, examples of Class 3 areas include weapons storage areas or incinerators.

Surveys of Class 3 areas are not standardized and may be conducted randomly. There is no limit to the size of a survey unit. Sizes of the survey units depend on the type and dimensions of the building, structure, or area.

### **4.4      PREPARATION OF THE NAS BRUNSWICK HRA**

#### **4.4.1      Approach and Rationale**

Preparation of the NAS Brunswick HRA presented an unusual set of challenges because historical information on radiological operations was not readily available. This HRA will lay the groundwork for initiation of radiological investigations by reviewing historical radiological operations and past radiological investigations to provide a complete picture of the current radiological status of the site.

To prepare the NAS Brunswick HRA, all available historical and current radiological and non-radiological information was evaluated. This research became the basis for designating sites as non-impacted or impacted and will subsequently be used by the Navy and other Federal, state, and local regulators to determine future actions for the areas.

Obtaining and evaluating information during preparation of the HRA included:

- Archival research
- Site assessments and reconnaissance
- Personal interviews
- Site designation and classification
- Identification of radionuclides of concern

These activities are discussed in [Sections 4.4.2](#) through [4.4.6](#).

#### **4.4.2 Archival Research**

Because Navy operations at NAS Brunswick has ceased and limited radiological records could be found, archival research was the primary method used to prepare the NAS Brunswick HRA. Every effort was made to locate records concerning radiological operations at NAS Brunswick. Due to Federal and Navy record retention requirements, records were destroyed after a designated amount of time. Both government and private archives were reviewed.

A list of all documents and sources used as references in this HRA are provided in [Section 10.0](#). Electronic copies of these documents are provided on compact discs as [Appendix D](#). The numbering of the references is not consecutive because they correspond directly to the database of historical information compiled during research for the HRA.

##### **4.4.2.1 *Archive Locations***

[Table 4-1](#) lists archives where information was found. Thousands of pertinent documents, varying in length from 1 to 800 pages, and more than 100 maps and drawings were reviewed.

#### **4.4.2.2**      *Archive Information*

Archival information was reviewed to identify potential radiological sources, areas of use, radiological controls, regulatory procedures, and releases of radioactive materials at NAS Brunswick ([Appendix D](#)).

#### **4.4.3**      **Site Assessments and Reconnaissance**

##### **4.4.3.1**      *Historical Assessments*

Throughout its history, NAS Brunswick had a minimal radiological program or mission. Relatively few records for radiological surveys and monitoring were found for NAS Brunswick. [Section 6.5](#) includes a synopsis of known radiological assessments performed at NAS Brunswick, including investigation techniques and findings.

##### **4.4.3.2**      *HRA Site Reconnaissance*

As a supplement to archival research, on-site visual inspections of areas with a history of radiological operations were conducted. Through these site visits, current facilities were compared with previous radiological assessments, historical documentation, and maps. Few of the remaining buildings still had warning signs or operational restrictions posted. The on-site assessments did not include radiological surveys. The history of each impacted site, with descriptions of the current condition of the site, is provided in [Section 8.0](#).

#### **4.4.4**      **Interviews**

Individuals with knowledge of early operations or radiological operations knowledge at NAS Brunswick were interviewed in 2008 and 2009. These individuals included current employees and retired Navy employees previously stationed at NAS Brunswick. These employees were located with help from station personnel and published advertisements in both the local newspaper (Times Record) and on the internet (VP Navy.org – web forum for current and retired Navy personnel flying (VP/VPB) patrol aircraft). The content of this advertisement is provided in [Appendix B](#).

The purpose of the HRA and the interview was explained to each individual. The individuals interviewed provided: former position and responsibilities; period(s) of employment; and how the individual was involved with, or knew of, radiological operations at NAS Brunswick. Information on operations that may have involved radioactive material was gathered through discussion and from specific questions on an interview form. Information from the interviews was summarized into a single document, which is provided in [Appendix C](#).

#### **4.4.5 Site Designation**

Each building, structure, and open space at NAS Brunswick has been designated as either radiologically non-impacted or impacted based on information derived from the archive reviews, site reconnaissance, and personal interviews. Impacted areas have been assessed as to the possibility and extent of residual contamination and recommendations of actions to either evaluate the extent of potential residual radioactive contamination or radiologically release of the property are provided. Recommendations for each impacted site are provided in [Section 8.0](#).

#### **4.4.6 Radionuclide Identification**

To properly assess a site, the HRA must determine which radionuclides were used at NAS Brunswick. A list was compiled by researching Station operations and uses of radioactive material. Three of the radionuclides identified (americium-241 (Am-241), krypton-85 (Kr-85), and promethium-147 (Pm-147)) were not considered to be a radiological hazard and will receive no further discussion in this assessment. Am-241 is used as a sealed source in smoke detectors and is not a concern. Kr-85, a gas found in tubes for use as a source or as a self-luminous material, would dissipate from a broken tube and no longer be considered a hazard. Pm-147, which is used in wrist watches and compasses, would have decayed through 10 half-lives since its use at NAS Brunswick and is no longer considered a hazard. The radionuclides remaining as a potential concern at NAS Brunswick today and potential previous uses are listed in [Table 4-2](#).

### **4.5 HRA BOUNDARIES**

The intent and purpose of this HRA is to assess the radiological status of NAS Brunswick Main Station and offsite locations as described in [Section 3.0](#). Therefore, this HRA also addresses radiological concerns or support facilities directly related to NAS Brunswick

operations that were located in areas outside of the Main Station fence line but under the jurisdiction of, and in the vicinity of, the Main Station. These areas include: Topsham Annex (used by the Marine Corps at NAS Brunswick); McKeen Street Housing Complex (used by NAS Brunswick for housing purposes only); East Brunswick Transmitter Site (used as an offsite transmission facility); Small Point Rake Station and Sabino Hill Rake Station (used for offshore surveillance).

**TABLE 4-1  
RECORD LOCATIONS**

<b>Facility</b>	<b>Location</b>
National Archives and Records Administration (NARA)	College Park, Maryland
National Archives and Records Administration (NARA)	Boston, Massachusetts
National Archives and Records Administration (NARA)	Philadelphia, Pennsylvania
Naval Historical Center	Washington, DC
Naval Air Station Brunswick	Brunswick, Maine
Naval Sea Systems Command Detachment, Radiological Affairs Support Office	Yorktown, Virginia
Pejepscot Historical Society	Brunswick, Maine
Curtis Memorial Library	Brunswick, Maine
Tetra Tech EM Inc.	Boston, Massachusetts
National Oceanographic and Atmospheric Administration	<a href="http://www.noaa.gov/">http://www.noaa.gov/</a>
Personal records from interviewees	Summarized in <a href="#">Appendix C</a>

**TABLE 4-2  
 RADIONUCLIDES OF CONCERN AT NAS BRUNSWICK**

<b>Radionuclide</b>	<b>Half-life<sup>1,2</sup></b>	<b>Radiation<sup>2</sup></b>	<b>Uses</b>
Co-60 (Cobalt)	5.27	beta and gamma	<ul style="list-style-type: none"> <li>• Electron tubes</li> <li>• Radar Transmitter</li> <li>• Spark gap irradiator/ignition exciter</li> </ul>
Cs-137 (Cesium)	30.1	beta and gamma	<ul style="list-style-type: none"> <li>• Radar Transmitter</li> <li>• Spark gap irradiator/ignition exciter</li> </ul>
H-3 (Tritium)	12.3	beta	<ul style="list-style-type: none"> <li>• Weapons</li> <li>• Aircraft lights</li> <li>• Self-illuminating signs</li> <li>• Lensatic compasses</li> <li>• Night vision devices</li> </ul>
Pu-239 (Plutonium)	$2.41 \times 10^4$	alpha and gamma	<ul style="list-style-type: none"> <li>• Weapons</li> </ul>
Ra-226 (Radium)	1,599	alpha and gamma	<ul style="list-style-type: none"> <li>• Instrument panels</li> <li>• Watches and chronometers</li> <li>• Compasses</li> <li>• Multimeters/Ammeters</li> <li>• Radio Sets</li> <li>• Equipment toggles and fuse caps</li> <li>• Compass Rose</li> <li>• Smoke Detectors</li> <li>• Ground Control Approach Radar</li> </ul>
Sr-90 (Strontium)	28.78	beta	<ul style="list-style-type: none"> <li>• Aircraft ice detector probes</li> <li>• Pressure indicators</li> <li>• Personnel markers</li> <li>• Helicopter In-flight Blade Inspection System (IBIS)</li> </ul>

**TABLE 4-2 (CONTINUED)  
 RADIONUCLIDES OF CONCERN AT NAS BRUNSWICK**

<b>Radionuclide</b>	<b>Half-life<sup>1,2</sup></b>	<b>Radiation<sup>2</sup></b>	<b>Uses</b>
Th-232 (Thorium)	$1.405 \times 10^{10}$	alpha, beta, and gamma	<ul style="list-style-type: none"> <li>• Turret assemblies</li> <li>• Night vision devices</li> <li>• Electron tubes</li> <li>• Spark gap irradiator/ignition exciter</li> <li>• Aircraft gear boxes (Magnesium-Thorium)</li> </ul>
U-235 (Uranium)	$7.04 \times 10^8$	alpha, beta, and gamma	<ul style="list-style-type: none"> <li>• Weapons</li> </ul>
U-238 (Uranium)	$4.5 \times 10^9$	alpha, beta, and gamma	<ul style="list-style-type: none"> <li>• Aircraft depleted uranium counterweights</li> <li>• Munitions</li> </ul>

<sup>1</sup>Half-life in years

<sup>2</sup>Source: The Health Physics and Radiological Health Handbook, Revised Edition, 1992, Shleien.

## 5.0 REGULATORY INVOLVEMENT

This section provides an overview of federal and DON oversight of radioactive materials and their uses at NAS Brunswick. Although not regulators, state and local government entities are discussed.

### 5.1 FEDERAL

#### 5.1.1 AEC/NRC

The Atomic Energy Act of August 1, 1946, established the AEC to develop and manage the atomic energy program in the United States after World War II (WWII). A civilian government agency, the AEC assumed responsibility for control of radioactive materials and their uses from the Manhattan Engineer District, the wartime entity responsible for developing the atomic bombs detonated in the United States and Japan during the last months of WWII ([HRA-0162](#)). The AEC's mission included the production and control of fissionable material, accident prevention, research, and peaceful uses of the atom, including the commercial generation of electricity. The AEC exercised absolute control over atomic energy production, nuclear materials, and facilities that used these materials. The Atomic Energy Act provided for a five-member commission, a General Advisory Committee, and a Military Liaison Committee within the National Military Establishment, which worked with the AEC on military applications of atomic energy.

From 1946 to 1954, there were no licensing requirements as they are known today because all nuclear activities were controlled by a virtual government monopoly through the AEC ([HRA-0295](#)). During this period, the AEC controlled uses of radioactive materials by issuing "authorizations" or "permits." When the Atomic Energy Act was modified in 1954, AEC controls were amended and the licensing program was established, which allowed for partnerships with private facilities to produce fissionable materials. An additional amendment in 1964 permitted private ownership of fissile material in nuclear fuels, aiding the growing nuclear power industry.

With the establishment of AEC licensing in 1954, procurement and use of radioactive materials became more rigorously controlled. Users were required to submit lengthy “license applications,” with different license types required for by-product, source, or special nuclear materials. AEC required license applications to include:

- Quantity of each radionuclide to be possessed at any one time
- Purposes for which the licensed material was to be used
- Location where radioactive materials were to be used
- Qualifications of an Radiation Safety Officer (RSO)
- Demonstration that facilities were adequate to safely control materials and protect human health
- Administrative controls
- Monitoring procedures and instrumentation
- Material receipt and accountability procedures
- An occupational radiation safety program for workers
- Standard operating and emergency procedures
- Radioactive waste disposal procedures

The Navy’s headquarters commands applied for authority to use, as required, radioactive materials under an AEC license, as required.

The Energy Reorganization Act of 1974 established two new federal agencies to administer and regulate atomic energy activities. On January 19, 1975, the AEC was dissolved and replaced with the US Energy Research and Development Administration (ERDA) and the NRC. The NRC assumed responsibility for regulation of the by-product, source, and special nuclear materials previously controlled by the AEC, as well as the civilian nuclear power program. Military weapons applications of radioactive materials remained under the control of ERDA, which became part of the newly formed Department of Energy (DOE) in 1977.

In 1975, when the NRC assumed the licensing duties previously held by the AEC, there were no substantive changes to the licensing rules. Licenses issued by the AEC remained in effect under the NRC.

In many instances, AEC and NRC licenses were issued to a single Navy headquarters command, whether or not the material was to be used by an individual field command or ship. In some cases, the licenses authorized use of a radioactive commodity by multiple commands. There were no AEC or NRC licenses issued directly to NAS Brunswick. However, NAS Brunswick handled radioactive commodity items licensed by AEC or NRC. Licenses were issued to Navy headquarters commands for use of radioactive commodities in Navy aircraft.

The following is a list of available information on AEC and/or NRC licenses that authorized use of radioactive components possibly used at NAS Brunswick:

- AEC By-product Material License No. 08-05970-02, which was superseded by NRC By-product Material License No. 08-05970-02, was issued to the DON for the possession and use of radioactive components used throughout the US Navy in radioluminescent items. These licenses included radioactive by-product materials containing Pm-147, hydrogen-3 (H-3 or tritium), and thallium-204 (Tl-204). ([HRA-0323](#); [HRA-0368](#))
- AEC By-product Material License No. 08-05970-07, which was superseded by AEC By-product Material License No. 08-05970-03, was issued to the DON for the possession and use of radioactive components used throughout the US Navy in aircraft ([HRA-0391](#)). These licenses included radioactive by-product materials containing Sr-90, Kr-85, and H-3 ([HRA-0391](#)). This license was amended in 1974 to allow the possession and use of Pm-147 ([HRA-0378](#)). AEC By-product Material License No. 08-05970-03 was later superseded by NRC By-product Material License No. 08-05970-03 ([HRA-0209](#)).
- AEC By-product Material License No. 08-05970-08, which was superseded by NRC By-product Material License No. 08-05970-02, was issued to the DON for the possession and use of radioactive components throughout the US Navy. This license included radioactive by-product materials containing Tl-204, Pm-147, and H-3. ([HRA-0439](#); [HRA-0334](#))
- NRC By-product Material License No. 08-05970-17, which was superseded by NRC By-product Material License No. 08-05970-07 and NRC By-product Material License No. 08-05970-03, was issued to the DON. The license

authorized the possession, use and distribution within the DON of items containing radioactive material used throughout the US Navy in aircraft. This license included radioactive by-product materials containing Sr-90, Kr-85, Pm-147, and H-3. ([HRA-0391](#))

- An NRC Master Materials License is currently held by the US Navy to cover use of NRC-licensed radioactive materials by the Navy, including the Marine Corps. The implementation of this license established the NRMP Program which is discussed in [Section 5.2.2](#).
- Additional details for AEC licenses are given in [Table 5-1](#). Additional details for NRC licenses are given in [Table 5-2](#).

“Special nuclear material” consists of uranium-233 or uranium-235, enriched uranium, or plutonium, or any material artificially enriched by these elements. “Special nuclear material” does not include source material and requires an AEC/NRC license, or NRMP when used by the Navy or Marine Corps.

“Byproduct material” is radioactive material, excluding special nuclear material, yielded in (or made radioactive by exposure to the radiation incident to) the process of producing or using special nuclear materials. Examples of byproduct material are tritium, carbon-14 (C-14), Kr-85, cobalt-60 (Co-60), and discrete sources of radium-226 (Ra-226). By-product materials require an AEC/NRC license, or NRMP when used by the Navy or Marine Corps.

“Source materials,” ores containing thorium or uranium, are either “unimportant quantities” or “generally licensed.” Examples of ‘unimportant’ quantities source materials” include thoriated tungsten welding rods, depleted uranium counterweights, magnesium-thorium alloys for aircraft engines, vacuum tubes, and thoriated lenses. These materials must be below specified quantities and be properly labeled. Use of “generally licensed source material” by Navy and Marine Corps activities is prohibited unless authorized under an NRMP.

Radioactive materials, exempt from licensing by the AEC/NRC, were used in commodity items at NAS Brunswick. Examples of “exempt devices” include electron tubes, lensatic compasses, some rifle optics, smoke detectors, and calibration sources for radiation survey

instruments. Additionally, radioluminescent devices containing Ra-226 used at NAS Brunswick were not under the auspices of the AEC or NRC.

“Generally Licensed Radioactive Devices” that are those that were manufactured under a specific license, but are designed with radiation safety features that allow use by individuals with no special training, but still require appropriate labeling, storage, and disposal. Examples of “generally licensed radioactive devices” are static eliminators, some ice detection systems, luminous exit signs, gun-sights, and calibration standards. These items have special registration requirements if the quantities of specified isotopes exceed specified limits. An example of an item that exceeds specified limits is an in-flight main rotor blade inspection system.

Industrial x-ray machines were used to support aircraft maintenance activities and produce ionizing radiation; however, they do not contain any radioactive materials. Prior to 1978, Navy industrial x-ray radiography programs generally followed manufacturers’ guidelines. After 1978, RASO oversaw industrial x-ray radiography programs under the RASP.

### **5.1.2 EPA**

The EPA is a federal agency established in 1970 to protect human health and safeguard the natural environment (air, water, and land). For NAS Brunswick, the EPA provides regulatory oversight under the CERCLA framework for determinations regarding the release of outdoor structures and open areas. The EPA participates in the Remedial Project Manager (RPM) Team Meetings and is a member of the Restoration Advisory Board (RAB) for NAS Brunswick.

#### **5.1.2.1 CERCLA**

The US Congress enacted CERCLA (commonly known as Superfund) in 1980. CERCLA allows the EPA to:

- Establish prohibitions and requirements for closed or abandoned hazardous waste sites
- Establish liability for entities responsible for releases of hazardous waste sites where cleanup costs are incurred

- Establish a trust fund to provide for cleanup when a responsible party cannot be identified

CERCLA authorizes two types of response actions:

- Removal actions, which are prompt responses to address releases that pose an imminent or substantial threat to human health or the environment
- Remedial responses, which are permanent actions taken to protect human health and the environment from a release of hazardous substances

CERCLA also enabled the revision of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) to provide guidance and procedures to respond to releases and threatened releases of hazardous substances, pollutants, or contaminants. This revision also established the NPL.

NAS Brunswick was placed on the NPL in 1984 for non-radiological hazards. In 2005, NAS Brunswick was selected for closure and reuse under the Base Closure and Realignment Act of 1990. The US Navy is proceeding with the process of removing NAS Brunswick from restrictions under CERCLA in coordination with EPA Region 1. Currently, there are no posted radiological restrictions at NAS Brunswick; however, investigative or intrusive activities in potentially radiologically impacted areas may require access restrictions and postings. The CERCLA remedial process will be followed for assessing potential radiological hazards at NAS Brunswick.

The CERCLA remedial process includes the following series of steps:

- Preliminary Assessment – A screening process to determine whether further study is necessary. (This HRA satisfies the requirements of a preliminary assessment for the CERCLA process.)
- Site Investigation – An on-site investigation to determine whether there has been a release or a potential for a release and to determine any associated threats.
- Remedial Investigation – A process generally taken by the responsible agency to determine the nature and extent of the problem associated with a release.

- Feasibility Study – Action taken by the lead agency to develop and evaluate options for remedial actions.
- Proposed Plan – Presentation of the nature and extent of contamination, alternatives evaluated, and preferred approach to remediation.
- Record of Decision – A public document that describes the selected cleanup action.
- Remedial Design – Technical analysis of the site remedy with detailed plans for implementation.
- Remedial Action – Actual implementation of the cleanup.

#### **5.1.2.2 SARA**

SARA amended CERCLA in 1986 and made significant changes to the program. These changes provided new enforcement requirements, including:

- Stressing the importance of permanent remedies and innovative technologies
- Considering other environmental laws and regulations
- Increasing state involvement
- Increasing the focus on human health problems
- Encouraging greater citizen participation in the decision-making process

SARA also required EPA to revise the Hazard Ranking System (HRS) to ensure accurate assessment of sites placed on the NPL.

#### **5.1.2.3 NPL**

The NPL was developed by EPA to rank the sites that most warrant cleanup of hazardous substances. EPA uses a numerical rating system with a specific cutoff score to determine whether a site is eligible for inclusion in the NPL. Eligibility of a site for the NPL notifies the public that the EPA has determined the site warrants further investigation to assess risks to human health and the environment. It also serves as notice to responsible parties that EPA may be seeking remedial action. The NPL identifies sites that may be eligible to receive funding for

response costs using EPA's trust fund. NAS Brunswick was listed on the NPL on July, 22, 1987 for soil and groundwater volatile organic contaminants, not for any radiological concerns.

## **5.2 DEPARTMENT OF DEFENSE AND US NAVY**

### **5.2.1 General Control of Radioactive Materials**

The first formal Navy document controlling use of radioactive materials was Safety Series No. 9 of 1942 for Ra-226 ([HRA-0146](#)). However, the DON did not establish a formal radiological controls program for all types of radioactive materials until 1946, shortly after the end of WWII. These were the predecessors of the more stringent radiological controls programs the DON has in effect today. In 1947, the Chief of Naval Operations (CNO) issued the first Radiological Safety Manual for general applications of radioactive materials ([HRA-0080](#)). This manual was based on knowledge gained from the bombing of Hiroshima and Nagasaki and OPERATION CROSSROADS testing of the atomic bomb. As experience with and knowledge of the effects of radiation on ships and naval personnel grew, the Navy worked to establish more protective requirements that met or exceeded federal regulations. In 1953, the DoD established the Committee on Atomic Energy (CAE) to provide assistance and guidance for research and development activities within DoD. The main areas of interest for the CAE were atomic research and its effect on national security, and research and development of atomic energy for military use. During this time, the AEC and DoD also formalized the Agreement for the Development, Production and Standardization of Atomic Weapons, which established regulations to prevent conflicts of responsibility between the military and the AEC ([HRA-0283](#)).

The Bureau of Aeronautics (BUAER) oversaw the procurement and maintenance of aircraft for Naval Aviation from 1921 to 1959. Naval weapons, however, were under the control of the Bureau of Ordnance (BUORD). BUAER and BUORD were merged in 1959 to create the Bureau of Weapons (BUWEPS), which was replaced with the current Naval Air Systems Command (NAVAIR) in 1966. Currently, NAVAIR provides procurement and support for aircraft and airborne weapons systems for the Navy. In 1940, the Bureau of Ships (BUSHIPS) was established by the Navy through the consolidation of the Bureau of Construction and Repair and the Bureau of Engineering. BUSHIPS was responsible for the design, construction, procurement, and maintenance of ships and other craft for the Navy. The bureau also managed

the shipyards, repair facilities, laboratories, and shore stations. The bureau also developed and procured instruments to detect radioactivity, equipment to protect personnel aboard ships, and methods and equipment for decontaminating ships. Eventually, the Navy reorganized, and these responsibilities were assigned to Naval Sea Systems Command (NAVSEA).

In the late 1940s and early 1950s, the Navy's Bureau of Medicine and Surgery (BUMED) and BUSHIPS worked closely with the Radiation Laboratory and the Naval Radiological Defense Laboratory at the Hunters Point Shipyard to develop controls for use of radioactive materials throughout the Navy. BUMED established and incorporated safety tolerances into regulations, determined physiological effects, developed treatment methods for radiation injuries, and approved specifications for instruments to cover medical uses and exposure to radioactive materials. BUMED remains responsible for overseeing medical uses of radioactive materials and evaluating radiation exposures today.

### **5.2.2 Naval Radioactive Materials Permit Program**

In 1987, the NRC granted a Master Material License to the Chief of Naval Operations which allows the Navy to issue NRMPs in lieu of the Navy issuing individual NRC licenses for uses of radioactive materials at specific Navy and Marine Corps commands. Implementation of the NRMP Program in 1987 included conversion of NRC licenses issued to the Navy and Marine Corps to NRMPs. ([HRA-0337](#))

The Naval NRMP Program is managed by the Naval Radiation Safety Committee (NRSC) with technical support provided by the Navy and Marine Corps Public Health Center for medical facilities and RASO for non-medical operations. The NRSC issues byproduct, source, and special nuclear materials NRMPs. Radioactive materials associated with naval nuclear propulsion or nuclear weapons programs are not covered under the license.

NAVSEA is responsible for the safe use of radioactive materials and machines that produce ionizing radiation. NAVSEA is responsible for controlling the use of radioactive materials by the Navy, including the Marine Corps, and provides oversight and regulatory guidance for Navy Nuclear Weapons Radiological Controls, Naval Low Level Radioactive

Waste and Naval Environmental G-RAM programs. NAVSEA is also responsible for the Naval Nuclear Propulsion Program, however, that is not applicable to NAS Brunswick or this HRA.

To implement the responsibilities for G-RAM, NAVSEA established and is responsible for the Radiological Affairs Support Program (RASP) which includes:

- all aspects of radiation safety with respect to the design, construction, and control of radiation including x-ray devices, accelerators, and radiographic units
- licensed and non-licensed radioactive materials; including radioactive waste in the Navy and Marine Corps.
- technical management of the RASP

RASO provides technical support to the NRSC and NAVSEA for administration and management of the following programs:

- RASP; manages the Navy's NRMP Program and the use of machines that produce ionizing radiation throughout the Navy and Marine Corps.
- Navy IR Program and Navy Base Realignment and Closure Program; provides radiological expertise on environmental issues at Navy and Marine Corps facilities managed by the Naval Facilities Engineering Command and its engineering field divisions.
- Naval Low-Level Radioactive Waste (LLRW) Program; manages the Navy's LLRW Program that covers all LLRW generated by the Navy and Marine Corps, excluding the NNPP. The program also provides contractual support for both command-specific and Naval Facilities Engineering Command -managed radiological contamination and remediation projects at Navy and Marine Corps commands. The program is an integral part of the DoD LLRW Program managed by the US Army.
- Radiation Safety Training; provides initial qualification training to prospective radiation safety officers (RSOs) and assistant radiation safety officers (ARSOs).

The NRSC did not issue any NRMPs to NAS Brunswick. However, the following is a list of NRMPs issued to Naval Supply Systems and Command (NAVSUP), and later to NAVAIR, which authorized radioactive commodities that were possibly used at NAS Brunswick:

- NRMP No. 08-00023-T2NP, which superseded NRC License No. 08-05970-03 and 08-05970-07, was issued to NAVSUP for the possession and use of radioactive components used throughout the US Navy (**HRA-0327**). This permit authorized use of commodities containing Sr-90, Kr-85, Pm-147, and H-3 (**HRA-0348**). NRMP No. 08-00023-T2NP was terminated on February 13, 1987 due to an address change for the permit holder and reissued as 45-0023-T2NP (**HRA-0349**). This permit also authorized use of commodities containing Sr-90, Kr-85, Pm-147, and H-3 (**HRA-0349**). On May 18, 1999, NRMP 45-00023-T2NP was terminated and reissued to NAVSUP as NRMP No. 37-00023-T2NP (**HRA-0401**). The new permit authorized use of commodities containing Kr-85 and H-3 for drogue assemblies; Sr-90 and Pm-147 were deleted (**HRA-0401; HRA-0350**). It was later determined that responsibility for the drogue assemblies was better suited for NAVAIR and NRMP No. 37-00023-T2NP was terminated and reissued to Patuxent River Naval Air Station as NRMP 19-00019-T4NP on February 23, 2001 (**HRA-0352**).
- NRMP No. 45-00023-T1NP, which superseded NRMP No. 08-00023-T1NP and NRC License No. 08-05970-02, was issued to NAVSUP on October 31, 2000 for the possession and use of radioactive components throughout the US Navy in aircraft (**HRA-0338; HRA-0340**). This permit authorized use of commodities containing Tl-204, Pm-147, and H-3. (**HRA-0340**). NRMP 45-00023-T1NP was later terminated and reissued as NRMP 37-00023-T1NP on June 15, 1999, without Pm-147 and Tl-204 (**HRA-0333**). The sole use of H-3 authorized by NRMP 37-00023-T1NP is for calibration standards not used at NAS Brunswick (**HRA-0333**).
- NRMP No. 19-00019-T5NP was issued to NAVSUP for the possession and use of radioactive components throughout the US Navy in aircraft. This permit

authorized use of commodities containing Sr-90 in IBIS components and expires in February 2012 ([HRA-0399](#)).

Additional details for NRMPs are given in Table 5-3.

### **5.2.3 Navy Environmental Restoration Program (NERP)**

The DON established the NERP to implement the requirements of Defense Environmental Restoration Program (DERP), the IR Program, and CERCLA. The purpose of the NERP is to identify, investigate, and clean up or control releases of hazardous substances and to reduce the risk to human health and the environment from past waste disposal operations and hazardous materials spills on Navy property in a cost-effective manner. RASO provides technical expertise to the Navy to assist in addressing G-RAM issues associated with the NERP, including support for radiological issues at NAS Brunswick.

## **5.3 STATE AND LOCAL**

### **5.3.1 State of Maine**

Following the creation of the NRC, the United States Government agreed to allow individual states permission to grant licenses to perform some of the in-state functions of a nuclear regulator, hence their being called “Agreement States.” Maine has been an Agreement State since April 1, 1992. However, because NAS Brunswick, when active, was considered exclusive federal jurisdiction, a state license would not have been applicable when NAS Brunswick was an active command.

The State of Maine works with EPA and the US Navy to ensure that requirements for state participation in CERCLA cleanup actions are fulfilled at NAS Brunswick. The primary state agencies involved with NAS Brunswick are listed below.

#### **5.3.1.1 *Maine Department of Health and Human Service (DHHS)***

The DHHS is the recognized Maine public health authority. This department also implements the Maine Radiation Control Program (RCP). The Radiation Control Program exists to minimize unnecessary radiation exposure to individuals through the licensing and inspection

of manmade and natural radiation sources, oversight of low-level radioactive waste generators, radioactive emergency preparedness and response, conducting environmental surveillance of nuclear facilities, and to minimize the public health impact associated with radon in air and water. The RCP issues licenses and performs inspections of radioactive materials users and maintains a regulatory agreement with the Nuclear Regulatory Commission.

**5.3.1.2**        *Maine Department of Environmental Protection (MEDEP)*

The Maine Department of Environmental Protection is the state agency charged with preventing, abating, and controlling pollution of the air, land, and water. The Department issues licenses; initiates enforcement actions; and serves as the main link to the federal government on environmental issues..

**5.3.2 Local Community**

The local community participates in the regulatory process through representation on the RAB.

**TABLE 5-1**  
**ATOMIC ENERGY COMMISSION LICENSES POTENTIALLY ASSOCIATED WITH**  
**NAS BRUNSWICK SORTED BY LICENSEE**

AEC License No.	Licensee	Dates of Issuance and Termination	Licensed Radionuclide(s)	Maximum Allowable Quantity <sup>1</sup>	Purpose of Use
08-05970-02	Department of Navy/	NA	Pm-147, Tl-204	Pm-147: 25 millicuries; Tl-204: 1.6 microcuries	By-product isotopes used in wrist compasses and watches, and depth gauges
08-05970-03	Department of Navy	NA	Sr-90, Pm-147, Kr-85, H-3	Sr-90: 50 microcuries; Pm-147: 300 microcuries; Kr-85: 25 millicuries; H-3: 90 millicuries	Licensed items installed in Navy aircraft: ice detector probes, exit markers, drogue lights, toggle lock switch handles
08-05970-07	Department of Navy	NA	Sr-90, Pm-147, Kr-85, H-3	Sr-90: 50 microcuries; Pm-147: 300 microcuries; Kr-85: 25 millicuries; H-3: 1 curie	Licensed items installed in Navy aircraft: ice detectors probes, exit markers, drogue lights, toggle lock switch handles
08-05970-08	Department of Navy	NA	Pm-147	Pm-147: 15.5 millicuries	Wrist compasses

<sup>1</sup> No single source to exceed this value  
 NA – Not available

**TABLE 5-2  
 NUCLEAR REGULATORY COMMISSION LICENSES POTENTIALLY ASSOCIATED WITH  
 NAS BRUNSWICK SORTED BY LICENSEE**

<b>NRC License No.</b>	<b>Licensee</b>	<b>Dates of Issuance and Termination</b>	<b>Licensed Radionuclide(s)</b>	<b>Maximum Allowable Quantity<sup>1</sup></b>	<b>Purpose of Use</b>
08-05970-02	Department of Navy/Naval Supply Systems Command	Converted to NRMP No. 08-00023-T1NP in April 1987	Pm-147, Tl-204	Pm-147: 25 millicuries; Tl-204: 1.6 microcuries	By-product isotopes used in wrist compasses and watches, and depth gauges
08-05970-03	Department of Navy/Naval Supply Systems Command	Converted to NRMP No. 08-00023-T2NP in May 1987	Kr-85, H-3, Sr-90, Pm-147	Kr-85: 25 millicuries; H-3: 1 curie; Sr-90: 50 microcuries; Pm-147: 300 microcuries	Licensed items installed in Navy aircraft: ice detector probes, exit markers, drogue lights, toggle lock switch handles
08-05970-07	Department of Navy/Naval Supply Systems Command	NA	Kr-85, H-3, Pm-147, Sr-90	Sr-90: 50 microcuries; H-3: 1 curie; Kr-85: 25 millicuries; Pm-147: 300 microcuries	Licensed items installed in Navy aircraft: ice detector probes, exit markers, drogue lights, toggle lock switch handles
08-05970-17	Department of Navy/Naval Supply Systems Command	NA	Kr-85, H-3, Pm-147, Sr-90	Sr-90: 50 microcuries; H-3: 90 millicuries; Kr-85: 25 millicuries; Pm-147: 300 microcuries	Licensed items installed in Navy aircraft: ice detector probes, exit markers, drogue lights, toggle lock switch handles

<sup>1</sup> No single source to exceed this value  
 NA – Not available

**TABLE 5-3  
 NAVY RADIOACTIVE MATERIALS PERMITS POTENTIALLY ASSOCIATED WITH  
 NAS BRUNSWICK**

Permit No.	Permit Holder	Dates of issuance and Termination	Licensed Radionuclide(s)	Maximum Allowable Quantity <sup>1</sup>	Authorized Use
08-00023-T2NP	Naval Supply Systems Command	Issued:05/18/1987 Terminated: 02/13/1997	H-3, Kr-85, Sr-90, Pm-147	H-3: 0.4 curies; Kr-85: 25 millicuries; Sr-90: 50 microcuries; Pm-147: 300 microcuries	Exit markers, drogue assemblies, ice detectors, toggle switch illumination and external wind direction indicators.
45-00023-T2NP	Naval Supply Systems Command	Issued:02/13/1997 Terminated: 05/18/1999	H-3, Kr-85, Sr-90, Pm-147	H-3: 0.4 curies; Kr-85: 25 millicuries; Sr-90: 50 microcuries; Pm-147: 300 microcuries	Exit markers, drogue assemblies, ice detectors, toggle switch illumination and external wind direction indicators.
37-00023-T2NP	Naval Supply Systems Command	Issued:05/18/1999 Terminated: 02/5/2001	H-3, Kr-85	H-3: 500 millicuries; Kr-85: millicuries	Drogue assemblies
19-00019-T4NP	Naval Supply Systems Command	Issued: 02/5/2001 Expires: 10/31/2015	H-3, Kr-85	H-3: 500 millicuries; Kr-85: millicuries	Drogue assemblies

**TABLE 5-3 (CONTINUED)**  
**NAVY RADIOACTIVE MATERIALS PERMITS POTENTIALLY ASSOCIATED WITH**  
**NAS BRUNSWICK**

Permit No.	Permit Holder	Dates of issuance and Termination	Licensed Radionuclide(s)	Maximum Allowable Quantity <sup>1</sup>	Authorized Use
19-00019-T5NP	Naval Air Systems Command	Issued: NA Expires: 02/28/2013	Sr-90	Sr-90: 500 microcuries	In-flight Blade Inspection System (IBIS) Indicator
08-00023-T1NP	Naval Supply Systems Command	Issued: 4/1/1987 Terminated: 10/31/2000	Tl-204, Pm-147, H-3	Tl-204: 1.6 millicuries; Pm-147: 25 millicuries; H-3: 30 microcuries	Watches, depth gauges, and compasses
45-00023-T1NP	Naval Supply Systems Command	Issued: 12/18/1998 Terminated: 6/15/1999	Tl-204, Pm-147, H-3	Tl-204: 1.6 millicuries; Pm-147: 25 millicuries; H-3: 30 microcuries	Watches, depth gauges, and compasses

<sup>1</sup>No single source to exceed this value

NA – Not available

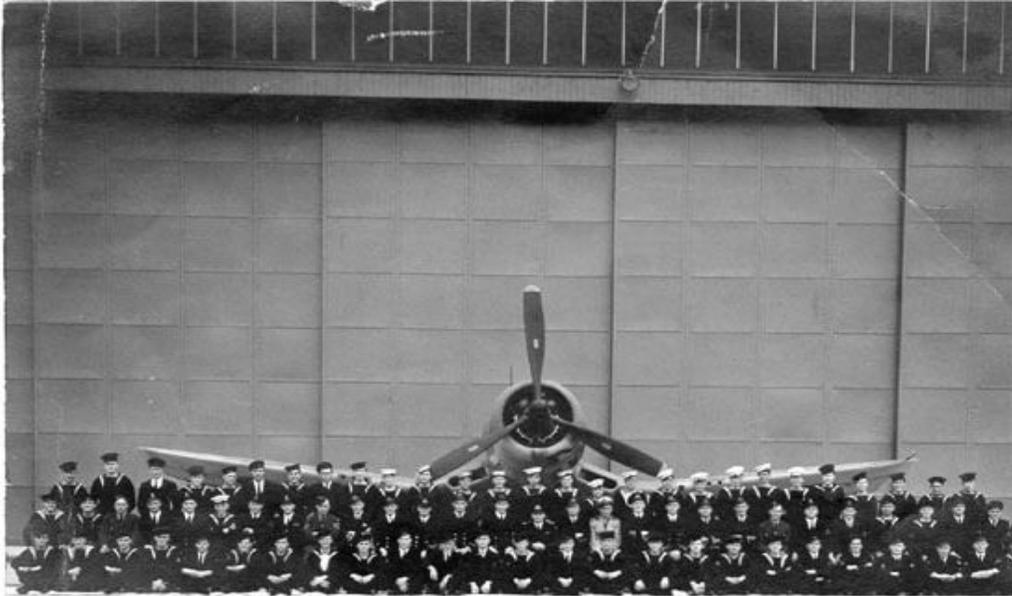
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## 6.0 HISTORY

This section presents a historical overview of the use of G-RAM at NAS Brunswick. The history is augmented by the specific building use and area details in [Section 8.0](#). NAS Brunswick used various commodity items containing radioactive components and radioluminescent devices. NAS Brunswick was also involved in storage of various types of ammunitions and weapons. A brief history of the development of NAS Brunswick is followed by a discussion of radioactive materials that were used, stored, or disposed at each site. The discussion of each operational use identifies what radionuclide would be present and the potential general building types and sites impacted by those operations. A brief summary of radiation surveys performed on NAS Brunswick and any remediation performed follows the description of the radiological operations.

### 6.1 NAVAL AIR STATION BRUNSWICK

NAS Brunswick was originally constructed on the site of a small municipal airport consisting of a control tower and two runways surrounded by blueberry fields. The airport was purchased by the Navy from the town of Brunswick in Cumberland County, Maine. Construction began on October 15, 1942, and by January 1943 the Operations Building was in use. By the date of commissioning, April 15, 1943, the Administration Building and several smaller buildings had been completed. Hangar 1 was completed in June 1943, followed shortly by Hangar 2 in August 1943. Between 1943 and 1946, several squadrons and detachments were stationed for short term activities at NAS Brunswick ([HRA-0114](#)). The original mission of NAS Brunswick was to train and form-up squadrons of Royal Canadian Air Force and Royal Navy pilots to fly Vought F4U Corsair fighters for the British Naval Command. Several of these aircraft were crashed on the base during the war years ([HRA-0164](#) and [Appendix C](#)). The station had a Royal Navy Fleet Air Arm, but the squadrons also practiced at other airports in Maine before eventual transport to Britain. At the height of its wartime operations, NAS Brunswick also supported three auxiliary landing fields located in Sanford, Lewiston, and Rockland, Maine ([HRA-0324](#)).



**NAS Brunswick Squadron Circa 1943**

NAS Brunswick was deactivated in October 1946, 14 months after the end of WWII ([HRA-0121](#)). The land and buildings were leased jointly to the University of Maine and Bowdoin College as annexes in order to ease the over-crowded conditions at both colleges caused by the influx of veterans ([HRA-0121](#)). In 1949, when the facilities were no longer needed, both colleges terminated their leases and NAS Brunswick was taken over by the Brunswick Flying Service ([HRA-0296](#)). At this time, the buildings that had housed military personnel and equipment were put to other uses ([HRA-0296](#)). Hangar 1 became a skating rink; Hangar 2 and the operations tower were part of a civilian flying school; Hangar 3 was used for automobile servicing; the ammunition magazines were used for growing mushrooms; and a shrub nursery was operated on the northern boundary ([HRA-0296](#)).

In 1950, the station was selected by the Navy as a prime center for development ([HRA-0296](#)). On March 15, 1951, the inactive station was recommissioned as a Naval Air Facility ([HRA-0296](#)). The established mission was to support three land-plane patrol squadrons and one fleet aircraft service squadron ([HRA-0296](#)). Its future mission was to be a master jet air station that conducted anti-submarine warfare off the Atlantic Coast ([HRA-0296](#)). In 1951, the station's designation was officially elevated to a Naval Air Station ([HRA-0296](#)).

During the development period, the Navy signed an agreement with the Air Force authorizing the construction of an Air Force Control and Warning Facility, as a part of the continental circumferential radar screen ([HRA-0296](#)). In 1951, the 654th Aircraft Control and Warning Squadron was assigned to Brunswick as a ground-control intercept and warning station and the facility was designated Brunswick Air Force Station (AFS) in 1956 ([HRA-0091](#)). The initial mission was to guide interceptor aircraft toward unidentified intruders picked up on the unit's radar scopes. In 1959, the mission was redirected to provide information to the Semi-Automatic Ground Environment (SAGE) Data Center in Topsham, ME. Brunswick AFS was removed from service in 1965 and the facility was eventually integrated into NAS Brunswick. A large radar tower remains standing and the property was used for an Anti-Submarine Warfare (ASW) Operations Center.

Approximately 222 structures and buildings were constructed during the 1950s, including a large portion of the existing housing, the ordnance magazine area south of the runways and the communications and navigational aids west of the runways ([HRA-0004](#)). Hangar 4 was completed in



**P2-V Neptune from VP-23 Circa 1959**

1956 ([HRA-0091](#)). A small detachment of Marines of the 2nd Marine Division from Camp Lejeune, North Carolina, was assigned to NAS Brunswick in 1958 ([HRA-0296](#)). In March 1959, the Marine detachment became a permanent establishment with the addition of the Marine Barracks at NAS Brunswick ([HRA-0296](#)). The Marines assumed control of all the base entrances from the civilian security police ([HRA-0296](#)). In 1966, the Navy replaced the aging fleet of P2-V Neptune aircraft with P-3 Orion aircraft, Hangars 1 and 3 were expanded, and new facilities were added in support of aircraft operations ([HRA-0004](#)). On July 1, 1971, Commander Patrol Wings United States Atlantic Fleet/ Commander Patrol Wing Five established headquarters at NAS Brunswick, which required numerous upgrades and additional space for the

new wing throughout the station ([HRA-0133](#)). In 1973, three weapons magazines were installed within a dedicated weapons compound ([HRA-0091](#)). In 1974, the Reserve Naval Mobile Construction Battalion was added along with new buildings for training purposes ([HRA-0091](#)). In 1980, construction began on Hangar 5, a six-bay aircraft maintenance hangar with an additional corrosion control hangar ([HRA-0004](#)). Hangar 6 was built in 2005 ([HRA-0305](#)). Hangar 3 was demolished in 2005 and Hangar 1 was demolished in 2007 ([HRA-0305](#)).

Over the past 40 years, many patrol squadrons, including VP 10, VP 11, VP 21, VP 23, VP 26, and VP 44, were based at NAS Brunswick ([HRA-0091](#)). All VP squadrons (active and reserve) that had not already been decommissioned prior to the closure activities for NAS Brunswick have been relocated to NAS Jacksonville ([HRA-0077](#)).

## **6.2 REMOTE PROPERTIES**

### **6.2.1 Topsham Annex**

The Former Topsham Annex, located approximately four miles north of the Main Station, was developed by the Air Force in the 1950s as the location for Bangor Air Defense Sector facilities ([HRA-0091](#)). This Bangor Sector facility was one of five in the region and each had a SAGE Data Center. The 654th Aircraft Control and Warning Squadron manned the data center for the operation of an advanced computer system used to track air activity with information from a wide range of sources, including weather stations, interceptor squadrons, and radar stations (including the radar station at Brunswick AFS). This information was analyzed to determine range, direction, altitude, speed, and intent (friendly or hostile) of identified aircraft. With the inactivation of the SAGE missions in 1969, the station was closed and the SAGE Data Center blockhouse was later demolished in 1970s.

When the Air Force closed the radar facility, NAS Brunswick obtained use and responsibility for the property. Prior to the closure of NAS Brunswick, Topsham Annex functioned as a general support facility for NAS Brunswick. Facilities included a commissary, a training facility, vehicle maintenance and storage facility, office space, recreational areas, a fire station, and 177 units of Capehart housing.

In addition to Navy facilities, Topsham Annex also had a reserve center and recruiting station for the Air Force, Marines, and Army that served the entire Midcoast region.

The facility will be transferred to Midcoast Regional Redevelopment Authority when all investigations are completed; however, groundwater use will be restricted and are subject to the approval of the Navy and appropriate regulatory agencies. ([HRA-0413](#))

### **6.2.2 McKeen Street Housing**

The Former McKeen Street Housing Complex is located approximately three miles from the Main Station. Constructed around 1960, it consists of 231 units of Capehart housing densely arranged in a suburban-style development of 70 acres. The housing consists of detached single-family and duplex dwellings located on a winding pattern of streets. The majority of the housing and assorted buildings in the complex were transferred in 2004 as part of a Public Private Venture. The Finding of Suitability to Transfer (FOST), investigated and written primarily for the land in the complex, was completed in September 2011 and the facility will be transferred to Midcoast Regional Redevelopment Authority. Groundwater use will be prohibited without the approval of the Navy and appropriate regulatory agencies. ([HRA-0413](#))

### **6.2.3 Former East Brunswick Remote Radio Transmitter Site**

The Former East Brunswick Remote Radio Transmitter Site is located approximately three miles northeast of the Main Station. The facility is no longer operational, and the transmitter tower and antenna array have been dismantled. Buildings 523 and 524, which once housed electrical equipment and facility operations, were demolished in 1998. The Finding of Suitability to Transfer was completed in September 2010 and the parcel will be assigned to the National Park Service - US Department of the Interior (the sponsoring federal agency under the Federal Land to Parks Program) for final conveyance to the Town of Brunswick for public park and recreational use. The parcel will be transferred with no restrictions for its proposed reuse. ([HRA-0412](#))

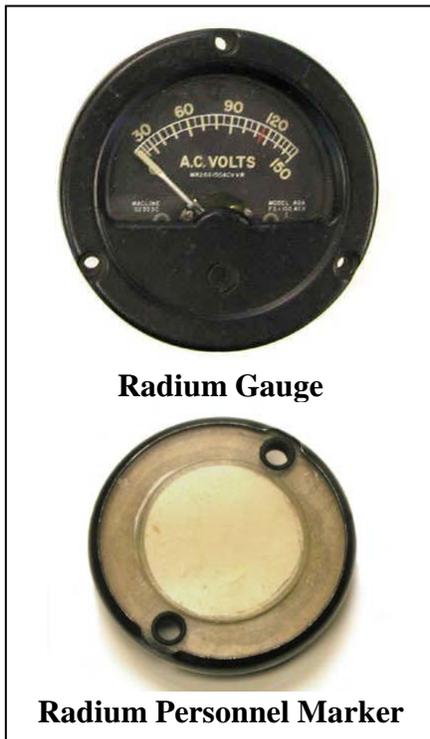
### 6.2.4 Rake Stations

The Small Point Rake Station and Sabino Point Rake Station were constructed in 1960 in Phippsburg, Maine, approximately 14 miles southeast of the Main Station. Both rake stations were last used by the Navy to observe and evaluate the success of aircraft training missions performed off the coast. The observation tower at each rake station has been removed and the areas restored. The Finding of Suitability to Transfer was completed in August 2010 for the Small Point Rake Station and in September 2010 for the Sabino Pont Rake Station. The Small Point parcel will be transferred with no restrictions to the original owner's heirs. The Sabino Point facility will be transferred to the Town of Phippsburg, Maine as a public benefit conveyance for recreational and public park purposes via the US Department of Interior - National Park Service. ([HRA-0411](#); [HRA-0414](#))

## 6.3 USE OF RADIOACTIVE MATERIAL

### 6.3.1 Radioluminescent Devices

Beginning in the late 1930s and continuing through the 1970s, radioluminescent devices and paint were widely used by the military ([HRA-0154](#); [HRA-0214](#)). Initially, dials and surfaces



that needed to be illuminated without a power source were coated with a radioluminescent compound, or paint, containing radium (Ra-226) mixed with a base (i.e., zinc sulfide) ([HRA-0146](#)). This mixture would “scintillate” or glow when the base and Ra-226 were mixed together. These radioluminescent properties allowed personnel to locate controls and gauges on instrument panels in aircraft during “darken ship” operations without the use of an external power source. These radioluminescent devices were used in all Navy aircraft. Radium was used on signs, warning placards, circuit breakers, oxygen quantity indicators and instruments for emergency use in the case of power failure ([HRA-0169](#)). Radium paint was also used in various other

devices that would likely be found at NAS Brunswick such as clocks, wristwatches, rangefinders, personnel markers, handheld compasses, radar knobs and toggle switches ([HRA-0148](#) and [HRA-0182](#)). These devices likely constituted the first G-RAM introduced to NAS Brunswick.

In the early 1950s, other radionuclides, including strontium Sr-90, H-3, and Pm-147, were used in radioluminescent devices. Sr-90 was primarily used in deck markers onboard ships and in personnel markers used in survival kits. H-3 and Pm-147 were commonly used in equipment such as watches, personnel markers and compasses issued to divers or to pilots as survival gear. H-3 was also used in helicopter blade tip lamps and self-luminous markers ([HRA-0169](#)). Radioluminescent devices containing radium were gradually phased out of the Navy programs, with air traffic control instrumentation seeming to be the last radioluminescent devices to be removed. This instrumentation had been removed from NAS Brunswick by 1979, but other air stations potentially had this instrumentation in use through at least 1983 ([HRA-0220](#)).



Many Navy facilities had radium paint shops that repaired and maintained radioluminescent devices in the 1940s, 1950s, and early 1960s. Historical research has not established any radium paint shops at NAS Brunswick; however, buildings on station have been described as containing “Electronic Shops.” These electronic and instrument repair shops commonly worked with radioluminescent devices containing Ra-226. When properly sealed or coated, radioluminescent devices containing Ra-226 were thought to present no health hazard present. However, potential health problems arose when the paint began to chip and peel off, releasing radium into the environment that could be inhaled or ingested, causing potential internal and external dose to the workers. Liquid wastes incidental to any cleaning of radioluminescent devices were thought to have low enough radioactivity for disposal via sanitary waste systems or directly overboard sea vessels ([HRA-0084](#)). In the late 1960s, the Navy began to implement stricter controls over the use of radium to prevent health hazards ([HRA-0086](#) and [HRA-0148](#)). The potential adverse health effect for personnel working with radioluminescent

material was well documented prior to the introduction of radium and radioluminescent devices at NAS Brunswick. The earliest known Navy regulations and guidance for the protection of workers handling radioluminescent compounds appear in General Safety Rules, Section No. 9, which was published in January 1942 ([HRA-0146](#)). Later, the Navy applied these same basic radiation safety principles to the use of other radioactive materials. These regulations continued to be improved over the years as knowledge about health effects of radioactive material evolved ([HRA-0084](#), [HRA-0085](#), and [HRA-0086](#)). Of the radionuclides used in radioluminescent devices, those still of concern are Ra-226 (1,599-year half-life), Sr-90 (28.78-year half-life) and H-3 (12.33-year half-life). Because of their short half-lives, Pm-147 (2.6 years) and Tl-204 (3.78 years) are not radionuclides of concern at NAS Brunswick.

### **6.3.2 Radioactive Commodities**

Radioactive materials were commonly used throughout NAS Brunswick in commodity items. These items possibly included, but are not limited to, smoke detectors, self-luminous exit signs, night vision equipment, spark gap irradiators/ignition exciters, thorium fluoride coated lenses, thoriated tungsten welding electrodes, magnesium-thorium aircraft engine components, oxygen system components, inflight blade inspection system (IBIS), aircraft ice detector probes, radar electronics, and electron tubes. Hydrogen-3 (H-3), also called tritium, is a radioactive isotope of hydrogen gas. It is used as a luminescent material and can be found as a gas or impregnated paint compound. The emitted electrons from small amounts of tritium cause phosphors to glow and are used to make self-powered lighting devices called beta-lights, which are now generally used in watches, exit signs, and a variety of other devices.

Thorium-232 is a naturally occurring radioactive metal found in rocks and soils. Thorium fluoride coating was used at NAS Brunswick on night vision lenses and on the P-3 Orion infrared detection system (IRDS) turret. The thorium fluoride coated lenses of the window on the IR turret presented a possible radiological hazard ([HRA-0260](#)). If these lenses were damaged or broken, the area surrounding the nose of the aircraft was immediately secured and surveyed ([HRA-0159](#)). Once the lenses were replaced, the aircraft and personnel were surveyed and the aircraft was released back to operational status ([HRA-0159](#)). Thoriated tungsten welding rods are commercially available and were commonly used at NAS Brunswick.

A wide variety of electron tubes containing radioactive material. These tubes were known as transmit-receive, anti-transmit-receive, pre-transmit-receive, spark-gap, voltage-regulator, gas-switching, and cold-cathode gas-rectifier tubes and were used in radar systems and other electronic components ([HRA-0306](#) and [HRA-0169](#)). Radioactive sources that were used in these devices included H-3, C-14, Co-60, nickel-63 (Ni-63), Kr-85, cesium-137 (Cs-137), Pm-147, lead-210 (Pb-210), Ra-226, and thorium-232 (Th-232). The radioactive source in these electron tubes ionized the fill gas so that the application of a high voltage across the tube resulted in an instantaneous, steady current ([HRA-0149](#)). No radiological hazard existed as long as these electron tubes remained intact. However, broken tubes could release fill gases or minute sources that were potentially hazardous, but were limited in the spread of contamination ([HRA-0306](#)).

DU is natural uranium depleted of the isotopes of uranium-234 (U-234) and uranium-235 (U-235) from an enrichment process. This “depletion” of U-234 and U-235 leaves the DU in a less radioactive state than naturally occurring uranium. DU is used where dense mass is required and is plated in cadmium to avoid oxidation. DU was used at NAS Brunswick in aircraft ballast and counterweights. Counterweights were found in aircraft gyroscopes, flight controls, helicopter blades, elevator balances, and aileron balances. DU counterweights were in the C-130 Hercules and various helicopters that were stationed at NAS Brunswick. DU has been phased out of use in most Navy aircraft. ([HRA-0405](#))

### **6.3.3 Weapons**

Due to security issues, the US Navy cannot disclose any specific information about types of weapons stored or maintained at NAS Brunswick in this HRA. While there were some radioactive components associated with these weapons, the probability of residual radioactive materials related to weapons storage or maintenance remaining in any magazines or buildings is very low. Radiological issues with the storage or maintenance locations are addressed in [Section 8](#).

### **6.3.4 Aircraft**

It is known that patrol squadrons flew P-2 and P-3 planes at NAS Brunswick, but other aircraft would have been used at NAS Brunswick over the years even though documentation of

types of aircraft used at NAS Brunswick is limited ([HRA-0004](#)). Other aircraft that could possibly have been used at NAS Brunswick include:

- C-130 Hercules
- H1 Bell
- S-2 Tracker
- F-4U Corsair
- F6F Hellcat
- TBF Avenger
- H-25 Army Mule
- HUP-2 Retriever
- EA-6 Prowler
- H-2 Sea Sprite
- F4H-1 Phantom II
- HU-16C Albatross
- SB2C Helldiver
- A-25 Strike
- J4F-2 Widgeon
- UH-1N Twin Huey

The Navy has manuals available that list aircraft parts that contain radioactive material ([HRA-0169](#); [HRA-0405](#)). However, because no documentation was found that the planes listed above were actually used at NAS Brunswick, radioactive aircraft parts that are generally used in aircraft are assumed to have been found at NAS Brunswick.

### 6.3.5 Other Generators of Radiation

Industrial X-ray radiography was historically used at NAS Brunswick in non-destructive testing of welds and aircraft parts by the Aircraft Intermediate Maintenance Department. While x-ray machines emit radiation, they do not create or use G-RAM and do not cause materials to become radioactively contaminated. Applying electricity to a special tube generates the x-rays, and when the electricity is turned off, radiation is no longer generated. Thus, there is no residual radioactivity from the use of industrial X-ray radiography equipment and no long-term impact from their use.

## 6.4 RADIOACTIVE MATERIAL STORAGE AND ON-SITE DISPOSAL

### 6.4.1 General Warehouses and Storage Areas

A number of buildings at NAS Brunswick have been used for storage of various radioactive components, equipment and devices. When radioactive components, equipment and devices were delivered to NAS Brunswick, they were sent to the Property Department and then to the Supply Department. Individual items were then moved to storage areas associated with a particular facility or operation, or into several smaller storage buildings located along the railroad spur adjacent to Fitch Avenue (Buildings 11, 12, 13, 14, 15, and 16) ([HRA-0091](#)). Eventually, a large central supply facility (Building 294) was developed for all storage on the footprint of Building 11; the remaining buildings (12, 13, 14, 15, and 16) have each been demolished through the years. No supply lists were found that would indicate what items were stored, or in which building specifically; however, radioluminescents used by a squadron would likely have been stored in their respective storage and supply rooms. Also, NAS Brunswick used various buildings as storage or retention areas for radioactive material while awaiting proper offsite disposal (i.e. Building 292 and Building 555) ([HRA-0272](#); [HRA-0276](#); [HRA-0277](#); [HRA-0313](#)).

### 6.4.2 Aircraft Maintenance Hangars and Aircraft Intermediate Maintenance Department

A total of six hangars supported the six to seven squadrons stationed at NAS Brunswick at any given time. Within the hangars, each squadron had its own work areas which included both avionics and electronics work rooms. Within these work rooms, technicians performed

maintenance and repair work and replaced avionic or electrical components of the aircraft such as compasses, gauges, altimeters, controllers, and indicators. Only three of the six hangars are still standing.

Hangars 1, 2 and 3 were the original hangars for the station and each hangar was designed to house a minimum of two squadrons. Hangars 1 and 3 were built in 1942 and extended in 1964 to accommodate the new, larger P-3 planes. Hangar 2 was built in 1943 and demolished in 1999. Hangar 3 was demolished in 2005. Hangar 1 was destroyed by fire in July 2007. These hangars were built and in use prior to the 1970s when there was a potential for having housed radium-painted components with less stringent radiological controls. The former locations of these three buildings are now vacant. Because the characteristics of the materials thought to be used in these buildings, as well as the type of operations performed there, it is unlikely that the hangar footprints would be affected by radioactive material.

Hangar 4, completed in 1956, was connected by an enclosed hallway with the Avionics Shop in a maintenance building ([HRA-0091](#)). In the spring of 1983, the Avionics Shop was expanded and re-designated the AIMD ([HRA-0247](#)). AIMD was responsible for calibration, repair, or replacement of damaged or unserviceable parts, components, or assemblies; limited manufacture of parts; and technical assistance ([HRA-0136](#)). Major repairs and maintenance were performed at major aircraft overhaul and repair facilities at other facilities. All squadrons would post technicians in AIMD who would perform any electronic or heavy maintenance work greater than replacing simple components in the aircraft. AIMD technicians were known to replace radioactive electron tubes and repair P-3 IRDS turret assemblies in the avionics department ([Appendix C](#)). Historically, AIMD was the central location for most maintenance and fabrication. It contained the welding and fabrication shops that used thoriated tungsten electrodes. It also housed the parachute shop, which assembled maritime survival kits, and housed electronic corrosion control rooms. In 1985, a new section was added to the front of Hangar 4 and the entire structure was re-designated Building 250 ([HRA-0091](#)). This building still remains standing and was functional until units were redeployed. As it was built in 1956, Hangar 4 has potential for Ra-226 contamination from the handling of radioluminescent components. Additionally, this hangar is likely to have housed other aircraft components which contain radioactive material such as those listed in [Table 4-2](#).

The two newest hangars, Hangars 5 and 6 were built with a larger capacity to support three squadrons each. Hangar 5 was built in 1982. Hangar 6 was the last hangar built in 2005. Because of the age of these newest hangars and the improved knowledge and controls for handling radioactive material, it is unlikely that these buildings would be affected by operations involving these types of materials. Both hangars still remain standing and were functional until squadrons were deployed.

#### **6.4.3 Weapons Maintenance and Storage Bunkers in Weapons Area**

Ordnance areas were developed beginning in 1943 as part of the original construction at NAS Brunswick. These early magazines and supporting shops were clustered together in groups in several remote areas of the property; a few were placed near hangars and runways. Due to the growth and needs of the Station, magazines remain in their original location, have been demolished, or have been moved over the years. ([HRA-0091](#); [HRA-0298](#))

Additional weapons facilities were constructed from the mid-1950s through the early 1980s in two locations in the southern portion of air station. These were mostly high explosive ordnance and weapons magazines built along Ordnance Road. In 1993, a Weapons Build-up Facility was built in an isolated area at the end of what appears to be Merriconeag Road. There is also an 18 acre ordnance disposal site added in 1981 (IR Site 12) to the east of the weapons area near Princes Point Road. ([HRA-0091](#); [HRA-0305](#))

In the early 1950s, an Advanced Undersea Weapons Division was added to the Weapons Department, which had the responsibility of overseeing weapons on NAS Brunswick. In 1958, a weapons shop (Building 539) was built to support Advanced Undersea Weapons (AUW) and Air Reconnaissance and Undersea Warfare Technology Weapons (AR/UWT) missions. This restricted weapons compound was located east of the south end of the runway and was secured with additional fencing and security. Two weapons magazines (Buildings 543 and 544) were also constructed in 1958, but were secured within a restricted area separate from the AUW/AR/UWT weapons compound. In 1973, three additional weapons magazines (Buildings 626 A, B, and C) were constructed within the AUW/AR/UWT weapons compound. ([HRA-0091](#))

A portion of the Topsham Annex was used by the Marine Reserves after the Air Force transferred the facility over to NAS Brunswick, including an armory in Building 339. The Marine Reserves used this building to store and repair weapons for the reserve unit. Due to postings on one doorway and one cabinet within the building, it is known that radioactive materials were used and/or stored in this building under an NRC license. Using information on the postings, it was determined that night vision devices containing tritium were stored in this area. The only radiological control required by the license for these devices is that they are locked away when not in use.

Additional details are given in [Table 3-4](#).

#### **6.4.4 On-site Disposal Landfills and Areas**

Controlled disposal of radioluminescent devices as low-level radioactive material (LLRW) was not implemented by the Navy until the early 1970s. Prior to that time, there were very few controls on the disposal of radioactive material by the military, private industry, and the general public and radioluminescent instruments and articles were commonly disposed by burial in landfills and possibly in remote areas. As unwanted or damaged non-licensed devices were not controlled as LLRW until the late 1950s, it is possible that these devices were disposed of in similar fashion. It was also a common practice to leave radioluminescent devices in place on equipment when it was sent to the salvage or scrap yard, stored, or processed through smelters. No information has been found indicating smelting activities existed at NAS Brunswick. However, record searches provided sufficient evidence of potential dumping of radioactive material in disposal sites at NAS Brunswick ([HRA-0155](#); [Appendix C](#)). NAS Brunswick disposal sites that could have remnants of equipment with radioactive material are the Orion Street Landfill North (IR Site 1), Hazardous Waste Burial Area (IR Site 3), Defense Reutilization and Marketing Office (DRMO) Laydown Yard within the Old Acid/Caustic Pit Site (IR Site 7), the Neptune Drive Disposal Site (IR Site 9), Quarry Area of Concern, and the DRMO Area (includes Building 584, IR Site 4, and IR Site 13), Laydown Yard located over and adjacent to IR Site 13 and IR Site 4 sites, and the Orion Street Undocumented Disposal Area. Potentially contaminated debris was removed from the Sandy Road Rubble and Asbestos Disposal Site (IR Site 6), but no radiological characterization surveys were performed to confirm that there was no

residual radioactive contamination from materials in the area prior to backfilling the excavation with clean material. These areas are shown on [Figure 6-1](#).

The Orion Street Landfill North (IR Site 1) was used as a major dumpsite for NAS Brunswick from 1955 to 1975. The landfill is located just north of the weapons compound and is approximately 8.5 acres. Waste such as solvents, pesticides, petroleum products, paint, aircraft and automobile parts, domestic waste, pharmaceuticals, photography-related chemicals, empty hazardous waste containers and waste oil were buried in a trench with a maximum depth of approximately 20 feet below ground surface. The site was also used as a borrow pit during and prior to its use as a landfill. ([HRA-0102](#))

The Orion Street Landfill South (IR Site 2) is smaller and older than IR Site 1. It was used as a disposal area for most of NAS Brunswick from 1945 to mid-1950s ([HRA-0004](#)). The landfill was actually operated less than 10 years as NAS Brunswick was closed between 1946 and 1951 ([HRA-0102](#)). The waste disposed of at this site included various solvents, paint residues, hydraulic fluid and oils. The site is located south of IR Site 1, IR Site 3, and Mere Brook in the vicinity of the southern extent of the main runways within the former Weapons Compound Area. Solid waste was reportedly incinerated at an incinerator facility located on the site before being buried in a 2 acre former borrow pit, which is currently covered with soil and pine trees ([HRA-0102](#); [HRA-0464](#)). The incinerator was likely in place from 1959 to 1965 and only a concrete pad remains on site. In 1999, the surface debris in the area was removed, the depression was backfilled, and capped with 12 inches of clean fill and three inches of top soil ([HRA-0102](#); [HRA-0320](#); [HRA-0464](#)). Monitoring wells were installed in the area; four of the wells are in close proximity to the concrete pad from the incinerator ([HRA-0464](#)).

The Hazardous Waste Burial Site (IR Site 3) was operated from 1960 to 1973 ([HRA-0004](#)). The site is located immediately adjacent to the southwest corner of IR Site 1 and is approximately 1.5 acres. It reportedly received solvents, pesticides, paint, isopropyl alcohol and petroleum products for burial. Based on their proximity and similar historical use, IR Site 1 and IR Site 3 have been combined. Approximately 300,000 cubic yards (yd<sup>3</sup>) of wastes are estimated to have been disposed of at the two sites ([HRA-0102](#)). Both sites have been capped and have long-term monitoring in place.

The Sandy Road Rubble and Asbestos Disposal Site (IR Site 6) is bordered by Sandy Road to the southeast and by a stream behind Building 516 to the north and is approximately 1 acre in size ([HRA-0514](#)). At this site, a small depression was reportedly used for general disposal of construction debris, aircraft parts, and other nonputrescible wastes until the late 1970s. Aerial photographs from 1953 and 1959 show a cleared, depressed area at the site, but it is unknown when disposal in this area began ([HRA-0515](#)). Material and debris, including asbestos materials, were at one time visible at the site surface. A 1993 Record of Decision (ROD) selected the remedial action of excavating and transporting material to IR Sites 1 and 3 for use as a subgrade material for a landfill cap that was already to be constructed ([HRA-0514](#); [HRA-0515](#)). A 1995 document states that approximately 8,800 cubic yards of construction debris and asbestos material would be excavated from Sites 5 and 6 ([HRA-0516](#)). Based on the 1993 Record of Decision (ROD), the area was to be sampled for non-radiological hazards, backfilled with clean fill, and revegetated after removal of the material, and no land-use restrictions, institutional controls, or five-year reviews would be required for IR Site 6. Records indicate that Site 6 remediation was performed in 1995 ([HRA-0517](#)).

The Old Acid/Caustic Pit Site (IR Site 7) is located in the northern portion of the base, west of the main gate (Fitch Avenue) ([HRA-0319](#)). The precise location of the pit is not known, but the location used in documents and maps has been identified through data results from field investigation ([HRA-0319](#)). IR Site 7 is a flat clearing of approximately 1.4 acres and the source area is thought to be approximately 3,800 ft<sup>2</sup> ([HRA-0319](#)). The site was part of DPDO operations (Defense Property Disposal Office, later called Defense Reutilization and Marketing Office) from 1952 to 1969, when DPDO moved to a new location (likely Building 584) ([HRA-0319](#)). The disposal pit was used for liquid waste disposal during these years ([HRA-0319](#)). In addition to the pit operations, aerial photographs ([HRA-0418](#)) show that the area was used as an equipment lay-down area during the same time frame (1952-1969) ([HRA-0319](#)). In April 2002, a Navy contractor completed removal of 400 yd<sup>3</sup> of stockpiled soil. Of this material, 140 yd<sup>3</sup> went off-site for disposal and 260 yd<sup>3</sup> was spread on the ground at the site ([HRA-0319](#)). In September 2002, the Record of Decision was signed and institutional controls of soil/ groundwater restriction and long-term monitoring were selected ([HRA-0407](#)). Long-term monitoring began in 2005 ([HRA-0320](#)). Investigations are complete at IR Site 7 for non-radiological hazards.

The Perimeter Road Disposal Site (IR Site 8) was reportedly used from 1964 to 1974 (HRA-0004). Most of the waste disposed of at this site was construction debris and trash (HRA-0004). The site is located along the northern boundary of NAS Brunswick property and is divided into two areas north and south of Perimeter Road. Additionally, certain solvents were reportedly disposed of at the site. A ravine located to the northeast of the site is also partially filled with landfill debris (HRA-0102). In 1993, the construction debris, rubble, and solvent-impacted soils were excavated and transported to IR Site 1 and IR Site 3 for use as a subgrade material for the landfill cap (HRA-0102).

The Neptune Drive Disposal Site (IR Site 9) was a former incinerator, ash landfill, and disposal area that operated from 1943 to 1953 (HRA-0319). It is thought to be the first landfill used on NAS Brunswick (HRA-0102). The 20 acre disposal site was identified on the 1946 map as “Dump Area No. 1” and was reportedly active from 1943 to possibly 1953 (HRA-0102). The dumpsite contains the footprint of former barracks (Buildings 216, 217, 218, 219, 220) and a former transformer storage station (Building 293), all of which were demolished between 1997 and 2008 (HRA-0102). The former Chief Petty Officer (CPO) Club and Galley (Buildings 201), which was still being used when the Station closed, is located in the southern portion of the disposal site boundary (HRA-0102). An incinerator (Building 31), which was located in the northeastern end of IR Site 9, was used from 1943 to 1946 to burn solid waste (HRA-0319). The resulting ash was disposed in the IR Site 9 landfill (HRA-0102). The incinerator was abandoned after 1946 when disposal operations were transferred to IR Sites 1 and 2, but the incinerator building remained in place until after 1983 (HRA-0102; HRA-0319; HRA-0518). Approximately 16,000 yd<sup>3</sup> of ash were deposited between two areas within the disposal site: one disposal area was located immediately west of the incinerator and a second disposal area was located behind Building 201 (HRA-0102). After the landfill was abandoned, a 42-inch-diameter storm drain pipe, which discharged to a local stream, was excavated from the southeastern portion of the site (HRA-0102). The landfill was capped before the barracks were built and the disposal site has been partially remediated since the barracks were demolished (HRA-0102). Site investigations in 2009 and 2010 have confirmed the presence of ash and there are ongoing efforts to further characterize and remediate the site (HRA-0319). Institutional controls are currently in place to prevent use of and contact with impacted groundwater and the disturbance of and contact with the contents of the ash landfill/dump area at Site 9.

The West Runway Study Area (IR Site 18) is an area where liquid was observed to be seeping from a hillside approximately 650 feet west of Runway I-19 between Mere Brook and Ordnance Road No. 3 ([HRA-0102](#)). The area is in the vicinity of a former ordnance bunker that was dismantled in the mid-1970s. In 1992, an NAS Brunswick employee observed water with a surface sheen leaching out of the hillside along Ordnance Road No. 3 ([HRA-0102](#)). NAS Brunswick has no records of disposal at this location. In 1993, a magnetometer survey and a ground penetrating radar survey were conducted, and test pits were excavated. Soil samples, water samples from the hillside seepage, surface water and sediment samples from Mere Brook were collected and analyzed for volatile organic contaminants. All concentrations were reported below applicable state and federal standards. During excavation of the test pits, fill material and metallic debris were uncovered and removed. An EPA finding of “No Further Action” was recommended for the approximately 0.8-acre site ([HRA-0102](#)). A radiological survey was performed in this area and further information is provided in [Section 6.5](#).

The Quarry Area of Concern is located southwest of the runways at the NAS Brunswick western boundary, adjacent to Maine State Route 123 ([HRA-0296](#)). A radar tower (Building 646) is located directly north of the site, but there are no structures located in the Quarry. The approximately four-acre area was used as a rock quarry in the 1940s and 1950s and contains a 20- to 30-foot tall rock face. The Quarry was used as an NAS Brunswick dumpsite during the 1943-1946 timeframe. There is a possibility that radiologically contaminated debris, radioluminescent devices, and electronics containing radioisotopes could have been disposed at this site because of its years of use. In 1992, 350 to 450 yd<sup>3</sup> of soil generated from the removal and cleaning of a underground (fuel) storage tank at NAS Brunswick, Building 538, were spread to a depth of 6 to 10 inches on top of the existing soil with no liner to protect the soil below, then fertilized to promote bioremediation in accordance with MEDEP guidance. The soil was to be tilled and turned 10 times before removal; however, no documentation was found indicating that the treated soil was ever removed from the Quarry. More of this land spreading was carried out in 1993 and 1995, but origin of the soil is unknown. During site reconnaissance and investigations (2007-2012), a significant amount of debris (including partially buried scrap metal, tires, and concrete) and ordnance was discovered in and outside the defined Quarry Area of Concern.

The DRMO Area consists of Building 584 (DRMO) and the adjacent DRMO yard. The DRMO yard is a paved, fenced enclosure that is approximately 84,000 ft<sup>2</sup> (HRA-0102). The DRMO coordinated sale or disposal for the Navy's hazardous waste and surplus materials. IR Sites 4 and 13 are located in the area occupied by this operation. IR Site 13 encompasses the majority of the DRMO building, the DRMO yard, the Public Works Buildings, and a regularly used storage and equipment lay-down area, which was located in a small clearing south of the paved DRMO yard. IR Site 4 is adjacent to DRMO enclosure on the north and was investigated due to the presence of an acid/caustic pit that was used between 1969 and 1974 (HRA-0102; HRA-0406). Building 584 was built in 1965 within the current IR Site 13 and was added onto in approximately 1975 (HRA-0305; HRA-0406). The square footage of the building is 7,200 square feet (ft<sup>2</sup>) (HRA-0305). The eastern portion of the building was built on top of the acid/caustic pit, now located within IR Site 4, so the building today is contained in both IR Sites 4 and 13 (HRA-0155; HRA-0102). IR Site 13 also contains the area where three underground storage tanks were previously located (HRA-0102). These tanks were installed in the early 1970s for storage of waste oil, solvents, and diesel, and were removed in the 1980s (HRA-0102). No soil was excavated when the USTs were removed (HRA-0102). A site investigation concluded there was no significant risk from the contaminants identified, and in 1998, a Record of Decision was signed for IR Site 13 recommending No Further Action (NFA) for hazardous material (HRA-0102). IR Site 4 contained the acid/caustic pit where liquid wastes were disposed by pouring them straight into a 4-foot-square by 3-foot-deep pit between the years 1969 and 1974 (HRA-0406). An investigation ensued, but the pit could not be directly sampled because of the presence of the 1974 addition to Building 584 (HRA-0406). A Record of Decision was signed in 1998 stating that no further source control action was necessary, but designated a contingent action if Building 584 is removed (HRA-0102).

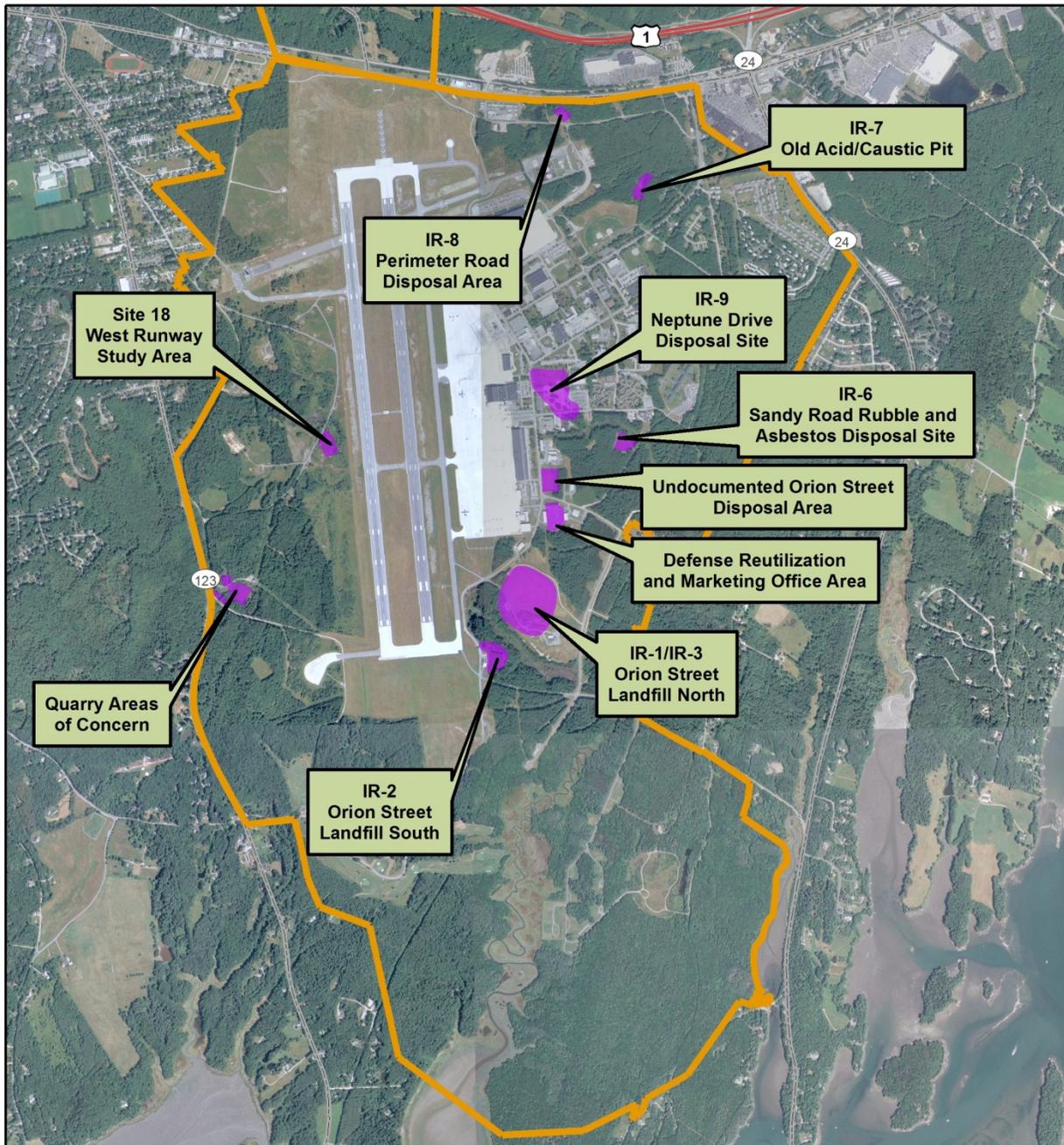
According to an individual interviewed, an unknown disposal area was used during the mid-1970s for general solid waste disposal (Appendix C- Goldner Interview). Used electron tubes from the Electronics Department were placed in this area and worked over with a bulldozer. This disposal area is located on the corner of Orion Street and Merriconeag Drive. No other information could be obtained on this area.

## 6.5 HISTORICAL RADIOLOGICAL INVESTIGATIONS, SURVEYS, STUDIES AND REMEDIAL EFFORTS

Limited documentation could be found that indicated any radiological surveys, sampling or investigations have been conducted at NAS Brunswick to assess residual G-RAM from radiological operations. The following studies and references were identified during this HRA:

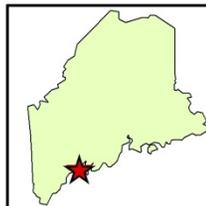
- West Runway Study Area - A radiological survey was conducted on June 4, 1994 in the area surrounding former Bunker 62 located in the West Runway Study Area of the Former West Ammunition Area. The survey was conducted in response to public comments and a request from Brunswick Area Citizens for a Safe Environment (BACSE). Survey results were compared to background readings and measurements were found to be equal to or below background. The survey was incorporated into the final Site Inspection Report for the West Runway Site and copies of the survey were distributed to the RAB, EPA, MEDEP, BACSE, and the town representative from Brunswick. ([HRA-0013](#))
- Building 95 - On March 17, 1994, at a NAS Brunswick RAB meeting, it was reported that during the excavation of Building 95, no radiation was detected above reference background readings, and that no radioactive airborne concentrations were detected above the action limits ([HRA-0110](#)). Further review of RAB minutes and agenda found no other mention of the Building 95 surveys and no documentation of these surveys was found during archival research for this HRA.
- Ground Control Approach (GCA) radar units - In a letter dated May 2, 1975, the US Army Electronics Command advised the Navy that the AN/FPN-36 radar contained radium in the compass rose and various other components. Although Naval Electronics Unit (NAVELEX) was advised that these components represented no immediate hazard to personnel, the Navy recommended that all components be identified, labeled, surveyed for leakage, replaced with non-radium bearing components at NAVEXLEX repair and maintenance facilities, and that surplus units be removed prior to excessing. NAVEXLEX advised all GCA users to survey the equipment and replace parts. Surveys by RASO found that

Class 5355 GCA radar knobs and toggle switches posed the greatest potential for contamination and should have the radioluminescent paint sealed until replacement parts could be supplied. RASO personnel visited all facilities undertaking the recommended actions in order to survey and supervise replacement of knobs and toggle switches in 1977 ([HRA-0193](#)). NAS Brunswick was one of approximately 40 Navy facilities and four supply depots at which RASO conducted these surveys due to the use of the Class 5355 GCA radar knobs and toggle switches in NAS Brunswick radar units ([HRA-0186](#)). Removal of these radar knobs and toggle switches at NAS Brunswick by RASO was listed as complete in 1979 ([HRA-0220](#)). Removed contaminated parts were shipped to RASO for decontamination, and then later shipped to Naval Electronic System Engineering Center, Vallejo, California for reuse ([HRA-0174](#)). No records could be found that indicate NAS Brunswick units/parts were included in these shipments.



**Legend**

- Areas of Concern
- NAS Brunswick Major Roads
- Limited Access
- Highways
- Secondary Roads



**Naval Air Station Brunswick, Maine  
 Historical Radiological Assessment  
 Figure 6-1: Landfill and Disposal Areas**

## 7.0 ASSESSMENT OF IMPACTED SITES

This section describes the methods used in [Section 8.0](#) to categorize and assess the likelihood of residual contamination at impacted sites, the contaminated media involved, the potential for migration of contamination, and the recommended actions for each impacted site. Evaluations and definitions are based on guidance provided in MARSSIM. The assessment of impacted sites was based on their operational history and whether G-RAM was used, stored, or potentially disposed of at the site. The US Navy also used previous site surveys and investigations, when available, to confirm or expand on the historical information.

### 7.1 IMPACTED SITES

An impacted site is one that is known to contain radioactive contamination or has a potential for radioactive contamination based on historical information. Areas immediately adjacent to the primary impacted site may be included in this designation ([HRA-0168](#)). Impacted sites may include:

- Sites where radioactive materials were used or stored
- Sites where known spills, discharges, or other unusual occurrences involving radioactive materials have occurred, or may have occurred, that could have resulted in the release or spread of contamination
- Sites where radioactive materials might have been disposed of or buried

### 7.2 NON-IMPACTED SITES

A non-impacted site is one with no reasonable possibility for radioactive contamination, based on historical documentation or results of previous radiological survey information ([HRA-0168](#)).

### 7.3 IMPACTED SITE ASSESSMENTS

[Section 8.0](#) provides the assessments for each impacted site. These are based on the historical record and any site surveys or assessments conducted prior to December 31, 2010. The assessments cover both media and migration pathways. These assessments may change in the

future as the result of the implementation of recommended actions or location of additional historical information. The process used to assess the potential radiological contamination at an impacted site is detailed below.

### **7.3.1 Contamination Potential**

The DON determined the potential for residual radioactive contamination at each impacted site through a systematic evaluation of historical information, previous survey results, discussions with knowledgeable people, and site reconnaissance. As recommended actions continue in the future, these assessments may change. Contamination potentials are categorized as:

- **Known-Restricted Access.** Radioactive contamination is known to exist at levels that could require protective clothing, respiratory protection, radiation monitoring, and site access controls.
- **Known-Continued Access.** Low levels of contamination exist, but the contamination is contained in a system, fixed on building surfaces, or is in generally inaccessible areas.
- **Likely.** Residual radioactive contamination is expected but has not been confirmed.
- **Unlikely.** Residual radioactive contamination is not expected, but investigation is warranted.
- **Unknown.** Residual radioactive contamination potentially exists, but no clear indication of possible contamination levels or contaminants has been established.
- **None.** Radioactive contamination has been fully assessed and removed, if necessary, and the site has been free-released by the US Navy and regulators. The site remains classified as impacted, but no further action is required.

### **7.3.2 Contaminated Media**

[Section 8.0](#) also categorizes and assesses different types of media at each impacted site that contain or are suspected of containing radioactive contamination. The US Navy used previous survey data, historical information, and professional judgment to confirm the presence

of contamination or determine contamination potential. Generic terms, as defined in MARSSIM, are used to categorize the types of material that would contain the contamination ([HRA-0168](#)). For example, if a building contains radioactive contamination in concrete floor materials, the medium would be defined as “structures.” To ensure that all potential media contamination has been evaluated, [Section 8.0](#) includes an assessment for all media categories for each impacted site. The definitions for the types of media that could be contaminated are:

- **Surface Soil.** The top layer of soil (to 6 inches below ground surface [bgs]), fill, gravel, waste piles, concrete, or asphalt that is available for direct exposure, growing plants, re-suspension of particles for inhalation, and mixing from human disturbances; this definition includes surface sediment in underwater areas
- **Subsurface Soil.** Solid materials and media found below the surface soils; this definition can include underwater subsurface sediment
- **Surface Water.** Waters found in streams, rivers, lakes, ponds, wetlands, and oceans as well as coastal tidal waters
- **Groundwater.** Waters contained in subsurface materials and aquifers
- **Air.** Atmosphere that becomes a migration pathway for resuspension and dispersal of radioactive contamination and contaminated media
- **Structures.** A man-made surface(s) above the ground surface or contained within subsurface media
- **Drainage Systems.** Sanitary drains, facility storm drains, or septic systems and leach fields and sediments contained therein; this category can include bay sediments where drainage to the bay occurs

### **7.3.3 Contaminated Media Assessment**

[Section 8.0](#) provides an assessment of each contaminated media category at each impacted site. The US Navy determined these ratings during the evaluation of each media type. The ratings may change if additional historical information becomes available or further information is developed during the performance of surveys at the site. Ratings are defined as:

- High. Evidence of contamination in the media or migration pathway has been identified.
- Moderate. The potential for contamination in the media or migration pathway exists, but the extent has not been fully assessed.
- Low. The potential for contamination in the type of media or migration pathway is remote.
- None. Evidence of contamination in the specific media or migration pathway has not been found, or known contamination has been removed, and surveys indicate that the media or migration pathways meet present release criteria.

#### **7.3.4 Potential Migration Pathways**

Migration pathways are the media or transport mechanisms that allow contamination to spread in the immediate vicinity of the contaminated media or off-site. The assessment of each impacted site in [Section 8.0](#) provides an evaluation of the potential migration of radioactive contamination. The type of potential or confirmed contaminated media and the Radionuclides of Concern (ROCs) were used to assess the potential migration pathways.

#### **7.4 RECOMMENDED ACTIONS**

[Section 8.0](#) also provides a recommended action for each impacted site. The recommendation is the result of the summary investigations conducted to determine ROCs, contamination potential, contaminated media, and potential migration pathways for exposure. Occasionally, area site specific recommendation will be provided that may differ slightly from the standard categories due to unique circumstances. The standard categories of recommended actions are defined below.

- Emergency Action. Immediate remediation or containment is required because the levels of radioactive contamination or radiation exposure are such that there is a high potential for significant exposure or release of radioactive materials to the public or the environment.
- Scoping Survey. Historical documentation indicates that radioactive materials may be present at an impacted site that has not had an initial evaluation previously

performed, and a survey is required to determine whether contamination in excess of current release criteria exists. The intent of scoping surveys is to identify radionuclide contaminants, relative radionuclide ratios, and general levels and extent of contamination. These surveys usually include minimal surface scans, sampling, and dose rate assessments.

- **Characterization Survey.** Radioactive contamination has been confirmed within an impacted site by a scoping survey, and action must be taken to determine the extent of the contamination and to identify and define the extent of the ROCs. These surveys include in-depth surveys of the facility or site, sampling, monitoring, and analysis to provide the basis for acquiring necessary technical information to develop, analyze, and select appropriate cleanup techniques.
- **Remediation.** Radioactive contamination has been fully characterized within an impacted site and remedial or removal action is necessary to comply with site specific release criteria. Remedial action support surveys are performed while remediation is being conducted to guide the cleanup activities.
- **Final Status Survey (FSS).** Historical documentation and previous investigations or remediation indicate that radioactive contamination has been removed from an impacted site, and a survey needs to be conducted in accordance with MARRSIM guidance to verify that the impacted site complies with applicable site release criteria. This survey includes the appropriate measurements and sampling that will define the radiological condition of the site in preparation for release. FSSs are conducted following completion of decontamination or remediation activities, if any are performed, but can also be conducted to confirm that past radiological activities at the impacted site did not result in residual contamination.
- **Free Release.** Historical documentation and previous investigations and surveys indicate that all applicable release criteria have been met, and the site documentation is ready for review by the US Navy and regulatory agencies for future non-radiological usage. This may include confirmatory surveys by the US Navy or regulatory personnel to verify the results reported in the release documentation.

- No Further Action. An impacted site has been shown by the US Navy and applicable regulatory agencies to meet release criteria.

## 7.5 MARSSIM SURVEY CLASSIFICATIONS

As described in [Section 4.3.5](#), MARSSIM classifies surveys for impacted sites as Class 1, 2, or 3, depending on the potential for residual contamination. This classification is used to ensure that areas with a higher potential for contamination receive a higher degree of survey effort, with areas with the greatest potential for contamination receiving Class 1 surveys. The survey classification impacts FSSs and is instrumental in assessing free release documentation.

The survey classifications will be applied to recommended actions in [Section 8.0](#), where appropriate. As surveys proceed and data are analyzed, areas may be reclassified based on newly acquired survey data ([HRA-0168](#)). For example, if contamination is found during a Class 3 survey, a more extensive Class 1 survey would typically be conducted. Detailed descriptions of the survey classifications are provided in [Section 4.3.5](#).

## 7.6 IMPACTED SITE EXAMPLE

A building formerly used as a research laboratory is identified as an impacted site. Undefined contamination has been found on interior building surfaces during a Class 3 scoping survey.

### **Contamination Potential:**

Known-Continued Access. The contamination has been confirmed, but there is no indication of hazardous levels.

### **Potentially Contaminated Media:**

Surface Soil – Low. There is a slight likelihood that contamination from the building could be in the surface soils immediately surrounding the site.

Subsurface Soil – Low. There is a very slight likelihood that contamination from the surface soils could be in subsurface soils. Depending on the information available at the time of rating and professional evaluation of the information, this potential could be identified as “None.”

Surface Water – None. There is no surface water near the site.

Groundwater – None. As the contamination is in the interior of the building, there is no potential for groundwater contamination.

Air – None. Contamination found on the building surfaces is insufficient to cause concern about airborne contamination. This rating would be based on the type and level of radioactivity identified in the contamination.

Structures – High. Contamination has been identified in the building.

Drainage Systems – High. With surface contamination on the building interior surfaces, there is a significant potential that the drainage systems (primarily sanitary) would be contaminated, as most laboratory rooms contain sink drains.

Potential Migration Pathways (for Exposure to the Public or Environment):

- Surface Soil – Low. The potential contamination in the surface soils would present a low probability for exposure to the public or off-site environment, as there is no probable transport mechanism to cause detectable levels of contamination to spread to off-site locations.
- Subsurface Soil – None. There is limited means of initially contaminating subsurface soils; therefore, an exposure to the public or off-site environment is not likely.
- Surface Water – None. The information on potentially contaminated media already established that there were no surface waters in the vicinity of the site.  
Contamination in the interior of a building would require transport of the contamination to surface waters by an indirect route such as runoff to a storm drain system, which is not likely to occur.
- Air – None. Low levels of interior building surface contamination would require transport of a significant portion of the contamination outside the confines of the building and then a secondary mechanism to carry the contamination off-site.
- Structures – Low to Moderate. Migration of the contamination in the building is likely. However, the potential for contamination to migrate to the public would be dependent on the access and security controls for the building.

- Drainage Systems – Low. With contamination on interior building surfaces, the building drainage sanitary system may be contaminated. Low levels in drainage systems would be diluted by the flow of non-contaminated liquids from other sources. The exposure potential from this contamination is minimal.

**Recommended Actions:** Characterization survey.

## 8.0 FINDINGS AND RECOMMENDATIONS

This section describes the 19 sites at NAS Brunswick that are designated as being impacted by G-RAM operations. The distinction between the terms “impacted” and “non-impacted” is discussed in [Section 8.1](#). The former use of an impacted site is provided in [Section 8.2](#), as well as ROCs and results of any previous radiological investigations. This section categorizes and defines the likelihood of residual contamination at each impacted area, the contaminated media involved, the potential for migration of G-RAM, and the recommended actions for each impacted site using the categories described in [Sections 4.0](#) and [7.0](#). This section also provides a summary of potential contamination and migration pathway assessments and recommendations for all impacted sites.

### 8.1 IMPACTED VERSUS NON-IMPACTED

In this HRA, the DON assessed historical radiological operations at NAS Brunswick to determine whether these operations had an impact on buildings, structures, or open areas. These evaluations were based on guidance in MARSSIM, which recommends that all sites be designated as either impacted or non-impacted by radiological operations ([HRA-0168](#)). Impacted sites are those areas with some potential for residual contamination due to radiological operations, including the use, handling, packaging, or disposal of radioactive materials. A non-impacted site is one with no reasonable possibility of residual radioactive contamination, based on historical documentation or results of previous radiological survey information.

### 8.2 IMPACTED SITES

There were 19 sites that were determined to be radiologically impacted. The 19 impacted sites are depicted on [Figures 8-20](#) and [8-21](#). Details regarding each site are provided in [Sections 8.2.1](#) through [8.2.19](#). [Table 8-1](#) provides a summary of the historical facility/site use for impacted sites from the time of base commissioning through closure.

### 8.2.1 MWR CPO Wardroom / VPU / Electronics and Ordnance Shop



**Site Description:** The Morale, Welfare and Recreation (MWR) CPO Wardroom (Building 9) was used from 2006 to 2011 as a lounge and mess facility for non-commissioned officers. This building was originally built as a laundry facility and later housed the Electronic and Ordnance Shop (1950s - 1960s) and the Patrol Squadron Special Unit (VPU) (1970s-1980s). The building was constructed in 1943 and its area is approximately 8,888 ft<sup>2</sup>. Historical floor plans for this building were reviewed to determine the locations of operational activities within the building ([HRA-0433](#)).

**Former Radiological Uses:** This building has no current radiological use; however, as an Electronics and Ordnance Shop, this building was used in the maintenance and repair of electronic components. Although the specific nature of the work performed in this building is unknown, electronics are known to include items with radioactive material. The building was later used by the VPU. VP squadrons flew P-2 Neptune and P-3 Orion aircraft. The Neptune replaced the Orion in 1966 because it was larger, more versatile, and could deliver a more powerful weapon ([HRA-0128](#)). The VPU likely used this building to house AUW components and for torpedo maintenance and overhaul. Examples of radioactive materials potentially used in this building would be aircraft components, electronics, and instrumentation.

**Current Uses:** Vacant Building

**ROCs:** Cs-137, H-3, Ra-226, Th-232, and U-238

**Previous Radiological Investigations:** None

**Contamination Potential:** Unknown

**Contaminated Media:**

Surface Soil: Low

Subsurface Soil: Low

Surface Water: Low

Groundwater: Low

Air: Low

Structures: Low

Drainage Systems: Low

**Potential Migration Pathways:**

Surface Soil: Low

Subsurface Soil: Low

Surface Water: Low

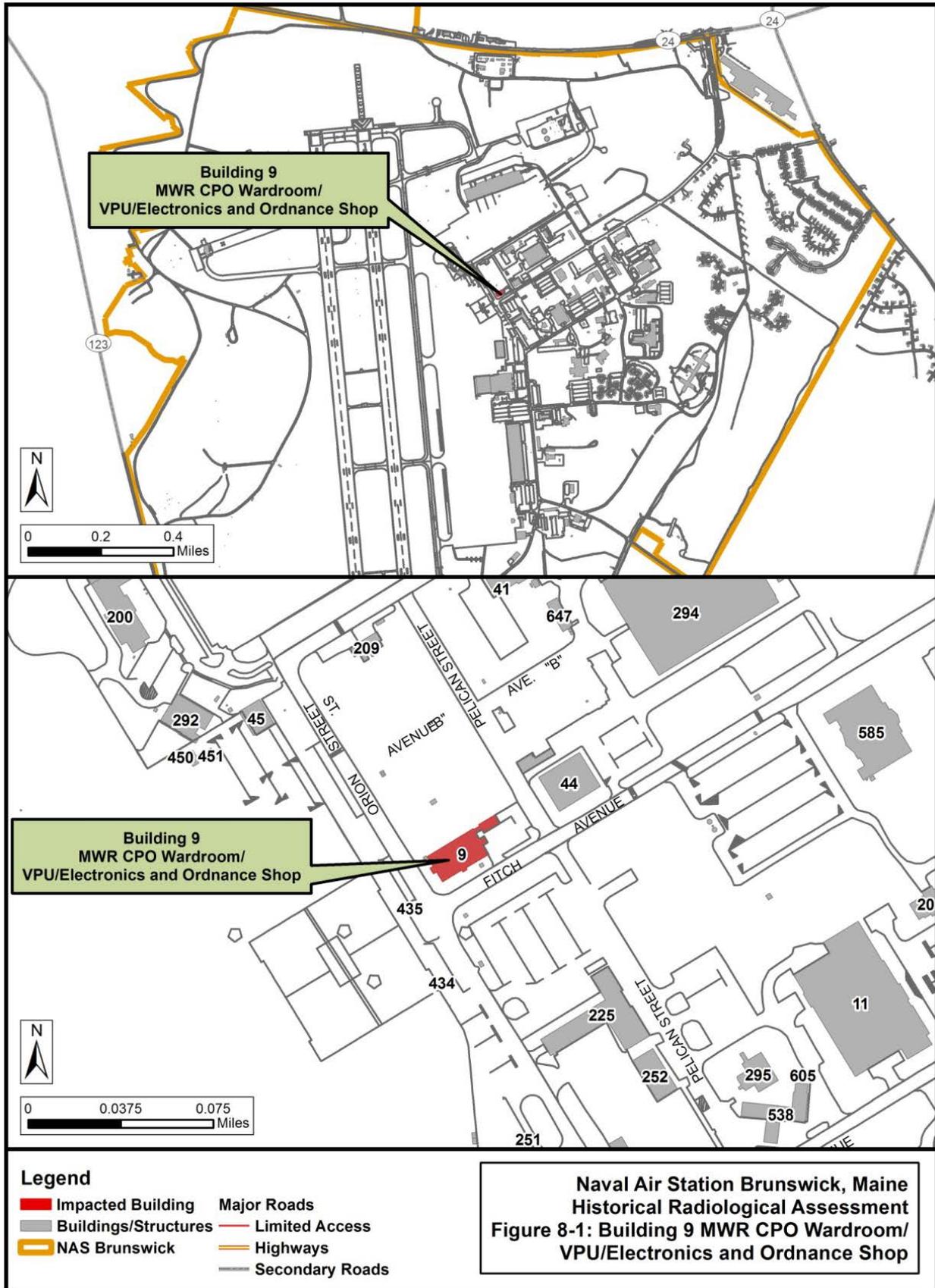
Groundwater: Low

Air: Low

Structures: Low

Drainage Systems: Low

**Recommended Actions:** Conduct scoping surveys of building and drains.



### 8.2.2 Police Station / Old Parachute Shop



**Site Description:** The Police Station is currently designated Building 41, but the same building was divided and designated Buildings 41 and 43 on maps from 1944 until 1973. During these years, the half of the building designated Building 41 was used for an unknown type of training and the half of the building designated Building 43 was used for parachute maintenance operations. The size of the building as currently configured is approximately 10,526 ft<sup>2</sup>, but only the portion of the building used for parachute maintenance is presumed to be impacted. Historical floor plans for this building were reviewed to determine the locations of operational activities within the building ([HRA-0434](#)).

**Former Radiological Uses:** One part of maintaining the parachutes was the maintenance of survival vests. During the years the parachute shop was located in this building, survival vests were equipped with compasses and personnel markers which contained radioluminescent material ([Appendix C](#), [HRA-0152](#), and [HRA-0154](#)).

**Current Uses:** Vacant Building

**ROCs:** H-3, Ra-226 and Sr-90

**Previous Radiological Investigations:** None

**Contamination Potential:** Unlikely

**Contaminated Media:**

Surface Soil: Low

Subsurface Soil: Low

Surface Water: Low

Groundwater: Low

Air: Low

Structures: Low

Drainage Systems: Low

**Potential Migration Pathways:**

Surface Soil: Low

Subsurface Soil: Low

Surface Water: Low

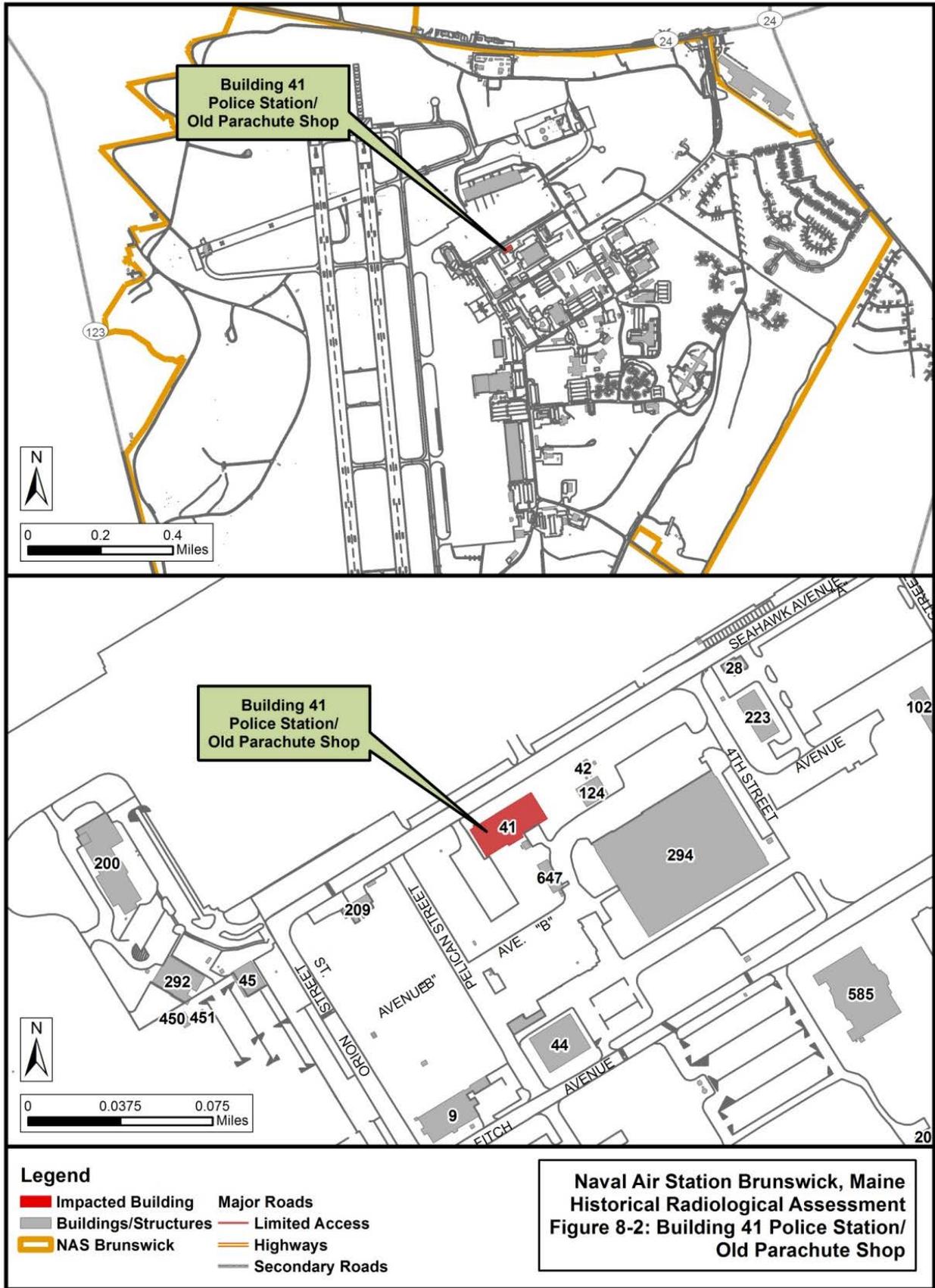
Groundwater: Low

Air: Low

Structures: Low

Drainage Systems: Low

**Recommended Actions:** Conduct scoping surveys of the building.



### 8.2.3 Incinerator



**Site Description:** The Incinerator Building (Building 31) was built in 1943 and ceased operations in 1953 ([HRA-0319](#)). The square footage is unknown and the building was demolished sometime after 1983 ([HRA-0518](#)). The building number was re-used for the new the Navy Lodge, which is not impacted. The area where the original building once stood is now vacant. No historical floor plans were available for this building.

**Former Radiological Uses:** The incinerator was used prior to the station's deactivation in 1946 through 1953 to incinerate solid hazardous waste for burial at adjacent dump sites IR Site 9) ([HRA-0004](#); [HRA-0319](#)). Site investigations have confirmed the presence of ash and there are ongoing efforts to further characterize and remediate the site. Institutional controls are currently in place to restrict excavation and groundwater use in the affected area.

**Current Uses:** Vacant Lot

**ROCs:** Ra-226.

**Previous Radiological Investigations:** None

**Contamination Potential:** Unknown

**Contaminated Media:**

Surface Soil: Low

Subsurface Soil: Low

Surface Water: Low

Groundwater: Low

Air: Low

Structures: None

Drainage Systems: None

**Potential Migration Pathways:**

Surface Soil: Low

Subsurface Soil: Low

Surface Water: Low

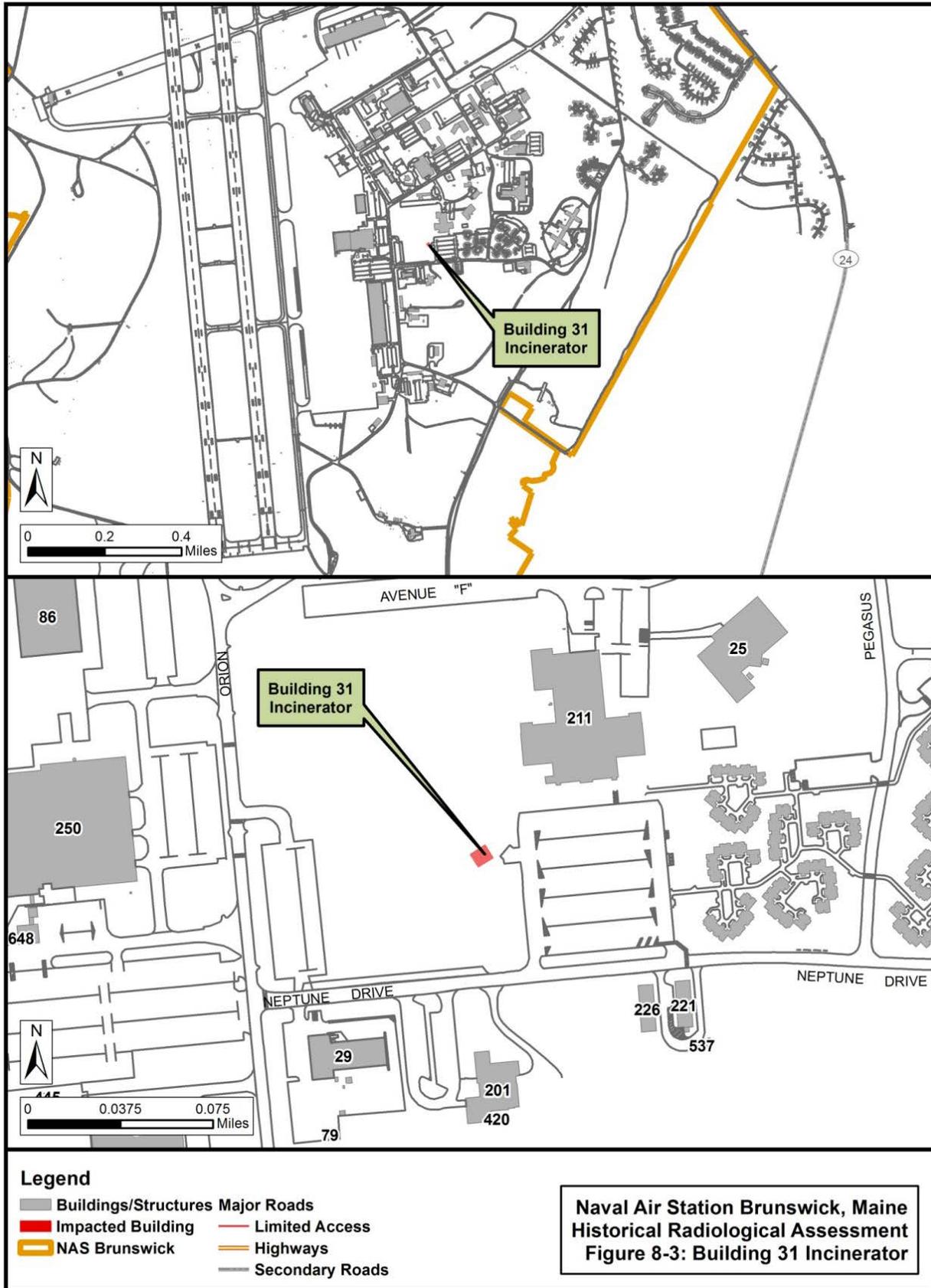
Groundwater: Low

Air: Low

Structures: None

Drainage Systems: None

**Recommended Actions:** Review (and revise as necessary) the Land Use Control Implementation Plan (LUCIP) to address radiological issues.



Note: Figure only shows the general area of the impacted area and does not define the actual boundaries.

#### 8.2.4 Control Tower and Operations Building



**Site Description:** A second air traffic control tower (Building 200) was built in 1952 to house Air Operations and replace the original Old Control Tower, which was just to the northwest. Building 200 was renovated with new paint flooring, and fixtures in 1985. The control tower and adjacent operations building combined total 22,409 ft<sup>2</sup>. A new tower and facility were built in 2005 and Air Operations and the station's air traffic control were moved from Building 200 to the new facility. The building was being used as a passenger terminal and weather office when the Station closed. Historical floor plans for this building were reviewed to determine the locations of operational activities within the building ([HRA-0435](#)).

**Former Radiological Uses:** The control tower may have contained radar equipment which was known to have contained radioluminescent parts until 1978 ([HRA-0191](#), and [HRA-0220](#)). In 1976, radiological surveys were performed during the removal of radioluminescent components from Ground Control Approach (GCA) systems at NAS Brunswick and these surveys confirmed that these components were in excess of transferable contamination limits ([HRA-0186](#)). In addition to the function of control tower, this facility was used to house air operations and the Ground Support Electronics Maintenance Shop (GSEM). GSEM performs maintenance and repair on station communications and on airfield navigational aid equipment (radar). Much of this equipment contains items suspected to contain radioactive material; some items are found in large quantity (e.g. radioluminescents, electron tubes, and

radar transmitters). Examples of radioactive materials potentially used in this building are electron tubes, self-illuminated gauges and dials, and equipment toggles and switches.

**Current Uses:** Vacant Building

**ROCs:** Co-60, Cs-137, and Ra-226

**Previous Radiological Investigations:** None

**Contamination Potential:** Unlikely

**Contaminated Media:**

Surface Soil: Low

Subsurface Soil: Low

Surface Water: Low

Groundwater: Low

Air: Low

Structures: Moderate

Drainage Systems: Low

**Potential Migration Pathways:**

Surface Soil: Low

Subsurface Soil: Low

Surface Water: Low

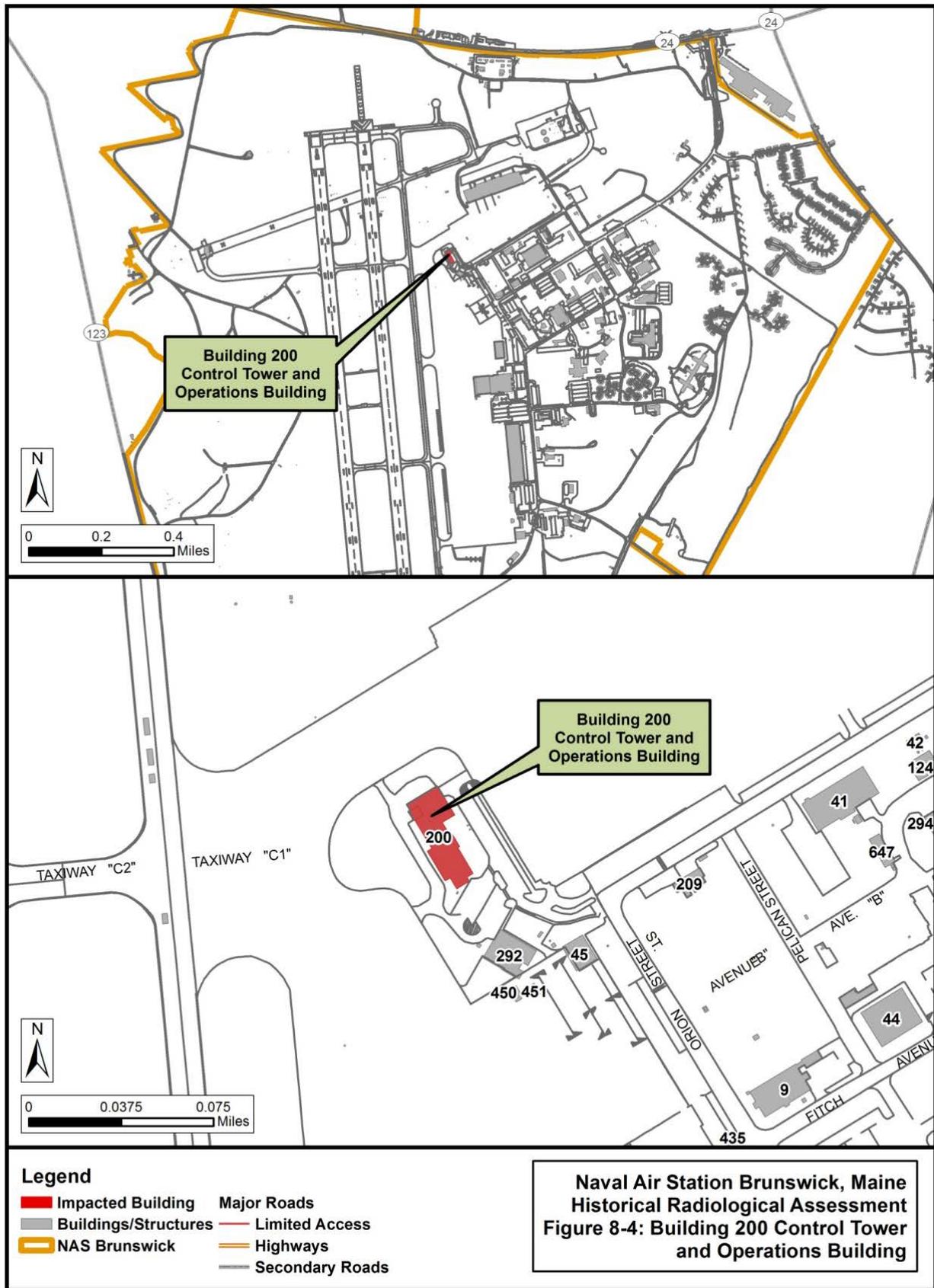
Groundwater: Low

Air: Low

Structures: Low

Drainage Systems: Low

**Recommended Actions:** Conduct scoping surveys of the building.



### 8.2.5 Aircraft Hangar 4 / AIMD Shop



**Site Description:** Hangar 4 (Building 250) is a steel structure on a concrete slab. Review of historical drawings indicates that the building was originally constructed in 1956. The hangar was originally connected to the Avionics Shop by an enclosed hallway ([HRA-0091](#)). Additions, including a second floor, were made to the building in 1985 and the entire structure was renamed Building 250 ([HRA-0091](#)). The Avionics Shop became the Aircraft Intermediate Maintenance Department (AIMD) around 1974, which was the central location for heavy electronics repair and maintenance of avionics component boxes from P-3 Orion aircraft. This facility also housed the parachute shop and welding/fabrication shops. When the parachute shop moved into Building 250 in 1973, Ra-226 compasses and Ra-226/Sr-90 personnel markers were no longer in use. The building remains undisturbed and was in use until closure of the Station. This facility is approximately 184,400 ft<sup>2</sup> in area, with approximately half of the area being the hangar deck and half being the AIMD building. Historical floor plans for this building were reviewed to determine the locations of operational activities within the building ([HRA-0436](#)).

**Former Radiological Uses:** From 1956 to 2011, Hangar 4 housed P-2 Neptune and P-3 Orion aircraft, squadron work areas, instrumentation, electronics and maintenance work shops, ordnance shops, and the welding and fabrication shops. Many aircraft components contain radioactive materials ([HRA-0175](#), [HRA-0179](#), [HRA-0311](#) and [HRA-0410](#)). ASW aircraft were also housed in this hangar ([HRA-0310](#)). Additionally, it was a common practice in the 1960s for personnel to dispose of liquid generated from work on radioluminescent devices into the domestic sewer system ([HRA-0084](#)). Examples of radioactive materials potentially used in this

building would be instrumentation panels, radar equipment, aircraft lighting, electronics, engine exciters, thoriated tungsten welding rods, and DU counterweights.

**Current Uses:** Vacant Building

**ROCs:** Co-60, Cs-137, H-3, Ra-226, Sr-90, Th-232, and U-238

**Previous Radiological Investigations:** None

**Contamination Potential:** Unknown

**Contaminated Media:**

Surface Soil: Low

Subsurface Soil: Low

Surface Water: Low

Groundwater: Low

Air: Low

Structures: Low

Drainage Systems: Low

**Potential Migration Pathways:**

Surface Soil: Low

Subsurface Soil: Low

Surface Water: Low

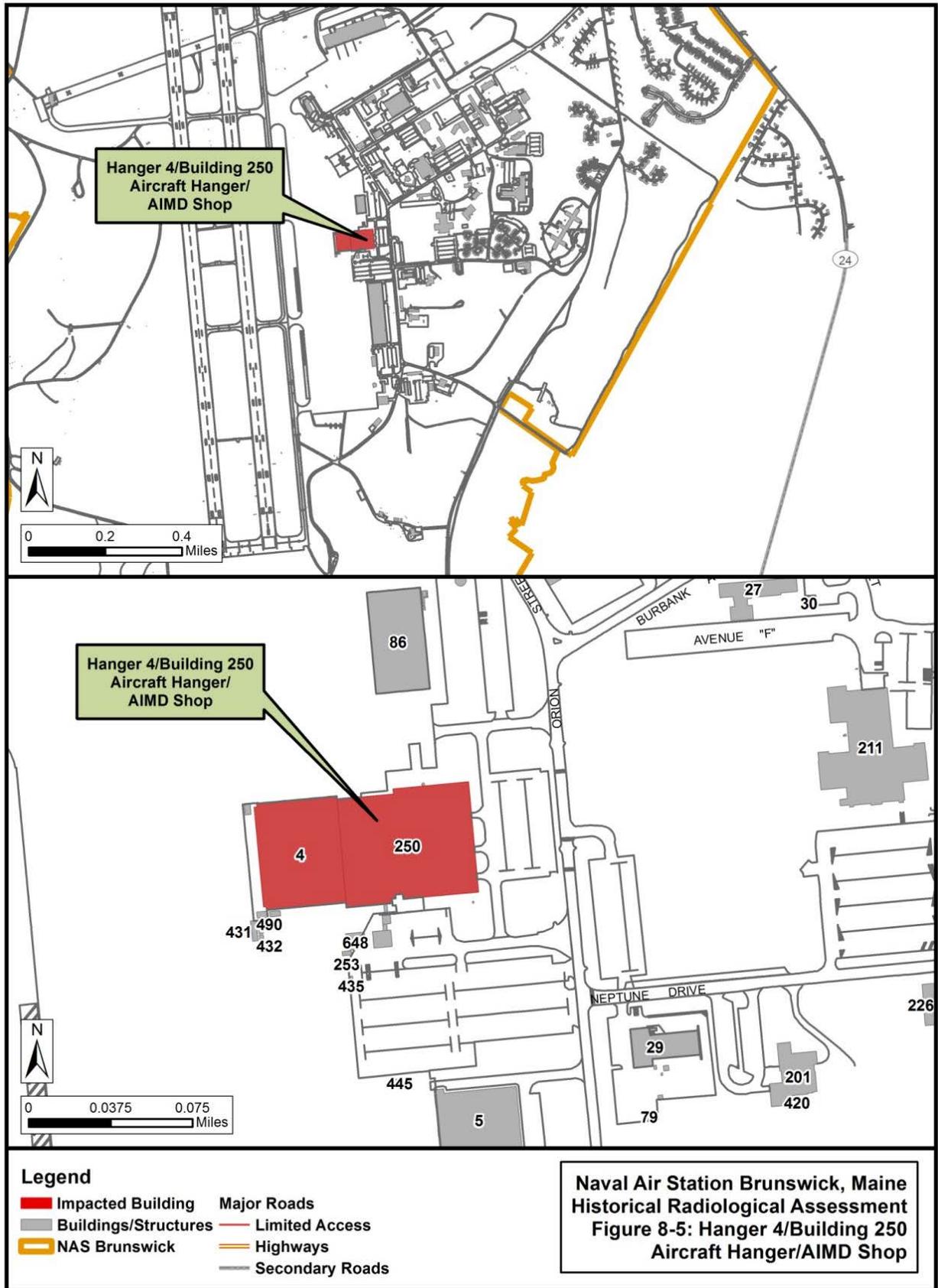
Groundwater: Low

Air: Low

Structures: Low

Drainage Systems: Low

**Recommended Actions:** Conduct scoping surveys of the hangar, shops, and drains.



### 8.2.6 Explosives Administration and Armory / AUW Shop



**Site Description:** Building 539 housed the Explosives Administration and Armory. The armory was originally built in 1958 and an addition was built in the 1960s that nearly doubled the building's size (HRA-0091). The square footage of the building is currently 10,311 ft<sup>2</sup> (HRA-0305). Historical floor plans for this building were reviewed to determine the locations of operational activities within the building (HRA-0437). Its use between 1958 and 1989 is unknown, but records indicate that it housed the AUW shop in 1989.

**Former Radiological Uses:** Because it is known that AUW shops were used for torpedo maintenance and overhaul, this AUW shop would have likely maintained and stored the weapons inventory for VP squadron missions and possibly housed AUW components. Because torpedoes and AUW components were likely present in this facility, there is a potential for radioactive material (HRA-0124).

**Current Uses:** Vacant Building

**ROCs:** H-3, Pu-239, and U-235

**Previous Radiological Investigations:** None

**Contamination Potential:** Unknown

**Contaminated Media:**

Surface Soil: Low

Subsurface Soil: Low

Surface Water: Low

Groundwater: Low

Air: Low

Structures: Low

Drainage Systems: Low

**Potential Migration Pathways:**

Surface Soil: Low

Subsurface Soil: Low

Surface Water: Low

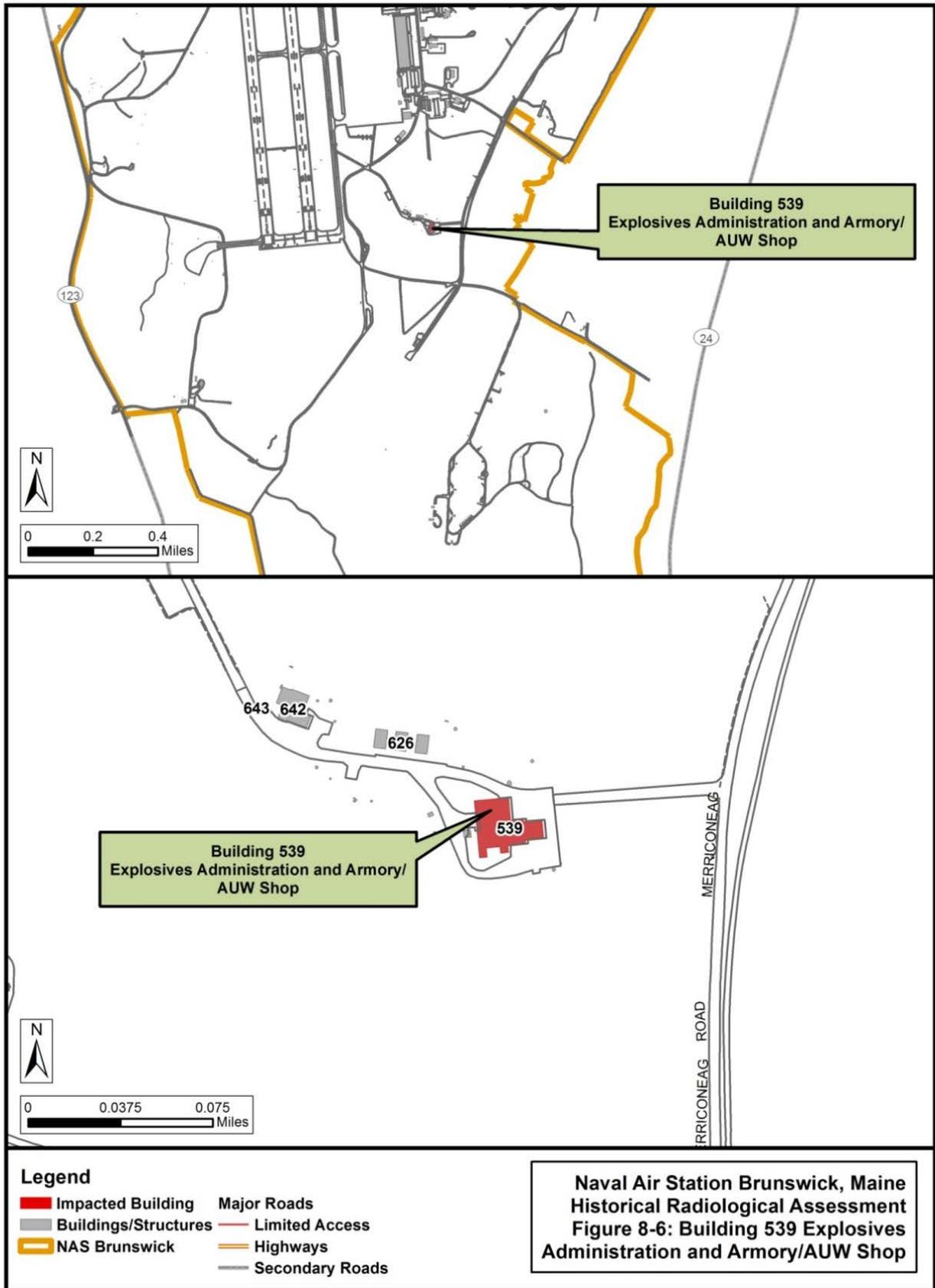
Groundwater: Low

Air: Low

Structures: Low

Drainage Systems: Low

**Recommended Actions:** Conduct scoping surveys of the building.



### 8.2.7 Defense Reutilization and Marketing Office



**Site Description:** The DRMO Area consists of Building 584 (DRMO) and the adjacent DRMO yard. The DRMO yard was a paved, fenced enclosure that is approximately 84,000 ft<sup>2</sup> (HRA-0102). The DRMO coordinated sale or disposal for the Navy's hazardous waste and surplus materials. IR Sites 4 and 13 are located in the area occupied by this operation. IR Site 13 encompasses the majority of the DRMO building, the DRMO yard, the Public Works Buildings, and a regularly used storage and equipment lay-down area, which was located in a small clearing south of the paved DRMO yard. IR Site 4 is adjacent to DRMO enclosure on the north and was investigated due to the presence of an acid/caustic pit that was used between 1969 and 1974 (HRA-0102; HRA-0406). Building 584 was built in 1965 within the current IR Site 13 and was added onto in approximately 1975 (HRA-0305; HRA-0406). The square footage of the building is 7,200 ft<sup>2</sup> (HRA-0305). Historical floor plans for this building were reviewed to determine the locations of operational activities within the building (HRA-0438). The eastern portion of the building was built on top of the acid/caustic pit, now located within IR Site 4, so the building today is contained in both IR Sites 4 and 13 (HRA-0155; HRA-0102). IR Site 13 also contains

the area where three underground storage tanks were previously located ([HRA-0102](#)). These tanks were installed in the early 1970s for storage of waste oil, solvents, and diesel, and were removed in the 1980s ([HRA-0102](#)). No soil was excavated when the USTs were removed ([HRA-0102](#)). A site investigation concluded there was no significant risk from the contaminants stored here, and in 1998, a Record of Decision was signed for IR Site 13 recommending No Further Action (NFA) for hazardous material ([HRA-0102](#)). IR Site 4 contained the acid/caustic pit where liquid wastes were disposed by pouring them straight into a 4-foot-square by 3-foot-deep pit between the years 1969 and 1974 ([HRA-0406](#)). An investigation ensued, but the pit could not be directly sampled because of the presence of the 1974 addition to Building 584 ([HRA-0406](#)). A Record of Decision was signed in 1998 stating that no further source control action was necessary, but designated a contingent action if Building 584 is removed ([HRA-0102](#)).

**Former Radiological Uses:** The DRMO Area (Building 584 and laydown yard area) has been in use since around 1965 for storage of equipment to be surplus by the Navy. Because commodities that contained radioactive materials may have been turned into DRMO, the site is considered a potential for radiological impact.

**Current Uses:** Vacant Buildings and Yard

**ROCs:** Co-60, Cs-137, H-3, Ra-226, Sr-90, Th-232, U-238

**Previous Radiological Investigations:** None

**Contamination Potential:** Unknown

**Contaminated Media:**

Surface Soil: Low

Subsurface Soil: Low

Surface Water: Low

Groundwater: Low

Air: Low

Structures: Low

Drainage Systems: Low

**Potential Migration Pathways:**

Surface Soil: Low

Subsurface Soil: Low

Surface Water: Low

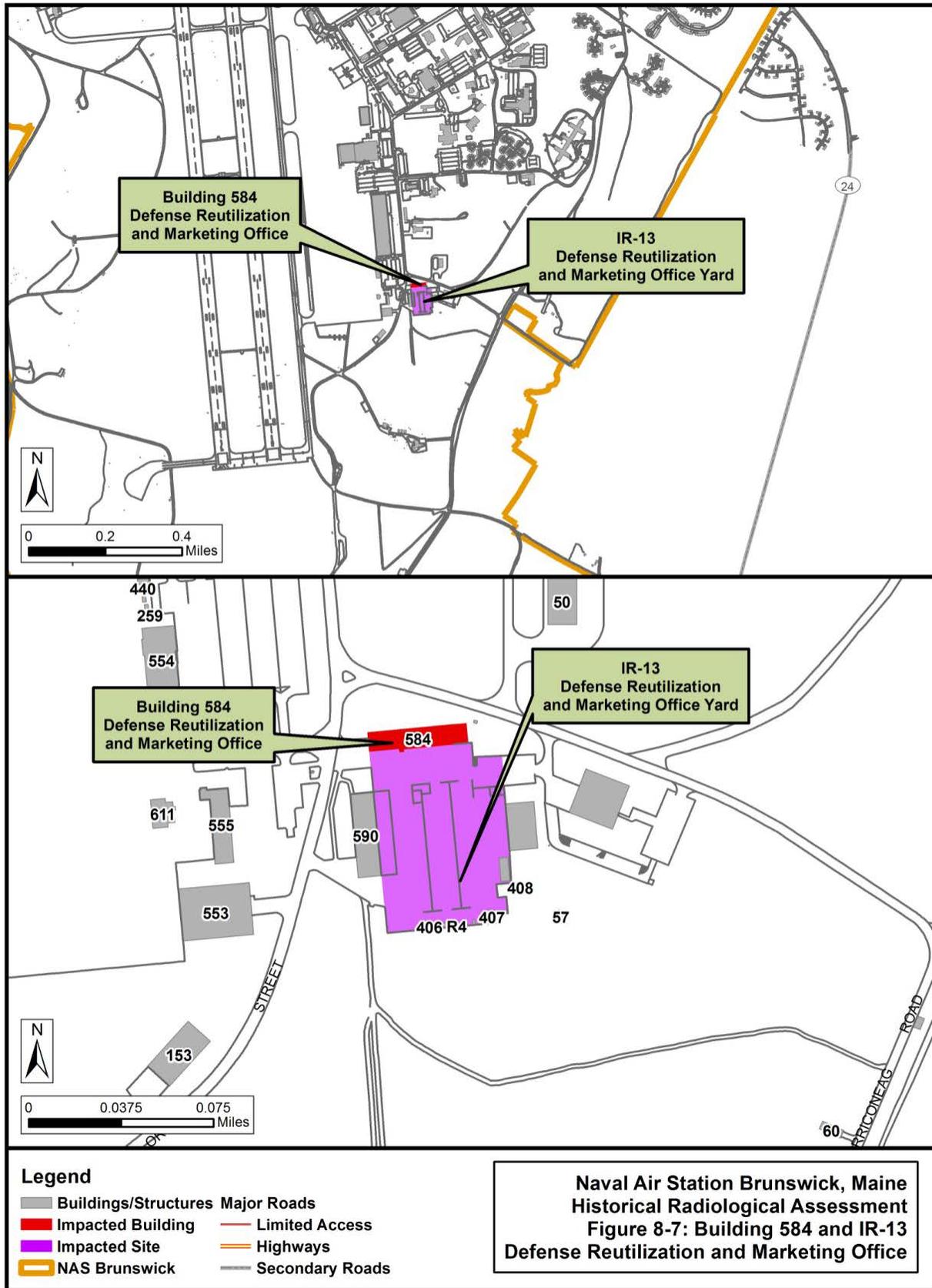
Groundwater: Low

Air: Low

Structures: Low

Drainage Systems: Low

**Recommended Actions:** Conduct scoping surveys of the building and surrounding paved area.



Note: Figure only shows the general area of the impacted area and does not define the actual boundaries.

### 8.2.8 Weapons Magazine 543



**Site Description:** Building 543 is a 1,232-square-foot weapons magazine that was built in 1958 ([HRA-0089](#)). Although the building did not show up on maps until 1983, dated documents show that the structure was used as an AUW magazine in 1966 ([HRA-0403](#)). A 1957 drawing shows that this magazine was located in a high security area with guarded entry ([HRA-0321](#)). Later maps and lists show that the magazine was used for high explosive storage ([Appendix F](#)). No historical floor plans were available for this building.

**Former Radiological Uses:** The magazine has a history of use as an AUW facility and would likely have stored the weapons inventory for P-3 missions. Beginning in 1966, VP squadrons flew P-3 aircraft, which carried AUW weapons ([HRA-0128](#)).

**Current Uses:** Vacant Building

**ROCs:** H-3, Pu-239, and U-235

**Previous Radiological Investigations:** None

**Contamination Potential:** Unknown

**Contaminated Media:**

Surface Soil: Low

Subsurface Soil: Low

Surface Water: Low

Groundwater: Low

Air: Low

Structures: Low

Drainage Systems: Low

**Potential Migration Pathways:**

Surface Soil: Low

Subsurface Soil: Low

Surface Water: Low

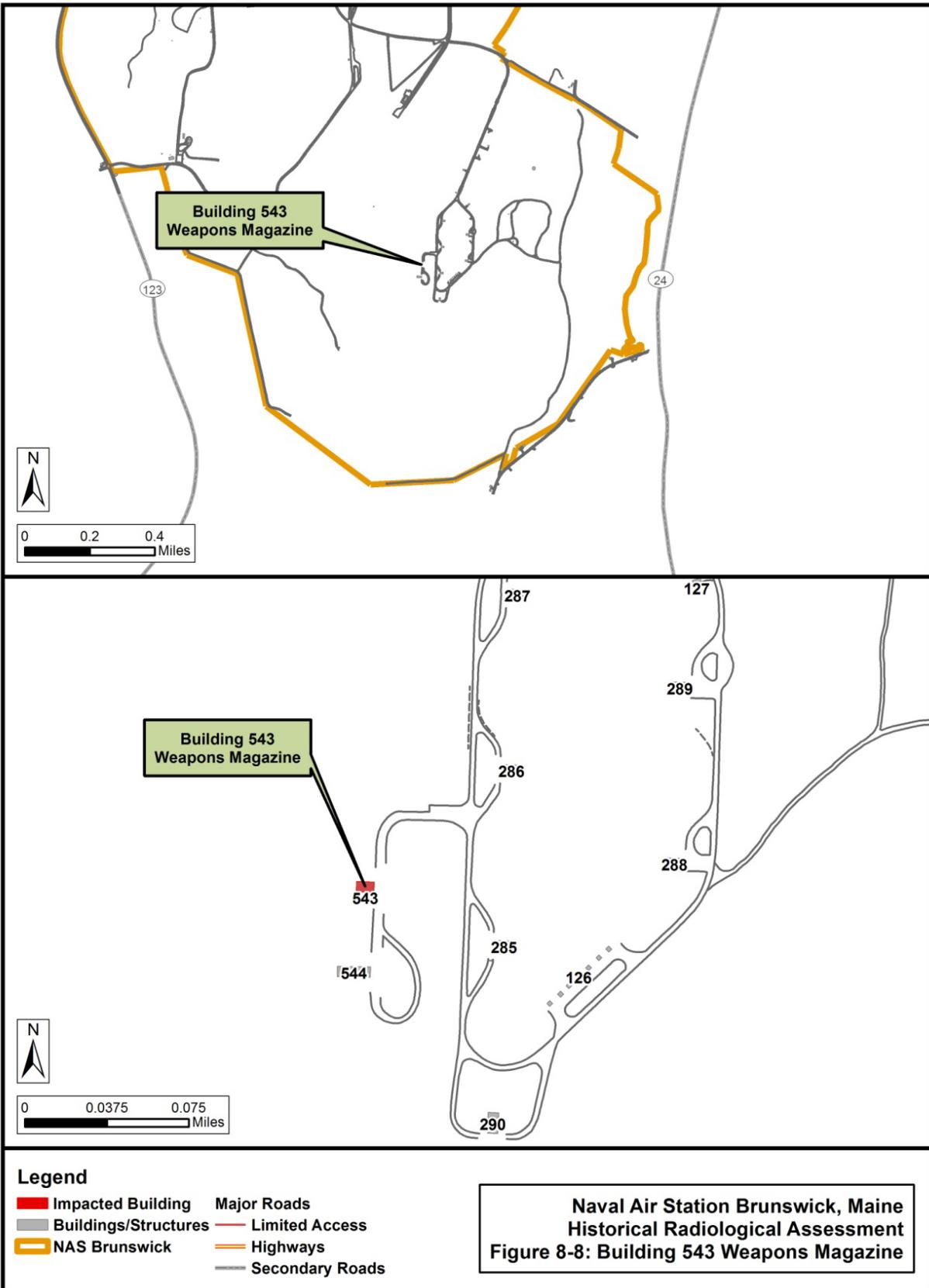
Groundwater: Low

Air: Low

Structures: Low

Drainage Systems: Low

**Recommended Actions:** Conduct scoping surveys of the building.



### 8.2.9 Weapons Magazine 544



**Site Description:** Building 544 is a 2,252-square-foot weapons magazine that was built in 1958 ([HRA-0089](#)). Although the structure did not show up on maps until 1983, dated documents show that the building was used as an AUW magazine in 1966 ([HRA-0403](#)). A 1957 drawing shows that this magazine was located in a high security area with guarded entry ([HRA-0321](#)). Later maps and lists show that the magazine was used for high explosive storage ([Appendix F](#)). No historical floor plans were available for this building.

**Former Radiological Uses:** The structure has a history of use as an AUW facility and would likely have stored the weapons inventory for P-3 missions. Beginning in 1966, VP squadrons flew P-3 aircraft which carried AUW weapons ([HRA-0128](#)).

**Current Uses:** Vacant Magazine

**ROCs:** H-3, Pu-239, and U-235

**Previous Radiological Investigations:** None

**Contamination Potential:** Unknown

**Contaminated Media:**

Surface Soil: Low

Subsurface Soil: Low

Surface Water: Low

Groundwater: Low

Air: Low

Structures: Low

Drainage Systems: Low

**Potential Migration Pathways:**

Surface Soil: Low

Subsurface Soil: Low

Surface Water: Low

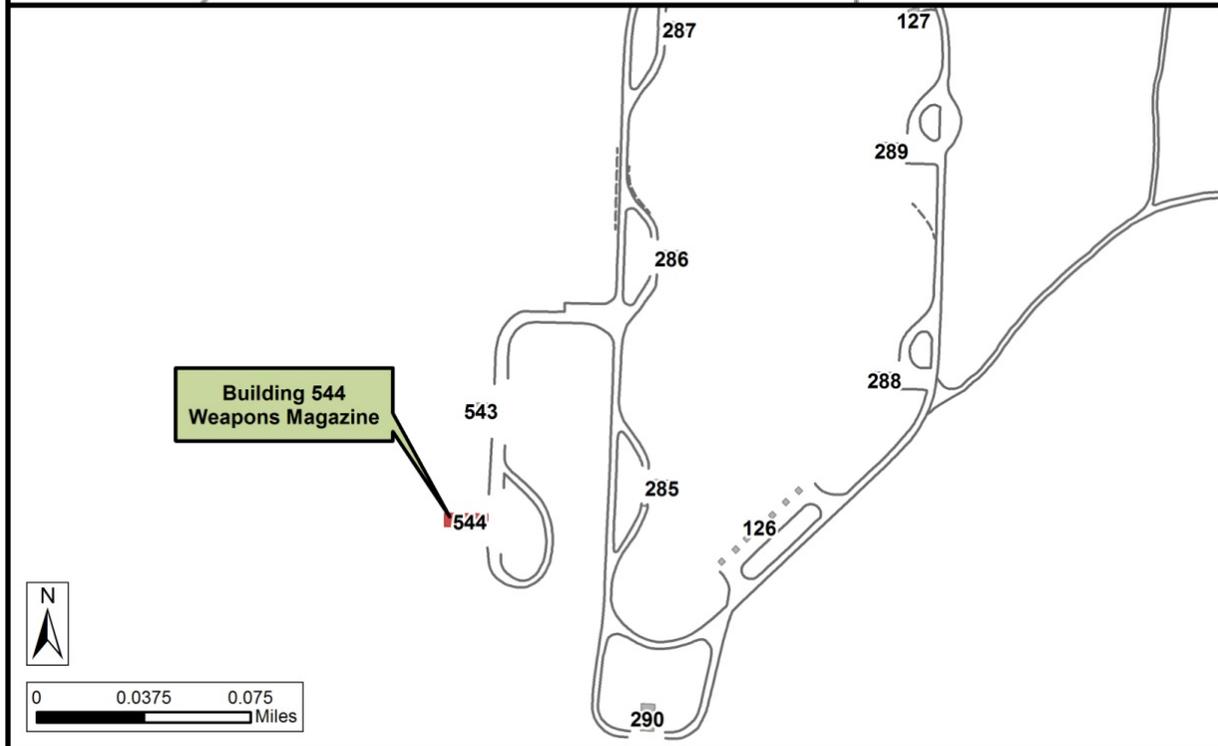
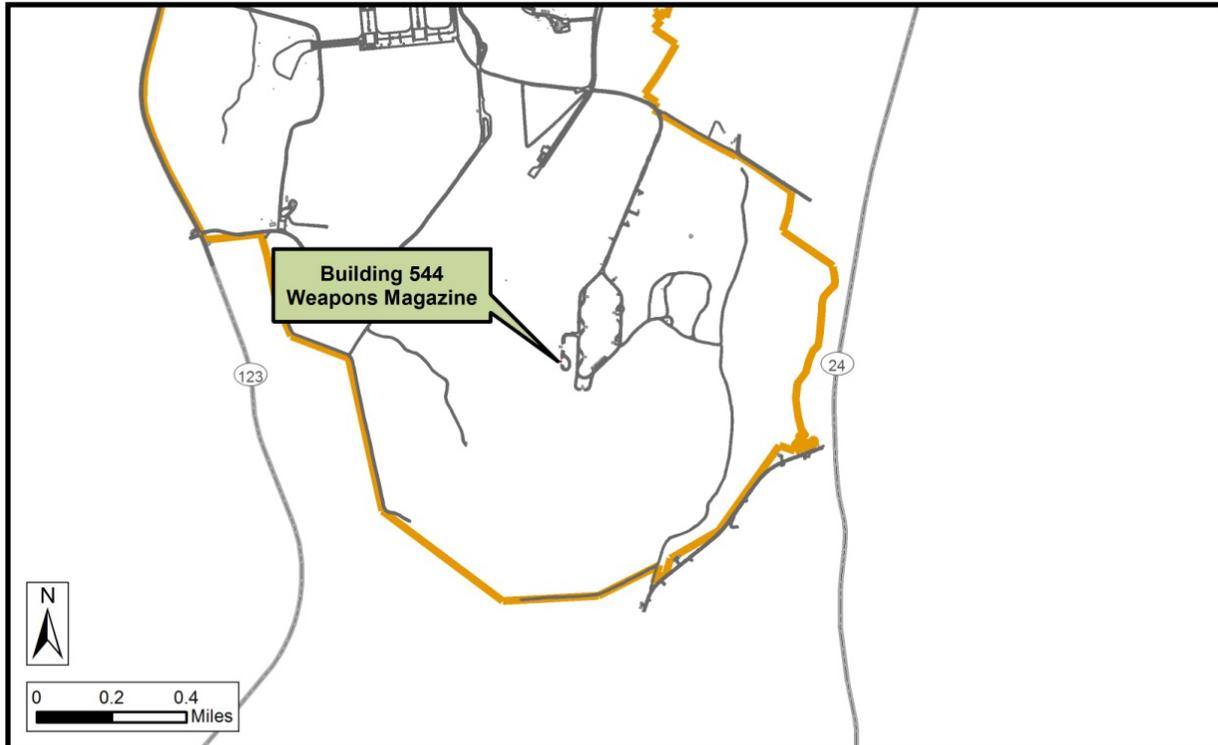
Groundwater: Low

Air: Low

Structures: Low

Drainage Systems: Low

**Recommended Actions:** Conduct scoping surveys of the building.



**Legend**

- Impacted Building
- Buildings/Structures
- NAS Brunswick
- Major Roads
- Limited Access
- Highways
- Secondary Roads

Naval Air Station Brunswick, Maine  
 Historical Radiological Assessment  
 Figure 8-9: Building 544 Weapons Magazine

### 8.2.10 Inert Ordnance Storage / Weapons Magazines



**Site Description:** This structure was built in 1973 and houses three 3,198-square-foot weapons magazines ([HRA-0091](#)). These magazines have been designated at different times as 626, 627, and 628, and as 626A, 626B, and 626C. The magazines were constructed in the AUW compound in 1973 near the AUW shop and were initially used as AUW magazines ([Appendix F](#)). Magazine 626/626A was later used for inert ordnance storage and 628/626C was used by the Naval Reserve Cold Weather Mobile Construction Battalion (NMCB-27), also known as the SkiBees beginning in 2006 ([Appendix F](#)). No historical floor plans were available for this building.

**Former Radiological Uses:** The entire structure has a history of use as an AUW facility and would likely have stored the weapons inventory for P-3 missions. Beginning in 1966, VP squadrons flew P-3 aircraft which carried AUW weapons ([HRA-0128](#)). This building possibly housed AUW ordnance, including torpedoes ([HRA-0124](#)).

**Current Uses:** Vacant Magazine

**ROCs:** H-3, Pu-239, and U-235

**Previous Radiological Investigations:** None

**Contamination Potential:** Unknown

**Contaminated Media:**

Surface Soil: Low

Subsurface Soil: Low

Surface Water: Low

Groundwater: Low

Air: Low

Structures: Low

Drainage Systems: Low

**Potential Migration Pathways:**

Surface Soil: Low

Subsurface Soil: Low

Surface Water: Low

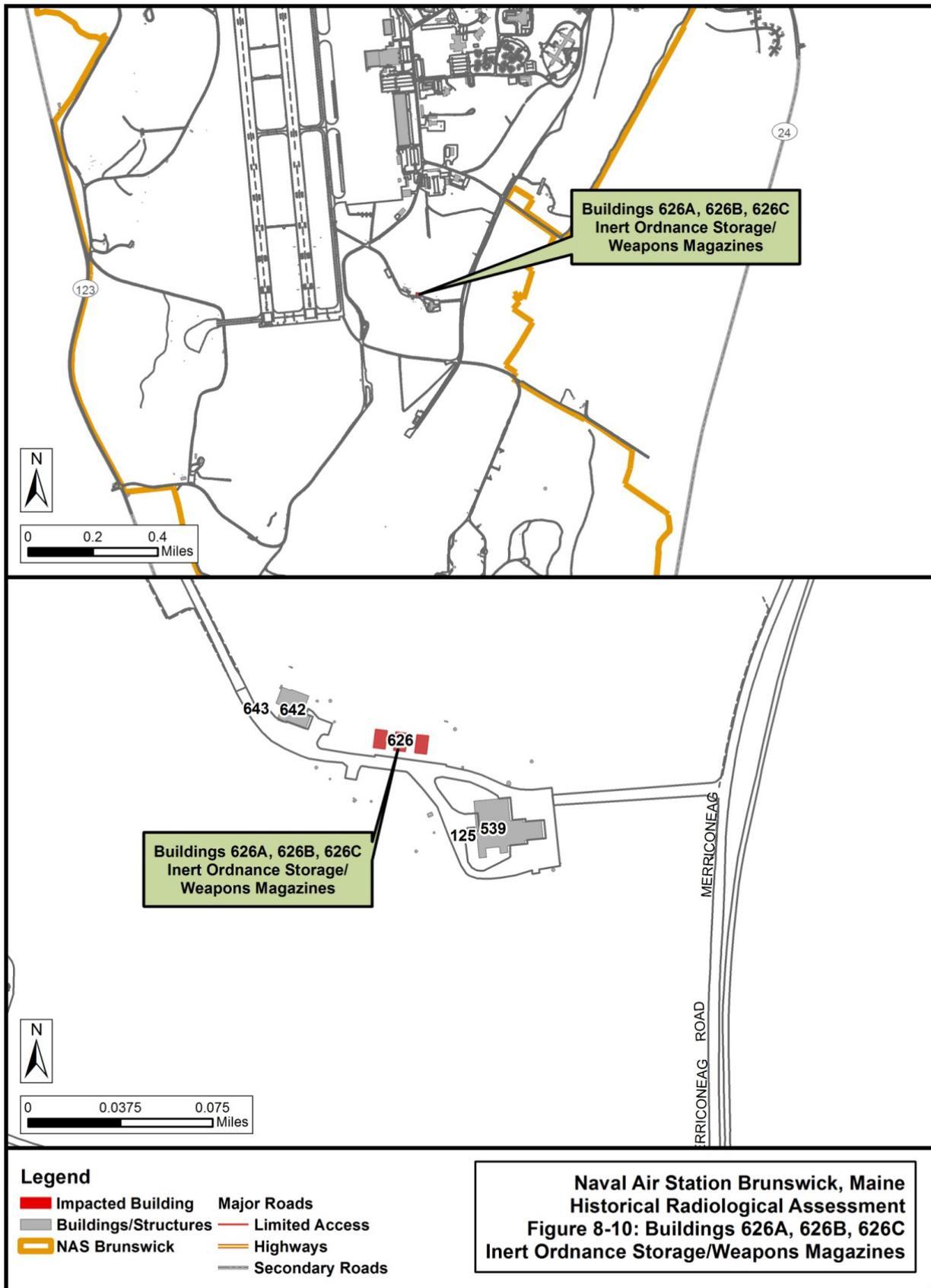
Groundwater: Low

Air: Low

Structures: Low

Drainage Systems: Low

**Recommended Actions:** Conduct scoping surveys of the building.



### 8.2.11 Quarry Area of Concern



Note: Aerial photo only shows the general area of the impacted area and does not define the actual boundaries.

**Site Description:** The Quarry Area of Concern is located southwest of the runways at the NAS Brunswick western boundary, adjacent to Maine State Route 123. There are no structures located in the Quarry. The approximately four acre area was used as a rock quarry in the 1940s and 1950s. In support of a the Site Investigation, a significant amount of debris, including partially buried scrap metal, tires, and concrete, was observed during site reconnaissance (2007-2010), especially along the rock face at the eastern end of the Quarry. Additionally, geophysical surveys found numerous subsurface anomalies that were consistent with suspicions that dumping/disposal activities may have taken place in the area ([HRA-0296](#)). A 1999 survey states that a quarry on the southwest side of the site was used by the Navy as a dump ([HRA-0091](#)). This site is also an active UXO (unexploded ordnance) area that is being cleared.

**Former Radiological Uses:** It is suspected that this area was used as a dumpsite. Because the type and years of use of the potential dumpsite are unknown, there is a possibility that radiologically contaminated debris, radioluminescent devices, and electronics containing radioisotopes could have been disposed at this site. Additionally, there were procedures in place as early as 1942 for radioluminescent items to be buried in remote areas ([HRA-0146](#)). No debris or soils have been removed from the site and no radiological characterization has been performed.

**Current Uses:** Vacant Lot

**ROCs:** Cs-137, Ra-226, Sr-90, and U-238

**Previous Radiological Investigations:** None

**Contamination Potential:** Unknown

**Contaminated Media:**

Surface Soil: Low

Subsurface Soil: Low

Surface Water: Low

Groundwater: Low

Air: Low

Structures: Not applicable

Drainage Systems: Not applicable

**Potential Migration Pathways:**

Surface Soil: Low

Subsurface Soil: Low

Surface Water: Low

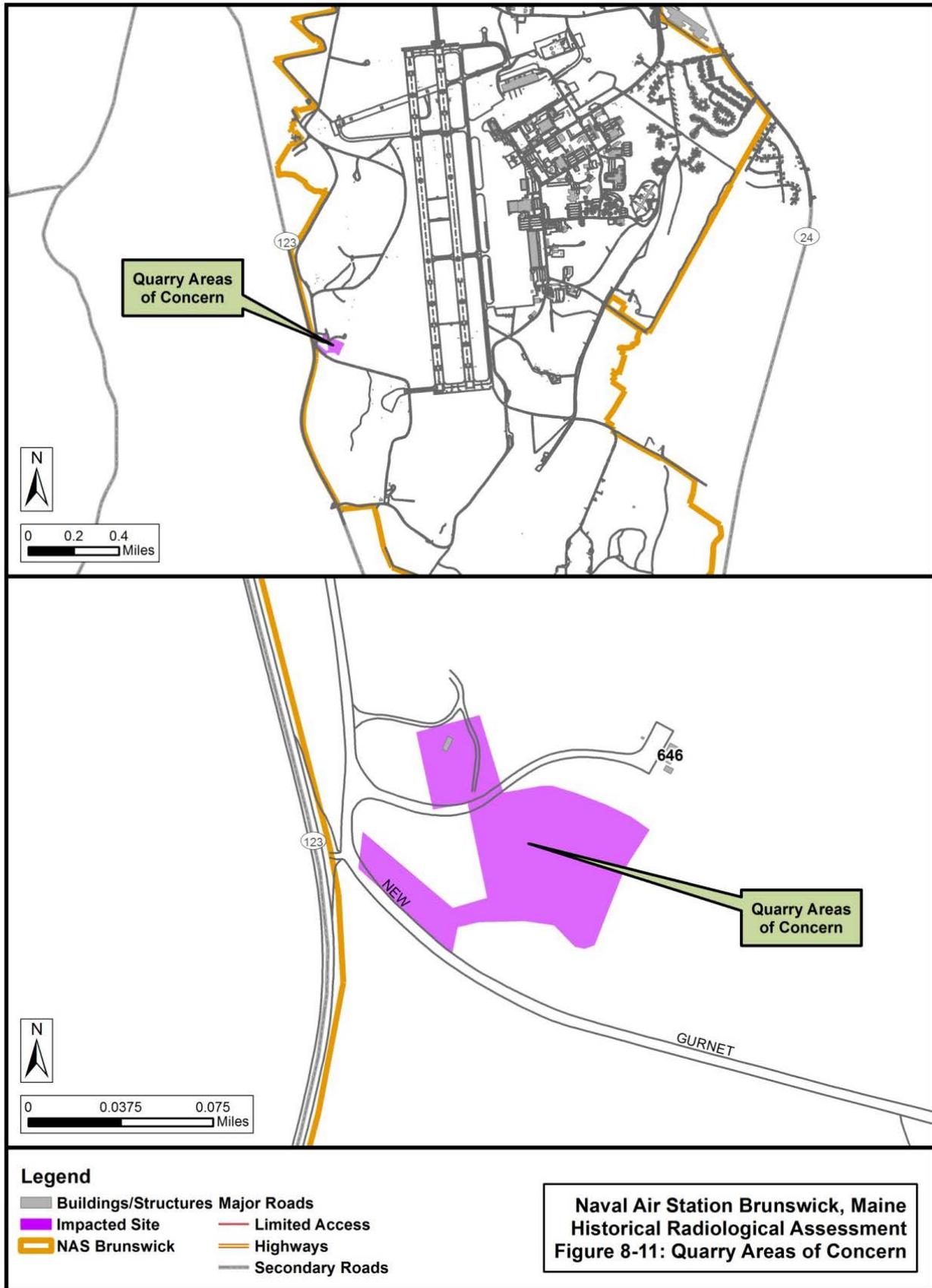
Groundwater: Low

Air: Low

Structures: Not applicable

Drainage Systems: Not applicable

**Recommended Actions:** Conduct scoping surveys of the area.



Note: Figure only shows the general area of the impacted area and does not define the actual boundaries.

### 8.2.12 IR Site 2 /Orion Street Landfill (South)



Note: Aerial photo only shows the general area of the impacted area and does not define the actual boundaries.

**Site Description:** The Orion Street Landfill (South) (IR Site 2) is located in the vicinity of the southern extent of the main runways within the former Weapons Compound Area. It was used as the station's primary landfill for domestic waste, hazardous materials, aircraft parts, and construction debris during the years of station operations between 1945 and 1955 (approximately 5 years due to deactivation and reactivation). Reportedly, wastes were incinerated on site and buried in a two-acre pit (formerly a borrow pit). Only a concrete pad remains were the incinerator once stood. The site is approximately three acres in area. In 1999, the surface debris was removed; the depression backfilled with clean fill; and a soil cap was installed. There are monitoring wells, signs, and fencing in place ([HRA-0102](#)).

**Former Radiological Uses:** As stated above, this site was used as the station's primary landfill between the years 1945 and 1955. Because it is unknown exactly what types of debris were disposed of in this area, it is possible that radiologically contaminated debris and radioluminescent devices could have been disposed at this site. Additionally, there were procedures in place as early as 1942 for radioluminescent items to be buried in remote areas ([HRA-0146](#)). Although surface debris and some soil have been removed, radioactive materials could still be present due to the lack of radiological characterization during site investigations and remediation.

**Current Uses:** Vacant Lot

**ROCs:** Ra-226

**Previous Radiological Investigations:** None

**Contamination Potential:** Unknown

**Contaminated Media:**

Surface Soil: Low

Subsurface Soil: Low

Surface Water: Low

Groundwater: Low

Air: Low

Structures: Not applicable

Drainage Systems: Not applicable

**Potential Migration Pathways:**

Surface Soil: Low

Subsurface Soil: Low

Surface Water: Low

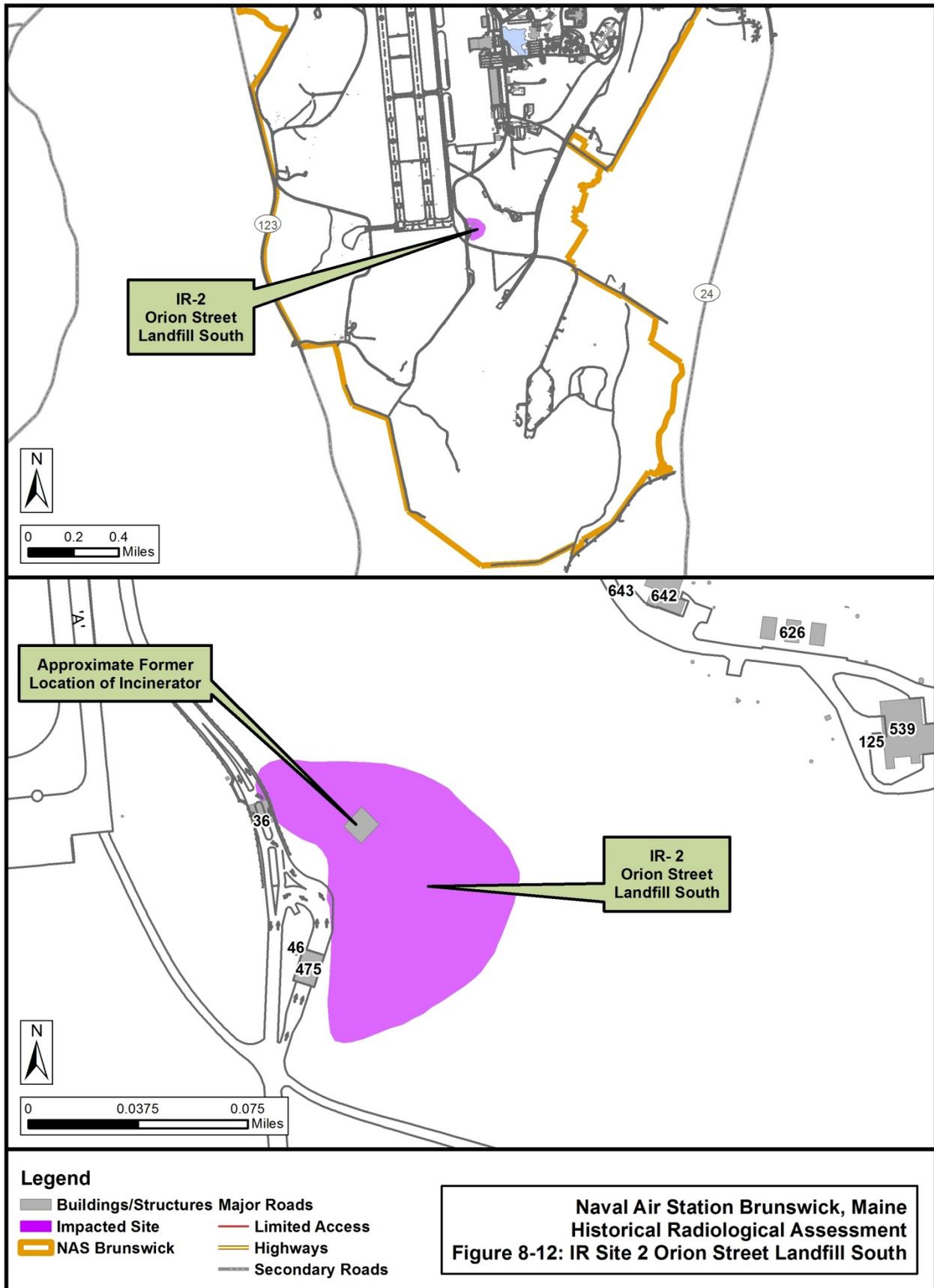
Groundwater: Low

Air: Low

Structures: Not applicable

Drainage Systems: Not applicable

**Recommended Actions:** Review (and revise as necessary) the Land Use Control Implementation Plan (LUCIP) to address radiological issues.



Note: Figure only shows the general area of the impacted area and does not define the actual boundaries.

### 8.2.13 IR Sites 1 and 3 Hazardous Waste Burial Area



Note: Aerial photo only shows the general area of the impacted area and does not define the actual boundaries.

**Site Description:** The Hazardous Waste Burial Area (IR Sites 1 and 3) is located immediately north of Building 642. IR Sites 1 and 3 were combined for remediation due to their proximity. The resulting area is approximately 10 acres and is estimated to contain 300,000 yd<sup>3</sup> of waste. IR Site 1 is an inactive landfill that operated two 20-foot-deep unlined trenches between 1955 and 1975. Site 3 operated between 1960 and 1973 with a historical use similar to IR Site 1. Domestic waste and hazardous materials were disposed of in these sites, including aircraft parts and construction debris. In 1995, the site was capped and groundwater treatment/recovery systems were installed (slurry wall, filtration, oxidation, etc.). Waste materials (demolition debris and rubble) from IR Sites 5, 6 and 8 were transferred to this site for use as sub-grade material for the low-permeability cap. ([HRA-0102](#); [HRA-0317](#))

**Former Radiological Uses:** As stated above, this area was used as the station's primary landfill between 1955 and 1975 for IR Site 1, and 1960 and 1973 for IR Site 3. Aircraft parts were disposed of in the North Orion Street Landfill part of this area, but it is unknown exactly what other type of debris were disposed of at this site and there is a possibility that radiologically contaminated debris, radioluminescent devices, and electronics containing radioisotopes could have been disposed in this area. Radioactive material was historically handled by hazardous waste groups in the military and it is possible that radiologically impacted items were mixed with

hazardous waste for disposal in this area. No debris or soils have been removed from the site and no radiological characterization has been performed, so there is the potential at this site for disposal of any radionuclides that were utilized at NAS Brunswick.

**Current Uses:** Vacant Lot

**ROCs:** Co-60, Cs-137, H-3, Ra-226, Sr-90, Th-232, and U-238

**Previous Radiological Investigations:** None

**Contamination Potential:** Unknown

**Contaminated Media:**

Surface Soil: Low

Subsurface Soil: Low

Surface Water: Low

Groundwater: Low

Air: Low

Structures: Not applicable

Drainage Systems: Not applicable

**Potential Migration Pathways:**

Surface Soil: Low

Subsurface Soil: Low

Surface Water: Low

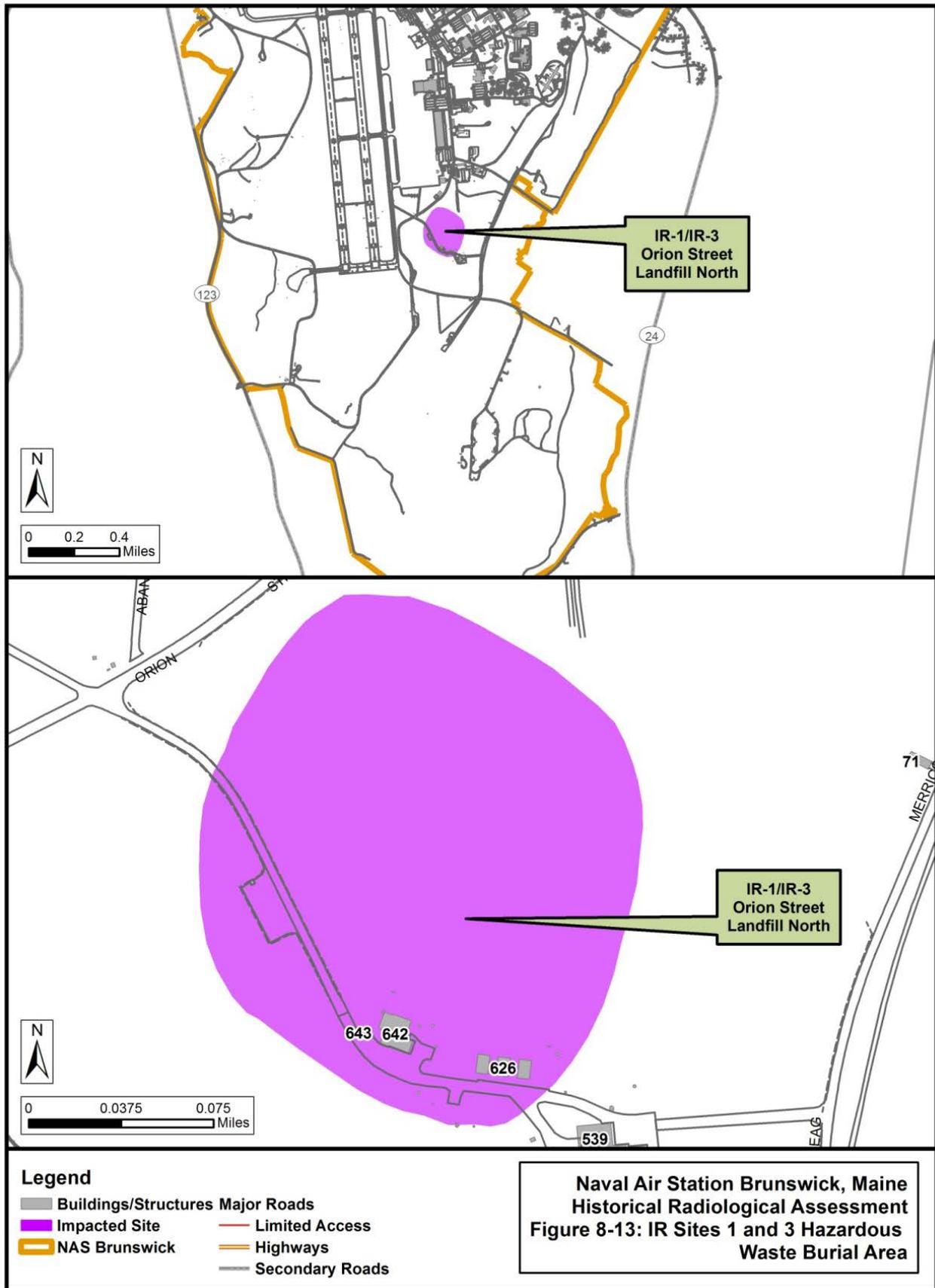
Groundwater: Low

Air: Low

Structures: Not applicable

Drainage Systems: Not applicable

**Recommended Actions:** Review (and revise as necessary) the Land Use Control Implementation Plan (LUCIP) to address radiological issues.



Note: Figure only shows the general area of the impacted area and does not define the actual boundaries.

#### 8.2.14 IR Site 6 Sandy Road Rubble and Asbestos Disposal Site



Note: Aerial photo only shows the general area of the impacted area and does not define the actual boundaries.

**Site Description:** The Sandy Road Rubble and Asbestos Disposal Site (IR Site 6) is bordered by Sandy Road to the southeast and by a stream behind Building 516 to the north and is approximately 1 acre in size ([HRA-0514](#)). At this site, a small depression was reportedly used for general disposal of construction debris, aircraft parts, and other nonputrescible wastes until the late 1970s. Aerial photographs from 1953 and 1959 show a cleared, depressed area at the site, but it is unknown when disposal in this area began ([HRA-0515](#)). Material and debris, including asbestos materials, were at one time visible at the site surface. A 1993 Record of Decision (ROD) selected the remedial action of excavating and transporting material to IR Sites 1 and 3 for use as a subgrade material for a landfill cap that was already to be constructed ([HRA-0514](#); [HRA-0515](#)). A 1995 document states that approximately 8,800 cubic yards of construction debris and asbestos material would be excavated from Sites 5 and 6 ([HRA-0516](#)). Based on the 1993 Record of Decision (ROD), the area was to be sampled for non-radiological hazards, backfilled with clean fill, and revegetated after removal of the material, and no land-use restrictions, institutional controls, or five-year reviews would be required for IR Site 6. Records indicate that Site 6 remediation was performed in 1995 ([HRA-0517](#)).

**Former Radiological Uses:** As stated above, this area reportedly used for general disposal until the late 1970s. The depressed area of the site in the 1953 and 1959 aerial

photographs could have been new disposal areas, or natural depressions that were later used for disposal areas. Since this is unknown, there is a potential that disposal in this area began as early as 1953. It is known that aircraft parts, construction materials and other unknown materials were disposed of in this area, so there is a potential that material containing radioisotopes could also have been disposed in this area. Sampling for non-radiological hazards was performed prior to back fill. Qualitative radiological surveys were performed during excavation for personnel protection, but no radiological characterization of the excavated site was performed prior to backfill. Therefore, it is unknown if residual radioactive material still exists at this site.

**Current Uses:** Vacant Lot

**ROCs:** Co-60, Cs-137, H-3, Ra-226, Sr-90, Th-232, and U-238

**Previous Radiological Investigations:** None

**Contamination Potential:** Unlikely

**Contaminated Media:**

Surface Soil: Low

Subsurface Soil: Low

Surface Water: Low

Groundwater: Low

Air: Low

Structures: Not applicable

Drainage Systems: Not applicable

**Potential Migration Pathways:**

Surface Soil: Low

Subsurface Soil: Low

Surface Water: Low

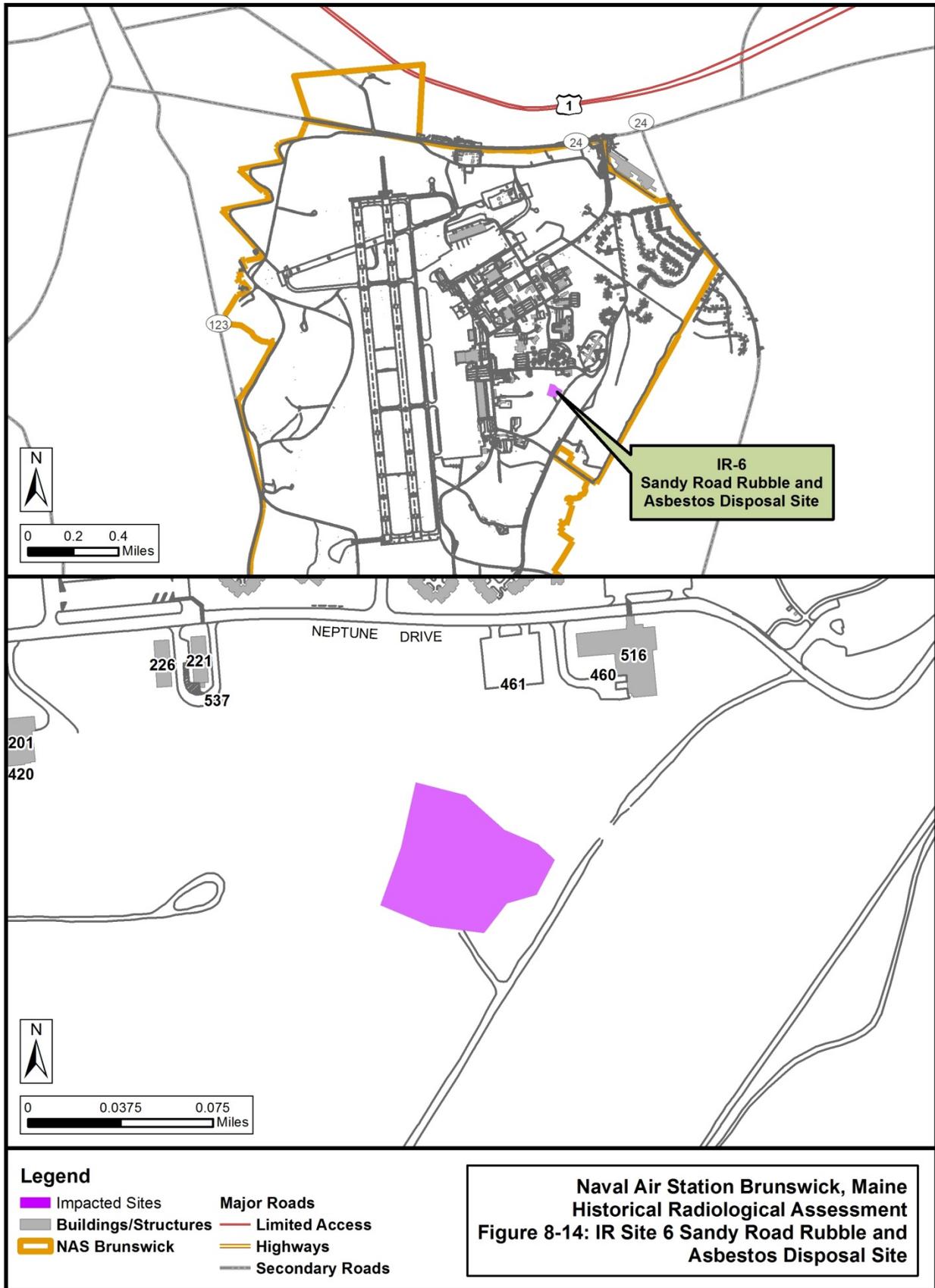
Groundwater: Low

Air: Low

Structures: Not applicable

Drainage Systems: Not applicable

**Recommended Actions:** Conduct scoping surveys of the area.



Note: Figure only shows the general area of the impacted area and does not define the actual boundaries.

### 8.2.15 IR Site 7 Old Acid/Caustic Pit



Note: Aerial photo only shows the general area of the impacted area and does not define the actual boundaries.

**Site Description:** The Old Acid/Caustic Pit Area (IR Site 7) is an approximately 1.4 acre flat open clearing located in the northeast portion of the installation (HRA-0319). The site was believed to have been used from 1952 to 1969 to dispose of non-radiological hazardous liquids, but the exact location of the pit is unknown (HRA-0319). During the period of pit operation, the site was also used by the DRMO Facility and aerial photography shows the area was also used as an outdoor storage area and equipment lay-down area (HRA-0319). A 1988 field investigation identified hazardous chemicals in the soil and metals in the groundwater and in 2000-2001, supplemental field investigations were performed (HRA-0407). In an April 2002 remedial action, approximately 400 yd<sup>3</sup> of soil were excavated from the area (HRA-0319). Approximately one-third of the soil was transported off-site for disposal, the remaining two-thirds was redistributed in six-inch layers on the site's ground surface over potentially contaminated soil (HRA-0319). A Record of Decision was signed in September 2002 mandating soil and groundwater restrictions, and long-term monitoring (HRA-0407).

**Former Radiological Uses:** This site was likely active between 1964 and 1974, when the pit area is believed to have been used, for storage of equipment and airplane components to be

surplused by the Navy, which could have been radiologically impacted. No characterization or remediation has been performed for radiological constituents.

**Current Uses:** Vacant Lot

**ROCs:** Co-60, Cs-137, H-3, Ra-226, Sr-90, Th-232, and U-238

**Previous Radiological Investigations:** None

**Contamination Potential:** Unknown

**Contaminated Media:**

Surface Soil: Low

Subsurface Soil: Low

Surface Water: Low

Groundwater: Low

Air: Low

Structures: Not applicable

Drainage Systems: Not applicable

**Potential Migration Pathways:**

Surface Soil: Low

Subsurface Soil: Low

Surface Water: Low

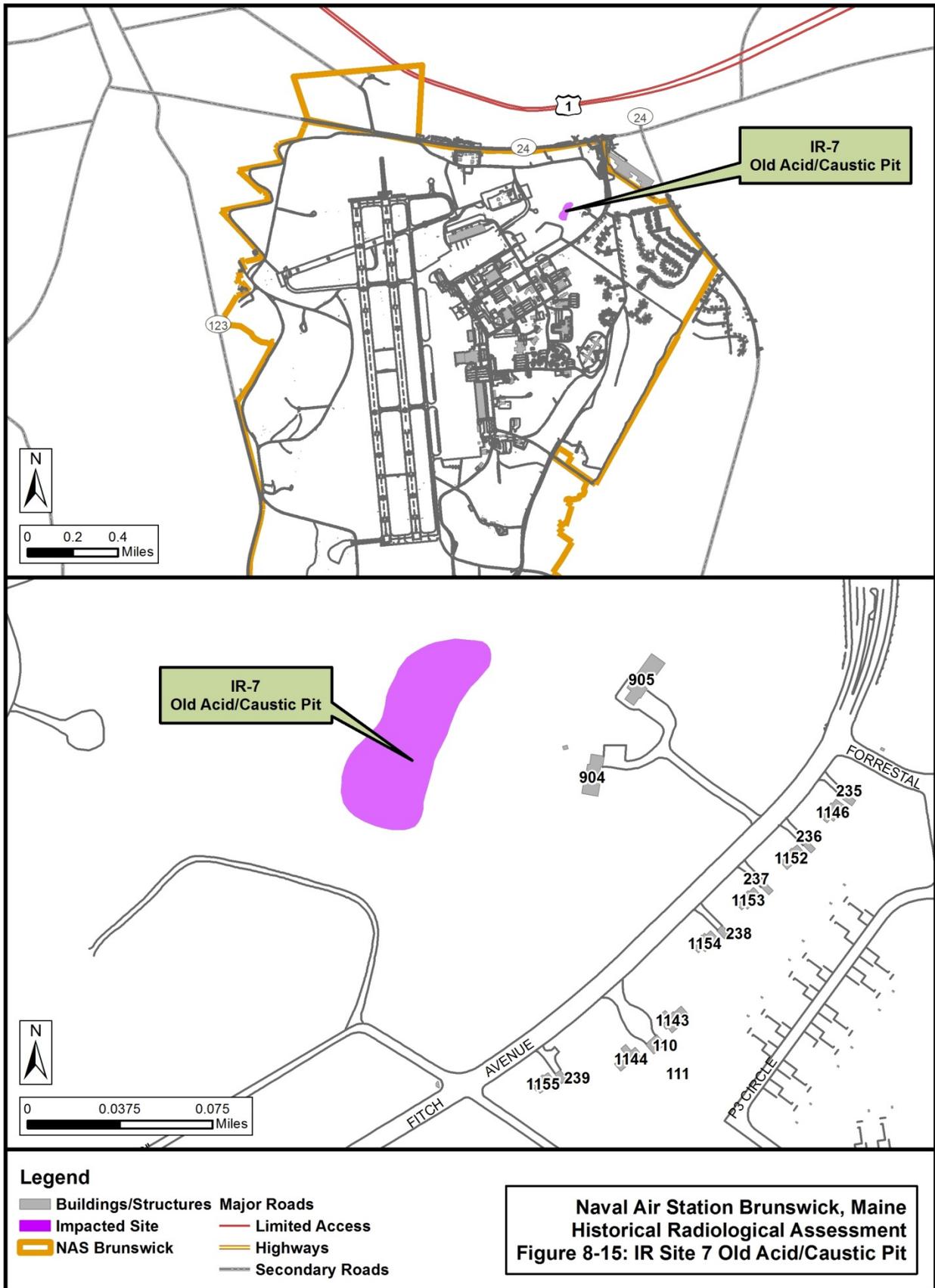
Groundwater: Low

Air: Low

Structures: Not applicable

Drainage Systems: Not applicable

**Recommended Actions:** Conduct scoping surveys of the area.



### 8.2.16 IR Site 8 Perimeter Road Landfill



Note: Aerial photo only shows the general area of the impacted area and does not define the actual boundaries.

**Site Description:** The Perimeter Road Disposal Site (IR Site 8) is located along the northern boundary of the installation (south of Bath Road), in a wooded area adjacent to Building 634. The site is approximately 1 acre in size. The site was believed to have been used to dispose of demolition debris (as well as construction material and solvents) from 1964 to 1974 ([HRA-0004](#)). In 1993, an unknown quantity of debris and soils contaminated with polycyclic aromatic hydrocarbons were removed and transferred to IR Sites 1 and 3 for backfill material ([HRA-0102](#)). Cleanup activities, including area restoration, were completed in the fall of 1995 ([HRA-0317](#)).

**Former Radiological Uses:** As stated above, this site was used as a disposal area for construction and demolition debris between the years 1964 and 1974. Because it is unknown what type of debris was disposed of in this area, there is a possibility that radiologically contaminated debris, radioluminescent devices, and electronics containing radioisotopes could have been disposed at this site. Radioactive material was historically handled by hazardous waste groups in the military and it is possible that radiologically impacted items were mixed with hazardous waste for disposal in this area. Although the debris and soils have been removed, radioactive materials could still be present due to the lack of radiological characterization during site investigations.

**Current Uses:** Vacant Lot

**ROCs:** Co-60, Cs-137, H-3, Ra-226, Th-232, and U-238

**Previous Radiological Investigations:** None

**Contamination Potential:** Unknown

**Contaminated Media:**

Surface Soil: Low

Subsurface Soil: Low

Surface Water: Low

Groundwater: Low

Air: Low

Structures: Not applicable

Drainage Systems: Not applicable

**Potential Migration Pathways:**

Surface Soil: Low

Subsurface Soil: Low

Surface Water: Low

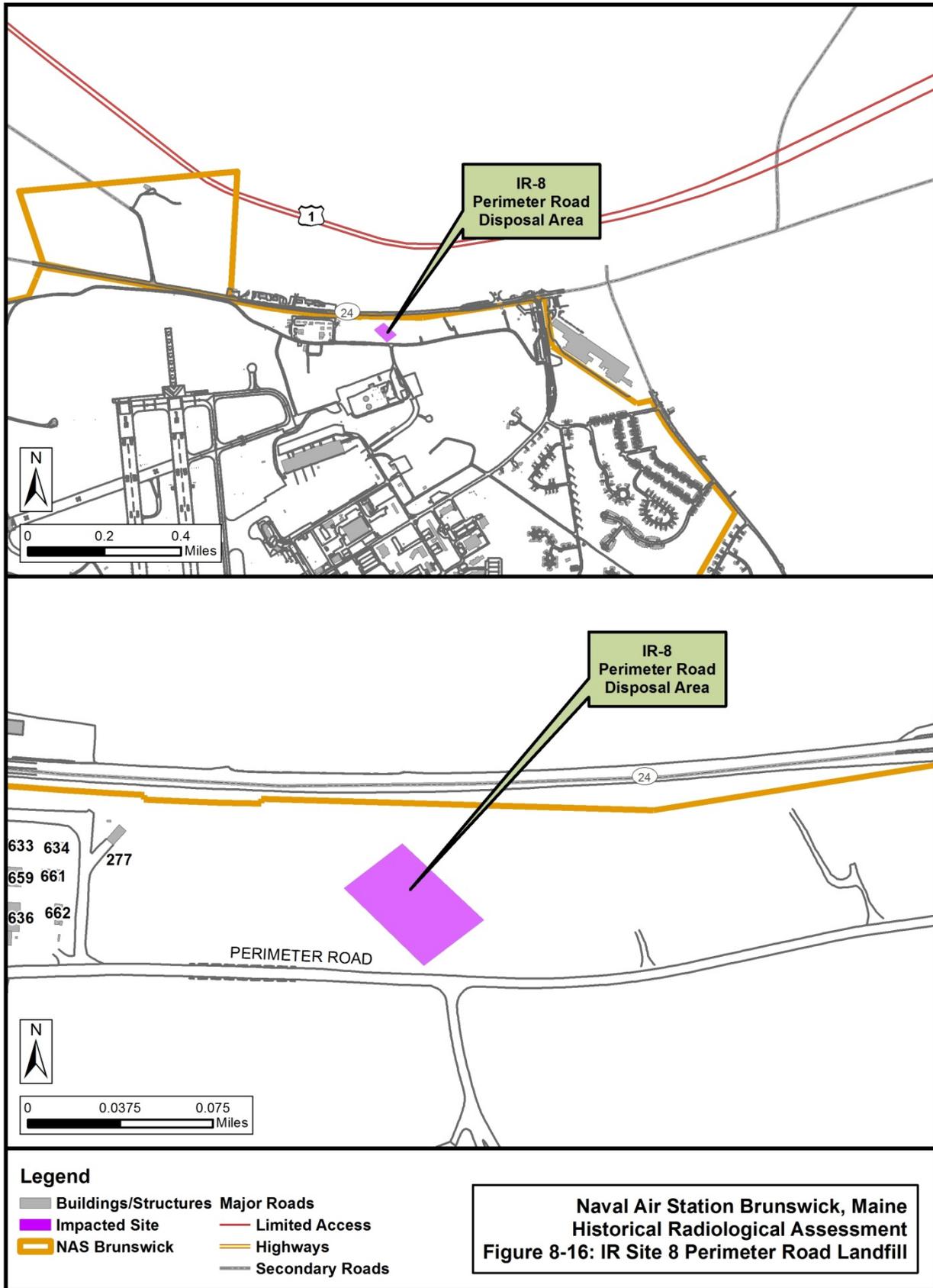
Groundwater: Low

Air: Low

Structures: Not applicable

Drainage Systems: Not applicable

**Recommended Actions:** Conduct scoping surveys of the area.



Note: Figure only shows the general area of the impacted area and does not define the actual boundaries.

### 8.2.17 IR Site 9 Neptune Drive Disposal Area



Note: Aerial photo only shows the general area of the impacted area and does not define the actual boundaries.

**Site Description:** The Neptune Drive Disposal Area (IR Site 9) is a partially remediated hazardous waste disposal area occupying approximately 20 acres in the central portion of the base ([HRA-0319](#)). Between 1943 and possibly 1953, solid hazardous waste was reportedly burned in the adjacent incinerator and ashes were disposed of in trenches at IR Site 9 ([HRA-0319](#)). Non-radiological site sampling and remediation began in the fall of 1994 and continued up until October 2008 ([HRA-0316](#); [HRA-0317](#); [HRA-0319](#)). Approximately 50,231 tons of material, including 6,544 tons of construction debris and 1,332 tons of hazardous material, have been excavated, characterized for non-radiological constituents and, shipped to an off-site licensed disposal facility ([HRA-0102](#)). A temporary cap consisting of a polyethylene liner, clean backfill, and a vegetated loam cover was placed between remediated areas on areas where removal of ash was impeded due to roads and utilities ([HRA-0102](#)). In areas where removal criteria were met, backfill material was placed in successive horizontal layers of loose material in 12-inch lifts to obtain a minimum of four inches of topsoil over the disposal area. Each lift was graded and compacted and the final cap was vegetated ([HRA-0316](#)). Site investigations have confirmed the presence of ash and further boundary characterization in 2009 and 2010 have shown that the disposal area was likely larger than that previously remediated. There are ongoing efforts to further characterize the site. Institutional controls are currently being implemented for IR Site 9 under NASB Instruction 5090.1C and meet the intent and goals of the

Environmental Protection Agency's Record of Decision ([HRA-0319](#)). NASB Instruction 5090.1C and future protectiveness requires a Land Use Control Implementation Plan (LUCIP) be created to ensure appropriate land use controls are implemented after closure of the base ([HRA-0319](#)).

**Former Radiological Uses:** As stated above, this site was used to dispose of ash from the site's incinerator between the years 1943-1953. Because it is unknown what type of debris was incinerated and disposed of in this area, there is a possibility that the ash may have been radiologically contaminated. Radioactive material was historically handled by hazardous waste groups in the military and it is possible that radiologically impacted items were mixed with hazardous waste for incineration and disposal in this area. Although some ash and soil have been removed, radioactive materials could still be present due to the lack of radiological characterization during site investigations.

**Current Uses:** Vacant Lot

**ROCs:** Co-60, Cs-137, H-3, Ra-226, Th-232, and U-238

**Previous Radiological Investigations:** None

**Contamination Potential:** Unknown

**Contaminated Media:**

Surface Soil: Low

Subsurface Soil: Low

Surface Water: Low

Groundwater: Low

Air: Low

Structures: Not applicable

Drainage Systems: Not applicable

**Potential Migration Pathways:**

Surface Soil: Low

Subsurface Soil: Low

Surface Water: Low

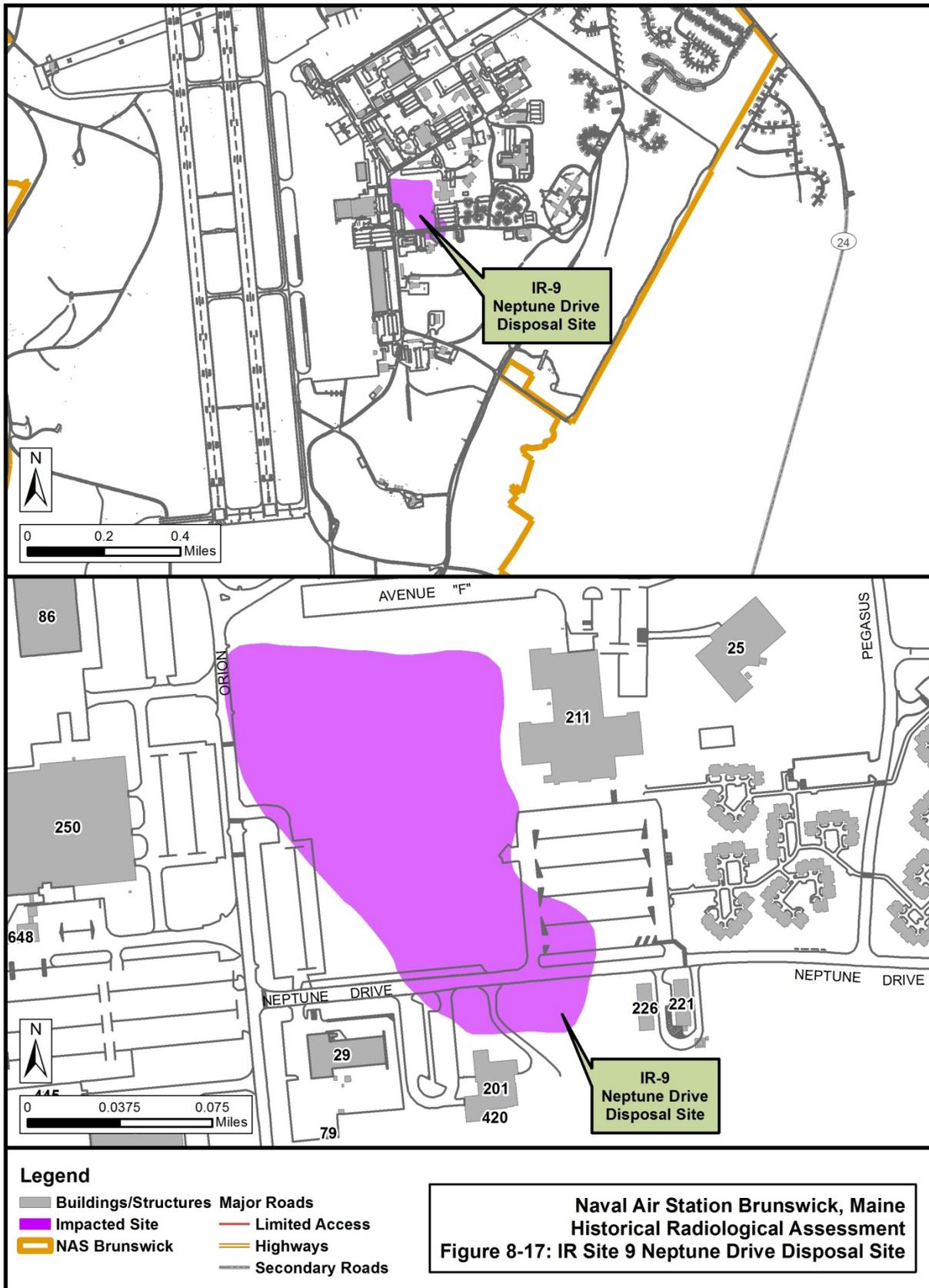
Groundwater: Low

Air: Low

Structures: Not applicable

Drainage Systems: Not applicable

**Recommended Actions:** Review (and revise as necessary) the Land Use Control Implementation Plan (LUCIP) to address radiological issues and conduct scoping surveys of the area.



Note: Figure only shows the general area of the impacted area and does not define the actual boundaries.

### 8.2.18 IR Site 18 West Runway Site



Note: Aerial photo only shows the general area of the impacted area and does not define the actual boundaries.

**Site Description:** The West Runway Site (IR Site 18) is located just to the west of the outbound runway and is partially included in the Former Munitions Bunkers area. NAS Brunswick has no records of disposal at this location. In 1993, a magnetometer survey and a ground-penetrating radar survey were conducted, and test pits were excavated ([HRA-0088](#)). During these field activities soil samples, seep water samples, surface water and sediment samples from Mere Brook were collected and analyzed for volatile organic contaminants ([HRA-0088](#)). All concentrations were reported below applicable state and federal standards ([HRA-0088](#)). During excavation of the test pits, fill material and metallic debris were uncovered and excavated ([HRA-0088](#)). A finding of “No Further Action” was recommended for the approximately 0.8-acre site ([HRA-0102](#)).

**Former Radiological Uses:** As stated above, this site’s use is unknown, but fill material and metallic debris were found in this area from a 1993 magnetometer survey and test pitting. Because it is unknown what type of debris was disposed of in this area, there is a possibility that radiologically contaminated debris, radioluminescent devices, and electronics containing radioisotopes could have been disposed at this site. A radiological survey of the ground surface was performed in the area in 1994 and no activity above reference background readings was detected ([Section 6.5](#)). Some debris and fill material have been removed, but radioactive

materials could still be present due to the lack of radiological characterization during site investigations ([HRA-0088](#)).

**Current Uses:** Vacant Lot

**ROCs:** Co-60, Cs-137, H-3, Ra-226, Sr-90, Th-232, and U-238

**Previous Radiological Investigations:** 1994 Radiological Survey (See [Section 6.5](#))

**Contamination Potential:** Unknown

**Contaminated Media:**

Surface Soil: Low

Subsurface Soil: Low

Surface Water: Low

Groundwater: Low

Air: Low

Structures: Not applicable

Drainage Systems: Not applicable

**Potential Migration Pathways:**

Surface Soil: Low

Subsurface Soil: Low

Surface Water: Low

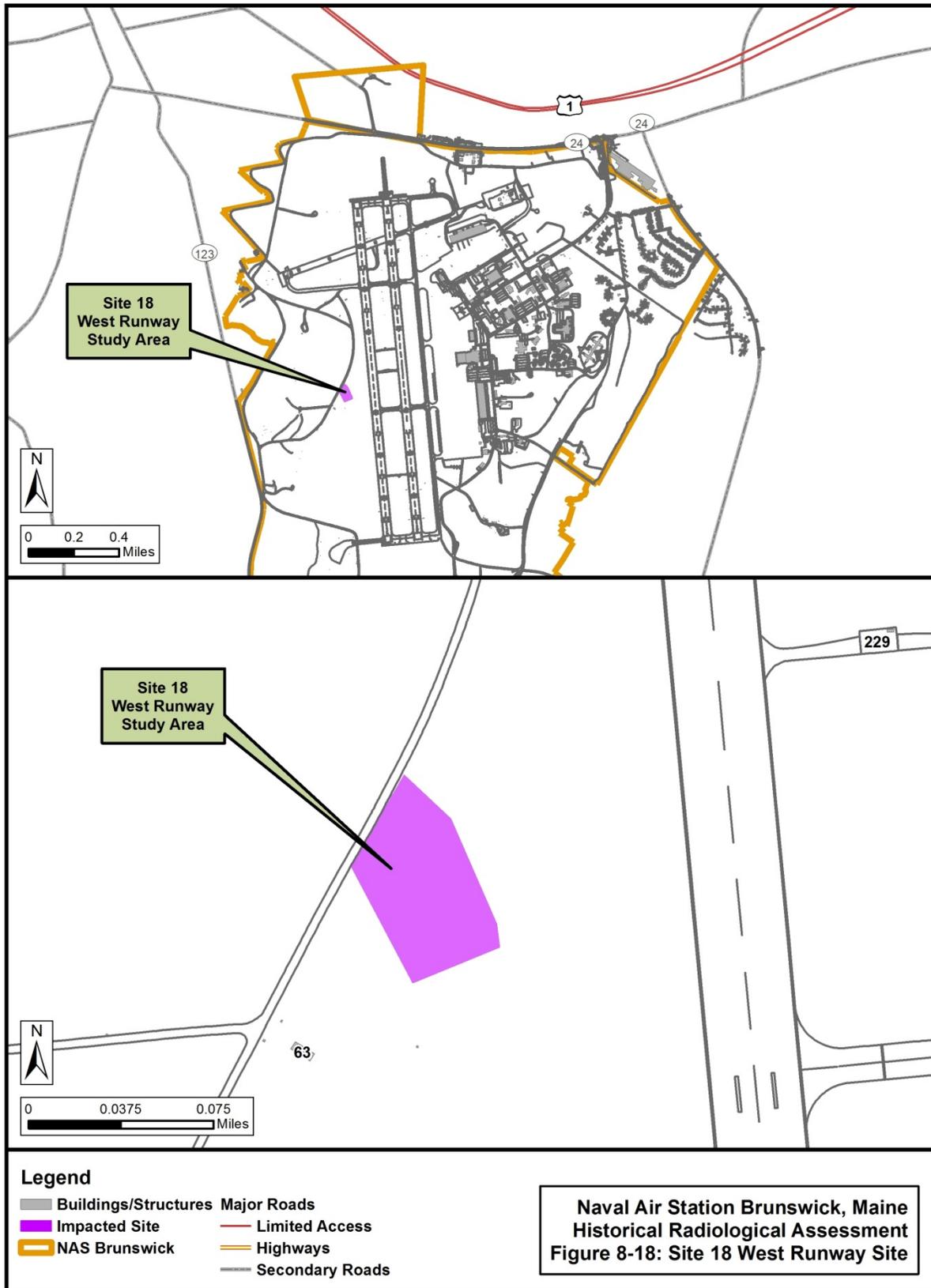
Groundwater: Low

Air: Low

Structures: Not applicable

Drainage Systems: Not applicable

**Recommended Actions:** Conduct scoping surveys of the area.



Note: Figure only shows the general area of the impacted area and does not define the actual boundaries.

### 8.2.19 Undocumented Former Orion Street Disposal Area



Note: Aerial photo only shows the general area of the impacted area and does not define the actual boundaries.

**Site Description:** The Undocumented Former Orion Street Disposal Area is located at the corner of Orion Street and Merriconeag Drive. The exact size of the area is unknown. The area is currently a vacant lot used for athletic activities.

**Former Radiological Uses:** The Undocumented Former Orion Street Disposal Area was identified by a former Navy electronics technician as an open disposal area where the Ground Electronics Division disposed of defective electronics components, including electron tubes. The technician stated that the area was an open field with no disposal trenches and was worked periodically with a bulldozer, which would cause these tubes to be broken. This operation was witnessed from 1972 through 1976. ([Appendix C](#) - Goldner Interview) No other information could be obtained on this area. Examples of radioactive material potentially disposed of in this area are electron tubes. [Table 4-2](#) lists the ROCs and their uses.

**Current Uses:** Vacant Lot

**ROCs:** Co-60, Ra-226, Sr-90, and Th-232

**Previous Radiological Investigations:** None

**Contamination Potential:** Unknown

**Contaminated Media:**

Surface Soil: Low

Subsurface Soil: Low

Surface Water: Low

Groundwater: Low

Air: Low

Structures: Not applicable

Drainage Systems: Not applicable

**Potential Migration Pathways:**

Surface Soil: Low

Subsurface Soil: Low

Surface Water: Low

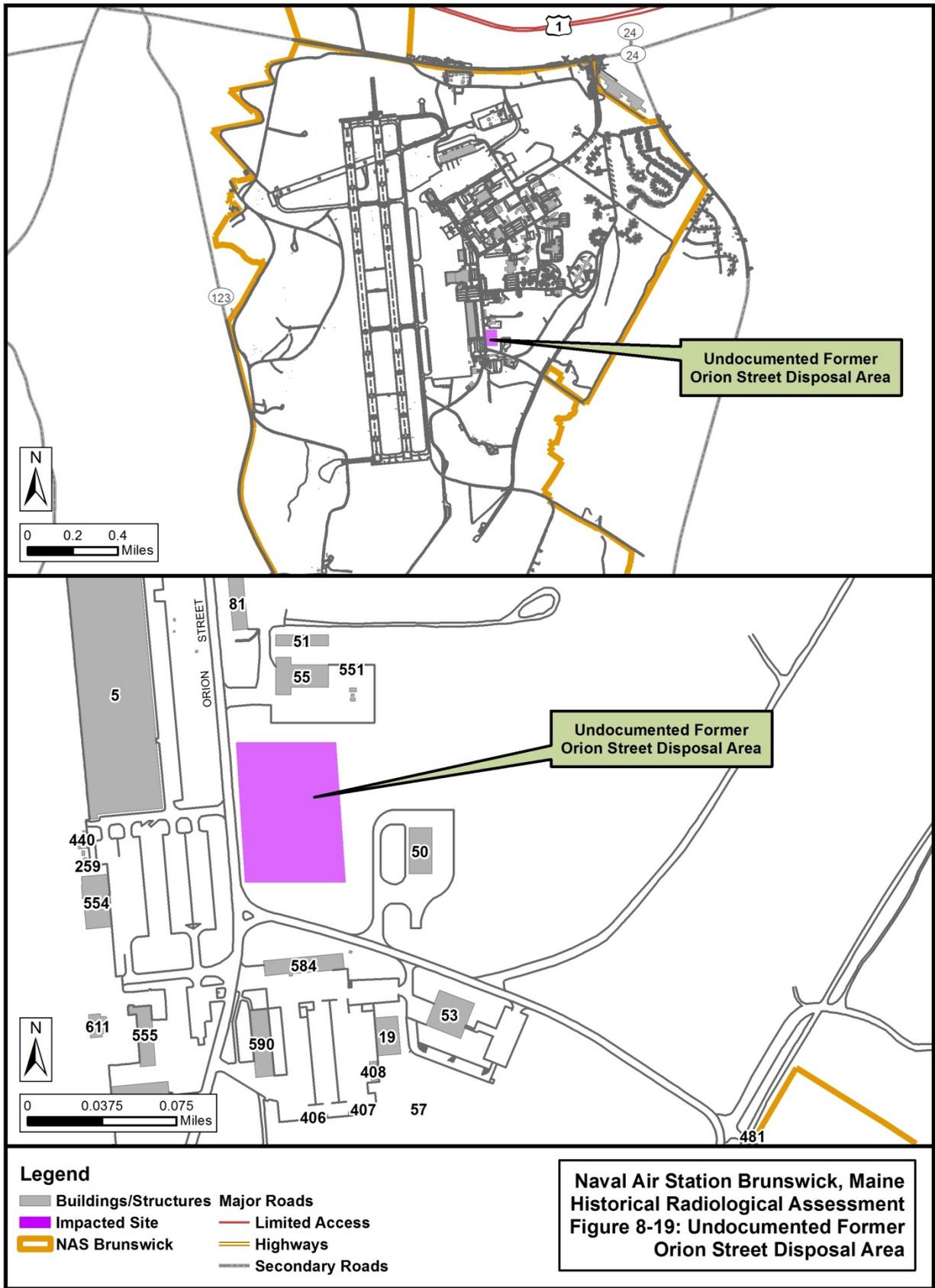
Groundwater: Low

Air: Low

Structures: Not applicable

Drainage Systems: Not applicable

**Recommended Actions:** Conduct scoping surveys of the area.



Note: Figure only shows the general area of the impacted area and does not define the actual boundaries.

**TABLE 8-1  
SUMMARY OF FACILITY FUNCTION FOR IMPACTED SITES**

Building/ Area	Current Name	1946 Map (HRA-0298)	1952 Map (HRA-0299)	1956 Map (HRA-0300)	1962 Map (HRA-0301)	1983 Map (HRA-0518)	1989 Map (HRA-0303)	1999 Report (HRA-0091)	2006 Map (HRA-0089)	2008 List (HRA-0305)	Year Built	Year Demolished	Area (ft <sup>2</sup> )	ROC
9	MWR CPO Ward Room	Laundry	Laundry	Electronics & Ordnance Shop	Electronics & Ordnance Shop	VPU	VPU	Housing Office	VPU	MWR CPO Ward Room	1943	NA	8,888	Cs-137, H-3, Ra-226, Th- 232, U-238
41	Police Station	Synthetic Training Group/ Parachute Shop	Synthetic Training Group/ Parachute Shop	Training Group/ Parachute Shop	Training Group/Parachute Shop	Training Group	Training Group	Police Station	Security	Police/ Security Station	1944	NA	10,526	H-3, Ra-226, Sr-90
31	Incinerator Building	Incinerator Building	Incinerator Building	Building shown but not listed	Not on Map	Building shown but not listed*	Not on Map	Not Listed	Not on map	Not Listed	Pre- 1946	Post- 1983	Unknown	Ra-226
200	Control Tower and Operations Building	Not on map	Not on map	Control Tower and Operations Building	Control Tower and Operations Building	Control Tower and Operations Building	Control Tower and Operations Building	Control Tower and Operations Building	Control Tower and Operations Building	Control Tower and Operations Building	1952	NA	22,409	Co-60, Cs- 137, Ra-226
250	Aircraft Maintenance Hangar (Hangar 4)	Not on map	Not on map	Aircraft Maintenance Hangar (Hangar 4)	Aircraft Maintenance Hangar (Hangar 4)	Aircraft Maintenance Hangar (Hangar 4)	1956	NA	184,400	Co-60, Cs- 137, H-3, Ra- 226, Sr-90, Th-232, U- 238				
539	Explosives Administration / Armory	Not on map	Not on map	Not on map	Not on map	Not on map	AUW Shop	Weapons Shop, Weapons Area	Explosives Administration /Armory	Explosives Administration /Armory	1958	NA	10,311	H-3, Pu-239, U-235
DRMO Area	DRMO Area (Building 584 and Laydown Yard)	NA	NA	NA	NA	DRMO	DRMO	DRMO	DRMO	General Warehouse	1965	NA	84,000 (yard) 7,200 (584)	Co-60, Cs- 137, H-3, Ra- 226, Sr-90, Th-232, U- 238

\*On map labeled as Building 178. No record found of a Building 178

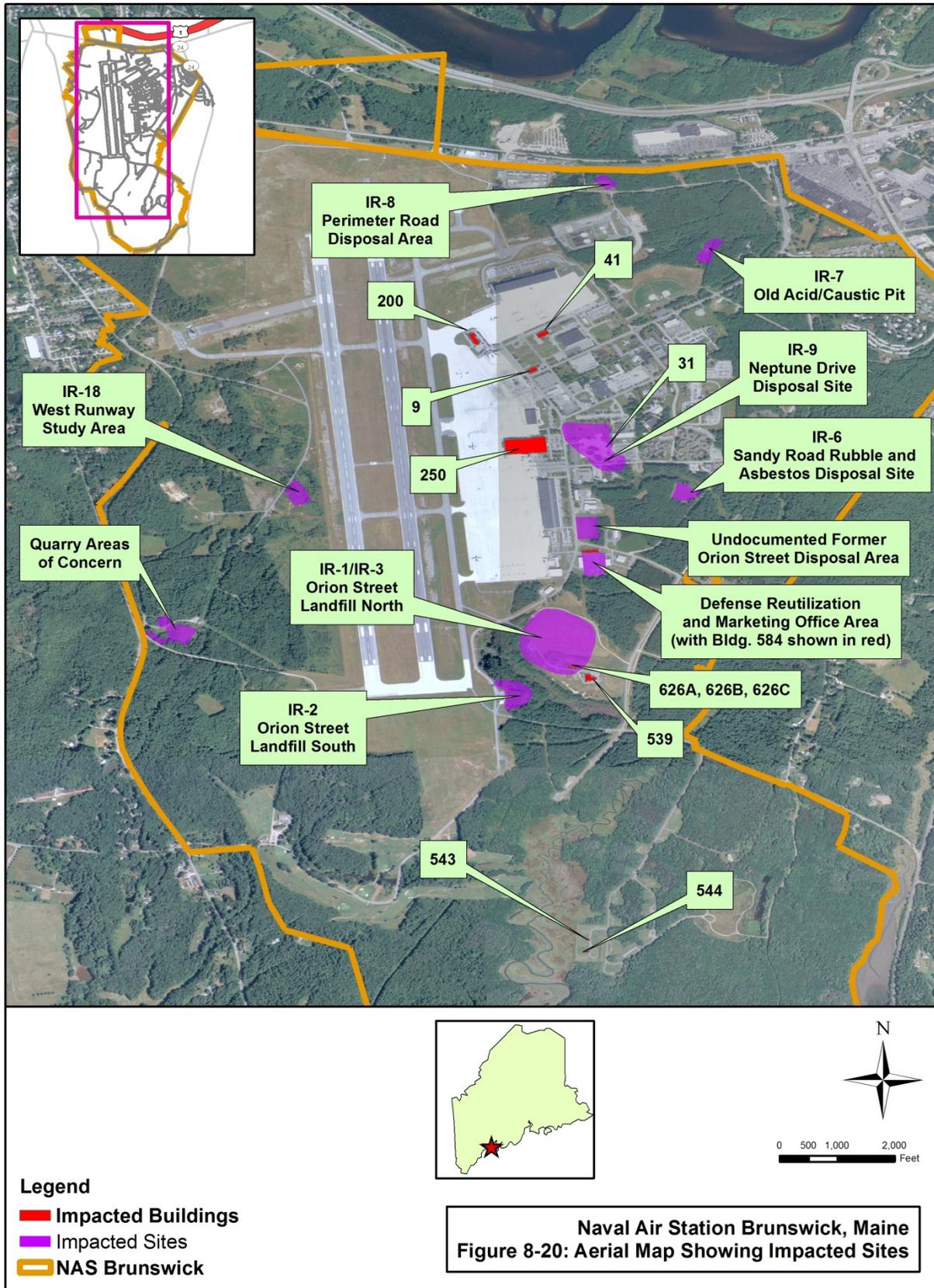
**TABLE 8-1 (CONTINUED)**  
**SUMMARY OF FACILITY FUNCTION FOR IMPACTED SITES**

Building/ Area	Current Name	1946 Map	1952 Map	1956 Map	1962 Map	1983 Map	1989 Map	1999 Cultural Resource Report	2006 Map	2008 Facility List	Year Built	Year Demolish ed	Area (ft <sup>2</sup> )	ROC
543	High Explosives Magazine	Prior to Construction	Prior to Construction	Prior to Construction	Not Mapped	Not Mapped	High Explosives Magazine	Weapons/ Ordnance Storage	High Explosives Magazine	High Explosives Magazine	1957	NA	1,232	H-3, Pu-239, U-235
544	High Explosives Magazine	Prior to Construction	Prior to Construction	Prior to Construction	Not Mapped	Not Mapped	High Explosives Magazine	Weapons/ Ordnance Storage	High Explosives Magazine	High Explosives Magazine	1957	NA	2,252	H-3, Pu-239, U-235
626 A, B, and C	Magazine	Not on map	Not on map	Not on map	Not on map	Not on map	AUW Building	Weapons Magazine, Weapons Area (626A), AUW Magazine (626B), and Use not listed (626C)	Inert Ordnance Storage (626A), Use not listed (626B), and NMCB-27 (626C)	Inert Ordnance Storage (626A), Use not listed (626B), and NMCB-27 (626C)	1973	NA	9,594 (3,198 for each magazine)	H-3, Pu-239, U-235
NA	Quarry Area of Concern	NA	NA	NA	NA	NA	NA	NA	NA	NA	Dumpsite used 1943- 1946	NA	4 acres	Cs-137, Ra- 226, Sr-90, U-238
IR Site 2	Orion Street Landfill	NA	NA	NA	NA	NA	NA	NA	NA	NA	Dumpsite used 1945 - 1955	Capped in 1999	3 acres	Ra-226
IR Sites 1 & 3	Hazardous Waste Burial Area/	NA	NA	NA	NA	NA	NA	NA	NA	NA	IR Site 1 used 1955- 1975; IR Site 3 used 1960- 1973	Capped in 1995	10 acres	Co-60, Cs- 137, H-3, Ra- 226, Sr-90, Th-232, U- 238

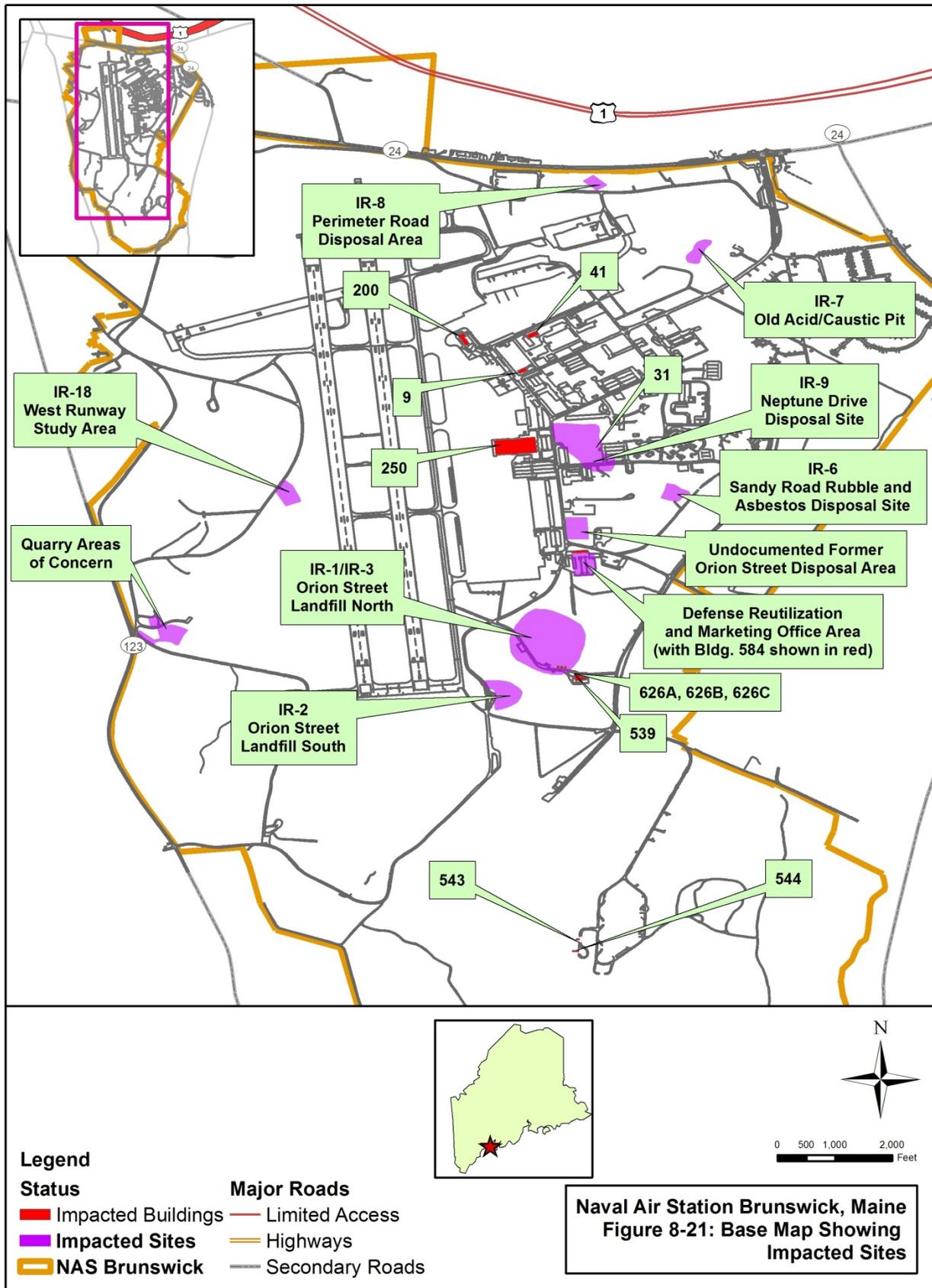
**TABLE 8-1 (CONTINUED)  
SUMMARY OF FACILITY FUNCTION FOR IMPACTED SITES**

Building/Area	Current Name	1946 Map	1952 Map	1956 Map	1962 Map	1983 Map	1989 Map	1999 Cultural Resource Report	2006 Map	2008 Facility List	Year Built	Year Demolished	Area (ft <sup>2</sup> )	ROC
IR Site 6	Sandy Road Rubble and Asbestos Disposal Site	NA	NA	NA	Unknown	Unknown	1 acre	Co-60, Cs-137, H-3, Ra-226, Sr-90, Th-232, U-238						
IR Site 7	Old Acid/Caustic Pit	NA	NA	NA	1952	1969	3,800	Co-60, Cs-137, H-3, Ra-226, Sr-90, Th-232, U-238						
IR Site 8	Perimeter Road Landfill	NA	NA	NA	Dumpsite used Mid-1960 thru Mid-1970	Cleanup activities completed 1995	7.6 acres	Co-60, Cs-137, H-3, Ra-226, Sr-90, Th-232 U-238						
IR Site 9	Neptune Drive Disposal Area	NA	NA	NA	Dumpsite used 1943-1953	Capped (temporary) in 2008	20 acres (5 acres actual disposal)	Co-60, Cs-137, H-3, Ra-226, Th-232 U-238						
IR Site 18	West Runway Site	NA	NA	NA	Unknown	Some soil/debris removal in 1993	0.8 acres	Co-60, Cs-137, H-3, Ra-226, Sr-90, Th-232 U-238						
NA	Undocumented Orion Street Disposal Area	NA	NA	NA	Dumpsite used 1972-1976	NA	Unknown	Co-60, Ra-226, Sr-90, Th-232, U-238						

NA- Not Available



Note: Figure only shows the general area of the impacted area and does not define the actual boundaries.



Note: Figure only shows the general area of the impacted area and does not define the actual boundaries.

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## **9.0 CONCLUSIONS**

### **9.1 HISTORICAL RESEARCH**

NAS Brunswick was purchased from the town of Brunswick, Maine in 1942 and commissioned on April 15, 1943 to train and form-up squadrons of Royal Canadian Air Force and Royal Navy pilots to fly Vought F4U Corsairs for the British Naval Command. The station was deactivated in October 1946, shortly after the end of WWII. On March 15, 1951, the inactive station was recommissioned Naval Air Facility, Brunswick with the established mission to support three land-plane patrol squadrons and one fleet aircraft service squadron. Its future mission was to be a master jet air station that conducted anti-submarine warfare operations off the Atlantic Coast. On December 1, 1951 the station's status was officially elevated to a Naval Air Station.

G-RAM was gradually introduced at the site, at first in the form of radioluminescent devices, and later with radioactive commodity items, depleted uranium and weapons.

### **9.2 IMPACTED SITE ASSESSMENTS**

The preparation of this HRA was a comprehensive process involving the review of information from several thousand records in seven federal record repositories, a variety of internet sources, and personnel interviews. Analysis of the information from this research resulted in a total of 19 sites being designated as impacted by G-RAM operations. This designation indicates each site has the potential for radioactive contamination based on historical information. Based on the potential for residual contamination, the impacted sites were placed into the following categories: Known-Restricted Access, Known-Continued Access, Likely, Unlikely, and Unknown. The assessment of potential contamination at the 19 impacted sites is summarized as follows:

Known-Restricted Access – 0

Known-Continued Access – 0

Likely – 0

Unlikely – 3

Unknown – 16

The categories High, Moderate, Low, and None were used to assess potentially contaminated media for each impacted site. The ratings of potentially contaminated media at each of the 19 impacted sites are:

High – 0

Moderate – 1

Low – 18

None – 0

The categories of High, Moderate, Low, and None were also used to assess potential migration pathways for any radioactive contamination at each impacted site. The ratings of migration pathways assessed at each of the 19 impacted sites are:

High – 0

Moderate – 0

Low – 19

None – 0

The categories of Emergency Action, Scoping Survey, Characterization Survey, Remediation, Final Status Survey, Free Release, and No Further Action were used to recommend future actions at each impacted site. The recommended actions for each of the 18 impacted sites are:

Emergency Action – 0

Scoping Survey – 19

Characterization Survey – 0

Remediation – 0

Final Status Survey – 0

Free Release Pending Review of Final Status Survey Report – 0

No Further Action – 0

### **9.3 SUMMARY OF FINDINGS**

Using the above criteria, this HRA concludes that:

- There is a low potential for residual radioactive contamination at 18 impacted sites and a moderate potential at 1 impacted site.
- Scoping surveys are recommended for 18 impacted sites and an assessment to be performed on one site to determine if a scoping survey is necessary.
- Adding radiological analysis to existing groundwater sampling is recommended for 2 impacted sites.
- Conducting area site assessment to determine if adequate administrative and engineering controls are currently in place for 4 impacted sites.
- To date, no historical information about radiological operations or previous radiological surveys at any of the impacted sites presents a level of concern that would require any emergency action.
- To date, no impacted sites require restricted access due to known levels of radioactive contamination.
- To date, no evidence of potential airborne contamination has been found.
- No evidence of a pathway for potential contamination to migrate off NAS Brunswick has been identified.

The overall conclusion of the HRA is that 19 sites are impacted; however, the potential for residual radioactive contamination is unlikely or unknown. This HRA recommends that the areas of potential contamination be assessed to determine if further action is warranted.

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**APPENDIX A  
RADIATION OVERVIEW**

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## APPENDIX A RADIATION OVERVIEW

### A1 GENERAL

Radiation is energy in the form of electromagnetic waves or subatomic particles. Radiation is emitted from the nucleus or electron cloud of atoms or from devices generating electromagnetic waves and particles such as x-ray machines, neutron generators, and cyclotrons. Radiation is either ionizing or non-ionizing.

Radiation that has insufficient energy to remove electrons from atoms is non-ionizing radiation. Examples of non-ionizing radiation include most visible light, infrared light, microwaves, and radio waves. Radiation that has sufficient energy to remove electrons from atoms is ionizing radiation. All radiological investigations at NASB have focused on ionizing radiation, which includes alpha, beta, and gamma radiation.

### A2 ALPHA RADIATION

Alpha particles are charged particles containing two protons and two neutrons. Alpha particles are emitted from the nuclei of certain heavy atoms, such as uranium, when they decay. Because of its size and heavy electrical charge, +2, an alpha particle can travel only a few centimeters in air. It can be stopped or shielded by a sheet of paper. Alpha particles cannot penetrate the outer layer of skin but can cause localized damage inside the body if ingested or inhaled.

### A3 BETA RADIATION

Beta particles are particles with the mass of an electron and a -1 electrical charge; essentially, they are high-velocity electrons. Radioactive isotopes of many different elements emit beta particles. Even though moderate energy beta particles can travel as far as 10 feet through air, they easily can be stopped by a 1/3-inch-thick sheet of plastic or a 1/8-inch-thick sheet of aluminum. Because beta particles can penetrate the outer layer of skin and affect living tissue, they are a hazard to the body's skin and the eyes.

#### A4 GAMMA RADIATION

Gamma radiation is electromagnetic radiation with no mass or charge. Gamma rays are emitted from the nucleus of an atom during radioactive decay. Because it has no mass or charge, gamma radiation can penetrate most materials. In air, higher energy gamma radiation can travel several hundred feet. Gamma radiation can penetrate the skin and interact with the dense structures of the body. Dense materials such as lead or concrete are needed for shielding against gamma radiation.

#### A5 X-RAYS

X-rays are also electromagnetic radiation with no mass or charge. The difference between gamma radiation and radiation from x-rays is the nature of their origin. Gamma radiation originates in the nucleus, while x-rays originate in the electron region of the atom. The penetrating properties are the same; therefore, safety concerns and shielding mechanisms are similar. X-rays are typically produced by machines, and thus are not a hazard if the machine is turned off.

#### A6 SCIENTIFIC NOTATION

Radiation measurement units are normally reported in scientific notation. Scientific notation is also known as exponential notation or power-of-10 notation. It is a concise method of expressing numbers from very small to very large. Scientific notation is the expression of a number raised to a power of 10. For example, 3,456 can be expressed as  $3.456 \times 10^3$ . For the purpose of this HRA, scientific notation is often used when radiation units are reported.

Here is a listing of common numbers expressed in scientific notation:

$10^6 = 1,000,000$	$10^{-1} = 0.1 (1/10)$
$10^5 = 100,000$	$10^{-2} = 0.01 (1/100)$
$10^4 = 10,000$	$10^{-3} = 0.001 (1/1000)$
$10^3 = 1000$	$10^{-4} = 0.0001 (1/10,000)$
$10^2 = 100$	$10^{-5} = 0.00001 (1/100,000)$
$10^1 = 10$	$10^{-6} = 0.000001 (1/1,000,000)$
$10^0 = 1$	

## A7 RADIATION UNITS

For this HRA, radiation measurements are stated in units of curies, roentgens, rads, rems, and reps. These units are defined as:

Curie (Ci). The curie measures radioactivity; 1 curie is that quantity of a radioactive material that will have 37,000,000,000 ( $3.7 \times 10^{10}$ ) transformations in 1 second. Often radioactivity is expressed in smaller units like thousandths ( $10^{-3}$ , millicurie or mCi), millionths ( $10^{-6}$ , microcurie or  $\mu$ Ci), billionths ( $10^{-9}$ , nanocurie or nCi), or trillionths ( $10^{-12}$ , picocurie or pCi) of a curie.

Roentgen (R). The roentgen is a unit used to measure exposure. It describes an amount of gamma and x-rays present in air only. The roentgen is a measure of the ionization of the molecules in a mass of air: one roentgen is equal to depositing in dry air enough energy to cause an electrical charge of  $2.58 \times 10^4$  coulombs per kilogram (kg) (1 kg = 2.2 pounds). The main advantage of this unit is that it is easy to measure directly, but it is limited because it is only for deposition in air and only for gamma and x-rays.

Rad (from radiation absorbed dose). The rad is a unit used to measure absorbed dose. This relates to the amount of energy actually absorbed in some material. It is used for any type of radiation and any material. One rad is defined as the absorption of 100 ergs per gram of material. The unit rad can be used for any type of radiation, but it does not describe the biological effects of different radiations.

Rem (from roentgen equivalent man). The rem is a unit used to derive a quantity called equivalent dose. This relates the absorbed dose in biological tissue to the biological effect. Not all radiation has the same biological effect, even for the same amount of absorbed dose. Equivalent dose is often expressed in terms of thousandths of a rem, or millirem (mrem). To determine equivalent dose in rem, absorbed dose (rad) is multiplied by a quality factor (Q) that is unique to the type of incident radiation and the material in which the energy is deposited.

Rep (from roentgen equivalent physical). A unit of absorbed radiation dose equal to the amount of ionizing radiation that will transfer 93 ergs of energy to 1 gram of water or living tissue.

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**APPENDIX B  
PUBLIC FACTSHEET**

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# Historical Radiological Assessment

### Introduction

The Department of the Navy is preparing a **Historical Radiological Assessment (HRA)** for Naval Air Station Brunswick (NASB) in preparation for base closure. Through research, interviews and site visits, the HRA will document, refine and expand the record of historical radiological activities at NASB in order to facilitate transfer of the property for civilian redevelopment. Information for the HRA comes from record searches, interviews, and site visits regarding locations at NASB where **radioactive materials** may have been used, stored, or disposed.

Common items that used radioactive materials at NASB may have included smoke detectors, lead paint analyzers, static eliminators, non-electrically powered exit signs, aircraft parts, biological and chemical agent detectors and **radioluminescent devices**, including dials, deck markers and gauges.

The completed HRA will determine if additional **radiological investigations** are needed. The final report will be prepared in accordance with Federal and State guidelines and is expected to be complete sometime in the fall of 2010.

*(Text in bold is defined on Page 3.)*

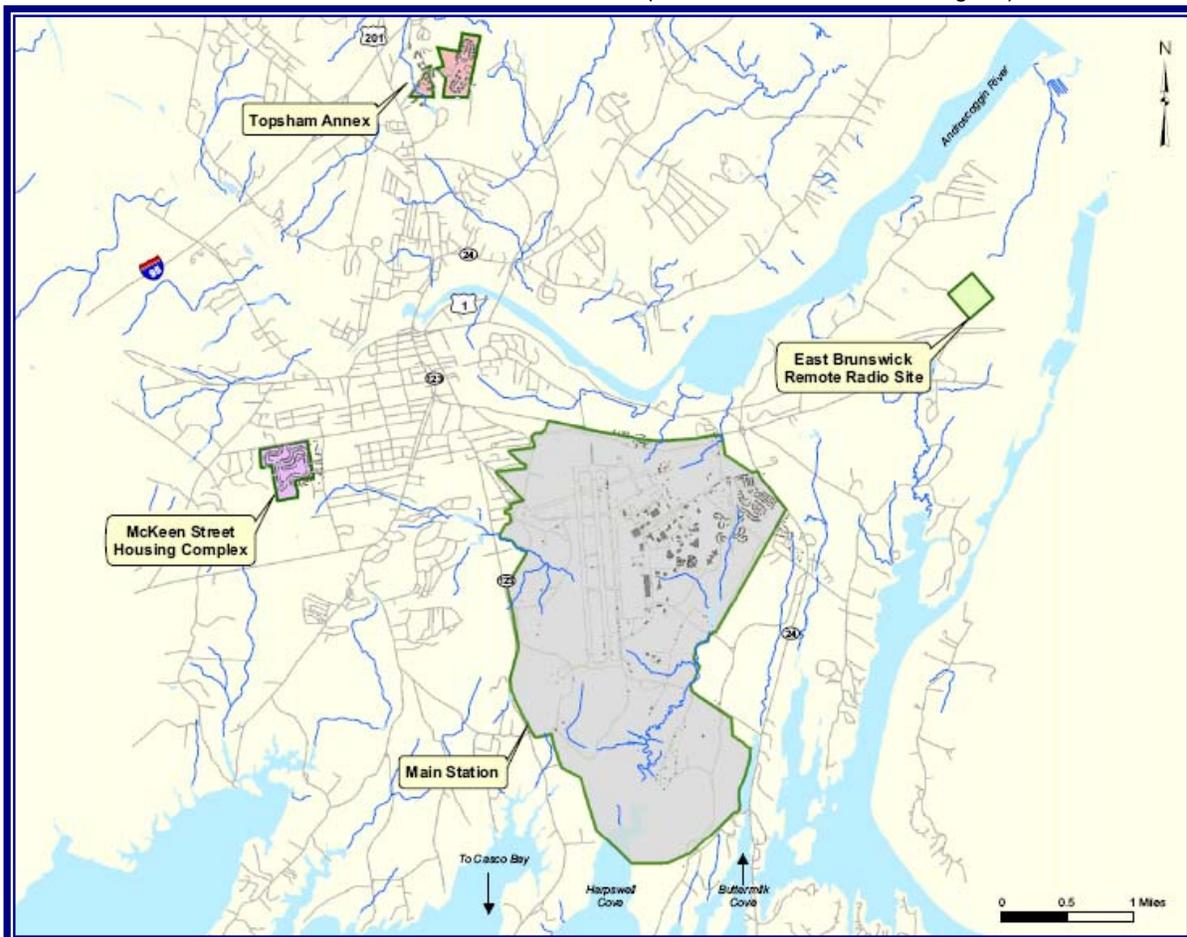


Figure 1 – Main Base and Outlying Facilities

The Navy desires to interview current and former Navy personnel, civilian employees, and contractors who can provide information regarding radiological activities at the NASB. Face-to-face, telephone, or e-mail interviews can be arranged. Information from the interviews will be used to prepare the HRA and is essential to augment historical records and develop an accurate and complete history of past radiological activities.

If you are a current or former member of the Navy, civilian employee, or contractor and have

information about radiological operations within NASB, please call **1-866-941-6426**, and tell us when and how to contact you. A member of the HRA team will return your call and schedule an interview. You can also e-mail us at [NASBrunswick@tetrattech.com](mailto:NASBrunswick@tetrattech.com).

**In order to expedite the HRA process and to schedule interviews, please contact the Navy before May 31, 2009**

### □ Overview of Base History

NASB is located in Cumberland County, Maine, and was first commissioned on April 15, 1943. The base remained active for four years, and was subsequently deactivated in 1947. On March 15, 1951, the dormant-air station was re-commissioned as a Naval Air Facility with the established mission of supporting three land-plane patrol squadrons and one Fleet Aircraft Service Squadron, and a planned future mission as a master jet air station with a primary mission of anti-submarine warfare.

On July 1, 1971 Commander Patrol Wings United States Atlantic Fleet/Commander Patrol Wing Five established its headquarters at NASB. Changes have occurred on the Air Station since 1971 so that at present, three patrol squadrons flying the P3 Orion perform their duties at NASB. In addition, two reserve squadrons are also based at NASB along with VPU-1 mission, the Naval Reserve Center and the Air Reserve Center. NASB also provides support for the ships at Bath, and various northeastern naval activities.

The NASB Main Base is comprised of approximately 2,834 acres situated between the Androscoggin River and Casco Bay southeast of the town center of Brunswick. It is bordered by Route 123 and Route 1 on the west and north sides, respectively, and is adjacent to Route 124 on the east side.

NASB is comprised of the Main Base and five remote properties listed below.

- McKen Street Housing Complex
- Former East Brunswick Remote Radio Transmitter Site
- Topsham Annex
- Sabino Hill Rake Station No. 1
- Small Point Rake Station No. 2

## Definitions

**Historical Radiological Assessment (HRA)** – a detailed investigation to collect historical radiological information and data for a particular site and its surroundings where radioactive materials were used, stored, or disposed.

**Radioactive material** – a substance that contains or emits radiation. Radioactive materials and radiation occur in nature. These materials are also used by the military and private industry and are present in common household items. Common items that use radioactive materials are smoke detectors, radioluminescent devices, including dials, ships' deck markers and gauges, lead paint analyzers, static eliminators, non-electrically powered exit signs, and biological and chemical agent detectors.

**Radiological investigation** – a systematic examination of an area to determine if radioactive materials are present and, if so, at what levels.

**Radioluminescent device**– an item containing radioluminescent paint that allows the device to be seen in the dark. These devices were commonly used by the Navy and possibly contained radium-226, strontium-90, tritium, or promethium-147.

**Radiologically impacted site** – a radiologically impacted site is one that has a potential for radioactive contamination based on historical information or is known to contain radioactive contamination. Areas immediately adjacent to the primary impacted site may be included in this designation. Radiologically impacted sites include: sites where radioactive materials were used or stored; sites where known spills, discharges, or other unusual occurrences involving radioactive materials have occurred, or may have occurred, that could have resulted in the release or spread of contamination; and sites where radioactive materials might have been disposed of or buried.

**Radioluminescence** – Radioluminescent or radioluminescence occurs when a radioactive material is mixed with another material to cause luminescence (emission of light), thus the term radioluminescence. A common item that uses this process is a tritium exit sign. Historically, timepieces, dials, and gauges were coated with paints containing radium so they would glow in the dark.

### □ What is a Historical Radiological Assessment?

Historical documentation indicates the potential past use and/or storage of radioactive materials at NASB. The HRA will define the extent of former activities involving radiation and radioactive materials. The HRA will:

- Document information about radiological operations, investigations, and surveys discovered during searches of historical records and interviews;
- Identify potential, likely, or known sources of radioactive material and areas where these materials might have been used;
- Classify as “radiologically impacted” those sites where radioactive materials were known to

have been used, stored, or disposed with reasonable potential for residual contamination (all other sites are, by definition, “non-impacted” by radiological operations);

- Assess the likelihood of any potential residual radioactive material to migrate into other areas or to the environment;
- Identify sites that need further action; and recommend actions that will achieve site closure.

The Navy is currently conducting on-site inspections and record reviews at NASB and comprehensive records searches and review of relevant documents at various Federal archives.

□ **What's Next?**

Because individual knowledge of activities involving radioactive material at NASB is essential to understanding work performed there, we will interview personnel who respond to this request for interviews. The Navy has put advertisements in local newspapers to reach as many potential interviewees as possible.

The HRA is anticipated to be completed and published in the fall of 2010. We will provide periodic updates at the Navy's Restoration Advisory Board (RAB) meetings. For a schedule of RAB meetings, see the Navy's environmental website at:

<http://nasbrunswick.navy-env.com/calendar.htm>

□ **To Contact the Navy**

**Call 1-866-941-6426**

**or**

**E-mail us at**

**[NASBrunswick@tetrattech.com](mailto:NASBrunswick@tetrattech.com)**



**APPENDIX C  
SUMMARY OF INTERVIEWS**

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**Summary of Information from Wayne Goldner**  
**Naval Air Station Brunswick Historical Radiological Assessment**  
**Page 1 of 4**

Mr. Wayne D. Goldner served as a GCA (Ground Control Approach) Radar and Nav aids Technician in Building 200 (Air Operations / Old Control Tower) at NAS Brunswick (NASB) between 10/1/1972 to 4/1/1977.

Mr. Goldner was interviewed by phone on 10/29/08 by Lawson Bailey of Tetra Tech, Inc. A summary of the information collected during the interview was mailed to Mr. Goldner for signature. Mr. Goldner returned the letter with an additional note and a signature by fax on 11/03/09. Mr. Goldner also sent information (including a maps and aerial views) regarding the location of an area he identified during his phone interview by fax to Shauna Stotler-Hardy of Tetra Tech, Inc. on 10/27/09 and on 10/28/09. Information collected from both the interview and the additional information sent are provided in this summary.

Mr. Goldner was aware of operations involving radioactive materials at NASB, including radioluminescents and various electronics tubes (Thyratron tubes and voltage regulators). Brand names included RCA, GE, Sylvania, Raytheon, Varian. Some have a tri-foil on ceramic envelope. These materials were used or stored in the electrical equipment maintenance room behind the IFR (instrument flight rules) room (Air Traffic Control) on the 2<sup>nd</sup> floor of the Operations Building. They were also used or stored in the radar installation between the two runways.

Electronics tubes were collected in regular trash cans and taken to dump on the east side of Orion Street, just south of Neptune Drive Intersection (past machine gun bore sight range). An average of 3-4 tubes was disposed of each month. Because tubes containing radioactive material may have also have been in the trash collected from other electronics installations on the base and from remote sites such as the high-frequency transmitter site on Old Bath Road, the monthly average of radioactive tubes disposed of in the dump site may be higher. The stated monthly average of 3-4 radioactive tubes is the monthly average generated by the electronics equipment maintenance room behind the IFR room and the radar installation only.

Maintenance logs and inventory for ground electrical units that might provide details of these operations were kept, but their current location is unknown.

A Navy directive was issued in August 1976 to discontinue general disposal. Tubes were segregated and collected by the hazardous material group for disposal. A radiological survey of sites where navigational aids were used, repaired, or stored (NAVAID sites) was performed circa 1975.

The dumping area was worked periodically with a bulldozer. Mr. Goldner suspects that tubes would be broken during this process. The dump was just open ground with no disposal trenches.

Mr. Goldner wrote that the dump site that Ground Electronic Division used for disposal of defective electronic components in the mid 1970's is located within the large rectangle between the gun bore site range and the paved road, which he indicated on a map (see page 2). Mr. Goldner wrote that he sent a 1977 aerial photo to Lisa Joy Environmental Director at NASB, and a hand drawn map to be sent to the Restoration Advisory Board. Mr. Goldner was surprised that this info wasn't made available to Mr. Bailey. Mr. Goldner sent a copy of the 1977 aerial photo and hand drawn map, using whiteout to show the location and approximate size of the dump site, to Tetra Tech, Inc. the next day (see pages 3 and 4).

Interviewers:

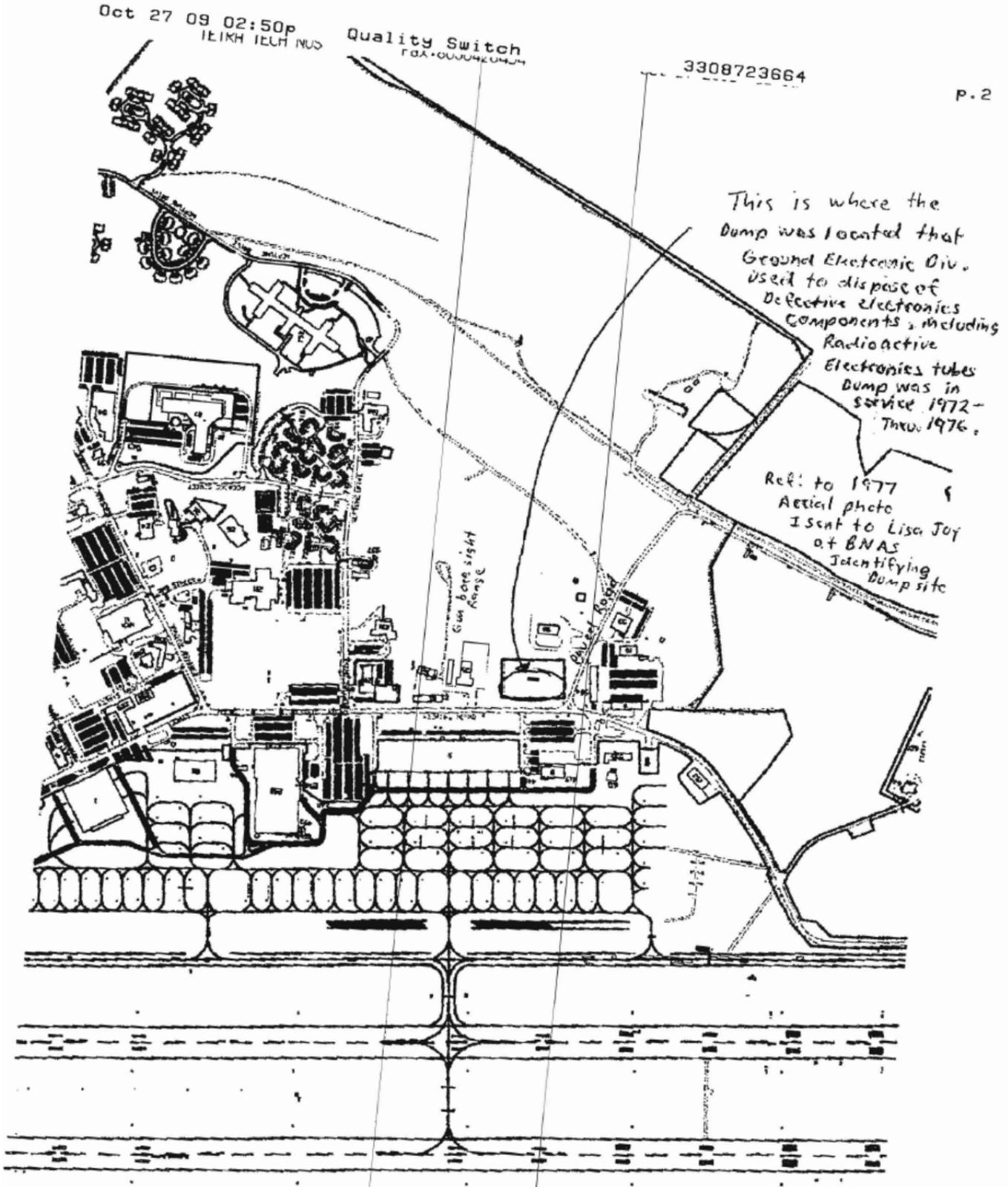
Print/Sign: Lawson Bailey/ *Lawson Bailey* Date: 3/6/12

Print/Sign: Shauna Stotler-Hardy/ *Shauna Stotler-Hardy* Date: 3/6/12

I have read this summary of the information that was provided by me from interviews and correspondence and I am satisfied with the contents, as amended by me (if applicable). I understand that my signature below provides authorization for the Navy to publish this information in the NASB HRA.

Print/Sign: Wayne Goldner/ *Wayne D. Goldner* Date: 3/12/12

Summary of Information from Wayne Goldner  
Naval Air Station Brunswick Historical Radiological Assessment  
Page 2 of 4





Summary of Information from Wayne Goldner  
Naval Air Station Brunswick Historical Radiological Assessment  
Page 4 of 4

Oct 28 09 12:55p  
TETRA TECH NUS

Quality Switch  
FAX-0330470474

3308723664

p. 2



White rectangular area indicates  
the location and approximate size of  
dump site.

Wayne Goldner

**Summary of Information from John James**  
**Historical Radiological Assessment**  
**Naval Air Station Brunswick**  
**Page 1 of 1**

Mr. John James was a Public Affairs Specialist (civilian employee) at NAS Brunswick (NASB) from 1994 until 2010. He had been an active duty serviceman from 1975 through 1980 at NASB, and later came back for the reserves from 1980 through 2000. During his military years, he worked in Hangars 1 and 3 and in Buildings 4, 211, and 250.

Mr. James was interviewed by phone on 9/14/2009 by Shauna Stotler-Hardy of Tetra Tech, Inc. A summary of the information collected during the interview was mailed to Mr. James for signature. Mr. James returned the signed interview sheet on 11/03/09 by fax. Information collected from the interview is provided in this summary.

Mr. James was aware of operations involving radioactive materials at NASB, including radioluminescents, depleted uranium in aircraft parts, and electronics tubes by the Aircraft Intermediate Maintenance Department (AIMD) in Building 250. He was also aware that radioactive material decontamination activities were performed.

Mr. James had no knowledge of radium paint shops in hangars or on base. He believes the clean rooms in AIMD were originally created for early micro mini repair of digital circuit boards, but is not aware of any radiological bearing device that would have been worked on in those rooms.

Mr. James stated that NBC (Nuclear Biological Chemical) practice drills were held from 1975-1980 in preparation for potential exposure.

Mr. James also stated that only some of the British F4U "Corsair" crashes were total losses or caused severe damage on base.

I have read this summary of the information that was provided to me from the interview and I am satisfied with the contents. I understand that my signature below provides authorization for the Navy to publish this information in the NAS Brunswick HRA.

Print/Sign: Shauna Stotler-Hardy/  Date: 3/6/12

I have read this summary of the information that was provided by me from interviews and correspondence and I am satisfied with the contents, as amended by me (if applicable). I understand that my signature below provides authorization for the Navy to publish this information in the NAS Brunswick HRA.

Print/Sign: John James /  Date: March 10, 2012

**Summary of Information from Doug Smith**  
**Historical Radiological Assessment**  
**Naval Air Station Brunswick**  
**Page 1 of 2**

Mr. Douglas (Bruce) Smith was employed at NAS Brunswick (NASB) from 1972 through 2011. He first served there in the Navy, then became a civilian employee at NASB for the Public Works Department. Because of his public works position, he has a working knowledge of the entire Station.

Mr. Smith was interviewed in person at NASB on 9/09/2009 by Shauna Stotler-Hardy of Tetra Tech, Inc. A summary of the information collected during the interview was signed by Mr. Smith. In October and November of 2009 and November 2010, additional questions were asked of Mr. Smith by Ms. Stotler-Hardy and he replied by email. Information collected from the interview and emails is provided in this summary.

Mr. Smith was aware of operations involving radioactive materials at NASB, including aircraft maintenance and the collection and handling of radioactive commodity items, such as tritium exit signs and smoke detectors. He also stated that there were no Naval Radiation Material Permits (NRMP) issued to NASB and that there were no sealed sources at the Station, but there were RGDs (radiation generating devices) present.

Mr. Smith gave the following information on buildings at NASB:

-Building 9 was used by VPU-1.

-Building 41 was initially used by the parachute department to reassemble survival kits/vests, but later moved to Building 250. However, by 1973 when this group moved, strobe lights with batteries had replaced the personnel markers as the luminescent devices on the vest.

-Building 200 (Control Tower and Ops Building) was used to service or repair radar equipment. It was built in 1954 and renovated in 1985. The renovations were mostly cosmetic, such as new flooring and some exterior work. The building was later used as a passenger terminal and administrative spaces for the weather office.

-Building 250 is used for Aircraft Intermediate Maintenance Department (AIMD). Mr. Smith stated that aircraft maintenance has changed over the years. In earlier years, the squadrons performed more maintenance on the aircraft. This maintenance didn't normally include changing tubes or other actions that in-depth. They did more painting operations. AIMD performed trouble shooting down to the component level to include changing tubes. Mr. Smith didn't know directly what type of tube or what they did with the bad ones. When speaking to a Navy Occupational Safety & Health (NAVOSH) employee, the topic of the dump site on the west side of the runway came up, but Mr. Smith had no direct knowledge of when this site was active or what types of materials went into it.

-Building 539 was the main facility for the assembly/disassembly of weapons, but Building 77 was AUW compound and weapons maintenance could have been conducted there.

-Sites 1 and 3 are currently capped with monitoring wells in place.

-Site 2 is open and is in process of remediation.

-Site 9 has been dug up and removed aside from a few tailings with wells in place.

**Summary of Information from Doug Smith**  
**Historical Radiological Assessment**  
**Naval Air Station Brunswick**  
**Page 2 of 2**

Mr. Smith had not been involved in packaging radioactive commodities for disposal until November 2010, when he was putting a list together to have some items (smoke detectors, electron tubes, emergency lights, receiver protectors, and a window assembly) shipped to an off-site disposal facility. He stated that the Radiation Safety Officer (RSO) handled the manifests for shipments.

I have read this summary of the information that was provided to me from interviews and correspondence and I am satisfied with the contents. I understand that my signature below provides authorization for the Navy to publish this information in the NAS Brunswick HRA.

Print/Sign: Shauna Stotler-Hardy /  Date: 3/6/12

I have read this summary of the information that was provided by me from interviews and correspondence and I am satisfied with the contents, as amended by me (if applicable). I understand that my signature below provides authorization for the Navy to publish this information in the NAS Brunswick HRA.

Print/Sign: Doug Smith /  Date: 3-21-12

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**APPENDIX D  
REFERENCES (ON DVD)**

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**APPENDIX E  
HISTORICAL MAPS AND PHOTOGRAPHS (ON DVD)**

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**APPENDIX F  
NAS BRUNSWICK BUILDING USE CHRONOLOGY**

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**APPENDIX F**  
**NAS BRUNSWICK BUILDING USE CHRONOLOGY**  
**PAGE 1 OF 26**

Table 3-4 summarizes the use of the buildings at NAS Brunswick from 1946 through 2011. The data in the table were extracted directly from the referenced documents. NAS Brunswick periodically inventoried the buildings at the site and documented the inventories in stand-alone documents or included them in site map revisions. It is not clear from these documents if the uses ascribed to individual buildings described the buildings actual use or if they indicated its intended use. These inventory documents reflect the installation's evolution from 1946 to the 2011 and are important to understanding where G-RAM could have been used.

Building Number	1946 (HRA-0298)	1950 (HRA-0027)	1952 (HRA-0299)	1956 (HRA-0300)	1962 (HRA-0301)	1966 (HRA-0147)	1976 (HRA-0408)	1999 (HRA-0091)*	2006 (HRA-0089)*	2008 (HRA-0305)*	2009 (HRA-0404)*	2011 (HRA-0403)*
<b>Main Station</b>												
1	Hangar 1	Hangar 1 (54, 512)	Hangar 1	Hangar 1	Hangar 1 (65,955)	Hangar	Hangar 1 (65,955)	Maintenance Hangar (1942)	Hangar 1 (1942) (10,376)	Aircraft Maintenance Hangar 1 - Demolished in 2007 (1942) (10,376)	Aircraft Maintenance Hangar 1 - Demolished in 2007 (1942) (10,376)	Aircraft Maintenance Hangar - Demolished
2	Hangar 2	Hangar 2 (64,656)	Hangar 2	Hangar 2	Hangar 2 (65,955)	Hangar 2 Line Shack	Hangar 2 (65,955)	Maintenance Hangar (1942)	Hangar 2 - Demolished in 1999 (65,954)	Not Listed	Not Listed	Not Listed
3	Hangar 3	Hangar 3 (54,512)	Hangar 3	Hangar 3	Hangar 3 (65,185)	Hangar	Hangar 3 / Photo Lab (65,085)	Aircraft Hangar (1942) - Vacant	Hangar 3 - Demolished in 2005	Aircraft Maintenance Hangar 3 - Demolished (1942) (75,440)	Aircraft Maintenance Hangar 3 - Demolished (1942) (75,440)	Aircraft Maintenance Hangar - Demolished
4	Administrative Building	Administrative Building (14,047)	Administrative Building	Administrative Building	Administrative Building (16,186)	Administrative Building	Administrative Building (16,186)	Administrative Offices (1942)	Administrative Building - Command Headquarters - Vacant 2000	Not Listed	Not Listed	Not Listed
5	Control Tower	Control Tower (7,379)	Control Tower	Not Listed	Not Listed	Not Listed	Not Listed	Aircraft Maintenance Hangar 5 (1982)**	Maintenance Hangar 5 (1982) (163,454)	Aircraft Maintenance Hangar 5 (1982) (163,454)	Aircraft Maintenance Hangar 5 (1982) (163,454)	Aircraft Maintenance Hangar 5 - Transferred
6	Electric Shop-Public Works	Electric Shop-Public Works (1,903)	Electric Shop-Public Works	Electric Shop-Public Works	Electric Shop-Public Works (1,973)	Public Works General Services	Public Works Shop (1,973)	Public Works Shop (1943)	Maintenance Hangar (2005)** (166,335) /Public Old Works Shop - Vacant in 2000 (1,973)	Aircraft Maintenance Hangar 6 (2005) (166,335)	Aircraft Maintenance Hangar 6 (2005) (166,335)	Aircraft Maintenance Hangar 6 - Transferred
7	Garage & Fire Station	Garage & Fire Station (11,566)	Garage & Fire Station	Garage & Fire Station	Garage & Fire Station (11,884)	Construction Battalion and Ground Support Equipment	Auto Vehicle Maintenance Facility (11,884)	Not Listed	Public Works Aircraft Maintenance Department - Disposed	Not Listed	Not Listed	Not Listed
8	Public Works	Public Works Office and Shops (16,956)	Public Works	Administration & Shops	Administration & Shops (17,252)	Public Works Office and Shops	Public Works Office and Shops (17,252)	Administrative Office (1944)	Public Works Office and Shops - Vacant (18,428)	Not Listed	Not Listed	Not Listed
9	Laundry	Laundry (7,296)	Laundry	Electronics & Ordnance Shop	Electronics & Ordnance Shop (8,598)	Housing Office and Warehouse	Housing Office and Storehouse (8,598)	Housing Administration and Storage (1943)	Administrative Space - Vacant (1943) (8,723)	Morale, Welfare and Recreation Chief Petty Officer Ward Room (1943) (8,723)	Morale, Welfare and Recreation Chief Petty Officer Ward Room (1943) (8,723)	Morale, Welfare and Recreation Chief Petty Officer Ward Room (1943) (8,723)
10	Enclosed Shed	Enclosed Shed (11,610)	Enclosed Shed	Garage	Garage (11,622)	Shops and Storage	Shops and Storehouse (11,622)	Not Listed	Oil Spill Equipment Storage (2004)** / Old Public Work Shop - Demolished	Oil Spill Equipment Storage (2004)	Oil Spill Equipment Storage (2004)	Oil Spill Equipment Storage (2004) (400)
11	Aircraft Storehouse	Aircraft Storehouse (20,610)	Aircraft Storage	Storehouse	Not Listed	Not Listed	Not Listed	Naval Exchange (1981)**	Naval Exchange (1981) (52,381)	Navy Exchange (1981) (52,381)	Navy Exchange (1981) (52,381)	Navy Exchange (1981) (52,381)
12	Aircraft Storehouse	Aircraft Storehouse and Supply (20,610)	Aircraft Storage	Administration & Storehouse	Administration & Storehouse (25,070)	Storage and Offices	Storehouse and Offices (25,070)	Supply Building and Administrative Offices (1945)	Supply Storage and Offices - Vacant in 2000	Not Listed	Not Listed	Not Listed
13	Paint & Oil Storehouse	Not Listed	Paint & Oil Storehouse	Storehouse	Storage - Paint and Oil (6,622)	Paint & Oil Storage	Paint & Oil Storage (6,622)	Paint & Oil Storage (1944)	Supply Paint and Oil Storage - Demolished (1998)	Not Listed	Not Listed	Not Listed
14	Cold Storehouse	Cold Storehouse (6,460)	Cold Storehouse	Cold Storehouse	Storage - Cold and Dry Stores (7,980)	Cold Storehouse	Cold Storehouse (7,980)	Not Listed	Supply Cold and Dry Storage -Demolished	Not Listed	Not Listed	Not Listed

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15	General Storehouse	General Storehouse (11,900)	General Storehouse	Storehouse	Navy Exchange (11,898)	Navy Exchange	Navy Exchange (11,898)	General Storehouse (1943)	Navy Exchange - Vacant in 1998	Not Listed	Not Listed	Not Listed
16	General Storehouse	General Storehouse (11,900)	General Storehouse	Storehouse	Commissary Store (12,041)	Commissary Store	Commissary Store (12,041)	Navy Exchange Warehouse (1943)	Commissary - Vacant in 1998	Not Listed	Not Listed	Not Listed
17	Barracks	Barracks (26,672)	Barracks	Storehouse & Barracks	Red Cross, Credit Union and Training Building (25,235)	Red Cross, Credit Union and Aircraft Maintenance Department Survival Training Shop	Red Cross, Credit Union and Training Building (25,235)	Not Listed	Red Cross, Credit Union and Aircraft Maintenance Department Survival Training Shop - Demolished	Not Listed	Not Listed	Not Listed
18	Barracks	Barracks (13,018)	Barracks	Barracks & Chief Petty Officer Club	Chief Petty Officer Barracks	Chief Petty Officer Barracks	Chief Petty Officer Barracks	Not Listed	Chief Petty Officer Barracks (Demolished)	Not Listed	Not Listed	Morale, Welfare, and Recreation Golf Cart Storage (1970)** (2,100)
19	Barracks	Barracks (26,672)	Barracks	Barracks - Out-leased to Air Force	Marine Barracks (25,235)	Marine Barracks	Marine Barracks (25,235)	Disposal Storage Building (1981)**	Public Works Shop - Demolished (1981) (6,000)	Public Works Shop (1981) (6,000)	Public Works Shop (1981) (6,000)	Public Works Shop (1981) (6,000)
20	Barracks	Barracks (26,672)	Barracks	Storehouse & Chief Petty Officer Club	Library, Public Grade School, & Hobby Shop (25,235)	Nursery, Public School, Sunday School, and Hobby Shop	Library, Nursery, and Hobby Shop (25,235)	Administrative Offices, Post Office (1943)	Community Facilities (1943) (25,871)	Community Facilities (1943) (25,871)	Community Facilities (1943) (25,871)	Community Facilities (1943) (25,871)
21	Mess Hall	Mess Hall (49,369)	Mess Hall	Not Listed	Not Listed	Not Listed	Not Listed	Child Care Center (1983)**	Child Care Center (1983) (4,975)	Child Care Center (1983) (4,975)	Child Care Center (1983) (4,975)	Child Care Center (1983) (4,975)
22	Brig	Brig (2,680)	Brig	Brig	Brig (2,687)	Brig	Brig (2,687)	Brig (1943)	Brig - Demolished 1998 (2,687)	Not Listed	Morale, Welfare, and Recreation Golf Maintenance Shelter (1990)**(1,003)	Morale, Welfare, and Recreation Golf Maintenance Shelter (1990)** (1,003)
23	Ships Service & Auditorium	Ships Service & Auditorium (20,699)	Ships Service & Auditorium	Exchange & Auditorium	Recreation & Navy Exchange Cafeteria (20,895)	Gymnasium, Navy Exchange Cafeteria, and Country Store	Recreation & Navy Exchange Cafeteria (20,895)	Car Wash (1994)**	Car Wash (1994) (1,335) / Old Gymnasium, Navy Exchange Cafeteria, and Country Store - Demolished	Car Wash (1994) (1,335)	Car Wash (1994) (1,335)	Car Wash (1994) (1,335)
24	Bachelor Officers Quarters Building	Not Listed	Bachelor Officers Quarters Building	Bachelor Officers Quarters	Not Listed	Not Listed	Not Listed	Personnel Support Detachment Building (1982) **	Personnel Support Detachment Building (1982) (10,000)	Personnel Support Detachment Building (1982) (10,000)	Personnel Support Detachment Building (1982) (10,000)	Personnel Support Detachment Building (1982) (10,000)
25	Bachelor Officers Quarters Building	Not Listed	Bachelor Officers Quarters Building	Wave Quarters	Not Listed	Not Listed	Not Listed	Gymnasium (1983)**	Indoor Fitness Center (1983) (16,658)	Indoor Fitness Center (1983) (16,658)	Indoor Fitness Center (1983) (16,658)	Indoor Fitness Center (1983) (16,658)
26	Bachelor Officers Quarters Building	Not Listed	Bachelor Officers Quarters Building	Bachelor Officers Quarters	Transient Bachelor Officers Quarters and Stewards Barracks	Stewards Barracks	Motel and Stewards Barracks	Child Care Center (1990)**	Child Care Center (1990) (6,496) / Old Stewards Barracks (Demolished)	Child Care Center (1990) (6,496)	Child Care Center (1990) (6,496)	Child Care Center (1990) (6,496)
27	Bachelor Officers Quarters Building	Not Listed	Bachelor Officers Quarters Building	Bachelor Officers Quarters	Not Listed	Not Listed	Not Listed	Family Services Center (1982)**	Family Services Center (1984) (7,862)	Family Services Center (1984) (7,862)	Family Services Center (1984) (7,862)	Family Services Center (1984) (7,862)
28	Carbon Dioxide Building	Carbon Dioxide Building (10,785)	Fleet Air Service Squadrons Storage	Carburetor Shop	Oxygen Shop (784)	Oxygen Shop	Oxygen Shop (784)	Oxygen Shop (1944)	Oxygen Shop - Vacant (1944) (784)	Oxygen Shop (1944) (784)	Oxygen Shop (1944) (784)	Oxygen Shop (1944) (784)
29	Water Supply & Pumphouse	Not Listed	Water Supply & Pumphouse	Pumphouse	Transportation Dispatch (335)	Snow Removal Central	Transportation Dispatch (335)	Auto Hobby Shop (1988)**	Auto Hobby Shop (1988) (12,000) / Old Snow Removal Central - Demolished	Auto Hobby Shop (1988) (12,000)	Auto Hobby Shop (1988) (12,000)	Auto Hobby Shop (1988) (12,000)

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30	Infirmary	Dispensary (32,600)	Infirmary	Infirmary	Station Hospital	Station Hospital / Dental Clinic	Dispensary / Dental Clinic	Not Listed	Family Service Center Storage (1995)**(4,608) / Old Station Hospital & Dental Clinic - Demolished	Family Service Center Storage (1995) (4,608)	Family Service Center Storage (1995) (4,608)	Family Service Center Storage (1995) (4,608)
31	Incinerator Building	Incinerator (816)	Incinerator Building	Not Listed	Not Listed	Not Listed	Inactive	Not Listed	Navy Lodge (1999)** (15,054)	Navy Lodge (1999) (15,054)	Navy Lodge (1999) (15,054)	Navy Lodge (1999) (15,054)
32	Sewage Pumping Building	Not Listed	Sewage Pumping Building	Sewage Pumphouse	Classified Material Incinerator (560)	Vacant	Inactive	Police Operations Building (1981)**	Recreation Pavilion (1981) (1,500)	Police Office (1981) (1,500)	Police Office (1981) (1,500)	Police Office (1981) (1,500)
33	Gatehouse Building	Gatehouse (110)	Gatehouse Building	Gatehouse	Sentry Booth (106)	Sentry Booth, Main Entrance	Sentry Booth (106)	Main Gate Sentry House - Vacant (1954)	Sentry House Front Gate (1954) (106)	Sentry House Front Gate (1954) (106)	Sentry House Front Gate (1954) (106)	Sentry House Front Gate (1954) (106)
34	Armory	Post Office (1,915)	Armory	Library & Thrift Shop	Navy Relief and Chaplain's Office (1,930)	Navy Exchange Office	Navy Exchange Office (1,930)	Not Listed	Not Listed	Golf Cart Storage (1970)** (2,100)	Golf Cart Storage (1970) (2,100)	Morale, Welfare, and Recreation Golf Shed - Demolished (1999) (24)
35	Radio Transmission Building	Radio Transmittal Building (1,828)	Radio Transmission Building	Air Force Communications Receiver	Marine Aviation Detachment Building** (3,034)	Marine Aviation Detachment Building	Marine Aviation Detachment Building (3,034)	Applied Instruction Building (1943)	Sentry House Front Gate (2004)** / Air Conditioning Maintenance - Demolished in 1998 (2,704)	Main Sentry House Front Gate (2004)	Main Gate Sentry House (2004) (200)	Main Gate Sentry House (2004) (200)
36	Heating Plant	Heating Plant (4,999)	Heating Plant	Heating Plant	Not Listed	Not Listed	Not Listed	Heating Plant (1985)	Dyer's Gate Sentry House (2004)** /Unknown Building - Demolished in 1998 (8,640)	Dyer's Gate Sentry House (2004)	Dyer's Gate Sentry House (2004) (200)	Dyer's Gate Sentry House (2004) (200)
37	Security & Labor Board Building	Not Listed	Security & Labor Board Building	Independent Review Office & Security Administration	Gatehouse (2,363)	Pass Office and Shore Patrol	Gatehouse (2,363)	Pass Office (1943)	Naval Criminal Investigative Service (1943) (2,320)	Midcoast Maine Redevelopment	Midcoast Main Redevelopment Authority (1943) (2,320)	Midcoast Main Redevelopment Authority (1943) (2,320)
38	Officers' Mess & Lounge	Not Listed	Officers' Club	Officers' Club	Officers' Club (23,466)	Officers' Club	Officers' Club (23,466)	Commissioned Officers' Mess (1943)	Pass & ID Office (2004)** / Officers' Club - Demolished in 1998 (19,612)	Pass & Decal Office (2004) (760)	Pass & Decal Office (2004) (760)	Pass & Decal Office (2004) (760)
39	Demolished	Not Listed	Demolished	Not Listed	Not Listed	Not Listed	Not Listed	Golf Course Maintenance Building (1985)**	Golf Course Maintenance (1985) (2,800)	Golf Course Maintenance (1985) (2,800)	Golf Course Maintenance (1985) (2,800)	Golf Course Maintenance (1985) (2,800)
40	Logistics Transformation Agency Office	Logistics Transformation Agency Office (145)	Logistics Transformation Agency Office	Not Listed	Not Listed	Not Listed	Not Listed	Oil Spill Equipment Storage (1986)**	Not Listed	Environmental Equipment Storage - Demolished in 2004 (1986) (352)	Environmental Equipment Storage - Demolished (1986) (352)	Environmental Equipment Storage - Demolished (1986) (352)
41	Synthetic Training Group	Synthetic Training and Parachute Shop	Synthetic Training Group	Training Building and Fleet Air Service Squadrons Supply	Training Building (12,446)	Fleet Airborne Electronics Training Unit Atlantic Building	Training Building (12,446)	Police Station (1944)	Police/Security Station Vacant (1944) (10,526)	Police/Security Station (1944) (10,526)	Police/Security Station (1944) (10,526)	Police/Security Station (1944) (10,526)
42	Auxiliary Water Storage & Pump	Not Listed	Auxiliary Water Storage & Pumping Station	Pumphouse	Pumphouse, Emergency Water (660)	Pumphouse, Emergency Water	Pumphouse, Emergency Water (660)	Water Distribution (1944)	Pumphouse (1944) (660)	Pumphouse (1944) (660)	Pumphouse (1944) (660)	Pumphouse (1944) (660)
43	Parachute Shop	Synthetic Training and Parachute Shop (10,233)	Parachute Shop	Parachute Shop	Not Listed	Not Listed	Not Listed	Telephone Exchange Building (1988)**	Telephone Exchange Building (1988) (1,156)	Telephone Exchange Building (1988) (1,156)	Telephone Exchange Building (1988) (1,156)	Telephone Exchange Building (1988) (1,156)
44	Storage Warehouse	Torpedo Storage (1,285)	Storage Warehouse	Storehouse	Disaster Control Shelter (1,258)	Weapons Magazine	Disaster Control Shelter (1,258)	Weapons Magazine - Vacant (1943)	Inert Ordnance Storage (1943) (1,258)	Inert Ordnance Storage (1943) (1,258)	Inert Ordnance Storage (1943) (1,258)	Inert Ordnance Storage (1943) (1,258)

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45	General Storehouse	General Storehouse (2,179)	General Storehouse	Storehouse	Storage (2,163)	Aircraft Maintenance Division Storage	Inert Storehouse (2,163)	Hazardous Waste Storage (1992)**	Hazardous Waste Transfer Facility (1992) (3,000) / Aircraft Maintenance Division Storage - Demolished	Hazardous Waste Transfer Facility (1992) (3,000)	Hazardous Waste Transfer Facility (1992) (3,000)	Hazardous Waste Transfer Facility (1992) (3,000)
46	Direction Finder	Direction Finder (679)	Direction Finder	Not Listed	Not Listed	Not Listed	Not Listed	Emergency Dispatch Center Test Facility (No Date)	Security Inspection Office (2004)**	Dyer's Gate Security Inspection Office	Dyer's Gate Security Inspection Office (2004) (300)	Dyer's Gate Security Inspection Office (2004) (300)
47	Chapel	Chapel (3,245)	Chapel	Chapel	Not Listed	Not Listed	Not Listed	Not Listed	Ballfield Storage (1997)** (400)	Ballfield Storage (1997) (400)	Ballfield Storage (1997) (400)	Ballfield Storage (1997) (400)
48	Carpenter Shop-Public Works	Carpenter Shop-Public Works (3,256)	Carpenter Shop-Public Works	Carpenter Shop-Public Works	Carpenter Shop (3,260)	Carpenter Shop-Public Works	Carpenter Shop (3,260)	Public Works Shop (1943)	Carpenter Shop-Public Works - Demolished in 2000 (3,260)	Telephone Communications Vault (2006)**(225)	Telephone Communications Vault (2006) (225)	Telephone Communications Vault (2006) (225)
49	Crash Truck Storage	Crash Truck Storage (635)	Crash Truck Garage	Crash Equipment Garage	Not Listed	Not Listed	Not Listed	Electrical Substation (1981)**	Regulator / Substation Building (1981) (315)	Regulator / Substation Building (1981) (315)	Regulator / Substation Building (1981) (315)	Regulator / Substation Building (1981) (315)
50	10,000 gallon (gal) Used Oil Tank	Not Listed	10,000 gal Used Oil Tank	Oil Pumphouse	Oil Pumphouse (370)	Oil Pumphouse	Oil Pumphouse (370)	Groundwater Treatment Plant (1995)**	Groundwater Extraction & Treatment Facility (1995) (6,000) / Old Supply Oil Pumphouse Demolished	Groundwater Treatment Plant (1995) (5,500)	Groundwater Treatment Plant (1995) (5,500)	Groundwater Treatment Plant (1995) (5,500)
51	Paint Locker-Public Works	Paint Locker-Public Works (1,520)	Paint Locker-Public Works	Paint Shop	Paint Shop (1,817)	Paint Shop	Paint Shop (1,817)	Paint Shop (1944)	Paint Shop - Vacant in 2000 (1,870) / Hazardous Waste Facility (2005)**(5,000)	Fire Prevention / Naval Criminal Investigative Service Building (2005) (4,200)	Fire Prevention / Naval Criminal Investigative Service Building (2005) (4,200)	Fire Prevention / Naval Criminal Investigative Service Building (2005) (4,200)
52	Not Listed	Inert Storehouse (4,000)	Inert Storehouse	Operations Storehouse	Inert Storage (4,000)	Inert Storage	Storehouse (4,000)	Inert Storage Building (1943)	Not Listed	Inert Storage Building (1943) (4,000)	Inert Storage Building - Demolished (1943) (4,000)	Inert Storage Building - Demolished (1943) (4,000)
53	Small Arms Magazine	Magazine (1,052)	Small Arms Magazine	Magazine	Not Listed	Not Listed	Not Listed	Hazmat Spill Response (1998)**	Public Works Shop (1996) (10,000)	Public Works Administration (1996) (10,000)	Public Works Administration (1996) (10,000)	Public Works Administration (1996) (10,000)
54	Small Arms Magazine	Magazine (1,052)	Small Arms Magazine	Magazine	Not Listed	Not Listed	Not Listed	Instruction (1988)**	Applied Instruction Building (1988) (30,000)	Applied Instruction Building (1988) (30,000)	Applied Instruction Building (1988) (30,000)	Applied Instruction Building (1988) (30,000)
55	Pyrotechnic	Magazine (1,052)	Pyrotechnic	Magazine	Explosive Ordnance Disposal Shelter (418)	Explosive Ordnance Disposal Shelter	Explosive Ordnance Disposal Shelter (418)	Not Listed	Police-Security Station (2005)** (11,000) / Explosive Ordnance Disposal Shelter - Demolished	Base Security (2005) (10,014)	Base Security (2005) (10,014)	Base Security (2005) (10,014)
56	High Explosives	Magazine (1,052)	High Explosives	Not Listed	Not Listed	Not Listed	Not Listed	Scale House (1987)**	Not Listed	Doss Aviation Trailer (no date)	Doss Aviation Trailer/ Fuel Farm Auxiliary Building (1987) (120)	Fuel Farm Auxiliary Building (1987) (120)
57	High Explosives	Magazine (1,052)	High Explosives	Magazine	Not Listed	Not Listed	Not Listed	Not Listed	Beacon Tower (2005)**	Rotating Beacon (2005)	Rotating Beacon	Rotating Beacon (2005) (400)
58	High Explosives Magazine	Magazine (1,052)	High Explosives Magazine	Magazine	Magazine (1,010)	Magazine	Magazine (1,010)	Not Listed	Tactical Air Navigation (2005)**	Tactical Air Navigation (2005)	Tactical Air Navigation (2005) (100)	Tactical Air Navigation (2005) (100)
59	High Explosives Magazine	Magazine (1,052)	High Explosives Magazine	Public Works Storehouse	Storage (1,010)	Public Works Storage	Storage (1,010)	Weapons/Ordnance Storage (1943)	High Explosives Magazine (1943) (1,010)	High Explosives Magazine (1943) (1,010)	High Explosives Magazine - Demolished (1943) (1,010)	High Explosives Magazine - Demolished (1943) (1,010)

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60	High Explosives Magazine	Magazine (1,052)	High Explosives Magazine	Storehouse	Storage (1,010)	Storehouse	Magazine (1,010)	Weapons/Ordnance Storage (1943)	Inert Ordnance Storage (1943) (1,010)	Inert Ordnance Storage (1943) (1,010)	Inert Ordnance Storage - Demolished (1943) (1,010)	Inert Ordnance Storage - Demolished (1943) (1,010)
61	High Explosives Magazine	Magazine (1,052)	High Explosives Magazine	Magazine	Magazine (1,010)	Magazine	Magazine (1,010)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
62	High Explosives Magazine	Magazine (1,052)	High Explosives Magazine	Magazine	Magazine (1,010)	Magazine	Magazine (1,010)	Weapons/Ordnance Storage (1943)	Ammo Storage Facility (1943) (1,010)	Ammo Storage Facility (1943) (1,010)	Ammo Storage Facility - Demolished (1943) (1,010)	Ammo Storage Facility - Demolished (1943) (1,010)
63	High Explosives Magazine	Magazine (1,052)	High Explosives Magazine	Magazine	Magazine (1,010)	Magazine	Magazine (1,010)	Squadron Storage (1943)	Storage Facility (1943) (1,010)			
64	Incendiary	Magazine (1,052)	Incendiary	Magazine	Magazine (1,010)	Magazine	Magazine (1,010)	Squadron Storage (1943)	Storage Facility (1943) (1,010)			
65	Fuse & Detonator	Magazine (105)	Fuse & Detonator	Magazine	Not Listed	Not Listed	Not Listed	Picnic Shelter (1986)**	Picnic Shelter (1966) (3,380)			
66	Fuse & Detonator	Magazine (105)	Fuse & Detonator	Magazine	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
67	Fuse & Detonator	Magazine (105)	Fuse & Detonator	Magazine	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
69	Ready Magazine	Ready Magazine (65)	Ready Magazine	Magazine	Magazine (69)	Weapons Magazine	Magazine (69)	Ammunition Storage (1943)	Not Listed	Not Listed	Not Listed	Not Listed
70	Fusing & Arming Building	Rocket Propellant Fusing (449)	Fusing & Arming Building	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
71	Ready Magazine	Ready Magazine (1,052)	Ready Magazine	Public Works Storehouse	Special Services Storage (1,010)	Special Services Storage	Magazine (1,010)	Weapons/Ordnance Storage (1943)	Ammo Magazine (1943) (1,010)	Ammo Magazine (1943) (1,010)	Ammo Magazine - Demolished (1943) (1,010)	Ammo Magazine - Demolished (1943) (1,010)
72	Ready Magazine	Ready Magazine (216)	Ready Magazine	Not Listed	Not Listed	Not Listed	Not Listed	Skating Area Gazebo (1985)**	Not Listed	Not Listed	Not Listed	Not Listed
73	Ready Magazine	Ready Magazine (65)	Ready Magazine	Operations Storehouse	Pyrotechnics Locker (64)	Pyrotechnics Locker	Pyrotechnics Locker (64)	Storage (1945)	Pyrotechnics Locker - Demolished in 2000 (64)	Not Listed	Not Listed	Not Listed
74	Lumber Shed	Lumber Storage (6,324)	Lumber Shed	Lumber Shed	Lumber Shed (3,139)	Lumber Shed	Lumber Shed (3,139)	Lumber Shed (1944)	Lumber Shed - Demolished in 2000 (3,072)	Not Listed	Not Listed	Not Listed
75	Ammunition Belting Shed	Ammunition Belting Shack (330)	Ammunition Belting Shed	Ammunition Belting Shed	Paint Storage (332)	Paint Storage	Paint Storehouse (332)	Paint Shop Storage (Vacant)	Paint Storage - Demolished in 2000 (332)	Not Listed	Not Listed	Not Listed
76	Sheet Range Storage	Dwelling (Sheet Range Storehouse) (605)	Enlisted Men Quarters	Not Listed	Not Listed	Not Listed	Not Listed	Ready Magazine (1981)**	Not Listed	Not Listed	Not Listed	Not Listed
77	Bus Waiting Room	Bus Waiting Room (297)	Bus Waiting Room	Bus Waiting Room	Not Listed	Not Listed	Not Listed	Weapons Area Receiving Building (1994)**	Weapons Build-up Facility (1993) (4,000)			
78	Line Shack	Line Shack (320)	Line Shack	Line Shack	Not Listed	Not Listed	Not Listed	Golf Clubhouse (1981)**	Golf Clubhouse (1981) (3,040)			
79	Rocket Propellant Ready Room	Rocket Propellant Ready Room (809)	Rocket Propellant Ready Room	Not Listed	Not Listed	Not Listed	Not Listed	Hobby Shop Storage (1980)**	Hobby Shop Storage (1980) (540)			
81	Sea Bag Lockers	Sea Bag Lockers (974)	Hobby Shop	Hobby Shop	Not Listed	Not Listed	Not Listed	Inert Storage Building (1980)**	Consolidated Hazardous Material Reutilization and Inventory Management Program Facility (1980) (7,000)	Consolidated Hazardous Material Reutilization and Inventory Management Program Facility (1980) (7,000)	Consolidated Hazardous Material Reutilization and Inventory Management Program Facility (1980) (7,000)	Consolidated Hazardous Material Reutilization and Inventory Management Program Facility (1980) (7,000)
83	Storehouse	General Storehouse (1,200)	General Storehouse (To Be Razed)	Not Listed	Not Listed	Not Listed	Not Listed	Ordnance Disposal Area (1981)**	Ordnance Disposal Site (1981) (18 Acre)			
84	Storehouse	General Storehouse (1,200)	Storehouse (To Be Razed)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed

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Building Number	1946 (HRA-0298)	1950 (HRA-0027)	1952 (HRA-0299)	1956 (HRA-0300)	1962 (HRA-0301)	1966 (HRA-0147)	1976 (HRA-0408)	1999 (HRA-0091)*	2006 (HRA-0089)*	2008 (HRA-0305)*	2009 (HRA-0404)*	2011 (HRA-0403)*
85	Storehouse	General Storehouse (1,200)	Storehouse (To Be Razed)	Not Listed	Not Listed	Not Listed	Not Listed	Athletic Facility Toilet Building (1980)**	Not Listed	Not Listed	Not Listed	Not Listed
86	Storehouse	General Storehouse (1,200)	Storehouse (To Be Razed)	Not Listed	Not Listed	Not Listed	Not Listed	Aircraft Ground Support Shop (1992)**	Ground Support Equipment Maintenance Shop (1992) (31,980)	Ground Support Equipment Maintenance Shop (1992) (31,980)	Ground Support Equipment Maintenance Shop (1992) (31,980)	Ground Support Equipment Maintenance Shop (1992) (31,980)
87	Line Shack - Removed	Line Shack (777)	Line Shack - Removed	Not Listed	Not Listed	Not Listed	Not Listed	Communications Center (1988)**	Antisubmarine Warfare Operations Center (1988) (52,513)	Antisubmarine Warfare Operations Center (1988) (52,513)	Antisubmarine Warfare Operations Center - Leased (1988) (52,513)	Antisubmarine Warfare Operations Center - Leased (1988) (52,513)
88	Maintenance Trainer	Maintenance Training (1,466)	Maintenance Trainer	Storehouse	Storage (1,462)	Public Works Storage	Storehouse (1,462)	Public Works Storage (1945)	Public Works Storage - Demolished in 2000 (1,462)	Not Listed	Not Listed	Not Listed
90	Line Shack - Removed	Line Shack - Relocated near Control Tower Building 5 (535)	Line Shack - Removed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
91	Foam Generator Shack	Foam Generator (160)	Foam Generator Shack	Carbon Dioxide Storehouse	Foam Storage (169)	Foam Storage for Gas Farm	Foam Storage (169)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
92	Aviation Gas Unloading	Aviation Gas Unloading Shed (686)	Aviation Gas Unloading	Gas Unloading Rack	Aviation Gas Pumps Shelter	Shelter for Aviation Gas Pumps	Shelter, Aviation Gas Pumps	Pump Shelter, Glycol (No Date)	Not Listed	Not Listed	Not Listed	Not Listed
93	General Storehouse	General Storehouse (4,119)	General Storehouse	Storehouse	Storage (3,645)	Public Works Storage	Storehouse (645)	Public Works Maintenance Storage Building (1943)	Public Works Storage - Demolished in 1998 (2,400)	Not Listed	Not Listed	Not Listed
94	Paint Locker-Hangar	Paint Locker (65)	Paint Locker-Hangar	Storehouse	Pyrotechnics Storage (64)	Pyrotechnics Storage	Storehouse (64)	Paint Locker (1945)	Weapons Pyrotechnics Storage - Demolished in 2000 (64)	Not Listed	Not Listed	Not Listed
95	Gas Farm Office	Gas Farm Office (184)	Gas Farm Office	Storehouse	Insecticide Storage (240)	Insecticide Storage	Storehouse (240)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
96	General Storehouse	General Storehouse (2,170)	General Storehouse	Storehouse	Squadron Storage (2,163)	Aircraft Intermediate Maintenance Department Material Storage	Squadron Storage (2,163)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
97	General Storehouse	General Storehouse (2,170)	General Storehouse	Storehouse	Squadron Storage (2,163)	Marine Fleet Storage	Storehouse (2,163)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
98	Transformer Vault	Not Listed	Transformer Vault	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
99	Heavy Equipment Repair	Heavy Equipment Shop (10,352)	Heavy Equipment Repair	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
100	Garage-Quarters D	Not Listed	Garage-Quarters D	Garage-Quarters D	Garage-Quarters D (267)	Quarters "D" Garage	Garage-Quarters D (267)	Garage, Quarters "D" (1944)	Not Listed	Garage, Quarters "D" (1944) (267)	Garage, Quarters "D" (1944) (267)	Garage, Quarters "D" (1944) (267)
101	100,000 gal Fuel Storage Tank	Not Listed	100,000 gal Fuel Storage Tank	100,000 gal Fuel Storage Tank	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed			
102	100,000 gal Fuel Storage Tank	Not Listed	100,000 gal Fuel Storage Tank	100,000 gal Fuel Storage Tank	Not Listed	Indoor Small Arms Range (2004)**(4,975)	Indoor Small Arms Range (2004) (4,975)	Indoor Small Arms Range (2004) (4,975)	Indoor Small Arms Range (2004) (4,975)			
103	100,000 gal Fuel Storage Tank	Not Listed	100,000 gal Fuel Storage Tank	100,000 gal Fuel Storage Tank	Not Listed	Military Working Dog Kennel (2004)**(1,600)	Military Working Dog Kennel (2004) (1,600)	Military Working Dog Kennel (2004) (1,600)	Military Working Dog Kennel (2004) (1,600)			
104	25,000 gal Fuel Storage Tank	Not Listed	25,000 gal Fuel Storage Tank	50,000 gal Fuel Storage Tank	25,000 gal Fuel Storage Tank	25,000 gal Fuel Storage Tank	100,000 gal Fuel Storage Tank	Not Listed	Mechanical Barrier at Dyer's Gate (2004)**(80)	Mechanical Barrier at Dyer's Gate (2004) (80)	Mechanical Barrier at Dyer's Gate (2004) (80)	Mechanical Barrier at Dyer's Gate (2004) (80)

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Building Number	1946 (HRA-0298)	1950 (HRA-0027)	1952 (HRA-0299)	1956 (HRA-0300)	1962 (HRA-0301)	1966 (HRA-0147)	1976 (HRA-0408)	1999 (HRA-0091)*	2006 (HRA-0089)*	2008 (HRA-0305)*	2009 (HRA-0404)*	2011 (HRA-0403)*
106	Gasoline Pumphouse	Not Listed	Gasoline Pumphouse	Gasoline Pumphouse	Gasoline Pumphouse (124)	Gasoline Pumphouse	Gasoline Pumphouse (124)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
107	Gasoline Loading Platform	Not Listed	Gasoline Loading Platform	Gasoline Loading Rack	Gasoline Truck Dock	Gasoline Truck Dock	Gasoline Truck Dock	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
108	Storehouse-Public Works	Not Listed	Storehouse-Public Works	Storehouse-Public Works	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Fuel Tank (1995)**	Not Listed	Not Listed
109	Storehouse-Public	Not Listed	Storehouse-Public	Storehouse-Public	Not Listed	Not Listed	Not Listed	Police Dog Kennel (1983)**	Dog Kennel (1983) (529) (Vacant)	Dog Kennel (1983) (529)	Dog Kennel (1983) (529)	Dog Kennel (1983) (529)
110	Garage - Commanding Officer and Executive Officer	Not Listed	Garage - Commanding Officer and Executive Officer	Garage - Commanding Officer and Executive Officer	Garage - Quarters A & B	Quarter "A" & "B" Garage	Garage - Quarters A & B	Garage, Quarters "A" & "B" (1943)	Not Listed	Garage, Quarters "A" & "B" (1943) (864)	Garage, Quarters "A" & "B" - Transferred (1943) (864)	Garage, Quarters "A" & "B" - Transferred (1943) (864)
111	Sewage Pumphouse	Sewage Pumphouse	Sewage Pumphouse	Sewage Pumphouse	Sewage Pumphouse	Sewage Pumphouse	Sewage Pumphouse	Sewage Pumphouse (1943)	Sewage Pumphouse (1943) (64)	Sewage Pumphouse (1943) (64)	Sewage Pumphouse (1943) (64)	Sewage Pumphouse (1943) (64)
113	Abandoned House	Not Listed	Abandoned House	Abandoned House	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
114	Abandoned House	Not Listed	Abandoned House	Abandoned House	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
115	Abandoned House	Not Listed	Abandoned House	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Aircraft Arresting Gear (1958)**	Aircraft Arresting Gear - Transferred (1958)	Aircraft Arresting Gear - Transferred (1958)
116	Abandoned House	Not Listed	Abandoned House	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
117	Abandoned House	Not Listed	Abandoned House	Not Listed	Not Listed	Not Listed	Not Listed	Gas Filling Station (1984)**	Filling Station (1984) (124)	Filling Station (1984) (124)	Filling Station (1984) (124)	Filling Station (1984) (124)
118	Abandoned House	Not Listed	Abandoned House	Not Listed	Not Listed	Not Listed	Not Listed	Filling Station Storage (1984)**	Filling Station Storage (1984) (42)	Filling Station Storage (1984) (42)	Filling Station Storage (1984) (42)	Filling Station Storage (1984) (42)
120	Abandoned House	Not Listed	Abandoned House	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
121	Abandoned House	Not Listed	Abandoned House	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
122	Abandoned House	Not Listed	Abandoned House	Not Listed	Flag Pole** (55 feet tall)	Marine Barracks Flagpole	Flag Pole (55 feet tall)	Flag Pole (1988)	Flag Pole / Administrative (1953)	Flag Pole (1953)	Flag Pole (1953)	Flag Pole (1953)
123	Abandoned House	Not Listed	Abandoned House	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
124	Abandoned House	Not Listed	Abandoned House	Not Listed	Fire Protection 250,000 gal Water Tank	250,000 gal Fire Water Tank	Fire Protection 250,000 gal Water Tank	Fire Protection Water Tank (1944)	Storage Tank Ground Level (1944) (3,721)	Storage Tank Ground Level (1944) (33,489)	Storage Tank Ground Level (1944) (33,489)	Storage Tank Ground Level (1944) (33,489)
125	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Guard Tower (1983)**(256)	Guard Tower (1983) (256)	Guard Tower (1983) (256)	Guard Tower (1983) (256)
126	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	National Guard Magazine (A-G) (1983)**	National Guard Magazine (1983) (2,040)	National Guard Magazine (1983) (2,040)	National Guard Magazine (1983) (2,040)	National Guard Magazine (1983) (2,040)
127	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	National Guard Magazine (1983)**	National Guard Magazine (1983) (264)	National Guard Magazine (1983) (264)	National Guard Magazine (1983) (264)	National Guard Magazine (1983) (264)
128	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	3,000 gal Gasoline Tank	3,000 gal Gasoline Tank	National Guard Magazine (1983)**	National Guard Magazine (1983) (266)	National Guard Magazine (1983) (266)	National Guard Magazine (1983) (266)	National Guard Magazine (1983) (266)
137	Abandoned House	Not Listed	Abandoned House	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
139	Not Listed	Not Listed	Not Listed	Not Listed	Pistol Range	Marine Pistol Range	Pistol Range	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
142	Abandoned House	Not Listed	Abandoned House	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
143	Abandoned House	Not Listed	Abandoned House	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
144	Abandoned House	Not Listed	Abandoned House	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
145	Not Listed	Not Listed	Not Listed	Not Listed	Railroad Dock (1,575)	Weapons Railroad Dock	Railroad Dock (1,575)	Not Listed	Loading Platform (1943) (7,452)	Loading Platform (1943) (7,452)	Loading Platform (1943) (7,452)	Loading Platform (1943) (7,452)
146	Not Listed	Not Listed	Not Listed	Not Listed	Athletic Field	Athletic Field	Athletic Field	Not Listed	Watermain Entrance Shelter (1987)**(230)	Watermain Entrance Shelter (1987) (230)	Watermain Entrance Shelter (1987) (230)	Watermain Entrance Shelter (1987) (230)
147	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Water Meter Pit Shelter (1987) (240)	Water Meter Pit Shelter (1987) (240)	Water Meter Pit Shelter (1987) (240)	Water Meter Pit Shelter (1987) (240)

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Building Number	1946 (HRA-0298)	1950 (HRA-0027)	1952 (HRA-0299)	1956 (HRA-0300)	1962 (HRA-0301)	1966 (HRA-0147)	1976 (HRA-0408)	1999 (HRA-0091)*	2006 (HRA-0089)*	2008 (HRA-0305)*	2009 (HRA-0404)*	2011 (HRA-0403)*
148	Not Listed	Not Listed	Not Listed	Not Listed	Skeet House - Low (47)	Skeet House - Low	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
149	Not Listed	Not Listed	Not Listed	Not Listed	Skeet Operator House (32)	Skeet Operator House - Middle	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
150	Not Listed	Not Listed	Not Listed	Not Listed	Skeet House - High (45)	Skeet House - High	Not Listed	Aviation Physiology, Water Survival Training Unit (1992)**	Naval Air Reserve Center (1992) (13,196)	Naval Air Reserve Center (1992) (13,196)	Naval Air Reserve Center (1992) (13,196)	Naval Air Reserve Center (1992) (13,196)
151	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Naval Surface Reserve Center (2002)** (24,480)	Naval Surface Reserve Center (2002) (24,480)	Naval Surface Reserve Center - Transfer (2002) (24,480)	Naval Surface Reserve Center - Transfer (2002) (24,480)
153	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Sand/Gravel Storage Building (1992)**	Recycling Center (1992) (7,800)	Recycling Center (1992) (7,800)	Recycling Center (1992) (7,800)	Recycling Center (1992) (7,800)
156	Not Listed	Not Listed	Not Listed	Not Listed	Ornamental Gun Emplacement - South	Ornamental Gun Emplacement - South	Ornamental Gun Emplacement - South	Naval Guns Monument (1946)	Monument (1943)	Monument (1943)	Monument - Transferred (1943)	Monument - Transferred (1943)
157	Not Listed	Not Listed	Not Listed	Not Listed	Ornamental Gun Emplacement - North	Ornamental Gun Emplacement - North	Ornamental Gun Emplacement - North	Naval Guns Monument (1946)	Monument (1943)	Monument (1943)	Monument - Transferred (1943)	Monument - Transferred (1943)
200	Not Listed	Not Listed	Not Listed	Operations Building & Control Tower (1954**)	Operations Building (19,790)	Air Operations - Operations Building	Operations Building (19,790)	Control Tower and Operations Building (1952)	Operations-Control Tower Building (1954) (22,409)	Operations-Control Tower Building (1954) (22,409)	Operations-Control Tower Building (1954) (22,409)	Operations-Control Tower Building (1954) (22,409)
201	Not Listed	Not Listed	Not Listed	Enlisted Men's Club (1953**)	Chief Petty Officer Club (9,425)	Chief Petty Officer Club	Chief Petty Officer Club (9,425)	Galley (1953)	Galley / Neptune Hall (1953) (9,425)	Galley / Neptune Hall (1953) (9,425)	Galley / Neptune Hall (1953) (9,425)	Galley / Neptune Hall (1953) (9,425)
202	Not Listed	Not Listed	Not Listed	567,000 gal Fuel Tank	567,000 gal Aviation Gas Tank	567,000 gal Aviation Gas Tank	567,000 gal Aviation Gas Tank	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
203	Not Listed	Not Listed	Not Listed	567,000 gal Fuel Tank	567,000 gal Jet Fuel Tank	567,000 gal Jet Gas Tank	567,000 gal Jet Fuel Tank	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
204	Not Listed	Not Listed	Not Listed	567,000 gal Fuel Tank	567,000 gal Aviation Gas Tank	567,000 gal Aviation Gas Tank	567,000 gal Aviation Gas Tank	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
205	Not Listed	Not Listed	Not Listed	567,000 gal Fuel Tank	567,000 gal Jet Fuel Tank	567,000 gal Jet Fuel Tank	567,000 gal Jet Fuel Tank	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
206	Not Listed	Not Listed	Not Listed	Fuel Loading Rack	Truck Dock and Separator House (830)	Truck Dock and Separator Supply	Truck Dock and Separator House (830)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
208	Not Listed	Not Listed	Not Listed	Generator Building (1952**)	Gas Farm Transformer Vault (244)	Gas Farm Transformer Vault	Gas Farm Transformer Vault (244)	Fuel Farm Transformer Vault (1952)	Not Listed	Not Listed	Not Listed	Not Listed
209	Not Listed	Not Listed	Not Listed	Transformer Building (1954**)	Runway Lighting Transformer Vault (456)	Runway Lighting Transformer Vault	Runway Lighting Transformer Vault (456)	Rigging Shop (1954)	Electric Distribution Building (1954) (2,283)	Electric Distribution Building (1954) (2,283)	Electric Distribution Building (1954) (2,283)	Electric Distribution Building (1954) (2,283)
210	Not Listed	Not Listed	Not Listed	Rotating Beacon (1954**)	Beacon Tower - 73 feet tall	Beacon Tower	Beacon Tower - 73 feet tall	Aviation Beacon (1954)	Not Listed	Old Beacon Tower - Demolished in 2004 (1954)	Beacon Tower - Demolished (1954)	Old Beacon Tower - Demolished (1954)
211	Not Listed	Not Listed	Not Listed	Subsistence Building (1954**)	Subsistence Building	Subsistence Building	Subsistence Building	Neptune Hall (1954)	Physical Fitness Building (1954) (50,984)	Physical Fitness Building (1954) (50,984)	Physical Fitness Facility (1954) (50,984)	Physical Fitness Building (1954) (50,984)
213	Not Listed	Not Listed	Not Listed	Barracks (1954**)	Barracks	Barracks	Barracks	Bachelor Enlisted Quarters Barracks (1954)	Barracks - Vacant in 2003 (22,174)	Not Listed	Not Listed	Not Listed
214	Not Listed	Not Listed	Not Listed	Barracks (1954**)	Barracks	Barracks	Barracks	Bachelor Enlisted Quarters Barracks (1954)	Barracks - Vacant in 2003 (22,174)	Not Listed	Not Listed	Not Listed

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215	Not Listed	Not Listed	Not Listed	Barracks (1954**)	Barracks	Barracks	Barracks	Bachelor Enlisted Quarters Barracks (1954)	Barracks - Vacant in 2003 (22,174)	Not Listed	Not Listed	Not Listed
216	Not Listed	Not Listed	Not Listed	Barracks (1954**)	Barracks	Barracks	Barracks	Bachelor Enlisted Quarters Barracks (1954)	Barracks - Vacant in 2003 (22,174)	Not Listed	Not Listed	Not Listed
217	Not Listed	Not Listed	Not Listed	Barracks (1954**)	Barracks	Barracks	Barracks	Bachelor Enlisted Quarters Barracks (1954)	Barracks - Vacant in 2003 (22,174)	Not Listed	Not Listed	Not Listed
218	Not Listed	Not Listed	Not Listed	Barracks (1954**)	Barracks	Barracks	Barracks	Bachelor Enlisted Quarters Barracks (1954)	Barracks - Vacant in 2003 (22,174)	Barracks - Demolished in 2004 (1954) (22,174)	Barracks - Demolished in 2004 (1954) (22,174)	Barracks - Demolished in 2004 (1954) (22,174)
219	Not Listed	Not Listed	Not Listed	Barracks (1954**)	Barracks	Barracks	Barracks	Bachelor Enlisted Quarters Barracks (1954)	Barracks - Vacant in 2003 (22,174)	Barracks - Demolished in 2004 (1954) (22,174)	Barracks - Demolished in 2004 (1954) (22,174)	Barracks - Demolished in 2004 (1954) (22,174)
220	Not Listed	Not Listed	Not Listed	Barracks (1954**)	Barracks	Barracks	Barracks	Bachelor Enlisted Quarters Barracks (1954)	Barracks - Vacant in 2003 (22,174)	Barracks - Demolished in 2004 (1954) (22,174)	Barracks - Demolished in 2004 (1954) (22,174)	Barracks - Demolished in 2004 (1954) (22,174)
221	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Thrift Shop (1999) (600)	Thrift Shop (1999) (600)	Thrift Shop (1999) (600)	Thrift Shop (1999) (600)
222	Not Listed	Not Listed	Not Listed	Sewage Pumphouse	Storage (10,590)	Storage	Storehouse (706)	Storage (1954)	Bachelor Enlisted Quarters Maintenance Storage - Vacant (1954) (706)	Bachelor Enlisted Quarters Maintenance Storage - Demolished in 2004 (1954) (706)	Bachelor Enlisted Quarters Maintenance Storage - Demolished in 2004 (1954) (706)	Bachelor Enlisted Quarters Maintenance Storage - Demolished in 2004 (1954) (706)
223	Not Listed	Not Listed	Not Listed	Advanced Undersea Weapons Shop	Mine Shop (4,284)	Armory and Explosive Ordnance Disposal Spaces	Mine Shop (4,284)	Advanced Undersea Weapons Shop (1953)	Navy/Marine Corps Intranet (1953) (4,284)	Navy/Marine Corps Intranet (1953) (4,284)	Navy/Marine Corps Intranet (1953) (4,284)	Navy/Marine Corps Intranet (1953) (4,284)
224	Not Listed	Not Listed	Not Listed	Training Building	Training Building (8,000)	Fleet Airborne Electronics Training Unit Atlantic Building	Training Building (8,000)	Thrift Shop & Offices (1954)	Training Building - Demolished in 1999 (4,000)	Not Listed	Not Listed	Not Listed
225	Not Listed	Not Listed	Not Listed	Heavy Equipment Garage	Vehicle Maintenance Shop (8,000)	Public Works Vehicle Maintenance Shop	Vehicle Maintenance Shop (8,000)	Vehicle Maintenance (1953)	Automotive Equipment Repair Shop (1953) (15,020)	Vacant Building - Abandoned in 2005 (1953) (15,020)	Vacant Building (1953) (15,020)	Vacant Building (1953) (15,020)
226	Not Listed	Not Listed	Not Listed	Comm. Transmitter	Electronic Storage (400)	Air Operations Electronics Storage	Electronic Storage (400)	Radar Station (1956)	Sea Cadets Building (2001)** (2,560)	Sea Cadets Building (2001) (2,560)	Sea Cadets Building (2001) (2,560)	Sea Cadets Building (2001) (2,560)
227	Not Listed	Not Listed	Not Listed	Generator Building	Generator Building (160)	Generator Building	Generator Building (160)	Electrical Power Generation (1956)	Generator Building (1956) (160)	Generator Building (1956) (160)	Generator Building (1956) (160)	Generator Building (1956) (160)
228	Not Listed	Not Listed	Not Listed	Ground Control Approach Hardstand	Not Listed	Not Listed	Not Listed	Gate/Sentry House (1980)**	Gate/Sentry House (1980) (96)	Gate/Sentry House (1980) (96)	Gate/Sentry House (1980) (96)	Gate/Sentry House (1980) (96)
229	Not Listed	Not Listed	Not Listed	Ground Control Approach Hardstand	Ground Control Approach Turntable (4,000)	Ground Control Approach Hardstand	Ground Control Approach Turntable (4,000)	Ground Control Approach Hardstand (1963)	Ground Control Approach Hardstand (1963) (12,852)	Ground Control Approach Hardstand (1963) (12,852)	Ground Control Approach Hardstand (1963) (12,852)	Ground Control Approach Hardstand (1963) (12,852)
230	Not Listed	Not Listed	Not Listed	Tactical Control Transmitter Building	Tactical Control Transmitter Building (336)	Tactical Control Transmitter Building	Tactical Control Transmitter Building (336)	Communications Maintenance (1956)	Not Listed	Old Tactical Control Transmitter Building (1954) (456)	Old Tactical Control Transmitter Building (1956) (456)	Old Tactical Control Transmitter Building (1956) (456)
231	Not Listed	Not Listed	Not Listed	Battery Shop	Battery Shop (677)	Battery Shop	Battery Shop (677)	Not Listed	Air Traffic Control Tower (2005)** (15,661)	Air Traffic Control Tower (2005) (15,661)	Air Traffic Control Tower (2006) (15,661)	Air Traffic Control Tower (2006) (15,661)
232	Not Listed	Not Listed	Not Listed	Not Listed	Emergency Generator Building (455)	Emergency Generator Building	Emergency Generator Building (455)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
233	Not Listed	Not Listed	Not Listed	Not Listed	Central Heating Plant (24,048)	Central Heating Plant	Central Heating Plant (24,048)	Heating Plant (1956)	Central Heating Plant - Vacant in 2001 (24,048)	Not Listed	Not Listed	Not Listed

\* Construction date (XXXX) is shown in parentheses.

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**APPENDIX F**  
**NAS BRUNSWICK BUILDING USE CHRONOLOGY**  
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Building Number	1946 (HRA-0298)	1950 (HRA-0027)	1952 (HRA-0299)	1956 (HRA-0300)	1962 (HRA-0301)	1966 (HRA-0147)	1976 (HRA-0408)	1999 (HRA-0091)*	2006 (HRA-0089)*	2008 (HRA-0305)*	2009 (HRA-0404)*	2011 (HRA-0403)*
234	Not Listed	Not Listed	Not Listed	Not Listed	Emergency Generator Building (768)	Emergency Generator Building	Emergency Generator Building (768)	Stand-by Generator (1956)	Emergency Generator Building - Vacant in 1998 (768)	Not Listed	Not Listed	Not Listed
235	Not Listed	Not Listed	Not Listed	Not Listed	Quarters "E" Garage	Quarters "E" Garage	Quarters "E" Garage	Automobile Garage (1955)	Not Listed	Garage, Quarters "E" (1955) (297)	Garage, Quarters "E" - Transferred (1955) (297)	Garage, Quarters "E" - Transferred (1955) (297)
236	Not Listed	Not Listed	Not Listed	Not Listed	Quarters "F" Garage	Quarters "F" Garage	Quarters "F" Garage	Automobile Garage (1955)	Not Listed	Garage, Quarters "F" (1955) (297)	Garage, Quarters "F" - Transferred (1955) (297)	Garage, Quarters "F" - Transferred (1955) (297)
237	Not Listed	Not Listed	Not Listed	Not Listed	Quarters "G" Garage	Quarters "G" Garage	Quarters "G" Garage	Automobile Garage (1955)	Not Listed	Garage, Quarters "G" (1955) (297)	Garage, Quarters "G" - Transferred (1955) (297)	Garage, Quarters "G" - Transferred (1955) (297)
238	Not Listed	Not Listed	Not Listed	Not Listed	Quarters "H" Garage	Quarters "H" Garage	Garage, Quarters "H"	Automobile Garage (1955)	Not Listed	Garage, Quarters "H" (1955) (297)	Garage, Quarters "H" - Transferred (1955) (297)	Garage, Quarters "H" - Transferred (1955) (297)
239	Not Listed	Not Listed	Not Listed	Not Listed	Quarters "I" Garage	Quarters "I" Garage	Garage, Quarters "I"	Automobile Garage (1955)	Not Listed	Garage, Quarters "I" (1955) (297)	Garage, Quarters "I" - Transferred (1955) (297)	Garage, Quarters "I" - Transferred (1955) (297)
240	Not Listed	Not Listed	Not Listed	Not Listed	Quarters "EA" Garage	Quarters "EA" Garage	Garage, Quarters "EA"	Automobile Garage (1955)	Not Listed	Garage, Quarters "EA" (1955) (297)	Garage, Quarters "EA" - Transferred (1955) (297)	Garage, Quarters "EA" - Transferred (1955) (297)
241	Not Listed	Not Listed	Not Listed	Not Listed	Quarters "EB" Garage	Quarters "EB" Garage	Garage, Quarters "EB"	Automobile Garage (1955)	Not Listed	Garage, Quarters "EB" (1955) (297)	Garage, Quarters "EB" - Transferred (1955) (297)	Garage, Quarters "EB" - Transferred (1955) (297)
242	Not Listed	Not Listed	Not Listed	Not Listed	Quarters "EC" Garage	Quarters "EC" Garage	Garage, Quarters "EC"	Automobile Garage (1955)	Not Listed	Garage, Quarters "EC" (1955) (297)	Garage, Quarters "EC" - Transferred (1955) (297)	Garage, Quarters "EC" - Transferred (1955) (297)
243	Not Listed	Not Listed	Not Listed	Not Listed	Quarters "ED" Garage	Quarters "ED" Garage	Garage, Quarters "ED"	Automobile Garage (1955)	Not Listed	Garage, Quarters "ED" (1955) (297)	Garage, Quarters "ED" - Transferred (1955) (297)	Garage, Quarters "ED" - Transferred (1955) (297)
244	Not Listed	Not Listed	Not Listed	Not Listed	Quarters "EE" Garage	Quarters "EE" Garage	Garage, Quarters "EE"	Automobile Garage (1955)	Not Listed	Garage, Quarters "EE" (1955) (297)	Garage, Quarters "EE" - Transferred (1955) (297)	Garage, Quarters "EE" - Transferred (1955) (297)
245	Not Listed	Not Listed	Not Listed	Not Listed	Vehicle Storage	Vehicle Storage	Vehicle Storehouse	Electrical Charging Facility (1956)	Pavement & Ground Equipment Shed (1956) (229)	Pavement & Ground Equipment Shed (1956) (229)	Pavement & Ground Equipment Shed - Demolished (1956) (229)	Pavement & Ground Equipment Shed - Demolished (1956) (229)
246	Not Listed	Not Listed	Not Listed	Not Listed	Tactical Air Navigation Antenna Tower - 51 feet tall	Tactical Air Navigation Antenna Tower	Tactical Air Navigation Antenna Tower	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
250	Not Listed	Not Listed	Not Listed	Not Listed	Hangar - Commander, Fleet Air Wing Headquarters (117,276)	Hangar/Fleet Air Wing Commander Headquarters/ Operations Control	Hangar - Commander, Fleet Air Wing Headquarters (117,276)	Maintenance, Photographic Building, Offices, Classrooms (1956)	Maintenance Hangar (1956) (184,400)	Maintenance Hangar (1956) (184,400)	Maintenance Hangar (1956) (184,400)	Maintenance Hangar (1956) (184,400)
251	Not Listed	Not Listed	Not Listed	Not Listed	Flag Pole (Fuel Farm) - 50 feet tall	Fuel Farm Flagpole	Flag Pole (Fuel Farm)	Not Listed	De-Ice/Rinse Pumphouse (2000) ** (1,026)	De-Ice/Rinse Pumphouse (2002) (1,026)	De-Ice/Rinse Pumphouse (2002) (1,026)	De-Ice/Rinse Pumphouse (2002) (1,026)
252	Not Listed	Not Listed	Not Listed	Not Listed	Hobby Shop (4,130)	Hobby Shop	Hobby Shop (4,130)	Vehicle Maintenance Shop (1957)	Auto Equipment Repair Shop (1957) (5,100)	Vacant Auto Equipment Repair Shop - Abandoned in 2005 (1957) (5,100)	Vacant	Vacant Auto Equipment Repair Shop - Leased (1957) (5,100)
253	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Hangar 4 Turnstile Entry Control Point (2006) (45,000)	Hangar 4 Turnstile Entry Control Point (2006) (45,000)	Hangar 4 Turnstile Entry Control Point (2006) (45,000)				

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**NAS BRUNSWICK BUILDING USE CHRONOLOGY**  
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Building Number	1946 (HRA-0298)	1950 (HRA-0027)	1952 (HRA-0299)	1956 (HRA-0300)	1962 (HRA-0301)	1966 (HRA-0147)	1976 (HRA-0408)	1999 (HRA-0091)*	2006 (HRA-0089)*	2008 (HRA-0305)*	2009 (HRA-0404)*	2011 (HRA-0403)*
254	Not Listed	Not Listed	Not Listed	Not Listed	Pump Test Pit (84)	Pump Test Pit	Pump Test Pit (84)	Drafting Tank (1957)	Drafting Tank (1957) (436)	Drafting Tank (1957)	Drafting Tank - Demolished (1957)	Drafting Tank - Demolished (1957)
255	Not Listed	Not Listed	Not Listed	Not Listed	Golf Course - 9 hole	Golf Course	Not Listed	Golf Course (1955)	Golf Course & Driving Range (1955)	Golf Course & Driving Range (1955)	Golf Course & Driving Range (1955)	Golf Course & Driving Range (1955)
256	Not Listed	Not Listed	Not Listed	Playing Field (1943)	Athletic Field (1943) (175,000 square yards)	Athletic Field (1943) (175,000 square yards)	Athletic Field (1943) (175,000 square yards)	Athletic Field (1943) (175,000 square yards)				
257	Not Listed	Not Listed	Not Listed	Not Listed	Picnic Storage (120)	Picnic Storage	Golf Course Booth (120)	Playing Courts (1965)	Playing Courts (1965)	Playing Courts (1965)	Playing Courts (1965)	Playing Courts (1965)
258	Not Listed	Not Listed	Not Listed	Not Listed	Men's Toilet (Picnic Grounds) (42)	Not Listed	Not Listed	Not Listed	Not Listed	P-3 Support Building Shack (2007) (96)	P-3 Support Building Shack (2007) (96)	Not Listed
259	Not Listed	Not Listed	Not Listed	Not Listed	Women's Toilet (Picnic Grounds) (16)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	P-3 Support Turnstile (2004) (144)
260	Not Listed	Not Listed	Not Listed	Not Listed	Incinerator (West) (810)	Inactive	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
261	Not Listed	Not Listed	Not Listed	Not Listed	Incinerator (East) (810)	Inactive	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
262	Not Listed	Not Listed	Not Listed	Not Listed	Salvage Dump Shelter (120)	Salvage Dump Shelter	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
264	Not Listed	Not Listed	Not Listed	Not Listed	Electric Substation	Electrical Substation	Electric Substation	Electric Substation (1953)	Not Listed	Not Listed	Not Listed	Not Listed
265	Not Listed	Not Listed	Not Listed	Not Listed	Sentry Booth (Forrestal Gate) (31)	Forrestal Gate Sentry Booth	Sentry Booth (Forrestal Gate) (31)	Sentry Booth (Forrestal Gate) (1960)	Sentry Booth Forrestal Road (1960) (31)	Sentry Booth Forrestal Road (1960) (31)	Sentry Booth Forrestal Road - Demolished (1960) (31)	Sentry Booth Forrestal Road - Demolished (1960) (31)
266	Not Listed	Not Listed	Not Listed	Not Listed	Hangar 2 Line Shack (739)	Hangar 2 Line Shack	Hangar 2 Line Shack (739)	Line Shack (1945)	Not Listed	Not Listed	Not Listed	Not Listed
267	Not Listed	Not Listed	Not Listed	Not Listed	Gas Farm Office (697)	Gas Farm Office	Gas Farm Office (697)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
274	Not Listed	5,000 gal Gas Tank, East	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed				
275	Not Listed	5,000 gal Gas Tank, West	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed				
277	Not Listed	Not Listed	Not Listed	Not Listed	Sewage Pump Station (Trailer Park) (569)	Inactive Sewage Pump Station	Sewage Pump Station (Trailer Park) (569)	Sewage Pumping Station (1953)	Sewage Pumping Station (1953)	Sewage Pumping Station (1953) (96)	Sewage Pumping Station (1953) (96)	Sewage Pumping Station (1953) (96)
279	Not Listed	Not Listed	Not Listed	Not Listed	Bus Shelter (55)	Bus Waiting Shelter	Bus Shelter (55)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
280	Not Listed	Not Listed	Not Listed	Not Listed	Transmitter Building (420)	Air Operations Transmitter Building	Transmitter Building (420)	Transmitter (1945)	Transmitter Building (1956) (974)	Transmitter Building (1956) (974)	Transmitter Building (1956) (974)	Transmitter Building (1956) (974)
282	Not Listed	Not Listed	Not Listed	Not Listed	Compass Rose (34,695)	Compass Rose	Compass Rose (34,695)	Compass Rose (1956)	Compass Rose (1956) (11,313)	Compass Rose (1956) (11,313)	Compass Rose (1956) (11,313)	Compass Rose (1956) (11,313)
283	Not Listed	Not Listed	Not Listed	Not Listed	Pyrotechnics Locker (244)	Pyrotechnics Locker	Pyrotechnics Locker (244)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
284	Not Listed	Not Listed	Not Listed	Not Listed	Pyrotechnics Locker (120)	Pyrotechnics Locker	Pyrotechnics Locker (120)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
285	Not Listed	Not Listed	Not Listed	Not Listed	Magazine (1,493)	Magazine	Magazine (1,493)	Weapons / Ordnance Storage (1956)	Ammo Storage Facility (1956) (1,493)	Ammo Storage Facility (1956) (1,493)	Ammo Storage Facility (1956) (1,493)	Ammo Storage Facility (1956) (1,493)
286	Not Listed	Not Listed	Not Listed	Not Listed	Magazine (1,493)	Magazine	Magazine (1,493)	Weapons / Ordnance Storage (1956)	Ammo Storage Facility (1956) (1,493)	Ammo Storage Facility (1956) (1,493)	Ammo Storage Facility (1956) (1,493)	Ammo Storage Facility (1956) (1,493)
287	Not Listed	Not Listed	Not Listed	Not Listed	Magazine (1,493)	Magazine	Magazine (1,493)	Weapons / Ordnance Storage (1956)	Ammo Storage Facility (1956) (1,493)	Ammo Storage Facility (1956) (1,493)	Ammo Storage Facility (1956) (1,493)	Ammo Storage Facility (1956) (1,493)

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**APPENDIX F**  
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Building Number	1946 (HRA-0298)	1950 (HRA-0027)	1952 (HRA-0299)	1956 (HRA-0300)	1962 (HRA-0301)	1966 (HRA-0147)	1976 (HRA-0408)	1999 (HRA-0091)*	2006 (HRA-0089)*	2008 (HRA-0305)*	2009 (HRA-0404)*	2011 (HRA-0403)*
288	Not Listed	Not Listed	Not Listed	Not Listed	Magazine (1,493)	Magazine	Magazine (1,493)	Weapons / Ordnance Storage (1956)	Ammo Storage Facility (1956) (1,493)	Ammo Storage Facility (1956) (1,493)	Ammo Storage Facility (1956) (1,493)	Ammo Storage Facility (1956) (1,493)
289	Not Listed	Not Listed	Not Listed	Not Listed	Magazine (1,493)	Magazine	Magazine (1,493)	Weapons / Ordnance Storage (1956)	Ammo Storage Facility (1956) (1,493)	Ammo Storage Facility (1956) (1,493)	Ammo Storage Facility (1956) (1,493)	Ammo Storage Facility (1956) (1,493)
290	Not Listed	Not Listed	Not Listed	Not Listed	Magazine (1,493)	Magazine	Magazine (1,493)	Weapons / Ordnance Storage (1956)	High Explosives Magazine (1956) (1,493)	High Explosives Magazine (1956) (1,493)	High Explosives Magazine (1956) (1,493)	High Explosives Magazine (1956) (1,493)
291	Not Listed	Not Listed	Not Listed	Not Listed	Magazine (192)	Magazine	Magazine (192)	Weapons Storage (1956)	High Explosives Magazine (1956) (192)	High Explosives Magazine (1956) (192)	High Explosives Magazine (1956) (192)	High Explosives Magazine (1956) (192)
292	Not Listed	Not Listed	Not Listed	Not Listed	Crash Facility (10,150)	Crash Facility and Fire Station	Crash Facility (10,150)	Fire/Rescue Facility (1957)	Fire/Rescue Facility (1957) (10,665)	Fire/Rescue Facility (1957) (10,665)	Fire/Rescue Facility (1957) (10,665)	Fire/Rescue Facility (1957) (10,665)
293	Not Listed	Not Listed	Not Listed	Not Listed	Theater (8,803)	Theater	Theater (8,803)	Theater (Vacant / Storage) (19577)	Theater -Demolished in 1997 (8,803)	Not Listed	Not Listed	Not Listed
294	Not Listed	Not Listed	Not Listed	Not Listed	Storage and Material, Division Office (69,280)	Storage and Material Division Office	Storage and Material, Division Office (69,280)	General Storage (1956)	Warehouse (1956) (64,530)	Warehouse (1956) (64,530)	Warehouse (1956) (64,530)	Warehouse (1956) (64,530)
295	Not Listed	Not Listed	Not Listed	Not Listed	Reservoir and Pumping Station (5,000 gal per minute)	Water Reserve and Pumphouse	Reservoir (5,000 gal per minute)	Fire Protection Pumping Station (1957)	Water Reserve and Pumphouse (1957)	Water Reserve and Pumphouse (1957)	Water Reserve and Pumphouse (1957)	Water Reserve and Pumphouse (1957)
296	Not Listed	Not Listed	Not Listed	Not Listed	Transmitter Building (Very High Frequency Omni-Directional Radio Range) (408)	Transmitter Building	Transmitter Building (Very High Frequency Omni-Directional Radio Range) (408)	Tactical Air Navigation Building (1956)	Very High Frequency Omni-Directional Radio Range Tactical Air Navigation Aid (1956) (408)	Old Tactical Control Tower - Demolished in 2005 (1956) (408)	Tactical Control Tower - Demolished (1956) (408)	Old Tactical Control Tower - Demolished (1956) (408)
297	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Batting Cage (1988)	Not Listed	Not Listed	Not Listed	Not Listed
300	Not Listed	Not Listed	Not Listed	Married Enlisted Men's Quarters and Garage	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
301	Not Listed	Not Listed	Not Listed	Married Enlisted Men's Quarters	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
302	Not Listed	Not Listed	Not Listed	Fleet Reserve Clubhouse	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
304	Not Listed	Not Listed	Not Listed	Not Listed	Well - Non-potable	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
305	Not Listed	Not Listed	Not Listed	Not Listed	Golf Course Club House (4,336)	Golf Course Club House	Golf Course Club House (4,336)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
306	Not Listed	Not Listed	Not Listed	Not Listed	Golf Course Shed (1,022)	Golf Course Shed	Golf Course Shed (1,022)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
308	Not Listed	Not Listed	Not Listed	Not Listed	Water Pumphouse (32)	Water Pumphouse	Water Pumphouse (32)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
309	Not Listed	Not Listed	Not Listed	Not Listed	Water Pumphouse (76)	Water Pumphouse	Water Pumphouse (76)	Water Pumphouse (1954)	Pumphouse / Irrigation (1954) (180)	Pumphouse / Irrigation (1954) (180)	Pumphouse / Irrigation (1954) (180)	Pumphouse / Irrigation (1954) (180)
310	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Golf Course Dam	Not Listed	Golf Course Dam (1954)	Dam (1955)	Dam (1955)	Dam (1955)	Dam (1955)
311	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Oil Spill Control Weir (1994)	Oil Spill Control Weir (1994)	Oil Spill Control Weir (1994)	Oil Spill Control Weir (1994)
316	Not Listed	Not Listed	Not Listed	Not Listed	Rocket Assembly Shop (952)	Rocket Assembly Shop	Rocket Assembly Shop (252)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed

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Building Number	1946 (HRA-0298)	1950 (HRA-0027)	1952 (HRA-0299)	1956 (HRA-0300)	1962 (HRA-0301)	1966 (HRA-0147)	1976 (HRA-0408)	1999 (HRA-0091)*	2006 (HRA-0089)*	2008 (HRA-0305)*	2009 (HRA-0404)*	2011 (HRA-0403)*
323	Not Listed	Not Listed	Not Listed	Not Listed	Garage / Storage (440)	Public Works Storage Garage	Garage / Storage (440)	Brunswick Gardens Storage (1949)	Storage Building (1949) (440)	Storage Building (1949) (440)	Storage Building - Transferred (1949) (440)	Storage Building - Transferred (1949) (440)
347	Not Listed	Picnic Area Dam	Not Listed	Picnic Pond Dam (1954)	Picnic Pond Dam (1954)	Dam (1954)	Dam (1954)	Dam (1954)				
349	Not Listed	Not Listed	Not Listed	Not Listed	Public Quarters (2,146)	Public Quarters	Public Quarters (2,146)	Residence (1958)	Not Listed	Quarters (1958) (2,146)	Quarters - Transferred (1958) (2,146)	Quarters - Transferred (1958) (2,146)
354	Not Listed	Not Listed	Not Listed	Country Clubhouse	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
399	Not Listed	Not Listed	Not Listed	Not Listed	Storage (Baggage) (1,096)	Vacant	Storehouse (1,096)	Not Listed	Not Listed	Not Listed	Four Bay Carport (1990) (720)	Four Bay Carport (1990) (720)
400	Not Listed	Not Listed	Not Listed	Not Listed	Laundry (669)	Laundry	Storehouse (669)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
402	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Seabees Mobile Trailer Chief Petty Officer's Mess (2004) (768)	Mobile Trailer Chief Petty Officer's Mess (2004) (768)	Seabees Mobile Trailer Chief Petty Officer's Mess (2004) (768)				
403	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Seabees Training Classroom (2004) (320)	Training Classroom (2004) (320)	Seabees Training Classroom (2004) (320)				
404	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Storage Shed - Demolished (249)				
405	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Storage Shed (Public Works) (1993) (160)	Storage Shed - Demolished (1990) (180)				
406	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Storage Shed (Public Works) (1993) (96)	Storage Shed - Demolished (1993) (99)				
407	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Trailer - Public Works Storage (1993) (40)	Trailer - Public Works Storage (1993) (40)				
408	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Storage Quonset Hut - Demolished (1,020)				
411	Not Listed	Dump Attendant Shelter	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed				
413	Not Listed	Not Listed	Not Listed	Temporary Office (Circa 1975-1985)	Not Listed	Not Listed	Not Listed	Line Shack - Fuel Farm - Demolished (375)				
414	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Line Shack Red Label - Demolished (375)				
415	Not Listed	Not Listed	Not Listed	Temporary Office, Kennel Area (1980)	Not Listed	Not Listed	Not Listed	Kennel Administration (1993) (375)				
420	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Storage Shed Galley - Transferred (144)				
426	Not Listed	Not Listed	Not Listed	Temporary Building (1980)	Not Listed	Not Listed	Not Listed	Not Listed				
429	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Apron B 554 Line Shack - Demolished (375)				
430	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Lockheed Office - Demolished (1990)				
431	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Hangar 4 South Line Shack (1980) (375)	Hangar 4 South Line Shack (1980) (375)	Hangar 4 South Line Shack (1980) (375)				
432	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Hangar 4 South Line Shack (1980) (375)	Hangar 4 South Line Shack - Demolished (1980) (375)	Hangar 4 South Line Shack - Demolished (1980) (375)				

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Building Number	1946 (HRA-0298)	1950 (HRA-0027)	1952 (HRA-0299)	1956 (HRA-0300)	1962 (HRA-0301)	1966 (HRA-0147)	1976 (HRA-0408)	1999 (HRA-0091)*	2006 (HRA-0089)*	2008 (HRA-0305)*	2009 (HRA-0404)*	2011 (HRA-0403)*
433	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Hangar 6 South Line Shack (2005) (624)	Hangar 6 South Line Shack - Transferred (2005) (624)	Hangar 6 South Line Shack - Transferred (2005) (624)				
434	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Hangar 6 West Line Shack (1980) (375)	Hangar 6 West Line Shack (1980) (375)	Hangar 6 West Line Shack (1980) (375)				
435	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Hangar 4 Entry Control Point Guard Shack (2000) (96)	Hangar 4 Entry Control Point Guard Shack - Transferred (2000) (96)	Hangar 4 Entry Control Point Guard Shack - Transferred (2000) (96)				
437	Not Listed	Not Listed	Not Listed	Temporary Building (1980)	Not Listed	Not Listed	Not Listed	Not Listed				
440	Not Listed	Not Listed	Not Listed	Temporary Building (1980)	Not Listed	Hangar 5S Line Shack (1980) (375)	Hangar 5S Line Shack - Demolished (1980) (375)	Hangar 5S Line Shack - Demolished (1980) (375)				
445	Not Listed	Not Listed	Not Listed	Line Shack (1980)	Not Listed	Hangar 5N Line Shack (1980) (375)	Hangar 5N Line Shack - Demolished (1980) (375)	Hangar 5N Line Shack - Demolished (1980) (375)				
446	Not Listed	Not Listed	Not Listed	Avionic Shop Trailer (1991)	Not Listed	Inverse Synthetic-Aperture Radar Equipment Maintenance Trailer (Added to Hangar 6 in August 2006)	Inverse Synthetic-Aperture Radar Equipment Maintenance Trailer - Demolished (2002) (1,440)	Inverse Synthetic-Aperture Radar Equipment Maintenance Trailer - Demolished (1980)				
450	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Fire Department Alert Response Office (1980) (375)	Fire Department Alert Response Office - Demolished (1980) (375)	Fire Department Alert Response Office - Demolished (1980) (375)				
451	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Fire Department Training Office (1980) (375)	Fire Department Training Office - Demolished (1980) (375)	Fire Department Training Office - Demolished (1980) (375)				
452	Not Listed	Not Listed	Not Listed	Not Listed	Maintenance Trailers	Fleet Airborne Electronics Training Unit Atlantic Maintenance Shop	Trailer Maintenance	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
460	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Morale, Welfare, and Recreation - Niteflite Storage (vinyl) (2004) (480)	Morale, Welfare, and Recreation - Niteflite Storage (vinyl) (2004) (480)	Morale, Welfare, and Recreation - Niteflite Storage (vinyl) (2004) (480)				
461	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Morale, Welfare, and Recreation - Niteflite Storage (metal) (2002) (520)	Morale, Welfare, and Recreation - Niteflite Storage (metal) (2002) (520)	Morale, Welfare, and Recreation - Niteflite Storage (metal) (2002) (520)				
471	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Main Gate Automatic Vehicle Identification Inspection Tent (2002) (1,750)	Main Gate Automatic Vehicle Identification Inspection Tent (2002) (1,750)	Main Gate Automatic Vehicle Identification Inspection Tent (2002) (1,750)				
472	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Main Gate Support Building (1990) (240)	Main Gate Support Building - Demolished (1990) (240)	Main Gate Support Building - Demolished (1990) (240)				
475	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Dyer's Gate Automatic Vehicle Identification Inspection Tent (2004) (1,750)	Dyer's Gate Automatic Vehicle Identification Inspection Tent (2004) (1,750)	Dyer's Gate Automatic Vehicle Identification Inspection Tent (2004) (1,750)				

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Building Number	1946 (HRA-0298)	1950 (HRA-0027)	1952 (HRA-0299)	1956 (HRA-0300)	1962 (HRA-0301)	1966 (HRA-0147)	1976 (HRA-0408)	1999 (HRA-0091)*	2006 (HRA-0089)*	2008 (HRA-0305)*	2009 (HRA-0404)*	2011 (HRA-0403)*
480	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Weapons Gate Guard Shack (1980) (96)	Weapons Gate Guard Shack - Demolished (1980) (96)	Weapons Gate Guard Shack - Demolished (1980) (96)				
481	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Coombs Rd Guard Shack (1980) (64)	Coombs Rd Guard Shack - Demolished (1980) (64)	Coombs Rd Guard Shack - Demolished (1980) (64)				
490	Not Listed	Not Listed	Not Listed	Temporary Storage (1980)	Not Listed	Lockheed (Hangar 4) Line Shack (1980) (375)	Lockheed (Hangar 4) Line Shack (1980) (375)	Lockheed (Hangar 4) Line Shack (1980) (375)				
491	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Line Shack Fire Department (300)	Not Listed				
496	Not Listed	Not Listed	Not Listed	Temporary Storage (1980)	Not Listed	Not Listed	Not Listed	Not Listed				
497	Not Listed	Not Listed	Not Listed	Temporary Storage (1980)	Not Listed	Hangar 4 North Line Shack (1980) (96)	Hangar 4 North Line Shack - Demolished (1980) (96)	Hangar 4 North Line Shack - Demolished (1980) (96)				
498	Not Listed	Not Listed	Not Listed	Temporary Storage (1980)	Not Listed	Not Listed	Not Listed	Not Listed				
499	Not Listed	Not Listed	Not Listed	Temporary Storage (1980)	Not Listed	Not Listed	Not Listed	Not Listed				
501	Abandoned House	Not Listed	Abandoned House	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
502	Abandoned House	Not Listed	Abandoned House	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
504	Abandoned House	Not Listed	Abandoned House	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
505	Abandoned House	Not Listed	Abandoned House	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
506	Abandoned House	Not Listed	Abandoned House	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
507	Abandoned House	Not Listed	Abandoned House	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
508	Abandoned House	Not Listed	Abandoned House	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
509	Abandoned House	Not Listed	Abandoned House	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
510	Not Listed	Not Listed	4,000 gal Gas Tank	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed				
511	Not Listed	Not Listed	4,000 gal Kerosene Tank	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed				
512	Not Listed	Not Listed	Not Listed	Not Listed	Bachelor Officer's Quarters	Bachelor Officer's Quarters	Bachelor Officer's Quarters	Bachelor Officer Quarters (1958)	Bachelor Officer Quarters (1958) (61,882)	Bachelor Officer Quarters (1958) (61,882)	Bachelor Officer Quarters -Assigned for Transfer (1958) (61,882)	Bachelor Officer Quarters -Assigned for Transfer (1958) (61,882)
513	Not Listed	Not Listed	Not Listed	Not Listed	Hangar 1 Inflammable Storage Cage (120)	Hangar 1 Inflammable Storage Cage	Hangar 1 Inflammable Storage Cage (120)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
514	Not Listed	Not Listed	Not Listed	Not Listed	Hangar 2 Inflammable Storage Cage (196)	Hangar 2 Inflammable Storage Cage	Hangar 2 Inflammable Storage Cage (196)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
515	Not Listed	Not Listed	Not Listed	Not Listed	Hangar 3 Inflammable Storage Cage (192)	Hangar 3 Inflammable Storage Cage	Hangar 3 Inflammable Storage Cage (192)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
516	Not Listed	Not Listed	Not Listed	Not Listed	Enlisted Men's Club (14,983)	Enlisted Men's Club	Enlisted Men's Club (14,983)	Enlisted Personnel Club Nite Flite (1958)	Niteflight (1958) (14,983)	Niteflight (1958) (14,983)	Niteflight (1958) (14,983)	Niteflight (1958) (14,983)
517	Not Listed	Not Listed	Not Listed	Not Listed	Receiver Building (686)	Air Operations Receiver Building	Receiver Building (686)	Radio Receiver Building (1958)	Receiver Building (1958) (1,106)	Receiver Building (1958) (1,106)	Receiver Building - Transferred to Coast Guard (1958) (1,106)	Receiver Building - Transferred to Coast Guard (1958) (1,106)
518	Not Listed	Not Listed	Not Listed	Not Listed	Generator Building (176)	Generator Building	Generator Building (176)	Electrical Generator Building (1958)	Generator Building (1958) (176)	Generator Building (1958) (176)	Generator Building - Transferred to Coast Guard (1958) (176)	Generator Building - Transferred to Coast Guard (1958) (176)
519	Not Listed	Not Listed	Not Listed	Not Listed	97-foot Antenna Tower	Air Operations Antenna Tower	97-foot Micro-Channel Tower	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
520	Not Listed	Not Listed	Not Listed	Not Listed	63-foot Antenna Tower	Air Operations Antenna Tower	63-foot Micro-Channel Tower	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed

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Building Number	1946 (HRA-0298)	1950 (HRA-0027)	1952 (HRA-0299)	1956 (HRA-0300)	1962 (HRA-0301)	1966 (HRA-0147)	1976 (HRA-0408)	1999 (HRA-0091)*	2006 (HRA-0089)*	2008 (HRA-0305)*	2009 (HRA-0404)*	2011 (HRA-0403)*
521	Not Listed	Not Listed	Not Listed	Not Listed	16-foot Antenna Tower	Air Operations Antenna Tower	46-foot Micro-Channel Tower	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
522	Not Listed	Not Listed	Not Listed	Not Listed	43-foot Antenna Tower	Air Operations Antenna Tower	46-foot Micro-Channel Tower	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
525	Not Listed	Not Listed	Not Listed	Not Listed	90-foot Microwave Tower	Air Operations Antenna Tower	90-foot Microwave Tower	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
526	Not Listed	Not Listed	Not Listed	Not Listed	121-foot Micro-Channel Tower	Air Operations Antenna Tower	121-foot Micro-Channel Tower	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
527	Not Listed	Not Listed	Not Listed	Not Listed	46-foot Micro-Channel Tower	Air Operations Antenna Tower	46-foot Micro-Channel Tower	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
528	Not Listed	Not Listed	Not Listed	Not Listed	41-foot Micro-Channel Tower	Air Operations Antenna Tower	41-foot Micro-Channel Tower	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
529	Not Listed	Not Listed	Not Listed	Not Listed	97-foot Micro-Channel Tower	Air Operations Antenna Tower	97-foot Micro-Channel Tower	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
530	Not Listed	Not Listed	Not Listed	Not Listed	46-foot Micro-Channel Tower	Air Operations Antenna Tower	46-foot Micro-Channel Tower	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
531	Not Listed	Not Listed	Not Listed	Not Listed	81-foot Micro-Channel Tower	Air Operations Antenna Tower	81-foot Micro-Channel Tower	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
532	Not Listed	Not Listed	Not Listed	Not Listed	63-foot Micro-Channel Tower	Air Operations Antenna Tower	63-foot Micro-Channel Tower	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
533	Not Listed	Not Listed	Not Listed	Not Listed	81-foot Micro-Channel Tower	Air Operations Antenna Tower	81-foot Micro-Channel Tower	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
534	Not Listed	Not Listed	Not Listed	Not Listed	53-foot Micro-Channel Tower	Air Operations Antenna Tower	53-foot Micro-Channel Tower	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
535	Not Listed	Not Listed	Not Listed	Not Listed	63-foot Micro-Channel Tower	Air Operations Antenna Tower	63-foot Micro-Channel Tower	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
536	Not Listed	Not Listed	Not Listed	Not Listed	81-foot Micro-Channel Tower	Air Operations Antenna Tower	81-foot Micro-Channel Tower	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
537	Not Listed	Not Listed	Not Listed	Not Listed	Sewage Pumphouse (957)	Sewage Pumphouse	Sewage Pumphouse (957)	Sewage Pumping Station (1953)	Sewage Pumphouse (1958) (597)			
538	Not Listed	Not Listed	Not Listed	Not Listed	Navy Exchange Service Station (1,439)	Navy Exchange Service Station	Navy Exchange Service Station (1,439)	Naval Exchange-Retail Store Service Station (1954)	Naval Exchange Service Station (1957) (5,292)			
539	Not Listed	Not Listed	Not Listed	Not Listed	Anti-Submarine Underwater Warfare Shop (6,929)	Anti-Submarine Underwater Warfare Shop	Anti-Submarine Underwater Warfare Shop (6,929)	Air Reconnaissance/Under sea Warfare Technology Weapons Shop, Ammo, and Explosives Maintenance (1958)	Explosives Administration / Armory (1958) (10,311)			
540	Not Listed	Not Listed	Not Listed	Not Listed	Anti-Submarine Underwater Warfare Shop Sentry House (180)	Anti-Submarine Underwater Warfare Shop Sentry House	Anti-Submarine Underwater Warfare Shop Sentry House (180)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
541	Not Listed	Not Listed	Not Listed	Not Listed	Anti-Submarine Underwater Warfare Storage Sentry House (180)	Anti-Submarine Underwater Warfare Storage Sentry House	Anti-Submarine Underwater Warfare Storage Sentry House (180)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
542	Not Listed	Not Listed	Not Listed	Not Listed	Generator Building (210)	Generator Building	Generator Building (210)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
543	Not Listed	Not Listed	Not Listed	Not Listed	Anti-Submarine Underwater Warfare Magazine (1,232)	Anti-Submarine Underwater Warfare Magazine	Anti-Submarine Underwater Warfare Magazine (1,232)	Weapons / Ordnance Storage (1958)	High Explosives Magazine (1958) (1,232)			

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Building Number	1946 (HRA-0298)	1950 (HRA-0027)	1952 (HRA-0299)	1956 (HRA-0300)	1962 (HRA-0301)	1966 (HRA-0147)	1976 (HRA-0408)	1999 (HRA-0091)*	2006 (HRA-0089)*	2008 (HRA-0305)*	2009 (HRA-0404)*	2011 (HRA-0403)*
544	Not Listed	Not Listed	Not Listed	Not Listed	Anti-Submarine Underwater Warfare Magazine (2,252)	Anti-Submarine Underwater Warfare Magazine	Anti-Submarine Underwater Warfare Magazine (2,252)	Weapons / Ordnance Storage (1958)	High Explosives Magazine (1958) (2,252)	High Explosives Magazine (1958) (2,252)	High Explosives Magazine (1958) (2,252)	High Explosives Magazine (1958) (2,252)
545	Not Listed	Not Listed	Not Listed	Not Listed	Air Operations Localizer Building (488)	Air Operations Localizer Antenna	Air Operations Localizer Building (488)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
546	Not Listed	Not Listed	Not Listed	Not Listed	63-foot Air Operations Antenna Tower	Air Operations Antenna Tower	63-foot Micro-Channel Tower	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
547	Not Listed	Not Listed	Not Listed	Not Listed	63-foot Air Operations Antenna Tower	Air Operations Antenna Tower	63-foot Micro-Channel Tower	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
548	Not Listed	Not Listed	Not Listed	Not Listed	Fuse and Detonator Magazine (192)	Fuse and Detonator Magazine	Fuse and Detonator Magazine (192)	Weapons / Ordnance Storage (1959)	High Explosives Magazine (1959) (192)	High Explosives Magazine (1959) (192)	High Explosives Magazine (1959) (192)	High Explosives Magazine (1959) (192)
549	Not Listed	Not Listed	Not Listed	Not Listed	Fuse and Detonator Magazine (192)	Fuse and Detonator Magazine	Fuse and Detonator Magazine (192)	Weapons / Ordnance Storage (1959)	High Explosives Magazine (1959) (192)	High Explosives Magazine (1959) (192)	High Explosives Magazine (1959) (192)	High Explosives Magazine (1959) (192)
550	Not Listed	Not Listed	Not Listed	Not Listed	Sewage Control Plant	Sewage Control House and Digester	Sewage Control Plant	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
551	Not Listed	Not Listed	Not Listed	Not Listed	Primary Subsiding Basin	Primary Subsiding Basin	Primary Subsiding Basin	Not Listed	Not Listed	Security Generator Building (2005) (165) (Added in 2007)	Security Generator Building (2005) (165)	Security Generator Building (2005) (165)
552	Not Listed	Not Listed	Not Listed	Not Listed	Chlorine Contact Basin	Chlorine Contact Basin	Chlorine Contact Basin	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
553	Not Listed	Not Listed	Not Listed	Not Listed	Sludge Drying Bed - South	Sludge Drying Bed - South	Sludge Drying Bed - South	Not Listed	Airfield Support Building (2004)** (15,888)	Airfield Support Building (2004) (15,888)	Airfield Support Building (2004) (15,888)	Airfield Support Building - Transferred (2004) (15,888)
554	Not Listed	Not Listed	Not Listed	Not Listed	Sludge Drying Bed - North	Sludge Drying Bed - North	Sludge Drying Bed - North	Not Listed	P-3 Aircraft Support Facility (2002)** (10,000)	P-3 Aircraft Support Facility (2002) (10,000)	P-3 Aircraft Support Facility - Transferred (2002) (10,000)	P-3 Aircraft Support Facility - Transferred (2002) (10,000)
555	Not Listed	Not Listed	Not Listed	Not Listed	Ground Support Equipment (4,020)	Ground Support Equipment	Ground Support Equipment (4,020)	Maintenance and Storage Shop (1959)	Sonobuoy / Vehicle Storage (1959) (6,400)	Sonobuoy / Vehicle Storage (1959) (6,400)	Sonobuoy / Vehicle Storage (1959) (6,400)	Sonobuoy / Vehicle Storage (1959) (6,400)
556	Not Listed	Not Listed	Not Listed	Not Listed	End and Side Loading Dock (1,760)	Supply Loading Dock	End and Side Loading Dock (1,760)	Loading Dock (1948)	Not Listed	Not Listed	Not Listed	Not Listed
559	Not Listed	Not Listed	Not Listed	Not Listed	5,000 gal Used Aviation Lube Tank - North	Used Aviation Lube Tank - North	5,000 gal Used Aviation Lube Tank - North	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
560	Not Listed	Not Listed	Not Listed	Not Listed	5,000 gal Used Aviation Lube Tank - South	Used Aviation Lube Tank - South	5,000 gal Used Aviation Lube Tank - South	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
562	Not Listed	Not Listed	Not Listed	Not Listed	Air Operations Transmissometer Receiving Tower	Air Operations Transmissometer Receiving Tower	Transmissometer Receiving Tower	Transmissometer (1960)	Transmissometer (1960)	Transmissometer (1960)	Transmissometer Tower - Demolished (1960)	Transmissometer Tower - Demolished (1960)
563	Not Listed	Not Listed	Not Listed	Not Listed	Air Operations Transmissometer Transmission Tower	Air Operations Transmissometer Transmission Tower	Transmissometer Receiving Tower	Transmissometer (1960)	Transmissometer (1960)	Transmissometer (1960)	Transmissometer Tower - Demolished (1960)	Transmissometer Tower - Demolished (1960)
564	Not Listed	Not Listed	Not Listed	Not Listed	Air Operations Radar Tower	Air Operations Radar Tower	Radar Tower	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
579	Not Listed	Not Listed	Not Listed	Not Listed	Picnic Shelter	Picnic Shelter	Picnic Shelter (1,911)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
580	Not Listed	Not Listed	Not Listed	Not Listed	Waves Barracks	Waves Barracks	Waves Barracks	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed

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583	Not Listed	Not Listed	Not Listed	Not Listed	Bowling Alley (7,883)	Bowling Alley	Bowling Alley (7,883)	Not Listed	Bowling Center / Recreation Mall (1966) (19,380)			
584	Not Listed	Not Listed	Not Listed	Not Listed	Disposal Building (7,200)	Supply Disposal Building	Disposal Building (7,200)	Defense Reutilization and Marketing Office Disposal Facility and General Warehouse (1965)	Public Works Shop (1965) (7,200)	General Warehouse (1965) (7,200)	General Warehouse (1965) (7,200)	General Warehouse (1965) (7,200)
585	Not Listed	Not Listed	Not Listed	Not Listed	Chapel (11,148)	Chapel	Chapel (11,148)	Chapel	Chapel (1965) (13,610)	Chapel (1965) (13,610)	Chapel (1965) (13,610)	Chapel (1965) (13,610)
586	Not Listed	Ham Shack	Amateur Radio Shack (821)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed				
587	Not Listed	Navy Exchange Storage	Retail Storehouse (1,621)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed				
588	Not Listed	Unknown Structure	Communications Meeting Space (1,627)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed				
589	Not Listed	Air Operations Mobile Radio Maintenance	Mobile Radio Maintenance (2,171)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed				
590	Not Listed	Public Works Storage	Public Works Storehouse (2,304)	Not Listed	Transportation Maintenance Building (2004)**(8,000)	Transportation Maintenance Building (2004) (8,000)	Transportation Maintenance Building (2004) (8,000)	Transportation Maintenance Building (2004) (8,000)				
591	Not Listed	Unknown Structure	Security Storage (96)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed				
592	Not Listed	AIMD Storage	Telephone Exchange (1,621)	Telephone Exchange (1950)	Vet Clinic (1950) (1,621)	Vet Clinic (1950) (1,621)	Vet Clinic (1950) (1,621)	Vet Clinic (1950) (1,621)				
593	Not Listed	Public Works Storage	Communications (1,655)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed				
594	Not Listed	Unknown Structure	Fleet Air Wing 5 - Vacant (900)	Communications Center (1950)	Anti-submarine Warfare Operations Center Radar Tower (1950) (900)							
595	Not Listed	Unknown Structure	Fleet Aviation Specialized Operational Training Group Atlantic Storage (900)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed				
596	Not Listed	Unknown Structure	Tactical Support Center/Communi- cations Center (12,192)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed				
597	Not Listed	Unknown Structure	Inactive (1,555)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed				
598	Not Listed	Aircraft Maintenance Division Storage (former Air Force 3)	Storehouse (900)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed				
599	Not Listed	Aircraft Maintenance Division Storage (former Air Force R6)	Inactive (900)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed				
600	Not Listed	Air Operations Transmissometer Receiving Tower	Transmissometer Receiver Tower	Transmissometer Receiver Tower (1960)	Transmissometer Tower (1965)	Transmissometer Tower (1965)	Transmissometer Tower - Demolished (1965)	Transmissometer Tower - Demolished (1965)				

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Building Number	1946 (HRA-0298)	1950 (HRA-0027)	1952 (HRA-0299)	1956 (HRA-0300)	1962 (HRA-0301)	1966 (HRA-0147)	1976 (HRA-0408)	1999 (HRA-0091)*	2006 (HRA-0089)*	2008 (HRA-0305)*	2009 (HRA-0404)*	2011 (HRA-0403)*
601	Not Listed	Air Operations Transmissometer Transmission Tower	Transmissometer Transmission Tower	Transmissometer Transmission Tower (1965)	Air Support Operations Squadron (Air Force) Tower (1965)	Air Support Operations Squadron (Air Force) Tower (1965)	Air Support Operations Squadron (Air Force) Tower (1965)	Air Support Operations Squadron (Air Force) Tower (1965)				
602	Not Listed	Weapons Transshipment Office	Sonobuoy Storage (1,020)	Glide Scope Antenna Building (1998)	Glide Scope Antenna Building (1997)	Glide Scope Antenna Building (1997) (94)	Glide Scope Antenna Building - Transferred (1997) (94)	Glide Scope Antenna Building - Transferred (1997) (94)				
603	Not Listed	Line Shack (500)	Localizer Antenna (1998)	Localizer Antenna Shelter (1997)	Localizer Antenna Shelter (1997) (94)	Localizer Antenna Shelter - Transferred (1997) (94)	Localizer Antenna Shelter - Transferred (1997) (94)					
604	Not Listed	Line Shack (500)	Not Listed	Not Listed	Not Listed	Communication Bunker (2004) (120)	Communication Bunker (2004) (120)					
605	Not Listed	Tennis Court (12,600)	Not Listed	Not Listed	Not Listed	Environmental Shed (2004) (120)	Environmental Shed (2004) (120)					
606	Not Listed	Tennis Court (12,600)	Not Listed	Not Listed	Not Listed	Liquid Oxygen Storage (2004) (120)	Liquid Oxygen Storage (2004) (120)					
607	Not Listed	Volleyball Court (7,344)	Not Listed									
608	Not Listed	Badminton Court (2,640)	Not Listed									
609	Not Listed	Volleyball Court (3,024)	Not Listed									
610	Not Listed	Badminton Court (880)	Not Listed									
611	Not Listed	T-56 Engine Test Facility (2,449)	Not Listed	T-56 Engine Test Facility (1967) (2,484)								
612	Not Listed	Disaster Preparedness (150)	Not Listed									
613	Not Listed	Picnic Area Toilet (150)	Picnic Area Toilet (1966)	Picnic Area Toilet (1966) (150)								
614	Not Listed	Swimming Pool (7,844)	Not Listed									
615	Not Listed	2,000 gal Fuel Storage Tank	Not Listed									
616	Not Listed	Quadrant, Antenna	Not Listed									
617	Not Listed	Aircraft Intermediate Maintenance Department / Aircraft Maintenance Support Equipment Storage	Aircraft Maintenance Support Equipment Storehouse (7,213)	Aircraft Maintenance Support Equipment Storehouse (1968)	Not Listed	Not Listed	Not Listed	Not Listed				
618	Not Listed	Flag Pole	Not Listed	Flag Pole (1954)	Flag Pole (1954)	Flag Pole (1954)	Flag Pole (1954)					
619	Not Listed	2.5-10 Megahertz Antenna	Not Listed									
620	Not Listed	6-24 Megahertz Antenna	Not Listed									
626/626A	Not Listed	Special Weapons Magazine	Special Weapons Magazine (1973)	Not Listed	Inert Ordnance Storage (1973) (3,198)	Inert Ordnance Storage (1973) (3,198)	Inert Ordnance Storage (1973) (3,198)					
627/626B	Not Listed	Special Weapons Magazine	Special Weapons Magazine (1973)	Not Listed	Not Listed	Not Listed	Not Listed					
628/626C	Not Listed	Special Weapons Magazine	Special Weapons Magazine (1973)	Not Listed	Naval Mobile Construction Battalion-27 Camp	Naval Mobile Construction Battalion-27 Camp (1992) (960)	Reserve Training Building (1992) (960)					

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\*\*Building number reassigned to a new building in another location

Square footage (XX,XXX) is unit of measure unless otherwise specified

**APPENDIX F**  
**NAS BRUNSWICK BUILDING USE CHRONOLOGY**  
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Building Number	1946 (HRA-0298)	1950 (HRA-0027)	1952 (HRA-0299)	1956 (HRA-0300)	1962 (HRA-0301)	1966 (HRA-0147)	1976 (HRA-0408)	1999 (HRA-0091)*	2006 (HRA-0089)*	2008 (HRA-0305)*	2009 (HRA-0404)*	2011 (HRA-0403)*
629	Not Listed	Reserve Battalion Headquarters	Seabees Reserve Battalion Headquarters (1974)	Not Listed	Naval Mobile Construction Battalion-27 Camp (1974) (960)	Naval Mobile Construction Battalion-27 Camp (1974) (960)	Naval Mobile Construction Battalion-27 Camp (1974) (960)					
630	Not Listed	Reserve Battalion Headquarters	Seabees Reserve Battalion Headquarters (1974)	Not Listed	Naval Mobile Construction Battalion-27 Camp (1974) (960)	Naval Mobile Construction Battalion-27 Camp (1974) (960)	Naval Mobile Construction Battalion-27 Camp (1974) (960)					
631	Not Listed	Reserve Battalion Headquarters	Seabees Reserve Battalion Headquarters (1974)	Not Listed	Naval Mobile Construction Battalion-27 Camp (1974) (960)	Naval Mobile Construction Battalion-27 Camp (1974) (960)	Naval Mobile Construction Battalion-27 Camp (1974) (960)					
632	Not Listed	Reserve Battalion Headquarters	Seabees Reserve Battalion Shop (1974)	Not Listed	Naval Mobile Construction Battalion Trainer Building (2006)	Naval Mobile Construction Battalion Trainer Building (2006)	Naval Mobile Construction Battalion Trainer Building (2006)					
633	Not Listed	Reserve Battalion Headquarters	Seabees Reserve Battalion Storage (1974)	Not Listed	Naval Mobile Construction Battalion 27 Camp (1974) (2,640)	Naval Mobile Construction Battalion 27 Camp (1974) (2,640)	Naval Mobile Construction Battalion 27 Camp (1974) (2,640)					
634	Not Listed	Reserve Battalion Headquarters	Seabees Bravo Company Storage and Shops (1974)	Not Listed	Naval Mobile Construction Battalion 27 Camp (1974) (960)	Naval Mobile Construction Battalion 27 Camp (1974) (960)	Naval Mobile Construction Battalion 27 Camp (1974) (960)					
635	Not Listed	Reserve Battalion Headquarters	Seabees Auto Storage and Shops (1974)	Not Listed	Naval Mobile Construction Battalion 27 Camp (1974) (4,700)	Naval Mobile Construction Battalion 27 Camp (1974) (4,700)	Naval Mobile Construction Battalion 27 Camp (1974) (4,700)					
636	Not Listed	Maintenance Trailer	Seabees Shops (1990)	Not Listed	Naval Mobile Construction Battalion -27	Naval Mobile Construction Battalion -27 (1989) (3,960)	Naval Mobile Construction Battalion -27 (1989) (3,960)					
637	Not Listed	Line Shack Hangar 1 North	Not Listed	Not Listed	Naval Mobile Construction Battalion -27	Naval Mobile Construction Battalion -27 (1992) (960)	Naval Mobile Construction Battalion -27 (1992) (960)					
638	Not Listed	Sewage Pumphouse Brunswick Gardens	Sewage Pumphouse Brunswick Gardens (1954)	Not Listed	Sewage Pumping Station (1954)	Sewage Pumping Station (1954)	Sewage Pumping Station (1954)					
639	Not Listed	Direction Finding Acoustic Receiver	Operational Training Building (1975)	Not Listed	Operational Training Building (1975) (3,540)	Operational Training Building (1975) (3,540)	Operational Training Building (1975) (3,540)					
640	Not Listed	Salt Storage Shed	Sand and Gravel Storage (1974)	Not Listed	Not Listed	Not Listed	Not Listed					
641	Not Listed	Line Shack Hangar 1 South	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed					
642	Not Listed	Alert Force Building, Weapons Area (Vacant) (1978)	Not Listed	Weapons Administration (1978) (2,640)	Weapons Administration (1978) (2,640)	Weapons Administration (1978) (2,640)						
643	Not Listed	Sentry House / Weapons Area (Vacant) (1978)	Not Listed	Sentry House / Weapons Area (1978) (140)	Sentry House / Weapons Area (1978) (140)	Sentry House / Weapons Area (1978) (140)						
644	Not Listed	P-3C Operational Training Building (1979)	Not Listed	Operational Trainer Building (1979) (13,571)	Operational Trainer Building (1979) (13,571)	Operational Trainer Building (1979) (13,571)						
645	Not Listed	Medical Clinic (1979)	Not Listed	Branch Medical/Dental Clinic (1979) (31,559)	Branch Medical/Dental Clinic (1979) (31,559)	Branch Medical/Dental Clinic (1979) (31,559)						

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Building Number	1946 (HRA-0298)	1950 (HRA-0027)	1952 (HRA-0299)	1956 (HRA-0300)	1962 (HRA-0301)	1966 (HRA-0147)	1976 (HRA-0408)	1999 (HRA-0091)*	2006 (HRA-0089)*	2008 (HRA-0305)*	2009 (HRA-0404)*	2011 (HRA-0403)*
646	Not Listed	Radar Station (1979)	Not Listed	Radar Air Traffic Control Facility Antenna Building (1979) (480)	Radar Air Traffic Control Facility Antenna Building (1979) (480)	Radar Air Traffic Control Facility Antenna Building (1979) (480)						
647	Not Listed	Pesticide And Gas Storage (1978)	Not Listed	Bottled Gas Staging Building/Pest Control (1978) (1,541)	Bottled Gas Storage Building/Pest Control (1978) (1,541)	Bottled Gas Staging Building/Pest Control (1978) (1,541)						
648	Not Listed	Test Facility (1981)	Not Listed	Aircraft Intermediate Maintenance Department Auxiliary Power Unit Repair Shop (non-Naval Aircraft Rework/Refit Facility) (1980) (600)	Aircraft Intermediate Maintenance Department Auxiliary Power Unit Repair Shop (non-Naval Aircraft Rework/Refit Facility) (1980) (600)	Aircraft Intermediate Maintenance Department Auxiliary Power Unit Repair Shop (non-Naval Aircraft Rework/Refit Facility) (1980) (600)						
649	Not Listed	Ambulance Garage (1979)	Not Listed	Ambulance Garage (1979) (1,377)	Ambulance Garage (1979) (1,377)	Ambulance Garage (1979) (1,377)						
650	Not Listed	Not Listed	Jet Fuel Propellant-8 Tank, 840,000 gal (1992)	Jet Fuel Propellant-8 Tank, 840,000 gal (1992)	Jet Fuel Propellant-8 Tank, 840,000 gal (1992)							
651	Not Listed	Not Listed	Jet Fuel Propellant-8 Tank, 840,000 gal (1992)	Jet Fuel Propellant-8 Tank, 840,000 gal (1992)	Jet Fuel Propellant-8 Tank, 840,000 gal (1992)							
652	Not Listed	Not Listed	Jet Fuel Propellant-8 Truck Loading Rack (1992) (2,508)	Jet Fuel Propellant-8 Truck Loading Rack (1992) (2,508)	Jet Fuel Propellant-8 Truck Loading Rack (1992) (2,508)							
653	Not Listed	Not Listed	Fuel Farm Foam House (1992) (540)	Fuel Farm Foam House (1992) (540)	Fuel Farm Foam House (1992) (540)							
654	Not Listed	Not Listed	Jet Fuel Propellant-8 Pumphouse (1992) (2,145)	Jet Fuel Propellant-8 Pumphouse (1992) (2,145)	Jet Fuel Propellant-8 Pumphouse (1992) (2,145)							
655	Not Listed	Not Listed	Jet Fuel Propellant-8 Truck Off-Load Rack (1992) (5,038)	Jet Fuel Propellant-8 Truck Off-Load Rack (1992) (5,038)	Jet Fuel Propellant-8 Truck Off-Load Rack (1992) (5,038)							
656	Not Listed	Seabees Safety Office (1992)	Not Listed	Not Listed	Not Listed	Not Listed						
657	Not Listed	Pipe Storage (1992)	Not Listed	Reserve Training Building (1992) (960)	Reserve Training Building (1992) (960)	Not Listed						
658	Not Listed	Seabees Shop/Office (1970)	Not Listed	Fuel Farm Testing Facility (1998) (2000)	Fuel Farm Testing Facility (1998) (2000)	Fuel Farm Testing Facility (1998) (2000)						
659	Not Listed	Seabees Shop/Office (1970)	Not Listed	Naval Mobile Construction Battalion 27	Naval Mobile Construction Battalion 27 Seabee Camp (1,920)	Naval Mobile Construction Battalion 27 Seabee Camp (1,920)						
660	Not Listed	Truck Wash (1994)	Not Listed	Truck Wash (1998) (2,016)	Truck Wash (1998) (2,016)	Truck Wash (1998) (2,016)						
661	Not Listed	Not Listed	Naval Mobile Construction Battalion 27	Naval Mobile Construction Battalion 5 Bay Truck Port (1995) (1,000)	Naval Mobile Construction Battalion 5 Bay Truck Port (1995) (1,000)							
662	Not Listed	Not Listed	Not Listed	Not Listed	Naval Mobile Construction Battalion 2 Bay Truck Hi-Port (1995) (480)							

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Building Number	1946 (HRA-0298)	1950 (HRA-0027)	1952 (HRA-0299)	1956 (HRA-0300)	1962 (HRA-0301)	1966 (HRA-0147)	1976 (HRA-0408)	1999 (HRA-0091)*	2006 (HRA-0089)*	2008 (HRA-0305)*	2009 (HRA-0404)*	2011 (HRA-0403)*
730-749	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Bachelor Enlisted Quarters (2002) (Between 5,679 and 7,083 each)	Bachelor Enlisted Quarters (2002) (Between 5,679 and 7,083 each)	Bachelor Enlisted Quarters (2002) (Between 5,679 and 7,083 each)
750	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Transient Visitor Quarters	Transient Visitor Quarters (2005) (140,000)	Transient Visitor Quarters (2005) (129,770)
751	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	School Age Care Center	School Age Care Center (2004) (2,113)	School Age Care Center (2004) (1,800)
790-800	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Enlisted Housing (1982)	Not Listed	Midway Terrace (1982)	Midway Terrace - Transferred (1982)	Midway Terrace - Transferred (1982)
801-866	Not Listed	Not Listed	Not Listed	Not Listed	Wherry Public Quarters	Wherry Public Quarters	Family Housing	Brunswick Gardens Wherry Enlisted Men Housing (1954)	Family Housing 821-842 -Demolished 2002	Not Listed	Not Listed	Not Listed
867 - 874	Not Listed	Not Listed	Not Listed	Not Listed	Wherry Garages	Wherry Garages	Family Housing	Brunswick Gardens Garages (1954)	Not Listed	Not Listed	Not Listed	Not Listed
875-905	Not Listed	Not Listed	Not Listed	Not Listed	Public Quarters - Capehart	Capehart Public Quarters	Family Housing	Capehart Housing	Not Listed	Capehart Housing (1960)	Capehart Housing - Transferred (1960)	Capehart Housing - Transferred (1960)
1143	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Captains Public Quarters (1943) (2,721)	Captains Public Quarters - Transferred (1943) (2,721)	Captains Public Quarters - Transferred (1943) (2,721)
1144	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Married Officers Quarters (1943) (2,721)	Married Officers Quarters - Transferred (1943) (2,721)	Married Officers Quarters - Transferred (1943) (2,721)
1145	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Officers Public Quarters (1925) (1,750)	Officers Public Quarters - Transferred (1925) (1,750)	Officers Public Quarters - Transferred (1925) (1,750)
1146	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Married Officers Quarters (1954) (1,219)	Married Officers Quarters - Transferred (1954) (1,219)	Married Officers Quarters - Transferred (1954) (1,219)
1147-1151	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Married Enlisted Men Quarters (1954) (1,110)	Married Enlisted Men Quarters - Transferred (1954) (1,110)	Married Enlisted Men Quarters - Transferred (1954) (1,110)
1152-1155	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Married Officers Quarters (1954) (1,219)	Married Officers Quarters - Transferred (1954) (1,219)	Married Officers Quarters - Transferred (1954) (1,219)
1156	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Storage Yard (1965) (86,004)	Storage Yard (1965) (86,004)	Storage Yard (1965) (86,004)
1157	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	(Demolished 2000)	Not Listed	Not Listed	Not Listed
1200-1222	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Duplex and Quadplex Housing (2001)	Duplex and Quadplex Housing - Transferred (2001)	Duplex and Quadplex Housing - Transferred (2001)
A thru I	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Officer Public Quarters	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
EA thru EE	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Enlisted Public Quarters	Not Listed	Residence	Not Listed	Not Listed	Not Listed	Not Listed
T-201	Storage - Quonset Hut	Storage - Quonset Hut (612)	Storage - Quonset Hut	Public Works Storehouse	No name given (611)	Disaster Control Storage	Storehouse (611)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
T-202	Storage - Quonset Hut	Storage - Quonset Hut (612)	Storage - Quonset Hut	Public Works Storehouse	Storage (611)	Public Works Storage	Storehouse (611)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
T-203	Storage - Prefabricated	Storage - Prefabricated (1,622)	Storage - Prefabricated	Operations Line Shack	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed

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Building Number	1946 (HRA-0298)	1950 (HRA-0027)	1952 (HRA-0299)	1956 (HRA-0300)	1962 (HRA-0301)	1966 (HRA-0147)	1976 (HRA-0408)	1999 (HRA-0091)*	2006 (HRA-0089)*	2008 (HRA-0305)*	2009 (HRA-0404)*	2011 (HRA-0403)*
T-204	Storage - Prefabricated	Storage - Prefabricated (974)	Storage - Prefabricated	Public Works Storehouse	Storage (981)	Public Works Storage	Storehouse (981)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
T-205	Storage - Prefabricated	Storage - Prefabricated (1,460)	Storage - Prefabricated	Public Works Storehouse	Storage (1,474)	Public Works Storage	Storehouse (1,474)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
T-206	Barber Shop	Battery Shop (302)	Barber Shop	Operations Battery Shop	Not Listed	Not Listed	Not Listed	Public Works Storage (1945)	Not Listed	Not Listed	Not Listed	Not Listed
T-207	Communications Storage - Quonset Hut	Communications Storage (612)	Communications Storage - Quonset Hut	Air Force Storehouse	Storage (611)	Marine Barracks Storage	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
T-208	Communications Storage - Quonset Hut	Communications Storage (612)	Communications Storage - Quonset Hut	Air Force Storehouse	Storage (611)	Public Works Storage	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
T-209	Mobile Training - Prefabricated	Mobile Training (1,466)	Mobile Training - Prefabricated	Public Works Storehouse	Storage (1,462)	Supply Storage	Storehouse (1,462)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
T-210	Mobile Training - Prefabricated	Mobile Training (1,466)	Mobile Training - Prefabricated	Public Works Storehouse	Storage (1,462)	Supply Storage	Storehouse (1,462)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
T-211	Paint Locker	Paint Locker (224)	Paint Locker	Paint Storehouse	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
T-212	Vacant	Vacant (67)	Vacant	Unknown	Storage (For refueling contractor) (67)	Supply Storage	Storehouse (67)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
T-213	Squadron Gear	Squadron Gear (73)	Squadron Gear	Paint Storehouse	Not Listed	Not Listed	No Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
T-214	Squadron Gear	Squadron Gear (30)	Squadron Gear	Disaster Equipment Storehouse	Not Listed (73)	Marines Pistol Range Storage	Pistol Range Storehouse (73)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
T-215	Cooperative Administrative Support Units - Ammunition Stow Gear	Ammunition Tow Gear Storage (612)	Cooperative Administrative Support Units - Ammunition Stow Gear	Battery Shop	Pistol Range Storage (611)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
T-216	Mason's Storage	Mason's Storage (196)	Mason's Storage	Line Shack	Shelter (Incinerator) (192)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
T-217	Public Works Storage	Public Works Storage (660)	Public Works Storage	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
T-218	Public Works Storage	Public Works Storage (454)	Public Works Storage	Line Shack	Hangar 2 Line Shack (488)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
T-219	Public Works Storage	Public Works Storage (295)	Public Works Storage	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
T-220	Boatswain's Locker	Boatswain's Locker (224)	Boatswain's Locker	Navy Exchange Filling Station	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
T-221	Bombing Fighting Squadron Line Shack	Bombing Fighting Squadron Line Shack (612)	Bombing Fighting Squadron Line Shack	Line Shack	Hangar 1 Line Shack (611)	Hangar 1 Line Shack	Hangar 1 Line Shack (611)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
T-222	Cooperative Administrative Support Units - Line Shack	Cooperative Administrative Support Units - Line Shack (612)	Cooperative Administrative Support Units - Line Shack	Line Shack	Line Shack (611)	Air Force Line Shack	Line Shack (611)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
T-223	Public Works Storage	Public Works Storage (1,459)	Public Works Storage	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
T-224	Public Works Storage	Public Works Storage (173)	Public Works Storage	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
T-225	Freddie Storage	Storage (160)	Freddie Storage	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
T-226	Runway Maintenance Crew	Runway Maintenance (155)	Runway Maintenance Crew	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
T-227	Skeet Range Hut	Skeet Range Hut (312)	Skeet Range Hut	Skeet Range House	Skeet Storage (611)	Skeet Clubhouse	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
T-228	Skeet Range Hut Pigeon Storage	Skeet Range Hut Storage (92)	Skeet Range Hut Pigeon Storage	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
T-229	Not Listed	Not Listed	Not Listed	Railroad Tool House	Not Listed	Shed, Railroad Tools	Shed (107)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
T-230	Not Listed	Not Listed	Not Listed	Gas Farm Office	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed

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<b>East Brunswick</b>												
523	Not Listed	Not Listed	Not Listed	Not Listed	Transmitter Building (7,270)	Air Operations Transmitter Building	Transmitter Building (7,270)	East Brunswick Transmitter Building - Vacant (1958)	Not Listed	Not Listed	Not Listed	Not Listed
524	Not Listed	Not Listed	Not Listed	Not Listed	Generator Building (384)	Public Works Generator Building	Generator Building (384)	East Brunswick Stand-by Generator Building (Vacant) (1958)	Not Listed	Generator Building (1958) (384)	Generator Building (1958) (384)	Generator Building - Demolished (1958) (384)
621	Not Listed	Not Listed	2.5-10 Megahertz Antenna	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed				
622	Not Listed	Not Listed	2-8 Megahertz Antenna	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed				
623	Not Listed	Not Listed	24.5-18 Megahertz Antenna	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed				
<b>McKeen Street</b>												
561	Not Listed	Not Listed	Not Listed	Not Listed	McKeen Capehart Storage (446)	McKeen Capehart Storage	McKeen Capehart Storage (446)	McKeen Storage - Public Works (1940)	Not Listed	Public Works Storage (1940) (454)	Public Works Storage (1940) (454)	Public Works Storage - Transferred (1940) (454)
906-1091	Not Listed	Not Listed	Not Listed	Not Listed	Capehart Public Quarters	Off-Station Public Works	Family Housing	Capehart Housing (1960)	Not Listed	Capehart Housing (1960)	Capehart Housing (1960)	Capehart Housing - Transferred (1960)
<b>Sabino Hill</b>												
558	Not Listed	Not Listed	Not Listed	Not Listed	Sabino Hill Rake Tower	Sabino Hill Rake Tower	Sabino Hill Rake Tower	Sabino Hill Rake Tower (1960)	Not Listed	Sabino Hill Rake Tower (1960)	Sabino Hill Rake Tower (1960)	Sabino Hill Rake Tower - Demolished (1960)
<b>Small Point</b>												
557	Not Listed	Not Listed	Not Listed	Not Listed	Small Point Rake Tower	Small Point Rake Tower	Small Point Rake Tower	Small Point Rake Tower (1960)	Not Listed	Small Point Rake Tower (1960)	Small Point Rake Tower (1960)	Small Point Rake Tower - Demolished (1960)
<b>Topsham Annex</b>												
331	Not Listed	Traffic Check House - Vacant	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed				
332	Not Listed	Vacant	Not Listed	Topsham Vacant Administrative Office / Storage (1964)	Not Listed	Office Building - Vacant (1964) (1,248)	Office Building - Vacant (1964) (1,248)	Office Building - Vacant (1964) (1,248)				
333	Not Listed	Patrol Wings Atlantic Commander Headquarters	Not Listed	Topsham - Army Reserve Office (1958)	Not Listed	Flag Headquarters / Army Reserves Office (1958) (12,672)	Flag Headquarters / Army Reserves Office (1958) (12,672)	Flag Headquarters / Army Reserves Office (1958) (12,672)				
334	Not Listed	Flag Pole	Not Listed	Not Listed	Not Listed	Flag Pole (1958)	Flag Pole (1958)	Flag Pole (1958)				
335	Not Listed	Cold Storage and Commissary Warehouse	Not Listed	Not Listed	Not Listed	Commissary Store (1957) (35,466)	Commissary Store (1957) (35,466)	Commissary Store (1957) (35,466)				
336	Not Listed	Auto Storage Shed	Not Listed	Topsham - Commissary (1957)	Not Listed	General Storage Shed (1963) (2,960)	General Storage Shed (1963) (2,960)	General Storage Shed (1963) (2,960)				
337	Not Listed	Auto Maintenance Shop	Not Listed	Topsham - Reserve Training (1958)	Not Listed	Supply Warehouse (1958) (5,282)	Supply Warehouse (1958) (5,282)	Supply Warehouse (1958) (5,282)				
338	Not Listed	Maintenance Shop	Not Listed	Topsham - Reserve Training (1963)	Not Listed	Storage for Drill Hall (1963) (4,320)	Storage for Drill Hall (1963) (4,320)	Storage for Drill Hall (1963) (4,320)				

\* Construction date (XXXX) is shown in parentheses.

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**APPENDIX F**  
**NAS BRUNSWICK BUILDING USE CHRONOLOGY**  
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Building Number	1946 (HRA-0298)	1950 (HRA-0027)	1952 (HRA-0299)	1956 (HRA-0300)	1962 (HRA-0301)	1966 (HRA-0147)	1976 (HRA-0408)	1999 (HRA-0091)*	2006 (HRA-0089)*	2008 (HRA-0305)*	2009 (HRA-0404)*	2011 (HRA-0403)*
339	Not Listed	Maintenance Shop	Not Listed	Topsham - Reserve Training (1964)	Not Listed	Administrative Reserve (1964) (9,013)	Administrative Reserve (1964) (9,013)	Administrative Reserve (1964) (9,013)				
363	Not Listed	Fire Station	Not Listed	Topsham - Fire Station (1962)	Not Listed	Fire Station (1962) (2,651)	Fire Station (1962) (2,651)	Fire Station (1962) (2,651)				
364	Not Listed	Chief Petty Officer Bachelor Enlisted Quarters	Not Listed	Topsham - Navy Exchange Motel (1958)	Not Listed	Not Listed	Not Listed	Not Listed				
365	Not Listed	Supply and Equipment Bas Shed - Vacant	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed				
366	Not Listed	Pump Station	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed				
367	Not Listed	Direction Center Sentry - Vacant	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed				
368	Not Listed	Gas Station	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed				
369	Not Listed	Direction Center - Storage	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed				
370	Not Listed	Recreational Court	Not Listed	Not Listed	Not Listed	Playing Court (1966)	Playing Court (1966)	Playing Court - Transferred (1966)				
371	Not Listed	East Cooling Tower - Unused	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed				
372	Not Listed	West Cooling Tower - Unused	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed				
373	Not Listed	Maintenance Shop	Not Listed	Topsham - Vacant Public Works Storage (1959)	Not Listed	Not Listed	Not Listed	Not Listed				
374	Not Listed	Maintenance Shop	Not Listed	Topsham - Vacant Public Works Storage (1959)	Not Listed	Vacant (1959) (1,900)	Vacant (1959) (1,900)	Vacant - Demolished (1959) (1,900)				
375	Not Listed	Not Listed	Not Listed	Not Listed	Community Center	Not Listed	Not Listed	Topsham - Vacant Public Works Maintenance Storage (1958)	Not Listed	Not Listed	Not Listed	Not Listed
376	Not Listed	Bachelor Enlisted Quarters	Not Listed	Topsham - Bachelor Enlisted Quarters (1959)	Not Listed	Not Listed	Not Listed	Not Listed				
377	Not Listed	Sewage Facility	Not Listed	Topsham - Sewage Treatment Plant (1958)	Not Listed	Not Listed	Not Listed	Not Listed				
378	Not Listed	Pumphouse	Not Listed	Not Listed	Not Listed	Pumping Station (1962) (529)	Pumping Station (1962) (529)	Pumping Station - Transferred (1962) (529)				
381	Not Listed	Navy Exchange and Commissary Store Offices	Not Listed	Topsham - Vacant Office (1958)	Not Listed	Not Listed	Not Listed	Not Listed				
382	Not Listed	Gymnasium / Small Arms Range	Not Listed	Topsham - Vacant Gym and Pistol Range (1958)	Not Listed	Not Listed	Not Listed	Not Listed				
383	Not Listed	Non-Commissioned Officer's Club - Vacant	Not Listed	Topsham - Vacant Non-Commissioned Officer's Club (1959)	Not Listed	Not Listed	Not Listed	Not Listed				

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**APPENDIX F**  
**NAS BRUNSWICK BUILDING USE CHRONOLOGY**  
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<b>Building Number</b>	<b>1946 (HRA-0298)</b>	<b>1950 (HRA-0027)</b>	<b>1952 (HRA-0299)</b>	<b>1956 (HRA-0300)</b>	<b>1962 (HRA-0301)</b>	<b>1966 (HRA-0147)</b>	<b>1976 (HRA-0408)</b>	<b>1999 (HRA-0091)*</b>	<b>2006 (HRA-0089)*</b>	<b>2008 (HRA-0305)*</b>	<b>2009 (HRA-0404)*</b>	<b>2011 (HRA-0403)*</b>
384	Not Listed	Bachelor Enlisted Quarters	Not Listed	Topsham - Vacant Bachelor Enlisted Quarters (1958)	Not Listed	Not Listed	Not Listed	Not Listed				
385	Not Listed	Water Storage Tank	Not Listed	Topsham - Water Storage (1958)	Not Listed	Water Storage (1958)	Water Storage (1958)	Water Storage Tank (1958)				
386	Not Listed	Topsham - Water Distribution Building (1986)	Not Listed	Water Meter Pit Shelter (1987) (204)	Water Meter Pit Shelter (1987) (204)	Water Meter Pit Shelter (1987) (204)						
388	Not Listed	Not Listed	Not Listed	Not Listed	Pumping Station (1962) (529)							
1092-1142	Not Listed	Capehart Housing	Not Listed	Capehart Housing (1961)	Not Listed	Capehart Housing (1961)	Capehart Housing (1961)	Capehart Housing (1961)				

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