FINAL PRELIMINARY ASSESSMENT OF PER- AND POLYFLUOROALKYL SUBSTANCES

Natick Soldier Systems Center, Massachusetts

Prepared For:
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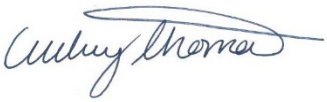
October 2020

Preliminary Assessment of Per- and Polyfluoroalkyl Substances

Natick Soldier Systems Center, Massachusetts



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Prepared for:

U.S. Army Corps of Engineers

Contract No.: W912DR-13-D-0019

Delivery Order No.: W912DR17F0396

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October 2020

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ES-1 Background

The United States Army (Army) is performing preliminary assessments (PAs) on the current or potential historical use of per- and polyfluoroalkyl substances (PFAS) at Army installations (installations) nationwide. The objective of a PA is to identify locations that are areas of potential interest (AOPIs) based on whether there was use, storage or disposal of aqueous film-forming foam (AFFF) and/or potential PFAS containing materials, in accordance with the 2018 Army Guidance for Addressing Releases of Per- and Polyfluoroalkyl Substances (Army 2018). This report provides the PA for Natick Soldier Systems Center (NSSC) and was completed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 and The National Oil and Hazardous Substances Pollution Contingency Plan.

NSSC consists of a Main Post and four off-post housing areas. NSSC Main Post is located on a peninsula on the eastern shore of Lake Cochituate in the town of Natick, Massachusetts, approximately 20 miles west of Boston. The four off-post housing areas associated with the installation include: Hudson Housing Area, which is approximately nine miles northwest of the NSSC Main Post; Wayland Housing Area, located eight miles north of the Main Post; Natick Housing Area, adjacent to the north border of the Main Post and Needham Housing Area, which is approximately six miles due east of the Main Post. NSSC is an active research and testing facility and the NSSC mission includes research and development activities in food engineering, food science, clothing, equipment, materials engineering, and aero-mechanical engineering. The United States Environmental Protection Agency conducted the third Unregulated Contaminant Monitoring Rule (UCMR3) related monitoring between 2013 and 2015. The Town of Natick, the Town of Needham, and the Town of Wayland Water Departments were sampled during the UCMR3 and results indicated that perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA), and perfluorobutanesulfonic acid (PFBS) were not detected with minimum reporting limits of 40 nanograms per liter (ng/L), 20 ng/L, and 90 ng/L, respectively. The Town of Hudson Water Department was also sampled during the UCMR3 and results indicated PFOS and PFBS were not detected and PFOA was detected at 50 ng/L in April 2015 and 40 ng/L in October 2015. The limit of detection during this analysis was also 40 ng/L, 20 ng/L, and 90 ng/L for PFOS, PFOA, and PFBS, respectively. Additionally, in response to Installation Management Command Operations Order 16-088, issued in 2016, NSSC conducted drinking water testing for PFOS, PFOA, and PFBS at the Main Post and the four off-post housing areas. Each housing area is supplied with potable water from a proximal town municipal water supply (Town of Natick, Town of Needham, Town of Wayland, and the Town of Hudson). The Hudson Housing Area, supplied by the Town of Hudson municipal water supply, was the only sampled area with a PFOA detection (29 ng/L) and is located approximately nine miles northwest of NSSC.

ES- 2 Preliminary Assessment and Conclusions

PAs were conducted at installations where AFFF or other PFAS containing materials were possibly used or stored as part of operational history (Army 2018). The following possible PFAS source types were evaluated during the PA: firefighting training areas, fire stations, fire response areas, fire nozzle testing

areas, crash sites or landing areas, fuel spills, installation storage warehouses, hangars and/or buildings with AFFF suppression systems, metal plating facilities, wastewater treatment systems, landfills, stormwater or sanitary sewer components, and remediated soil application areas. Following review of these possible source types at NSSC, no AOPIs have been identified, and fifteen areas were not retained for future investigation for this PA. The fifteen areas not retained for future investigation include areas that fall into a possible PFAS source type and were present at NSSC, however, as a result of the PA, these areas were found to not have current or historical PFAS use, storage, or disposal.

Results from this PA indicate further investigation for PFAS at NSSC is not warranted at this time.

1 INTRODUCTION

The United States (U.S.) Army (Army) is performing preliminary assessments (PAs) on the current or potential historical use of per- and polyfluoroalkyl substances (PFAS) at select active Army installations (installations) nationwide. The Army is the lead agency under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and Executive Order 12,580, and is conducting the PFAS PAs consistent with its authority under CERCLA, 42 United States Code (U.S.C.) §§ 9600, et seq. (as amended), and the Defense Environmental Restoration Program, 10 U.S.C. §§ 2701, et seq. The purpose of the PFAS PA is to identify locations that are areas of potential interest (AOPIs) at Natick Soldier Systems Center (NSSC) based on whether there was use, storage or disposal of aqueous film-forming foam (AFFF) and/or potential PFAS containing materials, in accordance with the 2018 Army Guidance for Addressing Releases of Per-and Polyfluoroalkyl Substances (Army 2018). This report provides the PA for NSSC and was completed in accordance with CERCLA and The National Oil and Hazardous Substances Pollution Contingency Plan.

1.1 Project Background

PFAS are a class of compounds that have been used in a wide range of industrial applications and commercial products due to their unique surface tension/leveling properties. Due to industry and regulatory concerns about the potential health effects and adverse environmental impacts, there has been a reduction in the manufacture and use of PFAS worldwide. In the U.S., significant reductions in the production, importation, and use of perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) (two individual compounds in the PFAS class) occurred between 2001 and 2015 (Interstate Technology Regulatory Council 2017). Perfluorobutanesulfonic acid (PFBS) replaced PFOS in some applications and is currently used and manufactured in the U.S.

The focus of the PA is to identify the locations at installations, which may be categorized as areas of potential interest (AOPIs), where AFFF and/or PFAS-containing materials were used, stored, and/or disposed.

AFFF was developed in the mid-1960s in response to a need for firefighting foams better suited to extinguish Class B, fuel-based fires. AFFF formulations consist of water, an organic solvent, up to 5 percent (%) hydrocarbon surfactants, and 1 to 3% PFAS (Interstate Technology Regulatory Council 2020). AFFF concentrate is designed to be diluted with water to become a 1, 3, or 6% foam. AFFF releases at Department of Defense (DoD) facilities may have occurred during firefighter training, emergency response actions, equipment testing, or accidental releases. The military still primarily uses AFFF for Class B fires; however, the current formulations of AFFF contain significantly lower amounts of PFOS, PFOA, and their precursors, and significant operational changes have been implemented to restrict uncontrolled releases and non-essential use of PFAS-containing foams. Army installations may still house AFFF, commonly stored in closed containers (e.g., 55-gallon drums, 5-gallon buckets), within designated storage buildings or at firehouses.

Potential PFAS use associated with metal plating activities may also be relevant to Army installations. During metal plating operations, a metal surface may be treated with a layer of electrochemically deposited metals in an acid bath. PFAS, specifically PFOS, have been used in metal plating operations

as surface tension-reducing wetting agents to mitigate the release of aerosolized chemicals into a working environment. Hard chromium plating is one type of metal plating operation where PFAS-containing mist suppressants were commonly used. Historically, it was common for spent plating baths from metal plating operations to be disposed of in a lined or unlined pit or into a sanitary or storm sewer. Therefore, PFAS present in mist suppressants during the metal plating process could be released to the environment.

Many of the PFAS found in AFFF and metal plating operations are surfactants (which do not volatilize) and are found in a charged or ionic state at environmentally-relevant pH (i.e., pH 5 to 9 standard units). PFOS, PFOA, and PFBS, are each negatively charged at environmentally friendly pH. The media potentially affected by PFAS use, storage, and disposal at Army installations are soil, groundwater, surface water, and sediment. Once released to the environment, a primary factor that inhibits the movement of PFAS is the presence of organic matter and organic co-constituents in soils and sediments. Generally, PFAS are mobile in the potentially affected media, and they are not known to be fully broken down by natural processes.

In 2016, the United States Environmental Protection Agency (USEPA) established a lifetime health advisory of 70 nanograms per liter (ng/L) in drinking water for PFOS or PFOA and for the sum of PFOS and PFOA when both are present (USEPA 2016a). In November 2018, the USEPA also issued draft subchronic and chronic oral toxicity values for PFBS for public comment. The new toxicity values for PFBS are intended to update the current PFBS toxicity values that were finalized in July 2014 (USEPA 2014). USEPA expects to finalize updated toxicity assessments for PFBS in 2020.

On 15 October 2019, the Office of the Secretary of Defense (OSD) provided guidance on the investigation of PFOS, PFOA, and PFBS at Operation and Maintenance accounts for the National Guard-funded, Environmental Restoration Account-funded, and Base Realignment and Closure Account-funded sites (OSD 2019). The 15 October 2019 Memorandum: Investigating Per- and Polyfluoroalkyl Substances within the Department of Defense Cleanup Program is provided for reference as **Appendix A**. The DoD guidance provides risk screening levels for PFOS, PFOA, and PFBS in groundwater (tap water) or soil, calculated using the USEPA's Regional Screening Level calculator for residential and industrial/commercial worker receptor scenarios.

1.2 PA Objectives

During the PA, investigators collect readily available information and conduct site reconnaissance. The PA is designed to distinguish between sites that pose little or no threat to human health and the environment and sites that require further investigation. The PA also identifies sites requiring further assessment for possible emergency response actions (USEPA 1991). This PA will evaluate and document areas, which may be categorized as AOPIs, where PFAS-containing materials were used, stored, and/or disposed, so the Army can distinguish between sites that pose little or no threat to human health and the environment and sites that require further investigation.

1.3 PA Process Description

For NSSC, PA development followed a similar process as described in **Sections 1.3.1** through **1.3.5** below. **Section 3** provides a summary of the PA activities completed at NSSC. The PA processes are documented in the PA Quality Control Checklist included as **Appendix B**.

1.3.1 Pre-Site Visit

First, an installation kickoff teleconference was held between applicable points of contact (POCs) from United States Army Environmental Command (USAEC), United States Army Corps of Engineers (USACE), NSSC, and Arcadis U.S., Inc. (Arcadis). The kickoff call occurred four to six weeks before the site visit to discuss the goals and scope of the PA, project scheduling, installation access, timeline for the site visit, access to installation-specific databases, and to request available records.

Records research was conducted before the site visit to obtain electronically available documents from the installation and external sources for review. The purpose of the records research was to identify any area on the installation that may have been a location where AFFF and/or PFAS-containing materials were used, stored, and/or disposed, as well as gather information on the physical setting and site history at NSSC.

A read-ahead package was prepared and submitted to the appropriate POCs two weeks before the site visit. The read-ahead package contains the following information:

- The Installation Management Command (IMCOM) operation order
- The Army PA Operations Security requirements package, which includes the antiterrorism/operations security review cover sheet (**Appendix C**)
- The PFAS PA kickoff call minutes
- An information paper on the PA portion of the Army's PFAS PA
- Contact information for key POCs
- A list of the data sources requested and reviewed
- A list of preliminary locations identified during the kickoff call and pre-site visit records review, that may be evaluated as preliminary AOPIs, where additional information on those areas will be collected through personnel interviews, additional document review, and site reconnaissance.
- A list of roles for the installation POC to consider when recommending potential interviewees.

1.3.2 Preliminary Assessment Site Visit

The site visit was conducted on 19 June 2020. An in brief meeting was held to provide installation staff with the objectives of the site visit and team introductions. **Section 3** includes information regarding personnel interviewed and areas where site reconnaissance was performed during the site visit.

Personnel interviews were conducted with individuals having significant historical knowledge at NSSC. The interviews focused on confirming information discussed in historical documents, collecting information that may have not been in historical documents, corroborating other interviewees' information.

Site reconnaissance at the preliminary AOPIs included visual surveys that assessed the points of potential PFAS use, storage, disposal, as well as potential secondary impacts and the migration potential from each AOPI (e.g., stormwater drains, building drains and sumps, cracks in the floor/pavement). Physical attributes of the preliminary AOPIs were documented, including local slope and ground and floor conditions (i.e., paved, or unpaved, visual staining), surface water bodies and surface flow, potential receptors, and the distance to the installation boundary. Access to existing groundwater monitoring wells, if present, were also noted during the site reconnaissance in case the monitoring wells could be proposed for site inspection sampling. Photo documentation of the preliminary AOPIs was collected, and access limitations or advantages related to potential future sampling activities were noted.

An exit briefing was offered to installation personnel at the conclusion of the site visit to raise any items identified during the site visit, discuss any follow-up items, and review the schedule for submitting deliverables. The exit briefing was conducted on 19 June 2020 with the installation and the Army to discuss preliminary findings of the PA site visit.

1.3.3 Post-Site Visit

After the site visit, information collected pre-, during, and post-site visit was reviewed and corroborated by cross-referencing records and reviewing interview details and observations noted during site visit reconnaissance. A site visit trip report was completed and provided to the installation POC, applicable USAEC POCs, and USACE regional POCs following the site visit.

2 INSTALLATION OVERVIEW

The following subsections provide general information about NSSC, including the location and layout, the installation mission(s) over time, a brief site history, current and projected land use, climate, topography, geology, hydrogeology, surface water hydrology, potable wells within a 5-mile radius of the installation, and applicable ecological receptors.

2.1 Site Location

NSSC Main Post is located on a peninsula on the eastern shore of Lake Cochituate in the town of Natick, Massachusetts, approximately 20 miles west of Boston. NSSC has four off-post housing areas associated with the installation. Hudson Housing Area is approximately nine miles northwest of the NSSC Main Post, Wayland Housing Area is approximately eight miles north of the Main Post, Natick Housing Area is adjacent to the north border of the Main Post and Needham Housing Area is approximately six miles due east of the Main Post (**Figure 2-1**). The surface of Lake Cochituate is approximately 138 feet above mean sea level (amsl). The town of Natick is a suburban area typified by light industry; the population is about 30,000 (Army 2013).

2.2 Mission and Brief Site History

NSSC is an active research and testing facility owned and operated by the Federal government through the Department of the Army and has been a permanent Army installation since October 1954. Its mission includes research and development activities in food engineering, food science, clothing, equipment, materials engineering, and aero-mechanical engineering (ICF International 2007a). Activities are housed in five directorates: combat feeding, individual protection, airdrop/aerial delivery, collective protection and the supporting science. In addition to these facilities, laboratory operations include the Navy Clothing and Textile Research Facility, which was established in 1967 to conduct research, design, and development of all protective clothing, dress uniforms, and utility garments worn by Navy and Coast Guard personnel. The Coast Guard, Bureau of Engraving and Printing, and the U.S. Army Research Institute of Environmental Medicine are additional tenant agencies located on the installation (Army 2013).

The Hudson Housing Area is an 86.5-acre piece of property located in Hudson and Stow, Massachusetts. Accessed by Bruen Road, the site was part of the former Sudbury Training Annex that was acquired by the DoD in 1942. The majority of the property was turned over to the United States Fish and Wildlife Service in 2000 to create the Assabet River National Wildlife Refuge. During this process, the 86.5-acre site was retained by the DoD and managed by the NSSC. The Hudson Housing Area encompasses the southwestern part of the former Sudbury Training Annex.

The northern part of the Hudson Housing Area was developed into the Capehart Family Housing Complex in 1962. Built for military housing, this area included a total of 35 living units or 17 structures. Demolished and redeveloped in the late 1990s, this area was renamed the Hudson Housing Area where there are currently 12 residential duplex structures (24-units) and two single family homes along with supporting facilities. These residential units were occupied until the end of 2018.

The southern part of the Hudson Housing Area was developed into a training area immediately after government acquisition in 1942 to support World War II efforts. With an active rail line along the southern border, over a dozen structures were constructed including multiple barracks, a maintenance building, garage, storehouse and locomotive shelter. All structures were demolished in the early 1960s except for the administrative building (T-101) which is currently the only original building still in existence.

2.3 Current and Projected Land Use

NSSC Main Post occupies 78 acres on a small peninsula extending from the eastern shoreline of Lake Cochituate. NSSC Main Post is mostly covered with asphalt and buildings used for research laboratories and offices (**Figure 2-2**). Open, uncovered areas include a softball field for employee recreational use and the unpaved perimeter road and embankment. The facility is surrounded by a chain-link fence. Future land use is expected to remain the same as current land use (ICF International 2007a). In addition to NSSC Main Post, there are four additional off-post residential areas owned by NSSC ranging in distance from less than a mile to approximately nine miles from the Main Post, as described above in **Section 2.1**.

2.4 Climate

Natick, Massachusetts has a temperate climate with strong seasonal changes in temperature. July tends to be the warmest month, with an average high temperature of 82 degrees Fahrenheit (˚F) and an average low temperature of 65 ˚F. January is the coldest month with average high and low temperatures of 36 and 22 ˚F, respectively. Precipitation amounts are relatively uniform across the seasons, with slightly higher amounts occurring in the fall and slightly lesser amounts occurring in the summer. Average monthly precipitation values range from 2.84 inches in July to 4.22 inches in November. Snow is typically present during the winter and early spring. Average snowfall amounts range from 0.1 and 0.2 inches in April and November, respectively, to 11.2 inches in January. The wind direction is generally from the west, with west-northwesterly winds typically occurring in October through April, south-southwesterly winds occurring in May, and west-southwesterly winds occurring in June through September. Average wind speeds are generally less than 15 miles per hour (Mactec 2007).

2.5 Topography

Topography at the NSSC main installation is generally flat to gently sloping. The maximum ground surface elevation at NSSC is 171 feet amsl along the northern boundary. Topography is relatively steeply sloping (15 to 25% slopes) to Lake Cochituate along the western and southwestern portions of the property (**Figure 2-3**). Relief is minimal at the two NSSC Natick Housing Areas, which occur at an elevation of approximately 190 feet amsl. Hudson Housing Area property occurs at an elevation of approximately 210 feet amsl and has relatively flat (0 to 3% slopes) topography. The Needham Housing Area is located on a plateau south of the summit of North Hill. The property is characterized by level to gently sloping (3 to 8% slopes) topography and occurs at an elevation of approximately 200 feet amsl. The Wayland Housing Area is situated on level ground (0 to 3% slopes) at an elevation of approximately 200 feet amsl. Topography is relatively irregular and steeply sloping east/southeast of Launcher Way. West of Launcher Way, topography is gently sloping (Mactec 2007).

2.6 Geology

The region surrounding NSSC is underlain by unconsolidated soils of glacial origin. The advancing movement of glaciers was generally to the south-southwest. The terrain is dominated by landforms resulting from the recession of the Wisconsin age Laurentide ice sheet. As the glacier retreated, hills to the south, east, and west, and the ice front to the north dammed glacial melt waters, thereby forming glacial Lake Charles and Lake Sudbury. As a result of the depositional scenario, younger sediments are typically found toward the north and older sediments to the south of the region. NSSC is located on a peninsula in a region formed during the East Natick Stage of Lake Charles's deposition, when Lake Charles had dropped 12 feet following its maximum elevation during the Sherborn Stage. This geologically recent event, approximately 15,000 to 8,000 years ago, left deposits that have not been dramatically altered by erosion. Some of the surficial deposits have been altered as terrain was filled or excavated for construction and other purposes. This is especially prevalent in the central portion of NSSC, where the topography has been artificially altered to a flat grade, and in the northwestern portion of the installation where sand and gravel were excavated prior to construction of NSSC (Mactec 2007).

The generalized stratigraphy prevalent in the region consists of (from shallow to deep) soil, outwash, till, and bedrock, with soil resulting from the weathering of any of the other layers. Outwash (i.e., materials deposited from glacial outwash streams) generally consists of sorted layers of sand and gravel. Till (i.e., materials deposited directly from melting glaciers), generally consists of an unsorted mixture of clay, silt, sand, and gravel. Bedrock types occurring beneath the installation properties are described below (Mactec 2007).

According to the Bedrock Geological Map of Massachusetts, bedrock beneath the NSSC main installation and adjacent Natick Housing Areas is classified as Dedham Granite. Dedham Granite consists of a light grayish-pink to greenish-gray variably altered granite. NSSC appears to be bounded by a bedrock trough and basin at its western and eastern edges, respectively, which likely formed as the result of glacial erosion. Bedrock outcrops have been observed along the eastern side of NSSC, just beyond the northeast corner of the NSSC boundary (Mactec 2007).

Bedrock beneath the Hudson Housing Area is mapped as Marlboro Formation, which comprises thinly layered amphibolite, biotite schist and gneiss, minor calc-silicate granofels and felsic granofels. The eastern fringe of the Hudson Housing Area may include bedrock consisting of biotite granite to granodiorite. At the Needham Housing Area, bedrock is classified as Roxbury Conglomerate, consisting of conglomerate, sandstone, siltstone, argillite and melaphyre. Bedrock beneath the Wayland Housing Area is mapped as intrusive rock consisting of orange-pink, rusty-weathering medium- to coarse-grained biotite granite to granodiorite (Mactec 2007).

2.7 Hydrogeology

The groundwater flow at NSSC occurs mainly in the glacially derived overburden soils and fractured portions of the bedrock. The overburden across the installation is comprised mainly of outwash sediments and includes sand and gravel, fine to coarse sand, peat, silty sand, and clayey silt. The stratigraphic units vary in order and appear to be laterally discontinuous. Soil generally decreases in grain size with depth, and a laterally discontinuous clayey silt later is present and apparently forms a semi-confined lower aquifer. Observed depth to bedrock in the vicinity of NSSC ranges from 0 to 199 feet below ground

surface. Bedrock at the site is primarily granodiorite that can be observed in outcrops along the eastern shore of the South Pond of Lake Cochituate and along Washington Avenue near Pegan Brook (Plexus 2018).

Groundwater in the unconsolidated soils at the site is divided into two aquifers: the unconfined water table aquifer, or “A” interval, and the locally semi-confined, deeper overburden aquifer, or “B” interval. The water table ranges in depth from 0 to 28 feet below ground surface (Plexus 2018).

Figure 2-4a illustrates the interpreted groundwater contours for the water table aquifer (“A” interval wells) across NSSC based on data collected on 27 November 2017. Consistent with historical interpretations, the interpreted water table piezometric surface reveals a divide across the center of the installation. Flow from the groundwater divide radiates outward toward the South Pond of Lake Cochituate. To the east of the divide, groundwater appears to discharge to the shallow eastern bay of the South Pond of Lake Cochituate. To the north and west of the divide, water table groundwater flow is generally to the west-northwest.

Figure 2-4b illustrates the interpreted piezometric contours for the deeper aquifer “B” interval wells. Deeper overburden groundwater appears to move from east to west beneath NSSC, discharging to the South Pond of Lake Cochituate with local variations beneath the eastern bay and the central and southern portion of the installation.

NSSC currently operates a groundwater extraction and treatment system (GWETS) in Building 94. The GWETS has been in operation since 1997 due to volatile organic compounds contamination (i.e., not associated with PFAS) at NSSC and includes fourteen groundwater extraction wells, two of which are offline. Groundwater is extracted from an on-site groundwater pump and treat system and is reused for non-potable purposes, including irrigation and cooling tower make-up water. Historically, little to no distortion of shallow water table contours has been observed due to groundwater pumping related to the GWETS at NSSC. However, historically, the influence of groundwater pumping is apparent with the distortion of piezometric contours in the vicinity of extraction wells in the deep overburden aquifer (**Figure 2-4b**) (Plexus 2018). The location of the GWETS and the associated extraction and monitoring wells are shown on **Figure 2-5**. A current monitoring well inventory at NSSC is included as an appendix to this report (**Appendix E**).

2.8 Surface Water Hydrology

NSSC is located within the Lake Cochituate drainage basin, which encompasses approximately 17.7 square miles. The main hydrogeologic features at NSSC and the surrounding area include the South Pond of Lake Cochituate and Fisk Pond. The South Pond of Lake Cochituate, which occupies approximately 0.9 square miles, flows northward to the Middle Pond and then North Pond of Lake Cochituate. The North Pond drains via Cochituate Brook into the Sudbury River, Concord River, and eventually Merrimack River (**Figure 2-6**) (Plexus 2018).

2.9 Relevant Utility Infrastructure

The following subsections provide general information regarding the installation’s stormwater and wastewater management systems, as well as information on how the utility infrastructures may influence the fate and transport of PFAS at NSSC.

2.9.1 Stormwater Management System Description

Stormwater on the property is collected in the NSSC subsurface drainage system via catch basins, which are located throughout the installation grounds. Water in the subsurface drainage system flows through oil/water separators prior to being discharged to Lake Cochituate to prevent discharge of oily substances (Mactec 2007)**.** The discharge locations are shown on **Figure 4-1**.

2.9.2 Sewer System Description

There is no wastewater treatment plant (WWTP) at NSSC. The Massachusetts Water Resources Authority and Town of Natick have issued a permit to NSSC to discharge sanitary wastewater into the Massachusetts Water Resources Authority sewer system through the Town of Natick sewerage system. Sanitary wastewater from NSSC is eventually treated at the Deer Island WWTP approximately 26 miles away. NSSC wastewater sewer lines are shown on **Figure 4-2**.

2.10 Potable Water Supply and Drinking Water Receptors

From the installation establishment around 1953 until 1995, NSSC Main Post utilized two on-post potable water supply wells. In 1995, the on-post potable wells were shut down due to maintenance issues. The Town of Natick has supplied NSSC Main Post with both potable and non-potable water supplies since the shutdown of these two wells. NSSC Main Post does not currently have any operational potable wells on post (**Figure 2-5**).

Other than the NSSC Main Post, there are four off-post housing areas associated with NSSC (**Figure 2-1**). The Natick Housing Area is adjacent to the NSSC Main Post, while the Hudson, Wayland and Needham Housing Areas are located more than five miles away. The Natick, Hudson, Wayland, and Needham Housing Areas obtain their potable water supply from the Town of Natick, Town of Hudson, Town of Wayland, and Town of Needham municipal water supplies, respectively. NSSC Main Post is located approximately 2,500 feet southeast of the Town of Natick's Springvale Municipal Water Supply Well Field (Springvale Well Field). The ground water beneath the entire NSSC facility has been designated as a Zone II primary recharge area for the Springvale Well Field (ICF International 2007a). NSSC Main Post, the Hudson Housing Area, the Wayland Housing Area, and the Natick Housing Area are all located within the Sudbury/Assabet/Concord Watershed. NSSC Main Post and the Natick Housing Area are located on the upgradient side of the Sudbury/Assabet/Concord Watershed relative to the Hudson Housing Area and the Wayland Housing Area, however various surface water bodies and streams intersect the general flow path. As noted in **Section 2.1**, the Hudson Housing Area is approximately nine miles northwest of the NSSC Main Post, Wayland Housing Area is approximately eight miles north of the Main Post, Natick Housing Area is adjacent to the north border of the Main Post. The Needham Housing Area is located in the Charles River Watershed and is approximately six miles due east of NSSC Main Post.

Lake Cochituate receives groundwater baseflow, surface water drainage as well as stormwater discharge from NSSC. Lake Cochituate is used for recreational activities, including swimming and fishing, but does not have any potable water purposes. There are numerous off-post potable water supply wells within a 5-mile radius of NSSC (**Figure 2-7**).

The Environmental Data Resources (EDR), Inc. report providing well search results is provided as **Appendix F**.

2.11 Ecological Receptors

Due to the availability of adequate toxicity data, the Army focused the PA on human receptors. The PA team collected information regarding ecological receptors that was available in the installation documents reviewed during the PA process. The following information is provided for future reference should the Army decide to evaluate exposure pathways relevant to the ecological receptors.

The main building area at NSSC has an area of approximately 35 acres, which consists of buildings, pavement, parking lots, and lawns. The remaining land, about 40 acres, is partially wooded and consists of mixed deciduous hardwoods and conifers. A variety of animals are found at NSSC, including squirrels, chipmunks, skunks, racoons, and rabbits. Waterfowl observed on Lake Cochituate include Canadian geese, mallards, and black ducks. No endangered species have been observed (USACE 1993).

Lake Cochituate is made up of three connected ponds (North, Middle, and South Ponds) and is a popular year-round fishery. A variety of fish species have been identified at the site and reference locations across Lake Cochituate, the most abundant being golden shiners, bluegills, largemouth bass and perch. Lake Cochituate is also stocked heavily with trout, broodstock salmon, northern pike and tiger muskie. Lake Cochituate receives surface drainage from NSSC primarily via the storm sewer system. In the late 1990s, all active stormwater outfalls were retrofitted with new oil/water separators to improve stormwater quality and minimize impacts to Lake Cochituate (ICF International 2007b).

2.12 Previous PFAS Investigations

The USEPA conducted the third Unregulated Contaminant Monitoring Rule (UCMR3) related monitoring between 2013 and 2015. UCMR3 is a national program that collects data for contaminants that are suspected to be present in drinking water and do not have health-based standards set under the Safe Drinking Water Act (USEPA 2016b). The UCMR3 published in 2012 included the analysis of PFOS, PFOA, and PFBS in public water systems serving more than 10,000 people between 2013 and 2015. The Town of Natick, the Town of Needham, and the Town of Wayland Water Departments were sampled during the UCMR3 and results indicated that PFOS, PFOA, and PFBS were not detected with minimum reporting limits of 40 ng/L, 20 ng/L, and 90 ng/L, respectively. The Town of Hudson Water Department was also sampled during the UCMR3 and results indicated that PFOS and PFBS were not detected and PFOA was detected at 50 ng/L in April 2015 and 40 ng/L in October 2015. The limit of detection during this analysis was also 40 ng/L, 20 ng/L, and 90 ng/L for PFOS, PFOA, and PFBS, respectively.

In response to IMCOM Operations Order 16-088, issued in 2016, NSSC conducted drinking water testing for PFOS, PFOA, and PFBS at the Main Post and the four off-post housing areas (**Figure 2-1).** None of the sample results from the 2016 IMCOM sampling exceeded the OSD risk screening levels (**Appendix A**). The PFOS, PFOA, and PFBS analytical results from this sampling on December 1, 2016 and the corresponding limit of quantitation (LOQ) are as follows:

- NSSC Building 4, Floor 1:
    - PFOS not detected with LOQ of 16 ng/L
    - PFOA not detected with LOQ of 9.5 ng/L

    - PFBS not detected with LOQ of 48 ng/L
- Natick Housing Area, 25 Heritage Lane:
    - PFOS not detected with LOQ of 15 ng/L
    - PFOA not detected with LOQ of 9.3 ng/L
    - PFBS not detected with LOQ of 47 ng/L
- Needham Housing Area, 10 Militia Heights Road:
    - PFOS not detected with LOQ of 15 ng/L
    - PFOA not detected with LOQ of 9.3 ng/L
    - PFBS not detected with LOQ of 47 ng/L
- Wayland Housing Area, 104 Oxbow Road:
    - PFOS not detected with LOQ of 15 ng/L
    - PFOA not detected with LOQ of 9.3 ng/L
    - PFBS not detected with LOQ of 47 ng/L
- Hudson Housing Area, 18 Bruen Drive:
    - PFOS not detected with LOQ of 16 ng/L
    - PFOA detected at 29 ng/L
    - PFBS not detected with LOQ of 48 ng/L

Each housing area is supplied with potable water from a proximal town municipal water supply (Town of Natick, Town of Needham, Town of Wayland, and the Town of Hudson). The Hudson Housing Area, supplied by the Town of Hudson municipal water supply, was the only sampled area with a PFOA detection of 29 ng/L and is located approximately nine miles northwest of NSSC. There are no historical activities other than residential barracks in the Hudson Housing Area that could result in a source of these detections within the Town of Hudson municipal water supply. **Section 4.4** discusses the potential for off-post PFAS sources to contribute to detections observed in the Hudson Housing Area analytical data. **Appendix G** provides further analytical results from this December 2016 sampling event.

3 SUMMARY OF PA ACTIVITIES

The following three principal sources of information were used to develop this PA:

1. Records Review
2. Personnel interviews
3. Site reconnaissance.

These sources of data, along with their relative application to this PA, are discussed below. The specific findings of records review, personnel interviews, and site reconnaissance relevant to PFAS at NSSC are described in **Section 4**.

3.1 Records Review

The records reviewed included, but were not limited to, various Installation Restoration Program administrative record documents, compliance documents, and GIS files. Internet searches were also conducted to identify publicly available and other relevant information. Additionally, an EDR report generated for NSSC was reviewed to obtain off-post water supply well information. A list of the documents reviewed is provided in **Appendix H**.

3.2 Personnel Interviews

Interviews were conducted during the site visit If a previously identified interviewee was not available during the site visit, attempts were made to complete the interview via telephone before or following the site visit or by contacting an alternate interviewee identified by the installation POC.

The list of roles for the installation personnel interviewed during the PA process for NSSC is presented below (affiliation is with NSSC unless otherwise noted).

- Environmental Chief
- Environmental Restoration Manager
- Environmental Resource Conservation and Recovery Act Manager
- Environmental Compliance Manager
- Fire Protection Inspector
- Captain at the Town of Natick Fire Department

The compiled interview logs provided in **Appendix I**.

3.3 Site Reconnaissance

Site reconnaissance and visual surveys were conducted at six areas identified during the records review process, the installation in-brief meeting, and during the installation personnel interviews. Under some circumstances, the team may not have conducted site reconnaissance at an AOPI identified in the read-ahead package due to additional information obtained during personnel interviews or if access to the site

was restricted. However, the area still may have been classified as an area not retained for further investigation or an AOPI based on other information collected (e.g., records reviewed, personnel interviews, internet searches) as described in **Sections 5.1**. A photo log from the site reconnaissance is provided in **Appendix J**; photos were used to assist in verification of qualitative data collected in the field. The site reconnaissance logs are provided in **Appendix K**.

Access to existing groundwater monitoring wells, if present, were also noted during the site reconnaissance in case the monitoring wells could be proposed for site inspection sampling.

Table 3-1. Site Reconnaissance Areas

Site Identifier	Description and Relevance
Buildings and Facilities	
Building 3	Mercury reduction treatment system with carbon filtration and ion exchange resin
Building 5	Army textile research laboratory
Building 7	Navy clothing and textile research facility laboratory
Building 93	Bulk hazardous waste storage facility (more than a gallon)
Building 94	CERCLA site groundwater extraction and treatment system building
Building 95	Small hazardous waste storage (less than a gallon)

4 SUMMARY OF SOURCE AREAS RESEARCHED

A summary of the observations made, and data collected through records review (**Appendix H**), installation personnel interviews (**Appendix I**), and site reconnaissance (**Appendix K**) during the PA process for NSSC is presented below.

4.1 AFFF Use and Storage at NSSC

Following the analysis of data collected from site reconnaissance, installation personnel interviews, and records review, there is no current or historical AFFF use or storage at NSSC. The NSSC Fire Inspector, who has been present at NSSC since 2016, stated that currently and historically to his knowledge, there are no AFFF suppression systems at NSSC and that AFFF has not been used or stored at the installation. The retired NSSC Fire Inspector could not be contacted for further information. A subsequent talk with a representative from the Town of Natick Fire Department who reviewed the records file for NSSC, confirmed there have not been any incident responses that involved AFFF at NSSC.

Analysis of data collected from site reconnaissance, installation personnel interviews, and records review identified that no fire stations or fire training areas have existed at NSSC. A memorandum of agreement exists between NSSC and the Town of Natick Fire Department (**Appendix L**) which allows the Town of Natick Fire Department to provide emergency and routine fire, hazardous material, or medical response services to NSSC and the two adjacent Natick housing areas. During site visit interviews with the NSSC fire inspector, it was noted that the Town of Natick Fire Department has responded to a few fire emergencies at NSSC in the past, none of which involved AFFF during the response. This was confirmed in the interview with the Town of Natick Fire Department as well. Information regarding the fire suppressant(s) used during these responses was not readily available. Additionally, Arcadis confirmed that the Town of Natick Fire Department carries AFFF, but rarely uses it. The Town of Natick Fire Department last recalled using AFFF during a response at an unspecified location on the Massachusetts Turnpike, at least two miles from NSSC. The Town of Natick Fire Department has no documentation of AFFF use during response to incidents on the installation.

4.2 Metal Plating Operations

Analysis of data collected from site reconnaissance trips, installation personnel interviews, and records review indicated that no metal plating operations currently exist or have historically existed at NSSC.

4.3 Other Potential PFAS Sources at NSSC

The September 2018 Army guidance indicates the mechanisms for potential use, storage, and disposal of PFAS include AFFF, metal plating facilities , WWTPs (and associated biosolids) and landfills (Army 2018). Other potential PFAS sources were also considered (e.g., installation storage warehouses, pesticide use, prescribed burn areas, automobile maintenance shops, photo-processing facilities, laundry/water-proofing facilities, car washes, stormwater or sanitary sewer components, or remediated soil application areas) and researched during the PA for NSSC.

Following review of possible PFAS source types and associated possible PFAS use, storage, and disposal at NSSC, no AOPIs were identified. It was noted during a discussion with a USAEC Pest

Management Consultant that the larger group of pesticides are generally not of PFAS concern. Specifically, products containing Sulfluramid (i.e., associated with insecticides) may have contained PFAS and were phased out in 1996. The USAEC Pest Management Consultant has records of pesticides used and stored at IMCOM installations, including NSSC, and did not identify NSSC as an installation ever using PFAS-containing pesticides/insecticides. Following records review, personnel interviews, and site reconnaissance at NSSC, other potential PFAS source types were either not identified at the installation or did not have confirmed or suspected PFAS use, storage, or disposal.

Further discussion regarding areas not retained for future investigation is presented in **Section 5.1**.

4.4 Readily Identifiable Off-Post PFAS Sources

An exhaustive search to identify all potential off-post PFAS sources (i.e., not related to operations at NSSC) is not part of the PA. However, potential off-post PFAS sources within a 5-mile radius of the installation that were identified during the records search and site visit are described below.

As previously mentioned, during an interview with a representative from the Town of Natick Fire Department, who last recalled using AFFF during a response at an unspecified location on the Massachusetts Turnpike. The closest point of the Massachusetts Turnpike is at least two miles from the NSSC installation boundary, however, the exact location and details of AFFF use (e.g., volume used, brand of AFFF used) are unknown.

Despite the AFFF use potentially proximal to NSSC, the 2016 IMCOM potable water sampling results at NSSC Main Post and the Natick Housing Area supplied by the Town of Natick Water Supply showed no detections of PFAS.

The Hudson Housing Area is located less than one mile from the Massachusetts Department of Fire Services (Fire Academy) located in Town of Hudson, Massachusetts. After review of various aerial photos of the Massachusetts Department of Fire Services from the 2000s, visible use of foam was noted on the concrete pad on most of the aerial photographs.

5 SUMMARY AND DISCUSSION OF PA RESULTS

The areas evaluated for potential PFAS use or storage and/or disposal at NSSC were refined during the PA process and identified either as an area not retained for further investigation or as an AOPI. In accordance with the established process for the PA, fifteen have been identified as areas not retained for further investigation and none have been identified as AOPIs. The process used for refining these areas is presented on **Figure 5-1**, below.

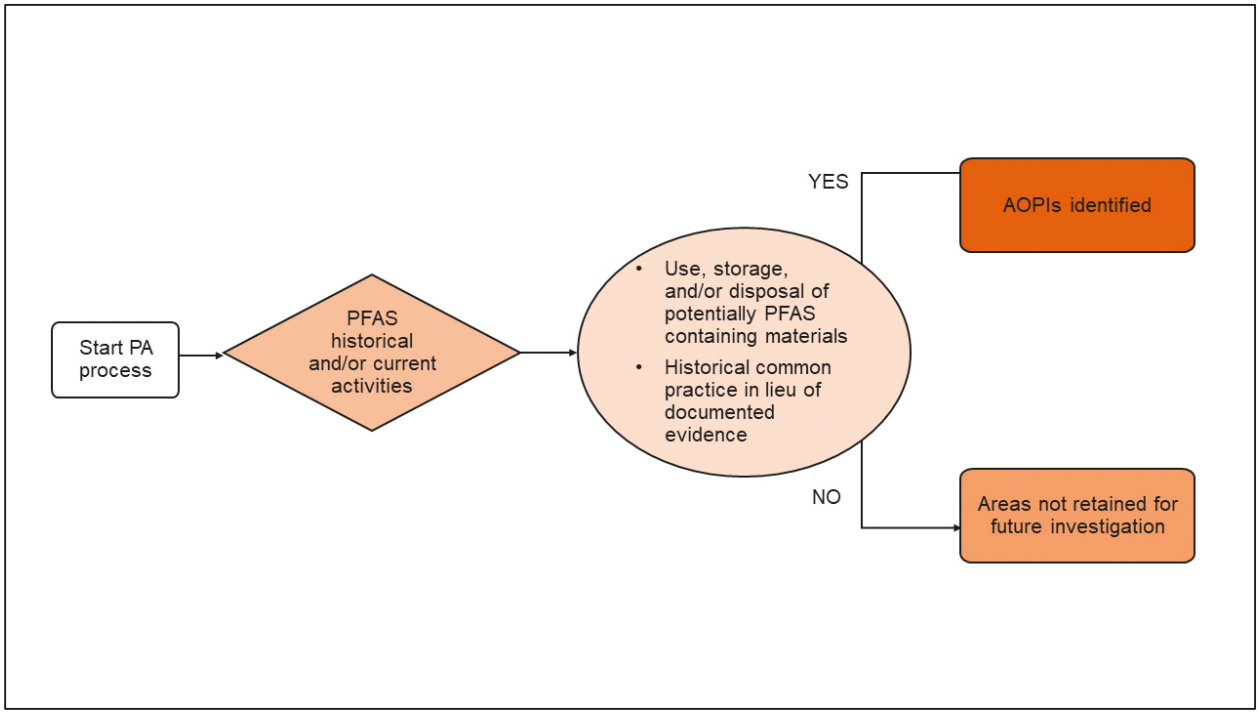

Figure 5-1: AOPI Decision Flowchart

The areas not retained for further investigation are presented in **Section 5.1**.

Data limitations for this PA at NSSC are presented in **Section 6**.

5.1 Areas Not Retained for Further Investigation

Through the evaluation of information obtained during records review, personnel interviews, and/or site reconnaissance, the areas described below were categorized as areas not retained for further investigation. These areas were previously identified as potential PFAS sources at NSSC. However, following site research conducted for this PA, PFAS use, storage, and/or disposal was not suspected at these areas. These areas are not retained for further investigation at this time but may be re-evaluated at a later date if additional information is collected and/or updated Army guidance is issued.

A brief site history for areas not retained for further investigation and the rationale for eliminating the areas as AOPIs is presented in **Table 5-1**, below.

Table 5-1. Installation Areas Not Retained for Further Investigation

Area Description	Dates of Operation	Relevant Site History	Rationale
Building T-68	Not available (NA)	Identification based on Current Assets File: Hazardous materials storage.	During interviews conducted at the site visit, it was determined that PFAS containing materials were not stored at this building, and that there are no AFFF suppression systems at NSSC. This temporary building has since been demolished.
Building T-73	NA	Identification based on Current Assets File: Hazardous materials storage.	During interviews conducted at the site visit, it was determined that PFAS containing materials are not stored in this building.
Building T-62	NA	Identification based on Current Assets File: Hazardous materials storage.	During interviews conducted at the site visit, it was determined that PFAS containing materials are not stored in this building.
Building 42	NA	Identification based on use as mercury reduction groundwater treatment	There was not PFAS use, storage, or disposal identified at NSSC to consider this system as a secondary source.
Building 93	NA	Identified based on use as a bulk hazardous waste storage facility (more than a gallon).	During the site visit, it was determined that PFAS containing materials are not stored in this building. This building has an IND-X industrial dry chemical-Ansul suppression system, not AFFF.
Building 94	NA	Identification based on status as CERCLA site – contaminated groundwater treatment system.	During the site visit, it was determined that PFAS containing materials are not stored here and there is no AFFF suppression system. There was not PFAS use, storage, or disposal identified at NSSC to consider this system as a secondary source. All treated water is used as grey water or discharged to stormwater system. Additional

Area Description	Dates of Operation	Relevant Site History	Rationale
			information can be found in the site reconnaissance logs in **Appendix J**.
Building 95	NA	Identification based on use as small hazardous waste storage (a gallon or less).	During the site visit, it was determined that PFAS containing materials are not stored in this building.
Building 3	NA	Identification based on use as mercury reduction groundwater treatment system with carbon filtration and ion exchange resin.	During the site visit, it was determined that PFAS containing materials are not stored in this building and there is no AFFF suppression system. There was not PFAS use, storage, or disposal identified at NSSC to consider this system as a secondary source. Water from the treatment system is discharged to the sanitary sewer system. Additional information can be found in the site reconnaissance logs in **Appendix J**.
The Helipad	NA	Listed as Rotary-Wing Landing Area in current assets file.	Following pre-site visit research and the site visit interviews, it was concluded that there are no known crashes that could have potentially involved AFFF here. There is little potential for PFAS use, storage, or disposal at this site, as it is seldom used as a landing area. Used daily as a parking lot.
Building 7	Established in 1967	Navy Clothing and Textile Research Facility Laboratory.	During the site visit, it was determined that clothing and materials are not treated on-site, and processes associated with this area pose no threat for PFAS use, storage, or disposal.

Area Description	Dates of Operation	Relevant Site History	Rationale
Building 5	Built in 1955	Army Clothing and Textile Research Facility.	During the site visit, it was determined that clothing and materials are not treated on-site, and processes associated with this area pose no threat for PFAS use, storage, or disposal.
Former Building T-25	1970 through about 1984	Bulk Hazardous Waste Storage Area.	During interviews conducted during the site visit, it was determined that PFAS containing materials are not stored in this building and there is no AFFF suppression system.
Vehicle Fueling Aboveground Storage Tank (69/70)	NA	Identification based on Current Assets File: Vehicle Fueling Facility.	During interviews conducted at the site visit, it was determined that there are no AFFF suppression systems at NSSC.
Facility Number 16A	NA	Identification based on Current Assets File: Other Operating Fuel Storage.	During interviews conducted at the site visit, it was determined that there are no AFFF suppression systems at NSSC.
Facility Number 2A	NA	Identification based on Current Assets File: Bulk liquid storage, other than fuel.	During interviews conducted at the site visit, it was determined that there are no AFFF suppression systems at NSSC.

6 DATA LIMITATIONS AT NSSC

Data collected during the PA, as discussed in **Section 3**, **Section 4**, and **Section 5** were sufficient to draw the conclusions summarized in **Section 7**. The data limitations relevant to the development of this PA for PFAS at NSSC are discussed below.

Readily identifiable potential off-post PFAS sources were documented in this PA for NSSC. This search was not exhaustive and was limited to areas that were identified during relevant document research, installation personnel interviews, and site reconnaissance trips.

As identified during an interview with the Town of Natick Fire Department representative, the Natick Fire Department last recalls using AFFF during a response on the Massachusetts Turnpike, a toll road in Massachusetts. The closest point of the turnpike is about two miles from NSSC, but it was not confirmed when this incident response occurred and the exact location on the turnpike where AFFF was used.

Records reviewed during the PA process were limited in information regarding AFFF use; procurement records of AFFF, and documentation of AFFF used during crash responses or fire training activities were not available. Anecdotal accounts of AFFF use (and therefore likely PFAS use) were limited to available installation personnel, whose knowledge of AFFF use may have been restricted by their time spent at the installation or previous roles held that limited their relevant knowledge of potential AFFF (or other PFAS) use.

Lastly, car washes were not yet identified as a potential PFAS source at the time of this report. Therefore, the historical or current presence of carwashes was not evaluated in this PA for NSSC.

A comprehensive well survey was not completed as part of this PA; therefore, the information reviewed regarding off-post wells is limited to what is contained in the EDR well search results. The EDR well search report (**Appendix F**) was referenced when identifying potential off-post drinking water receptors.

The searches for ecological receptors and off-post PFAS sources were not exhaustive and were limited to easily identifiable and readily available information evaluated during the relevant documents research, installation personnel interviews, and site reconnaissance.

Finally, the available PFAS analytical data is limited to UCMR3 and IMCOM sampling data, therefore the data reporting limits and list of PFAS which were analyzed are specific to the selected analytical methods at the time of sampling and analysis.

7 CONCLUSIONS AND RECOMMENDATIONS

The Army's PFAS PA focused on identifying the locations of potential PFAS use, storage, and disposal of PFAS containing materials per the Army Guidance for Addressing Releases of Per-and Polyfluoroalkyl Substances (Army 2018) at NSSC.

Although there is currently no federal maximum contaminant level for drinking water defined for any PFAS, OSD provided residential risk screening levels for PFOS, PFOA, and PFBS in soil and groundwater (tap water) and industrial/commercial risk screening levels for PFOS, PFOA, and PFBS in soil (**Appendix A**). A combination of document review, internet searches, interviews with installation personnel, and an installation site visit were used to identify specific areas of suspected PFAS use, storage, and disposal at NSSC. Following the evaluation, no AOPIs were identified.

Further investigation of PFAS is not recommended at NSSC at this time.

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ACRONYMS

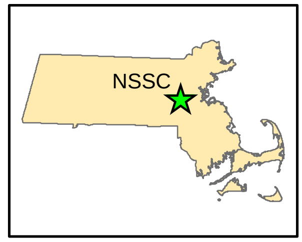
°F	degrees Fahrenheit
%	percent
AFFF	aqueous film-forming foam
amsl	above mean sea level
AOPI	area of potential interest
Arcadis	Arcadis U.S., Inc.
Army	United States Army
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
DoD	Department of Defense
EDR	Environmental Data Resources, Inc.
GIS	geographic information system
GWETS	groundwater extraction and treatment system
IMCOM	Installation Management Command
installation	United States Army or Reserve installation
LOQ	limit of quantitation
NA	not available
NSSC	Natick Soldier Systems Center
ng/L	nanograms per liter (parts per trillion)
OSD	Office of the Secretary of Defense
PA	preliminary assessment
PFAS	per- and polyfluoroalkyl substances
PFBS	perfluorobutanesulfonic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonate
POC	point of contact
U.S.	United States
USACE	United States Army Corps of Engineers
USAEC	United States Army Environmental Command
USEPA	United States Environmental Protection Agency

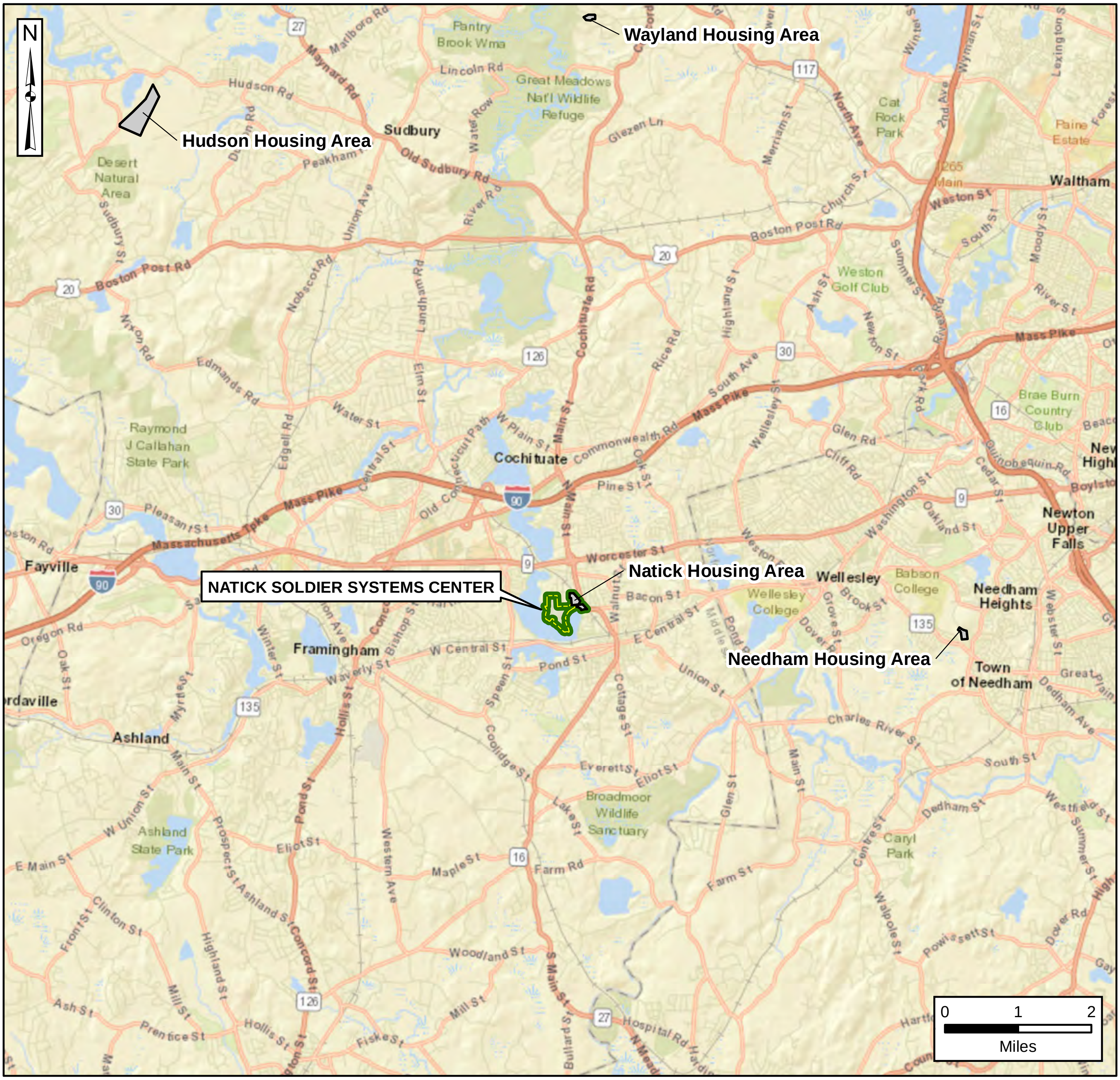
UCMR3	third Unregulated Contaminant Monitoring Rule
WWTP	wastewater treatment plant

FIGURES

USAEC PFAS Preliminary Assessments
Natick Soldier Systems Center, MA

Figure 2-1
Site Location





Installation Boundary

Natick Housing Areas

Coordinate System:
WGS 1984, UTM Zone 19 North

USAEC PFAS Preliminary Assessments
Natick Soldier Systems Center, MA

Figure 2-2
Site Layout

Installation Boundary
Natick Housing Area

Coordinate System:
WGS 1984, UTM Zone 19 North

USAEC PFAS Preliminary Assessments
Natick Soldier Systems Center, MA

Figure 2-3
Topographic Map

Installation Boundary
Natick Housing Areas
Elevation Contour (feet)

Coordinate System:
WGS 1984, UTM Zone 19 North

USAEC PFAS Preliminary Assessments
Natick Soldier Systems Center, MA

ARCADIS

Figure 2-4a
Shallow Table Aquifer Groundwater Flow Map

Installation Boundary

Natick Housing Area

Groundwater Elevation Contour (ft) (Nov. 27, 2017)

Extraction Well

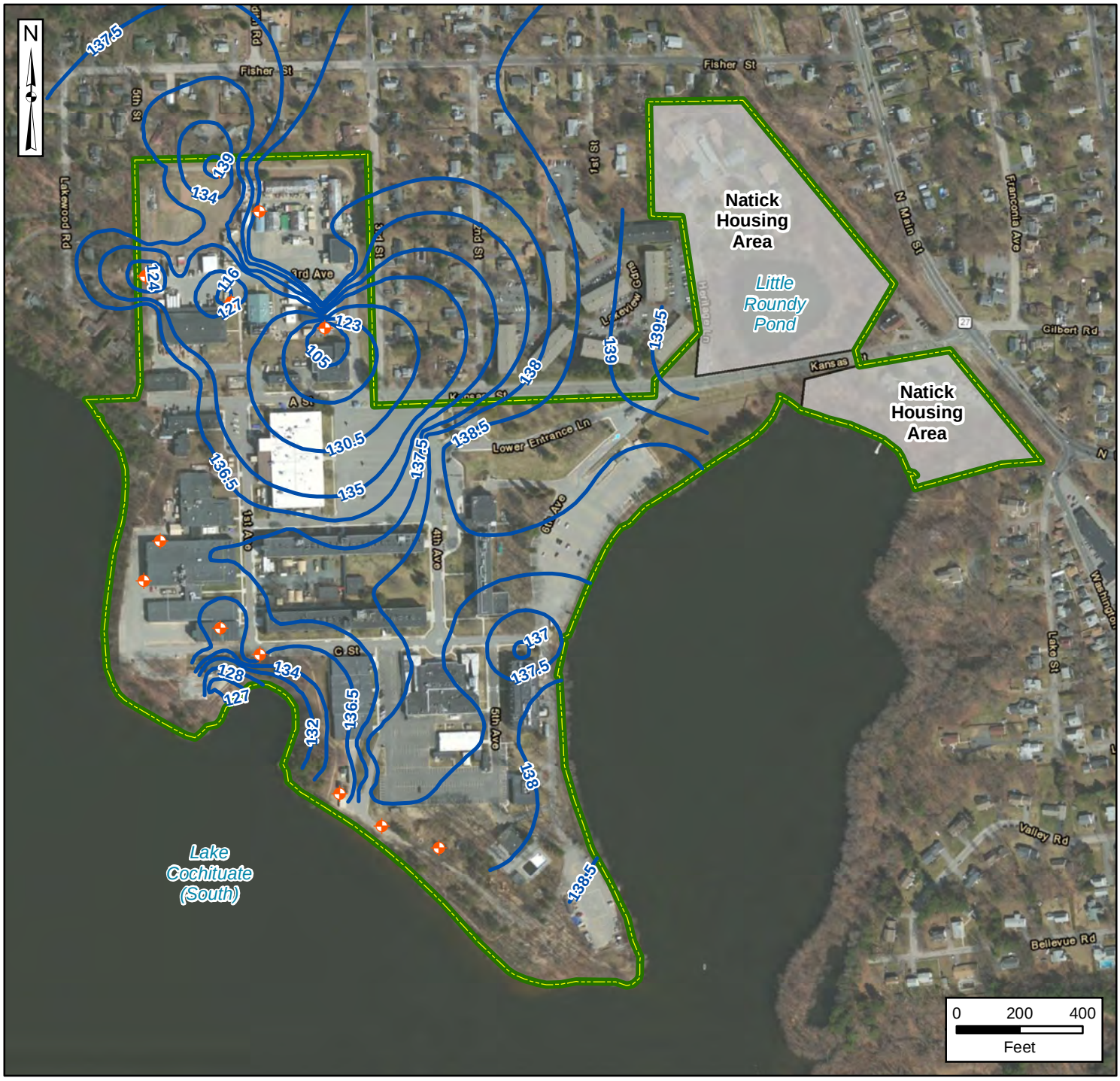
Note: Potentiometric contours and wells were obtained from the following report:
Plexus, 2018. Draft Groundwater Monitoring Event 75 and 2017 Groundwater Extraction and Treatment System Annual Report, U.S. Army Soldier Systems Center, Natick, Massachusetts. May.

Coordinate System:
WGS 1984, UTM Zone 19 North

USAEC PFAS Preliminary Assessments
Natick Soldier Systems Center, MA

ARCADIS

Figure 2-4b
Deep Overburden Aquifer Groundwater Flow Map



Installation Boundary

Natick Housing Area

Groundwater Elevation Contour (ft) (Nov. 27, 2017)

Extraction Well

Note: Potentiometric contours and wells were obtained from the following report:
Plexus, 2018. Draft Groundwater Monitoring Event 75 and 2017 Groundwater Extraction and Treatment System Annual Report, U.S. Army Soldier Systems Center, Natick, Massachusetts. May.

Coordinate System:
WGS 1984, UTM Zone 19 North

USAEC PFAS Preliminary Assessments
Natick Soldier Systems Center, MA

Figure 2-5
Installation Wells

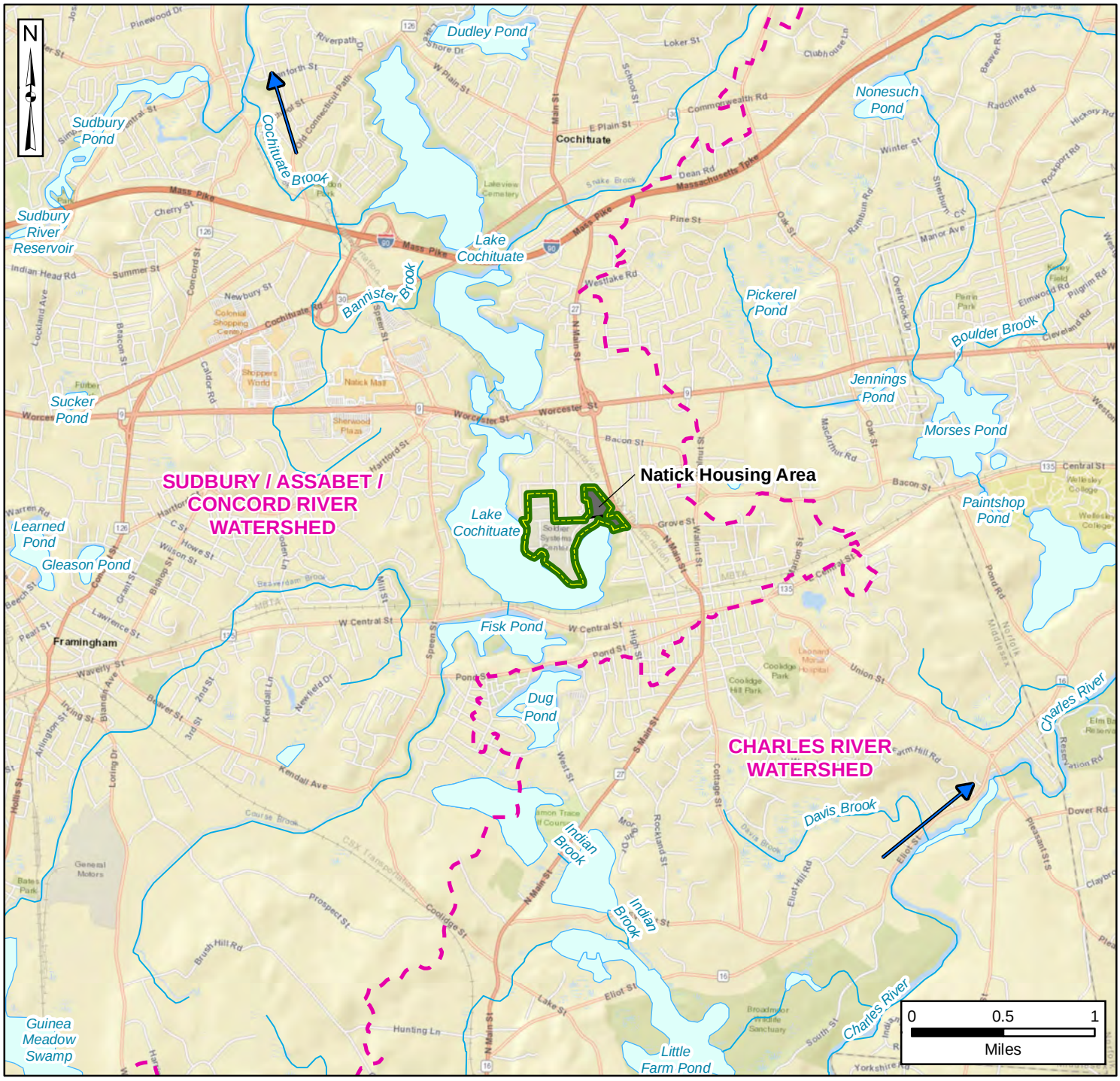
Installation Boundary
Natick Housing Area
Monitoring Well
Extraction Well
Former Public Supply Well

GWETS = Groundwater extraction treatment system

Coordinate System:
WGS 1984, UTM Zone 19 North

USAEC PFAS Preliminary Assessments
Natick Soldier Systems Center, MA

Figure 2-6
Surface Water Flow Map

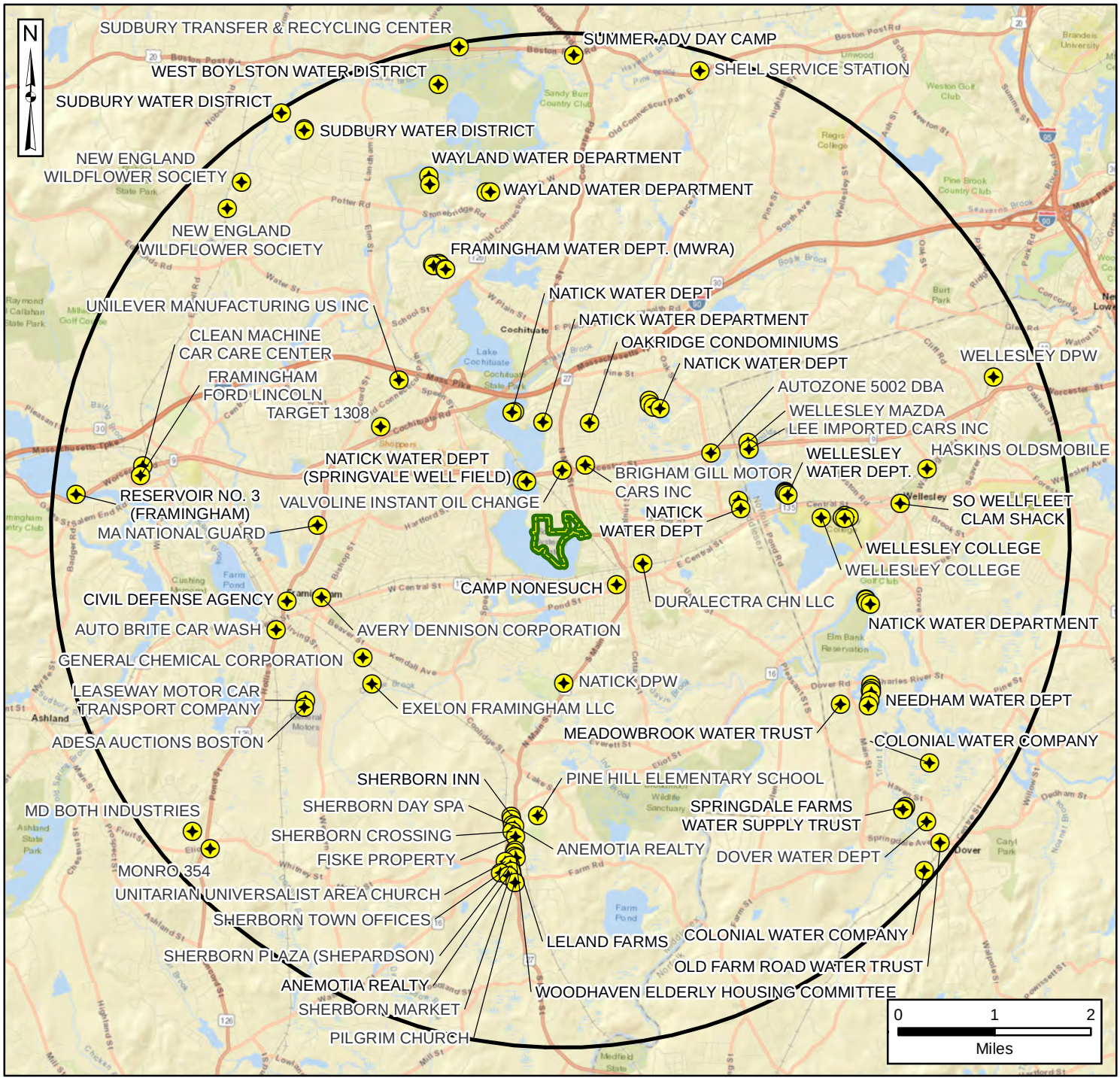


Installation Boundary
Natick Housing Area
River/Stream
Water Body
Watershed Boundary
Surface Water Flow Direction

Coordinate System:
WGS 1984, UTM Zone 19 North

USAEC PFAS Preliminary Assessments
Natick Soldier Systems Center, MA

Figure 2-7
Off-Post Potable Wells



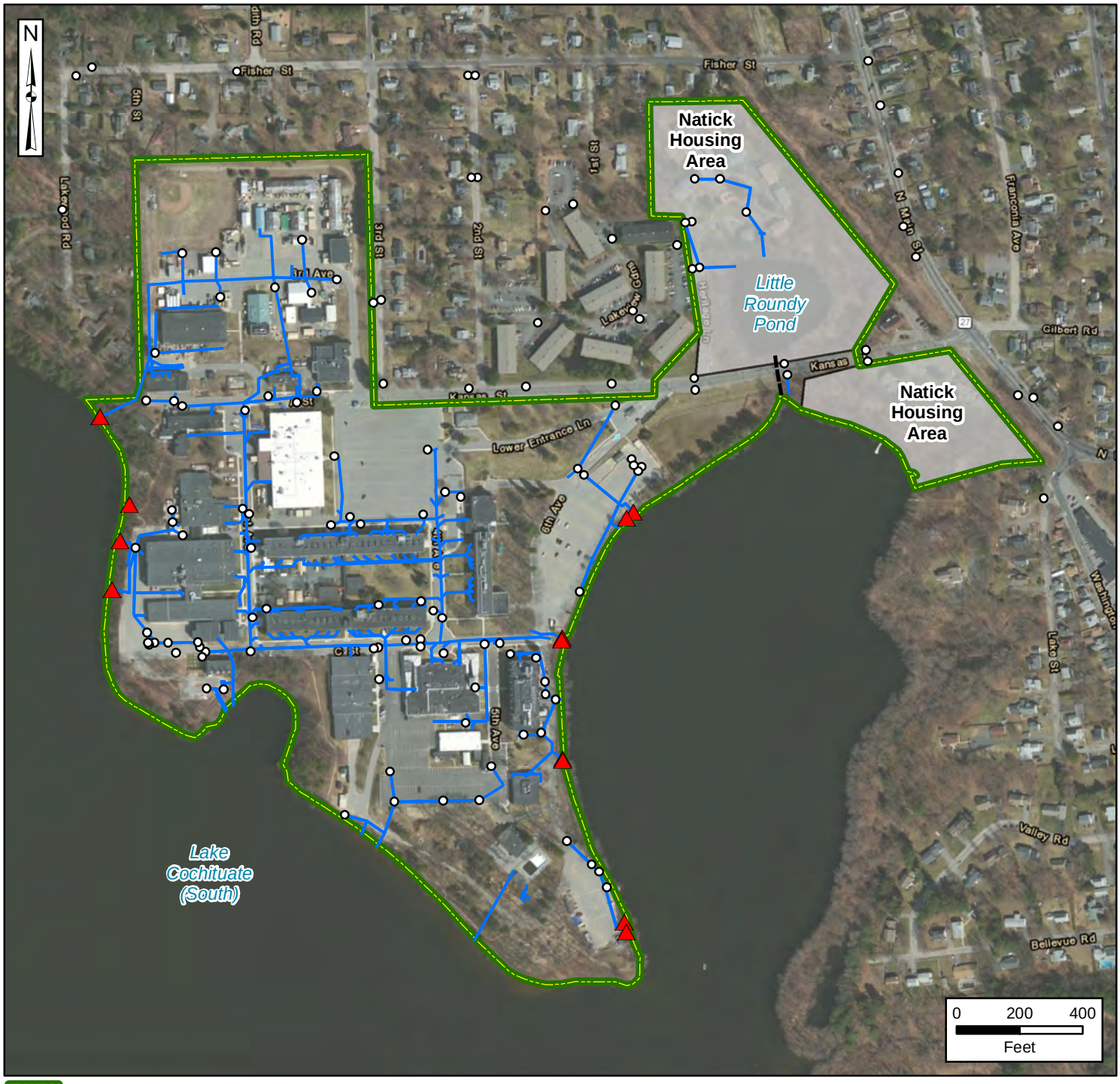
Installation Boundary

Water Supply Well

Coordinate System:
WGS 1984, UTM Zone 19 North

USAEC PFAS Preliminary Assessments
Natick Soldier Systems Center, MA

Figure 4-1
Storm Water Drainage Map



- Installation Boundary
- Natick Housing Area
- Catch Basin
- Storm Sewer Line
- Culvert
- Stormwater Discharge

Coordinate System:
WGS 1984, UTM Zone 19 North

USAEC PFAS Preliminary Assessments
Natick Soldier Systems Center, MA

Figure 4-2
Sewer System Map

Installation Boundary
Natick Housing Area
Wastewater Line

Coordinate System:
WGS 1984, UTM Zone 19 North

APPENDIX A

Office of the Secretary of Defense. 2019. Memorandum: Investigating Per- and Polyfluoroalkyl Substances within the Department of Defense Cleanup Program. October 15.

ASSISTANT SECRETARY OF DEFENSE
3500 DEFENSE PENTAGON
WASHINGTON, DC 20301-3500

OCT 15 2019

SUSTAINMENT

MEMORANDUM FOR ASSISTANT SECRETARY OF THE ARMY (INSTALLATIONS, ENERGY AND ENVIRONMENT)
ASSISTANT SECRETARY OF THE NAVY (ENERGY, INSTALLATIONS AND ENVIRONMENT)
ASSISTANT SECRETARY OF THE AIR FORCE (INSTALLATIONS, ENVIRONMENT AND ENERGY)
DIRECTOR, NATIONAL GUARD BUREAU (JOINT STAFF, J8)
DIRECTOR, DEFENSE LOGISTICS AGENCY (INSTALLATION SUPPORT)

SUBJECT: Investigating Per- and Polyfluoroalkyl Substances within the Department of Defense Cleanup Program

The Department of Defense (DoD) conducts cleanup under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Defense Environmental Restoration Program (DERP). Our goal is protection of human health and the environment in a risk-based, fiscally-sound manner. This memorandum provides clarifying technical guidance on the investigation of perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA), and perfluorobutanesulfonic acid (PFBS). This guidance is applicable to investigating PFOS, PFOA, and PFBS at Environmental Restoration Account-funded, Base Realignment and Closure Account-funded, and Operation and Maintenance accounts for the National Guard-funded sites.

PFOS, PFOA, and PFBS are part of a larger class of chemicals known as per- and polyfluoroalkyl substances (PFAS). PFAS shall be addressed in the same manner as other contaminants of concern within the DERP.

Under CERCLA, site-specific regional screening levels[1] (RSLs) for PFOS and PFOA are calculated using the Environmental Protection Agency (EPA) online calculator using the oral reference dose (RfD) of 2E-05 mg/kg-day. The RSL for PFBS is calculated using the EPA Provisional Peer Reviewed Toxicity Value (PPRTV) RfD of 2E-02 mg/kg-day, or it may be read off the tables available on the EPA RSL website. The values are provided in the attachment. These RSLs should be used for screening to determine if further investigation in the remedial investigation (RI) phase is warranted or if the site can proceed to site closeout. When multiple PFAS are encountered at a site, a 0.1 factor is applied to the screening level. For example, in cases where there are multiple PFAS, the screening level for PFOS and PFOA individually in tap water is 40 parts per trillion (ppt) (0.1 x 400 ppt = 40 ppt) and for PFBS it is 40 parts per billion (40,000 ppt).

[1] For sites on the National Priorities List, the DoD Components will use the EPA site specific screening levels, if provided.

During the RI phase, the RfDs for PFOS, PFOA, and PFBS and the oral cancer slope factor (CSF) for PFOA of 0.07 $(mg/kg\text{-}day)^{-1}$ will be used to conduct site specific risk assessments in accordance with Risk Assessment Guidance for Superfund Volume I, Part A (EPA/540/1-89/002, December 1989). Site-specific risk assessment results will be used to determine if any necessary remedial actions are required in accordance with CERCLA, DERP, and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).

My point of contact for this matter is Ms. Deborah Morefield at 703-571-9067 or deborah.a.morefield.civ@mail.mil.

Robert H. McMahon

Attachment:
As stated

Attachment: Risk Screening Levels Calculated for PFOS, PFOA, PFBS in Groundwater or Soil Using EPA's RSL Calculator

Chemical	Carcinogenic Slope Factor - Oral (SF) $(mg/kg\text{-}day)^{-1}$	Non-Carcinogenic Reference Dose (RfD) (mg/kg-day)	Residential Scenario Screening Levels Calculated Using EPA RSL Calculator								Industrial/Commercial Composite Worker Screening Levels Calculated Using EPA RSL Calculator			
			Tap Water (µg/L or ppb)				Soil (mg/kg or ppm)				Soil (mg/kg or ppm)			
			HQ = 0.1	HQ = 1.0	ILCR = 1E-06	ILCR = 1E-04	HQ = 0.1	HQ = 1.0	ILCR = 1E-06	ILCR = 1E-04	HQ = 0.1	HQ = 1.0	ILCR = 1E-06	ILCR = 1E-04
PFOS	NA	2.00E-05	0.040	0.40	NA	NA	0.13	1.3	NA	NA	1.6	16	NA	NA
PFOA	7.00E-02	2.00E-05	0.040	0.40	1.1	111	0.13	1.3	7.8	775	1.6	16	33	3,280
PFBS	NA	2.00E-02	40	400	NA	NA	130	1300	NA	NA	1600	16000	NA	NA

HQ=Hazard Quotient
ILCR=Incremental Lifetime Cancer Risk
NA=Not available/applicable

NOTES:

- The table represents screening levels based on residential and industrial/commercial worker receptor scenarios for either direct ingestion of groundwater (residential scenario only) or incidental ingestion of contaminated soil (both residential and composite worker scenarios).
- All values were calculated using slope factors or reference doses for PFOS and PFOA published by EPA Office of Water in support of the LHA, and default exposure assumptions for each potential receptor scenario, contained in EPA's RSL Calculator on April 6, 2018.
- Peer reviewed toxicity values considered valid for risk assessment exist for PFBS, and the screening levels may be found in EPA's RSL table or EPA's RSL calculator used to develop them.
- Other potential receptor scenarios (e.g., recreational user, site trespasser, construction worker) are not included in the above table, but could be relevant receptors at a site potentially contaminated with PFOS, PFOA and/or PFBS. These receptors, and their associated exposure scenarios, should be further considered in the scoping phase and completion of the Baseline Human Health Risk Assessment typically completed during an RI.
- The shaded values represent conservative screening levels for PFOS and PFOA in groundwater or soil that when exceeded should be considered a contaminant of potential concern in the risk assessment process and calculations of site-specific risk posed.

APPENDIX B

Preliminary Assessment Quality Control Checklist

Appendix B - PA Quality Control Checklist
USAEC PFAS Preliminary Assessment
Natick Soldier Systems Center, MA

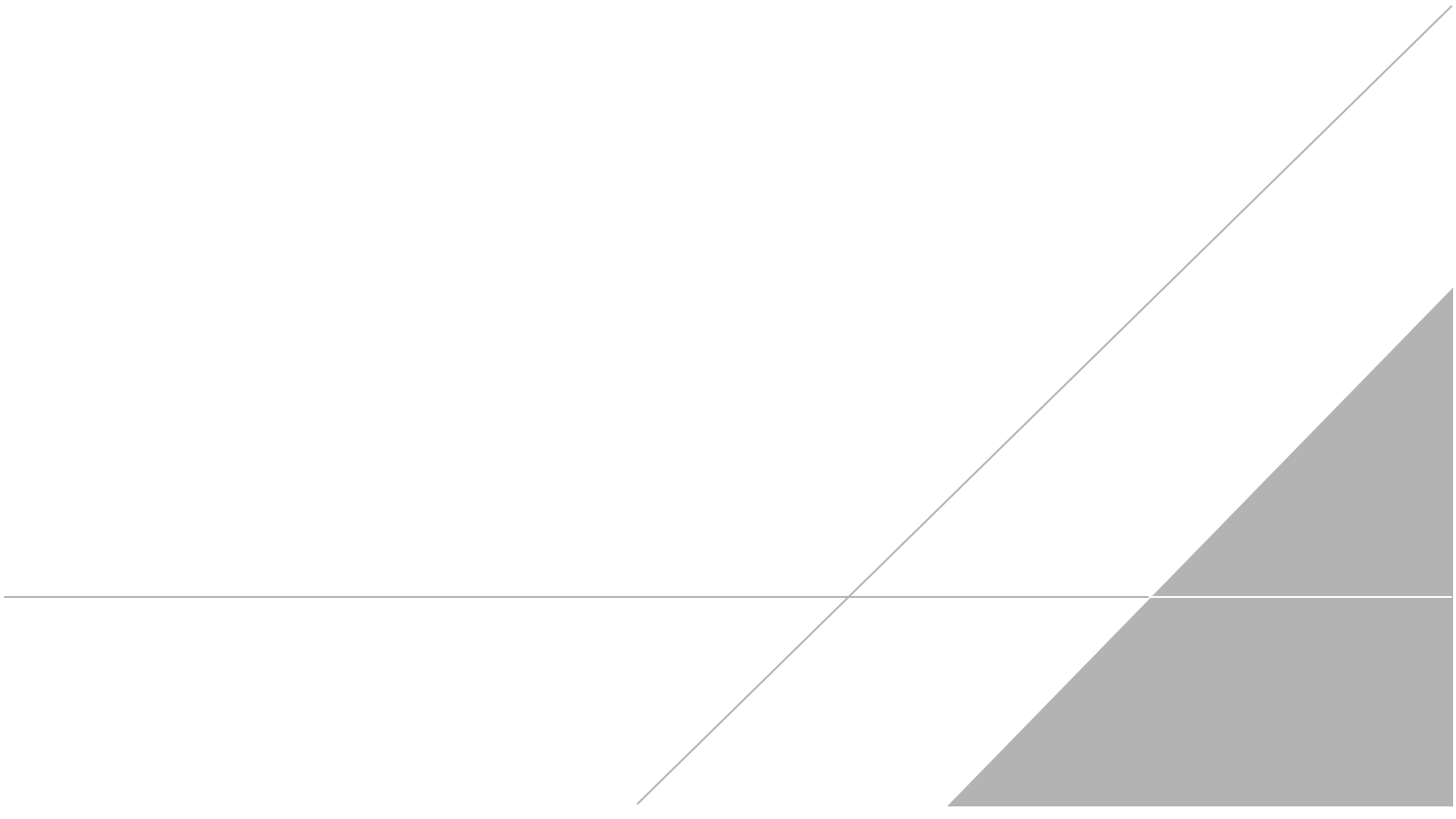
Action Item *(Target Date)*	Comments	Completed Date	Completed By
Preliminary Assessment			
Pre-site visit			
Kick-off teleconference *(6 weeks prior to site visit)*	Arcadis hosted a teleconference to introduce the USAEC PFAS program with Natick Soldier Systems Center (NSSC), USACE, and USAEC.	31 May 2018	A. Gupta, A.Thomas, M.Blower
Kick-Off Teleconference Meeting Minutes *(1 week after teleconference)*	Deliverable reviewed by Arcadis regional lead and technical editor prior to distribution to NSSC, USACE, and USAEC.	04 June 2018	A. Gupta, M. Barker
Pre-site visit records search *(6 weeks prior to site visit)*	Arcadis initiated the NSSC records search in June 2018.	08 June 2018	A.Thomas, M. Barker
Read-Ahead Package *(2 weeks prior to site visit)*	Deliverable reviewed by Arcadis regional lead and technical editor prior to distribution to NSSC, USACE, and USAEC.	08 June 2018	A. Gupta, M. Braverman, A. Thomas, M.Barker
Site visit			
Notification	Arcadis regional lead finalized site visit logistics and requested contact information for interviewees with submission of read-ahead package.	08 June 2018	A. Gupta
In-briefing	Arcadis hosted an in-briefing for several personnel, including NSSC and USAEC representatives.	19 June 2018	A. Gupta, A. Thomas, M. Barker
Site visit records search	Arcadis collected various documents and records during the site visit.	19 June 2018	A. Gupta, A.Thomas, M.Barker
Site visit personnel interviews	Arcadis interviewed several personnel (NSSC, Town of Natick Fire Department) during the site visit, completing interview logs for each interviewee (or group of interviewees).	19 June 2018	A. Gupta, A. Thomas, M. Barker
Site reconnaissance trips	Arcadis conducted site reconnaissance at several areas during the site visit, completing site reconnaissance logs for each area (or group of areas) visited. NSSC and USAEC representatives accompanied Arcadis during the site reconnaissance.	19 June 2018	A. Gupta, A. Thomas, M. Barker
Exit briefing	NSSC declined an exit briefing.	Not applicable	Not applicable
Post-site visit			
Data compilation, verification, and review	Arcadis evaluated additional information and data collected during the site visit to determine AOPI designations.	29 June 2018	A. Thomas, M. Barker
Site Visit Trip Report *(submittal and closing of pending action items within 2 weeks of site visit)*	Deliverable reviewed by Arcadis regional lead and technical editor prior to distribution to NSSC, USACE, and USAEC.	29 June 2018	A. Gupta, M. Braverman, A. Thomas, M. Barker
Post-site visit teleconference *(within 4 weeks of site visit)*	Arcadis hosted a discussion of proposed AOPIs with NSSC, USACE, and USAEC staff, and the list of AOPIs was finalized.	24 July 2018	A. Gupta, M. Braverman, A. Thomas, M. Barker

Appendix B - PA Quality Control Checklist
USAEC PFAS Preliminary Assessment
Natick Soldier Systems Center, MA

Action Item *(Target Date)*	Comments	Completed Date	Completed By
Preliminary Assessment			
Preliminary Assessment Report			
Initial draft preliminary assessment report	Initial draft deliverable was reviewed by Arcadis Regional Lead, Quality Control Reviewer, and Technical Editor prior to distribution to USACE and USAEC.	24 August 2018	A. Gupta, M. Braverman, M. Barker, A. Thomas
RTCs discussion teleconference *(within 15 days of receipt of comments)*	A teleconference to discuss RTCs related to comments provided by USACE and USAEC was not needed. Arcadis incorporated all requested changes.	Not applicable	Not applicable
Submittal of RTCs	Arcadis submitted an the RTC matrix to USACE and USAEC on 8 April 2019.	08 April 2019	A. Gupta
Revised draft preliminary assesment report	Arcadis incorported comments from review by USACE and USAEC. USAEC requested that Arcadis prioritize the Picatinny report updates and incorporate those edits into the NSSC updated draft deliverable. The revised draft deliverable was reviewed by the Arcadis Regional Lead, Quality Control Reviewer, and Technical Editor prior to distribution to NSSC and C-X.	08 April 2019	A. Gupta, A. Thomas
RTCs discussion teleconference *(within 15 days of receipt of comments)*	A teleconference to discuss RTCs related to comments provided by NSSC and C-X was not needed. Arcadis incorporated all requested changes.	Not applicable	Not applicable
Submittal of RTCs	Arcadis submitted the RTC matrix to NSSC for their review comments on 26 September 2019. C-X comments were addressed via RTCs submitted for exactly similar C-X comments on Picatinny PA report. NSSC approved the RTC matrix on 04 October 2019.	26 September 2019	A. Gupta
Final Preliminary Assessment Report *(submittal within 45 days of receipt of comments)*	The Final Preliminary Assessment Report was reviewed by the Arcadis Regional Lead, Quality Control Reviewer, and Technical Editor prior to distribution to NSSC, USAEC, and the USACE.	14 October 2019	A. Gupta, R. Sebek, A. Thomas
Revised Final Preliminary Assessment Report	In June 2020, Headquarters, Department of the Army (HQDA) provided comments on the Final Preliminary Assessment Report for NSSC. A Revised Final Preliminary Assessment was developed to incorporate edits and comments requested by HQDA. The deliverable was reviewed by the Arcadis PA Lead and technical reviewer prior to distribution to USACE for RTC and report backcheck. USACE approved the report backcheck on 06 November 2020, the PA is Final.	30 October 2020	A. Thomas, R. Sebek
Preliminary Assessment Complete at Installation - Quality Control Reviewer Signature		Jessica Travis	Jessica Travis, Seres E&S

APPENDIX C

Antiterrorism/Operations Security Review Cover Sheet



U.S. Army Corps of Engineers

CONTRACT REQUIREMENTS PACKAGE

ANTITERRORISM/OPERATIONS SECURITY REVIEW COVER SHEET

For use of this form, see AR 525-13, ALARACT 015/2012; and USACE OPORD 2013-74; the proponent agency is CECO-P.

SECTION I - CONTRACT INFORMATION

1. CONTRACT TITLE	2. LOCATION
US Army Environmental Command Preliminary Assessments (PAs) of Perfluorooctane Sulfonate (PFOS)	Nationwide
3. SOLICITATION/CONTRACT NO.	4. CLASS APPROVAL REQUEST NUMBER
W912DR-13-D-0019	

5. CONTRACT TYPE

☐ Construction ☐ IDIQ ☒ MATOC ☐ SATOC ☐ Service ☐ Supply ☐ Task Order

☐ Other (*specify*) _____

SECTION II - PURPOSE

Part A. Purpose of cover sheet is to document the review of the requirements package performance work statement (PWS)/statement of work (SOW)/ statement of requirements (SOR) for antiterrorism (AT) and other related protection matters to include, but not limited to: operation security (OPSEC), information assurance (IA), physical security, law enforcement, intelligence and foreign disclosure. **Army policy requirement:** A Signed AT/OPSEC cover sheet is required to be included in all requirements packages except for supply contracts under the simplified acquisition level threshold ($150K), field ordering officer actions and Government purchase card purchases. Local policy may require this form for supply contracts under the simplified acquisition level threshold based on risk and threat. **Mandatory review and signatures**: The organizational Antiterrorism Officer (ATO) and OPSEC Officer must review each requirements package, unless a signed class approval request form is completed, prior to submission to the supporting contracting activity to include coordination with other staff review as appropriate. If the requiring activity (RA) does not have an ATO or OPSEC Officer, the first ATO and OPSEC Officer in the chain of command will review the contract for AT/OPSEC considerations.

SECTION III - STANDARD CONTRACT LANGUAGE

Part B. Standard Contract Language and/or Additional PWS/SOW/SOR Language. The applicability of each requirement must be considered and each block must be checked "Yes" or "N/A". If the standard PWS/SOW/SOR language text found in Section VIII. of this form is sufficient to meet specific contract request requirements, check "Yes" in block below and include this language in the PWS/SOW/SOR. If the standard PWS/SOW/SOR language applies, but is not in of itself sufficient, check "Yes" and include both the standard language and additional contract specific language in the PWS/SOW/SOR. If standard PWS/SOW/SOR language text does not apply, check "N/A".

SECTION IV - REQUIRED CLAUSES

Required Clause(s) (*see Section VIII for sample language*)	YES	N/A
1. AT Level I training *(general).*	☒	☐
2. Access and General Protection/Security Policy and Procedures.	☒	☐
2a. Contractors requiring Common Access Card (CAC).	☒	☐
2b. Contractors who do not require CAC, but require access to a Department of Defense (DoD) facility or installation.	☒	☐
3. AT Awareness training for contractor personnel traveling overseas.	☒	☐
4. iWATCH and/or CorpsWatch training.	☒	☐
5. Access to government information systems.	☐	☒
6. OPSEC SOP/Plan requirements.	☒	☐
7. Requirement for OPSEC training.	☒	☐
8. Information assurance/information technology training.	☐	☒
9. Information assurance/information technology training certification.	☐	☒
10. Contractors Authorized to Accompany the Force (OCONUS).	☐	☒
11. Contract requires performance or delivery in a foreign country (OCONUS).	☐	☒
12. Handling/Access to Classified Information.	☐	☒
13. Will be escorted in areas where they may be exposed to classified and/or sensitive materials.	☐	☒
14. Contractor Company to obtain a Facility Clearance and individual clearances at the appropriate level.	☐	☒

15. Pre-screen candidates using E-Verify Program.	☐	☒
16. For contracts requiring armed security guards.	☐	☒
17. Threat Awareness Reporting Program (TARP) training.	☐	☒

SECTION V - REMARKS

1. CONTRACT TITLE	2. LOCATION
US Army Environmental Command Preliminary Assessments (PAs) of Perfluorooctane Sulfonate (PFOS)	Nationwide
3. SOLICITATION/CONTRACT NO.	4. CLASS APPROVAL REQUEST NUMBER
W912DR-13-D-0019	

5. CONTRACT TYPE

☐ Construction ☐ IDIQ ☒ MATOC ☐ SATOC ☐ Service ☐ Supply ☐ Task Order

☐ Other (*specify*) _____

SECTION VI - ANTITERRORISM REVIEWER'S SIGNATURE

I am ATO Level II certified and I have reviewed the requirements package and understand my responsibilities IAW Army Regulation 525-13, Antiterrorism.

1. TYPED OR PRINTED NAME	2. RANK/CIVILIAN GRADE	3. PHONE NUMBER
Pratya Siriwat	GS14	210-466-1656
4. SIGNATURE	5. DATE	
SIRIWAT.PRATYA.1159129710 Digitally signed by SIRIWAT.PRATYA.1159129710 Date: 2018.07.27 16:19:09 -05'00'	2018-07-27	

SECTION VII - OPERATIONS SECURITY REVIEWER'S SIGNATURE

I am OPSEC Level II certified and have reviewed the requirements package to ensure that there are no OPSEC concerns regarding the release and/or publication of attached documentation to public forums as well as to determine OPSEC requirements for the Contractor, and understand my responsibilities IAW Army Regulation 530-1, Operations Security.

1. TYPED OR PRINTED NAME	2. RANK/CIVILIAN GRADE	3. PHONE NUMBER
Pratya Siriwat	GS14	210-466-1656
4. SIGNATURE	5. DATE	
SIRIWAT.PRATYA.1159129710 Digitally signed by SIRIWAT.PRATYA.1159129710 Date: 2018.07.27 16:19:45 -05'00'	2018-07-27	

SECTION VIII - STANDARD CONTRACT PROVISION AND CLAUSE TEXT APPLICABILITY AND/OR ADDITIONAL PWS/SOW/SOR LANGUAGE

(To access a Word version of page 3 and 4 for this form please click on the attachment icon on the left of the form)

1. **AT Level I Training.** This provision/contract text is for contractor employees with an area of performance within an Army controlled installation, facility or area. **Proposed language:** "All contractor employees, to include subcontractor employees, requiring access to Army installations, facilities, controlled access areas, or require network access, shall complete AT Level I awareness training within 30 calendar days after contract start date or effective date of incorporation of this requirement into the contract, whichever is applicable. Upon request, the contractor shall submit certificates of completion for each affected contractor employee and subcontractor employee, to the COR or to the contracting officer (if a COR is not assigned), within 5 calendar days after completion of training by all employees and subcontractor personnel. AT Level I awareness training is available at the following website: http://jko.jten.mil/courses/atl1/launch.html; or it can be provided by the RA ATO in presentation form which will be documented via memorandum."

2. **Access and General Protection/Security Policy and Procedures**. This standard language text is for contractor employees with an area of performance within an Army controlled installation, facility or area. **Proposed language**: "All contractor and all associated sub-contractors employees shall comply with applicable installation, facility and area commander installation/facility access and local security policies and procedures (provided by government representative). The contractor shall also provide all information required for background checks to meet installation/facility access requirements to be accomplished by installation Provost Marshal Office, Director of Emergency Services or Security Office. Contractor workforce must comply with all personal identity verification requirements (FAR clause 52 204-9, Personal Identity Verification of Contractor Personnel) as directed by DOD, HQDA and/or local policy. In addition to the changes otherwise authorized by the changes clause of this contract, should the Force Protection Condition (FPCON) at any installation or facility change, the Government may require changes in contractor security matters or processes."

2a. **For contractors requiring Common Access Card (CAC).** Before CAC issuance, the contractor employee requires, at a minimum, a favorably adjudicated National Agency Check with Inquiries (NACI) or an equivalent or higher investigation in accordance with Army Directive 2014-05 and Homeland Security Presidential Directive-12 (HSPD-12). **Proposed language:** "The contractor and all sub-contractors employees will be issued a CAC only if duties involve one of the following: (1) Both physical access to a DoD facility and access, via logon, to DoD networks on-site or remotely; (2) Remote access, via logon, to a DoD network using DoD-approved remote access procedures; or (3) Physical access to multiple DoD facilities or multiple non-DoD federally controlled facilities on behalf of the DoD on a recurring basis for a period of 6 months or more. At the discretion of the sponsoring activity, an interim CAC may be issued based on a favorable review of the FBI fingerprint check and a successfully scheduled NACI at the Office of Personnel Management."

2b. **For contractors who do not require CAC, but require access to a DoD facility or installation. Proposed language**: Contractor and all associated sub-contractors employees shall comply with adjudication standards and procedures using the National Crime Information Center Interstate Identification Index (NCIC-III) and Terrorist Screening Database (TSDB) (Army Directive 2014-05 / AR 190-13), applicable installation, facility and area commander installation/facility access and local security policies and procedures (provided by government representative, as NCIC and TSDB are available), or, at OCONUS locations, in accordance with status of forces agreements and other theater regulations.

3. **AT Awareness Training for Contractor Personnel Traveling Overseas**. This standard language text required US based contractor employees and associated sub-contractor employees to make available and to receive government provided area of responsibility (AOR) specific AT awareness training as directed by AR 525-13 (Antiterrorism). Specific AOR training content is directed by the combatant commander with the unit ATO being the local point of contact. **Proposed language**: "All US based contractor employees and associated sub-contractor employees traveling overseas will receive the government provided AOR specific AT awareness training. The documentation of training completion must be provided to the COR prior to departure."

4. **Suspicious Activity Reporting Training (e.g.** iWATCH, CorpsWatch, or See Something, Say Something**).** This standard language is for contractor employees with an area of performance within an Army controlled installation, facility or area. **Proposed language:** "The contractor and all associated sub-contractors shall receive a brief/training (provided by the RA) on the local suspicious activity reporting program. This locally developed training will be used to inform employees of the types of behavior to watch for and instruct employees to report suspicious activity to the project manager, security representative or law enforcement entity. This training shall be completed within 30 calendar days of contract award and within 30 calendar days of new employees commencing performance with the results reported to the COR NLT 5 calendar days after the completion of the training."

5. **Contractor Employees Who Require Access to Government Information Systems.** This standard language text is for contractor employees with access to government info system. **Proposed language:** "All contractor employees with access to a government info system must be registered in the Army Training Certification Tracking System (ATCTS) at commencement of services, and must successfully complete the DOD Information Assurance Awareness prior to access to the information systems and then annually thereafter in accordance with personnel security standards listed in AR 25-2 (Information Assurance), an appropriate background investigation will be conducted prior to accessing the government information systems."

6. **For Contracts that Require an OPSEC Standing Operating Procedure/Plan.** This standard language text is for contractor employees with an area of performance for classified contracts or if the contract employee has access or responsibility to protect critical information. The Contractor, in collaboration with RA OPSEC Officer, shall develop an OPSEC Standard Operating Procedure (SOP)/Plan within 90 calendar days of contract award per AR 530-1 (Operations Security). **Proposed language:** "The Contractor shall develop an OPSEC SOP/Plan within 90 days of contract award. The OPSEC SOP/Plan must be reviewed and approved by the RA OPSEC Officer. The SOP/Plan will include the government's critical information, why it needs to be protected, where it is located, who is responsible for it and how to protect it. In addition, the contractor shall identify an individual who will be an OPSEC Coordinator."

7. **For Contracts that Require OPSEC Training.** Per AR 530-1, (Operations Security) contractor employees must complete Level I OPSEC Training within 30 calendar days of contract award. **Proposed language**: "All new contractor employees will complete Level I OPSEC Training within 30 calendar days of their reporting for duty. Additionally, all contractor employees must complete annual OPSEC awareness training. The contractor shall submit certificates of completion for each affected contractor and subcontractor employee, to the COR or to the contracting officer (if a COR is not assigned), within 5 calendar days after completion of training. OPSEC awareness training is available at the following websites: https://www.iad.gov/ioss/ or http://www.cdse.edu/catalog/operations-security.html; or it can be provided by the RA OPSEC Officer in presentation form which will be documented via memorandum."

8. **For Information assurance (IA)/information technology (IT) training.** This standard language text is for contract employees who need network access and/or working IA/IT functions. **Proposed language**: "All contractor employees and associated sub-contractor employees must complete the DoD IA awareness training before issuance of network access and annually thereafter. All contractor employees working IA/IT functions must comply with DoD and Army training requirements in DoDD 8570.01, DoD 8570.01-M and AR 25-2 within six months of employment."

9. **For information assurance (IA)/information technology (IT) certification.** Per DoD 8570.01-M , DFARS 252.239.7001 and AR 25-2, the contractor employees supporting IA/IT functions shall be appropriately certified upon contract award. The baseline certification as stipulated in DoD 8570.01-M must be completed upon contract award. **Proposed language:** "All contractor employees supporting IA/IT functions shall be appropriately certified upon contract IAW DoD 8570.01-M, DFARS 252.239-7001 and AR 25-2. The baseline certification as stipulated in DoD 8570.01-M must be completed upon contract award."

10. **For Contractors Authorized to Accompany the Force.** DFARS Clause 252.225-7040, Contractor Personnel Authorized to Accompany U.S. Armed Forces Deployed Outside the United States. The clause shall be used in solicitations and contracts that authorize contractor personnel to accompany US Armed Forces deployed outside the US in contingency operations; humanitarian or peacekeeping operations; or other military operations or exercises, when designated by the combatant commander. **Proposed language**: "All contractor employees shall ensure the following AT/OPSEC requirements are met prior to deploying personnel authorized to accompany U.S. Armed Forces outside the United States; to include compliance with laws, regulations, pre-deployment requirements, and required training in accordance with combatant command guidance."

11. **For Contracts Requiring Performance or Delivery in a Foreign Country.** DFARS Clause 252.225-7043, Antiterrorism/Force Protection for Defense Contractors Outside the US. The clause shall be used in solicitations and contracts that require performance or delivery in a foreign country. This clause applies to both contingencies and non-contingency support. **Proposed language:** "All non-local contracting personnel will comply with theater clearance requirements and allows the combatant commander to exercise oversight to ensure the contractor's compliance with combatant commander and subordinate task force commander policies and directives."

12. **For Contracts That Require Handling or Access to Classified Information.** This clause involves access to classified information, i.e. "Confidential," "Secret," or "Top Secret". **Proposed language**: "Contractor shall comply with AR 380-67 (Personnel Security Program) and Homeland Security Presidential Directive 12 (Policy for a Common Identification Standard for Federal Employees and Contractors) as well as FAR 52.204-2, Security Requirements. Additionally, Contractors must comply with - (1) The Security Agreement (DD Form 441), including the National Industrial Security Program Operating Manual (DoD 5220.22-M); any revisions to DOD 5220.22-M, notice of which has been furnished to the contractor. For classified contracts, the DD Form 254 will be attached with the contract."

13. **Will be escorted in areas where they may be exposed to classified and/or sensitive materials and/or sensitive or restricted areas.** The contractor will coordinate with the COR and/or the facility security office for access when required. (Use when security clearances are not required, i.e. facility repair or construction). **Proposed language**: "All contract employees, including subcontractor employees who are not in possession of the appropriate security clearance or access privileges, will be escorted in areas where they may be exposed to classified and/or sensitive materials and/or sensitive or restricted areas."

14. (FOR CLASSIFIED CONTRACTS ONLY) **Contractor Company to obtain a Facility Clearance and individual clearances at the appropriate level. Proposed language:** "The Prime Contractor Company must have a Facility Clearance (FCL) at the appropriate level (IAW the NISPOM DOD 5220.22-M and AR 380-49) prior to the start of the contract awarded period of performance. Contractor personnel performing work under this contract must have the required security clearance, per AR 380-67, at the appropriate level at the start of the period of performance. Security Clearances and FCL requirements are required to be maintained for the life of the contract IAW the DD Form 254 attached to the contract. If no FCL, the supporting Government Contracting Activity will sponsor the prime contract company in obtaining the FCL."

15. **Pre-screen candidates using E-Verify Program. Proposed language:** "The Contractor must pre-screen Candidates using the E-verify Program (http://www.uscis.gov/e-verify) website to meet the established employment eligibility requirements. The Vendor must ensure that the Candidate has two valid forms of Government issued identification prior to enrollment to ensure the correct information is entered into the E-verify system. An initial list of verified/eligible Candidates must be provided to the COR no later than 3 business days after the initial contract award." *When contracts are with individuals, the individuals will be required to complete a Form I-9, Employment Eligibility Verification, with the designated Government representative. This Form will be provided to the Contracting Officer and shall become part of the official contract file.

16. **For contract requiring armed security guards.** This standard language text is for contractor employees with an area of performance within an Army controlled installation, facility or area. The Physical Security Officer must or will review the PWS/SOW with the Contracting Officer (KO) for accuracy and completeness of AR 190-11 requirements. **Proposed language:** "All contractor and all associated sub-contractors employees shall comply with applicable installation, facility and area commander installation/facility policies and procedures on storing weapons and ammunition IAW AR 190-11 (provided by government representative)."

17. **Threat Awareness Reporting Program**. For all contractors with security clearances. Per AR 381-12 Threat Awareness and Reporting Program (TARP), contractor employees must receive annual TARP training by a CI agent or other trainer as specified in 2-4b. **Proposed language**: "All new contractor employees will complete annual Threat Awareness and Reporting Program (TARP) Training provided by a Counterintelligence Agent, IAW AR 381-12 . The contractor shall submit certificates of completion for each affected contractor and subcontractor employee(s) or a memorandum for the record, to the COR or to the contracting officer (if a COR is not assigned), within 5 calendar days after completion of training. Authorized web-based TARP training for CAC card holders is available at the following website: https://www.us.army.mil/suite/page/655474

APPENDIX E

NSSC Monitoring Well Inventory

Appendix E

Piezometric Water Level Summary

Annual Groundwater Monitoring Report (Event 75)

NSSC-Natick, Massachusetts

Well Identification	Well Diameter (Inches)	Screened Interval (ft. bgs)	Elevation of Screened Interval (ft. amsl)	Elevation of PVC Riser[1] (ft. amsl)	Water Level Measurement[2] (ft. bTOR)	Elevation of Groundwater (ft. amsl)
T-25 Area (on-post)						
MW-1	4	12.5-22.5	140.6-130.6	152.73	15.32	137.41
MW-2	4	12-22	138.9-128.9	150.37	12.42	137.95
MW-2B	4	39.8-59.8	111.1-91.1	150.26	38.95	111.31
MW-3	4	10-20	145.9-135.9	157.92	20.02	137.90
MW-3B	4	45-65	110-90	157.55	20.30	137.25
MW-9	4	12-22	139.3-129.3	150.52	13.23	137.29
MW-12A	4	15-25	137.6-127.6	151.88	14.20	137.68
MW-15B	4	45-65	109-89	154.25	15.98	138.27
MW-18B-HP2	2	50-60	100.3-90.3	149.77	13.50	136.27
MW-25B-2	2	48-58	110-100	157.77	20.45	137.32
MW-26B-M7	0.84	Unknown	Unknown	161.12	Unable to Access	Not Calculated
MW-27B-HP2	2	50-60	110.2-100.2	160.06	22.94	137.12
MW-32B-HP2	2	45-55	108.7-98.7	153.62	16.12	137.50
MW-35BR	2	Unknown	Unknown	150.55	13.20	137.35
MW-37B-HP2	2	50-60	99.5-89.5	149.33	12.10	137.23
MW-38B-HP2	2	59-69	98.1-88.1	156.85	19.60	137.25
MW-39B-HP4	4	53-63	105.8-95.8	158.58	22.10	136.48
MW-51BR	2	70-80	95.2-85.2	165.16	27.96	137.20
MW-74B-HP2	2	55-65	116.1-106.1	170.81	32.45	138.36
MW-83B-2	2	50-60	100.5-90.5	150.35	13.46	136.89
MW-88B-HP2	2	59-69	95.6-85.6	154.35	15.97	138.38
MW-90B-4	4	47-57	103.2-93.2	148.97	46.70	102.27
MW-94B-4	4	43-48	106.4-111.4	153.42	29.62	123.80
MW-95B-4	4	47-67	92.3-112.3	158.33	32.92	125.41
MW-96B-4	4	43-63	87.4-107.4	149.39	44.95	104.44
MW-128A	2	22-32	165.92-155.92	165.12	>27.40	Not Calculated
MW-129A	2	22-32	165.6-155.6	165.15	>27.40	Not Calculated
MW-167B-2	2	Unknown	Unknown	151.53	14.11	137.42
T-25 Area (off-post)						
MW-201A	4	17-27	136.9-126.9	153.62	16.28	137.34
MW-201B	4	53-73	100.6-80.6	153.29	15.96	137.33
MW-202B	4	55.75-75.75	101.7-81.7	157.18	19.97	137.21
MW-202C-2	2	86-106	71.4-51.4	157.26	20.11	137.15
MW-203B	4	58.5-78.5	117.9-97.9	176.12	38.38	137.74
MW-205B	4	60-70	113-103	172.72	35.47	137.25
MW207B-HP2	2	59-69	112.4-102.4	170.97	Unable to Locate	Not Calculated
MW-208A-2	2	33-43	140.0-130.0	172.75	35.47	137.28
MW208B-HP2	2	70-80	102.9-92.9	172.69	35.46	137.23
MW209B-HP2	2	65-75	104.1-94.1	168.92	31.64	137.28
MW-211B-4	4	60-72	108.5-96.5	168.19	30.83	137.36
MW-212C-2	2	105-115	71.2-61.2	175.84	38.73	137.11

Appendix E

Piezometric Water Level Summary

Annual Groundwater Monitoring Report (Event 75)

NSSC-Natick, Massachusetts

Well Identification	Well Diameter (Inches)	Screened Interval (ft. bgs)	Elevation of Screened Interval (ft. amsl)	Elevation of PVC Riser[1] (ft. amsl)	Water Level Measurement[2] (ft. bTOR)	Elevation of Groundwater (ft. amsl)
Former Proposed Gymnasium Site						
MW-4	4	6-16	136.3-126.3	144.42	5.80	138.62
MW-5R	4	6-16	142-132	148.43	10.20	138.23
MW-6	4	6-16	135.3-125.3	143.49	5.70	137.79
MW-7	4	6-16	144.7-134.7	152.88	13.56	139.32
MW-43B-2	2	40-50	101.6-91.6	143.18	5.20	137.98
MW100A-2	2	4-14	142.8-132.8	149.11	10.74	138.37
MW101A-2	2	11-21	142.7-132.7	153.16	Unable to Locate	Not Calculated
MW101B-2	2	32.5-42.5	120.8-110.8	153.06	13.14	139.92
MW102A-2	2	4-14	137.5-127.5	143.43	3.90	139.53
MW102B-2	2	31.7-41.7	110-100	144.18	5.20	138.98
MW114B-2	2	30-40	114-104	143.89	5.60	138.29
MW127A-2	2	3-13	143-133	146.24	6.42	139.82
MW-169B-2	2	Unknown	Unknown	144.67	6.55	138.12
MW-178B-2	2	Unknown	Unknown	170.27	32.32	137.95
Water Supply Well Site (on-post)						
MW-10A	4	25-35	136.5-126.5	161.10	23.11	137.99
MW-10B	4	34-54	127.6-107.6	161.20	23.80	137.40
MW-13B	4	27.5-37.5	116.5-106.5	143.76	Unable to Access	Not Calculated
MW-14A	2	3-13	139.7-129.7	142.37	4.65	137.72
MW-14B	4	46.5-56.5	96.1-86.1	142.26	3.55	138.71
Boiler Plant						
MW-40A-2	2	9-19	140.6-130.6	151.23	13.11	138.12
MW-40BR	2	50-60	100-90	152.42	53.40	99.02
MW-168B-2	2	51-61	100-90	150.97	14.33	136.64
CHI-2	2	12-22	139-129	153.29	15.11	138.18
CHI-3	2	8-18	141.2-131.2	149.03	10.85	138.18
CHI-4	2	7-17	141.5-131.5	148.25	10.27	137.98
CHI-5R	2	4-14	144-134	146.86	10.22	136.64
MW-91AR	2	6-16	141-131	146.73	Unable to Locate	Not Calculated
MW106A-2	2	7-17	141-131	147.21	9.98	137.23
MW107A-2	2	8-18	142-132	152.23	14.83	137.40
MW108A-2	2	14-24	144-134	158.05	19.63	Not Calculated
Buildings 22 and 36						
CHI-1	2	19-29	144.3-134.3	163.40	25.35	138.05
MW-44B-HP2	2	48-58	119.9-109.9	167.65	29.90	137.75
MW-92B-HP2	2	61-71	104.6-94.6	165.38	Unable to Access	Not Calculated
MW-93B-HP2	2	68.2-78.2	98.7-88.7	166.70	29.55	137.15
MW104B-2	2	60-70	103-93	162.90	25.40	137.50
MW105A-1	1	1-6	137.1-132.1	140.17	2.80	137.37
MW109B-2	2	65-70	99.3-94.3	164.11	26.55	137.56
MW110A-4	4	25-40	139.3-124.3	163.72	26.42	137.30
MW111B-2	1	55.8-65.8	108.3-98.3	164.10	Unable to Access	Not Calculated
MW112B-2	2	64.9-74.9	101.6-91.6	166.08	28.72	137.36

Appendix E

Piezometric Water Level Summary

Annual Groundwater Monitoring Report (Event 75)

NSSC-Natick, Massachusetts

Well Identification	Well Diameter (Inches)	Screened Interval (ft. bgs)	Elevation of Screened Interval (ft. amsl)	Elevation of PVC Riser[1] (ft. amsl)	Water Level Measurement[2] (ft. bTOR)	Elevation of Groundwater (ft. amsl)
Buildings 22 and 36 (Continued)						
MW113A-2	2	31-41	132.1-122.1	163.93	26.65	137.28
MW113B-2	2	55-65	109.1-99.1	163.82	Unable to Gauge	Not Calculated
PZ145A-2	2	24-34	140-130	163.82	26.49	137.33
PZ146A-2	2	26-36	139-129	165.04	27.19	137.85
PZ147A-2	2	29-39	136-126	164.88	27.47	137.41
PZ148A-2	2	26-36	138-128	163.87	26.46	137.41
MW150A-2	2	17-27	138-128	155.14	17.69	137.45
MW151A-2	2	26-36	138-128	163.53	26.22	137.31
MW152A-2	2	25-35	139-129	164.39	26.94	137.45
MW153A-2	2	25-35	139-129	163.91	26.52	137.39
MW154A-2	2	25-35	140-130	165.11	27.57	137.54
MW155A-2	2	26-36	138-128	163.67	20.11	143.56
MW156A-2	2	26-36	138-128	164.23	Unable to Gauge	Not Calculated
MW157A-2	2	23-33	141-131	163.97	26.17	137.80
Buildings 63, 2, and 45						
MW-11A	4	25-35	141.8-131.8	166.30	27.70	138.60
MW-11B	4	48-68	118.9-98.9	166.61	28.52	138.09
MW103A-2	2	6-16	140.6-130.6	146.35	8.22	138.13
MW103A*4	4	25-35	121.9-111.9	146.46	8.74	137.72
MW103B-2	2	55-65	92-82	146.79	9.13	137.66
MW120A-2	2	25-35	140-130	165.42	26.65	138.77
MW120B-2	2	40-50	125-115	165.31	27.25	138.06
MW121A-2	2	22-32	144-134	165.54	27.22	138.32
MW121B-2	2	35-45	130-120	165.42	27.30	138.12
MW122A-2	2	22-32	143-133	165.39	27.06	138.33
MW122B-2	2	35-45	131-121	165.70	27.55	138.15
MW123B-2	2	25-35	120-110	145.09	6.45	138.64
MW124B-2	2	20-30	121-111	141.44	4.07	137.37
MW125B-2	2	30-40	135-145	164.51	26.60	137.91
MW126B-2	2	30-40	119-109	149.45	11.55	137.90
PZ142A-2	2	6-16	136-126	142.41	4.57	137.84
PZ143A-2	2	7-17	136-126	142.73	4.95	137.78
PZ144A-2	2	7-17	139-129	145.99	8.15	137.84
MW158A-2	2	25-35	140-130	164.49	26.55	137.94
MW159A-2	2	5-15	139-129	144.08	6.44	137.64
MW160A-2	2	20-30	112-122	141.76	4.92	136.84
MW161A-2	2	19-29	112-122	141.39	3.66	137.73
MW162A-2	2	15-25	115-125	140.48	2.67	137.81
MW164B-2	2	22-32	116-126	147.47	9.17	138.30
MW165B-2	2	22-32	116-126	147.11	9.76	137.35
MW163A-2	2	15-25	116-126	140.85	3.03	137.82
MW-181B-2	2	Unknown	Unknown	153.62	16.80	136.82

Appendix E

Piezometric Water Level Summary

Annual Groundwater Monitoring Report (Event 75)

NSSC-Natick, Massachusetts

Well Identification	Well Diameter (Inches)	Screened Interval (ft. bgs)	Elevation of Screened Interval (ft. amsl)	Elevation of PVC Riser[1] (ft. amsl)	Water Level Measurement[2] (ft. bTOR)	Elevation of Groundwater (ft. amsl)
Lake Level and Pond Level Measurements Locations						
LL-WSW	NA	NA	NA	141.36*	3.18	138.18
LL-BP	NA	NA	NA	138.95*	1.62	137.33
LL-T25	NA	NA	NA	141.24*	2.51	138.73
LL-LRP	NA	NA	NA	140.09*	Unable to Locate	Not Calculated
Extraction Wells						
EW-2	6	10-35	132-112	140.70	2.65	138.05
EW-3	6	12-37	131-111	141.64	4.05	137.59
EW-4	6	20-35	126-116	144.56	11.70	132.86
EW-5	6	29-44	135-125	162.45	Unable to Gauge	Not Calculated
EW-6	6	31-46	135-125	163.85	30.50	133.35
EW-7	6	34-59	131-111	163.30	26.05	137.25
EW-8	6	38-58	126-111	162.83	25.55	137.28

Notes:

1 = Riser elevations obtained from Arthur D. Little, Harding ESE (1997 & 1998), and ECC (2007) surveys. Riser elevations have been updated to include changes resulting from installation of dedicated pumps and well head assemblies.

2 = Water level measurements obtained on November 27th, 2017

* = Elevation of benchmark

ft. = Feet

bgs = Below ground surface

amsl = Above mean sea level

PVC = Polyvinyl chloride

bTOR = Below top of riser

NA = Not applicable

APPENDIX F

Installation EDR Survey Reports (provided in final electronic copy only)

APPENDIX G

December 2016 PFAS Analytical Data

Copy ___of___ Copies
HQ, U.S. Army Installation Management Command
Fort Sam Houston, TX
191900ZSEP16

FRAGMENTARY ORDER 01 TO OPERATIONS ORDER 16-088: Perfluorochemical (PFC) Contamination Assessment (U)

Refs: (a) (U) Safe Drinking Water Act, dtd 16 Dec 74
(b) (U) Safe Drinking Water Act Amendments, dtd 96
(c) (U) National Primary Drinking Water Regulations; 40 CFR 141, dtd 12 May 16
(d) (U) Department of Defense Instruction (DODI) 4715.18, Emerging Contaminants (ECs), dtd 11 Jun 09
(e) (U) Department of Defense Manual 4715.20, Defense Environmental Restoration Program (DERP) Management, dtd 9 Mar 12
(f) (U) Department of Defense Instruction (DODI) 4715.08, Remediation of Environmental Contamination Outside the United States, dtd 1 Nov 13
(g) (U) Department of Defense Instruction (DODI) 4715.06 Environmental Compliance in the United States, dtd 4 May 15
(h) (U) Army Regulation 200-1, Environmental Protection and Enhancement, dtd 13 Dec 07
(j) (U) Assistant Secretary of the Army for Installations, Energy and Environment (ASA IE&E) Memorandum, Perfluorinated Compound (PFC) Contamination Assessment, dtd 10 Jun 16
(k) (U) Assistant Secretary of Defense for Energy, Installations, and Environment (ASD EI&E) Memorandum, Testing DOD Drinking Water for Perfluorooctane Sulfonate (PFOS) and Perfluorooctanoic Acid (PFOA), dtd 10 Jun 16
(l) (U) OPERATIONS ORDER 16-088: Perfluorochemical (PFC) Contamination Assessment, dtg 161900ZJUN16

(U) Time Zone Used Throughout the Order: Zulu.

1. (U) **SITUATION**.

1.A. (U) No Change. On 19 May 16, the Environmental Protection Agency (EPA) released life time health advisories (HA) for Perfluorooctanoic Acid (PFOA) and Perfluorooctane Sulfonate (PFOS) in drinking water (Annexes C & D). The HAs are 70 parts-per-trillion (ppt) in water for both PFOA and PFOS either individually or total of the two.

1.B. (U) No Change. The Army's primary known source of PFOS and PFOA is from the use of Aqueous Film Forming Foam (AFFF) for fire suppression, particularly AFFF

APPENDIX A6

PFC SAMPLING DATA AND PLAN OF ACTIONS FROM PURCHASED WATER SYSTEMS, CONSECUTVE WATER SYSTEMS, AND PRIVATIZED WATER SYSTEMS

Command (IMCOM, AMC, ARNG, Army Reserve)	Garrison/ Installation/ Site/ Facility	FFID	WATER SYSTEM NAME	IDENTIFY TYPE OF WATER SYSTEM: (1) CONSECUTIVE WATER SYSTEM, (2) PURCHASED WATER SYSTEM, (3) PRIVATIZED WATER SYSTEM	PUBLIC WATER SYSTEM ID (PWSID) (If applicable)	POPULATION SERVED	SOURCE WATER TYPE (GW, SW, MIX)	SAMPLE LOCATION (FACILITY/BLDG. NUMBER OR DESCRIPTION)	SAMPLE ID #	SAMPLE COLLECTION DATE (DD/MMM/YY)	ANALYTE NAME	CONCENTRATION LEVEL	UNIT OF MEASUREMENT	MINIMUM REPORTABLE LEVEL	UNIT OF MEASUREMENT	DETECTED IN ASSOCIATED TRIP BLANK? (YES OR NO)	TRIP BLANK CONCENTRATION	UNIT OF MEASUREMENT	CLP FLAGS	ANALYTICAL METHOD
IMCOM	USAG-Natick	MA213820631	Town of Natick	2	3198000	34,000	GW	Bldg 4, 1st flr	Natick SSC	1-Dec-16	PFOS	U	ng/l	16	ng/l	N	U	ng/l	-	EPA 537
IMCOM	USAG-Natick	MA213820631	Town of Natick	2	3198000	34,000	GW	Bldg 4, 1st flr	Natick SSC	1-Dec-16	PFOA	U	ng/l	9.5	ng/l	N	U	ng/l	M	EPA 537
IMCOM	USAG-Natick	MA213820631	Town of Natick	2	3198000	34,000	GW	Bldg 4, 1st flr	Natick SSC	1-Dec-16	PFNA	U	ng/l	11	ng/l	N	U	ng/l	-	EPA 537
IMCOM	USAG-Natick	MA213820631	Town of Natick	2	3198000	34,000	GW	Bldg 4, 1st flr	Natick SSC	1-Dec-16	PFHxS	U	ng/l	12	ng/l	N	U	ng/l	-	EPA 537
IMCOM	USAG-Natick	MA213820631	Town of Natick	2	3198000	34,000	GW	Bldg 4, 1st flr	Natick SSC	1-Dec-16	PFHpA	U	ng/l	4.6	ng/l	N	U	ng/l	M	EPA 537
IMCOM	USAG-Natick	MA213820631	Town of Natick	2	3198000	34,000	GW	Bldg 4, 1st flr	Natick SSC	1-Dec-16	PFBS	U	ng/l	48	ng/l	N	U	ng/l	-	EPA 537
IMCOM	USAG-Natick	MA213820631	Town of Natick	2	3198000	34,000	GW	Housing, 25 Heritage Lane	Natick Heritage	1-Dec-16	PFOS	U	ng/l	15	ng/l	N	U	ng/l	-	EPA 537
IMCOM	USAG-Natick	MA213820631	Town of Natick	2	3198000	34,000	GW	Housing, 25 Heritage Lane	Natick Heritage	1-Dec-16	PFOA	U	ng/l	9.3	ng/l	N	U	ng/l	M	EPA 537
IMCOM	USAG-Natick	MA213820631	Town of Natick	2	3198000	34,000	GW	Housing, 25 Heritage Lane	Natick Heritage	1-Dec-16	PFNA	U	ng/l	11	ng/l	N	U	ng/l	-	EPA 537
IMCOM	USAG-Natick	MA213820631	Town of Natick	2	3198000	34,000	GW	Housing, 25 Heritage Lane	Natick Heritage	1-Dec-16	PFHxS	U	ng/l	12	ng/l	N	U	ng/l	-	EPA 537
IMCOM	USAG-Natick	MA213820631	Town of Natick	2	3198000	34,000	GW	Housing, 25 Heritage Lane	Natick Heritage	1-Dec-16	PFHpA	U	ng/l	4.6	ng/l	N	U	ng/l	M	EPA 537
IMCOM	USAG-Natick	MA213820631	Town of Natick	2	3198000	34,000	GW	Housing, 25 Heritage Lane	Natick Heritage	1-Dec-16	PFBS	U	ng/l	47	ng/l	N	U	ng/l	-	EPA 537
IMCOM	USAG-Natick	MA213822650	Town of Needham	2	3199000	30,000	GW	Housing, 10 Militia Heights Rd	Natick MH	1-Dec-16	PFOS	U	ng/l	15	ng/l	N	U	ng/l	M	EPA 537
IMCOM	USAG-Natick	MA213822650	Town of Needham	2	3199000	30,000	GW	Housing, 10 Militia Heights Rd	Natick MH	1-Dec-16	PFOA	U	ng/l	9.4	ng/l	N	U	ng/l	M	EPA 537
IMCOM	USAG-Natick	MA213822650	Town of Needham	2	3199000	30,000	GW	Housing, 10 Militia Heights Rd	Natick MH	1-Dec-16	PFNA	U	ng/l	11	ng/l	N	U	ng/l	-	EPA 537
IMCOM	USAG-Natick	MA213822650	Town of Needham	2	3199000	30,000	GW	Housing, 10 Militia Heights Rd	Natick MH	1-Dec-16	PFHxS	U	ng/l	12	ng/l	N	U	ng/l	-	EPA 537
IMCOM	USAG-Natick	MA213822650	Town of Needham	2	3199000	30,000	GW	Housing, 10 Militia Heights Rd	Natick MH	1-Dec-16	PFHpA	U	ng/l	4.6	ng/l	N	U	ng/l	-	EPA 537
IMCOM	USAG-Natick	MA213822650	Town of Needham	2	3199000	30,000	GW	Housing, 10 Militia Heights Rd	Natick MH	1-Dec-16	PFBS	U	ng/l	47	ng/l	N	U	ng/l	-	EPA 537
IMCOM	USAG-Natick	MA213822806	Town of Wayland	2	3315000	13,500	GW	Housing, 104 Oxbow rd	Natick Oxbow	1-Dec-16	PFOS	U	ng/l	15	ng/l	N	U	ng/l	M	EPA 537
IMCOM	USAG-Natick	MA213822806	Town of Wayland	2	3315000	13,500	GW	Housing, 104 Oxbow rd	Natick Oxbow	1-Dec-16	PFOA	U	ng/l	9.3	ng/l	N	U	ng/l	M	EPA 537
IMCOM	USAG-Natick	MA213822806	Town of Wayland	2	3315000	13,500	GW	Housing, 104 Oxbow rd	Natick Oxbow	1-Dec-16	PFNA	U	ng/l	11	ng/l	N	U	ng/l	M	EPA 537
IMCOM	USAG-Natick	MA213822806	Town of Wayland	2	3315000	13,500	GW	Housing, 104 Oxbow rd	Natick Oxbow	1-Dec-16	PFHxS	U	ng/l	12	ng/l	N	U	ng/l	M	EPA 537
IMCOM	USAG-Natick	MA213822806	Town of Wayland	2	3315000	13,500	GW	Housing, 104 Oxbow rd	Natick Oxbow	1-Dec-16	PFHpA	U	ng/l	4.5	ng/l	N	U	ng/l	-	EPA 537
IMCOM	USAG-Natick	MA213822806	Town of Wayland	2	3315000	13,500	GW	Housing, 104 Oxbow rd	Natick Oxbow	1-Dec-16	PFBS	U	ng/l	47	ng/l	N	U	ng/l	-	EPA 537
IMCOM	USAG-Natick	MA213820556	Town of Hudson	2	2141000	19,000	SW & GW	Housing, 1B Bruen Dr	Natick Bruen	1-Dec-16	PFOS	U	ng/l	16	ng/l	N	U	ng/l	-	EPA 537
IMCOM	USAG-Natick	MA213820556	Town of Hudson	2	2141000	19,000	SW & GW	Housing, 1B Bruen Dr	Natick Bruen	1-Dec-16	PFOA	29	ng/l	9.5	ng/l	N	U	ng/l	J	EPA 537
IMCOM	USAG-Natick	MA213820556	Town of Hudson	2	2141000	19,000	SW & GW	Housing, 1B Bruen Dr	Natick Bruen	1-Dec-16	PFNA	U	ng/l	11	ng/l	N	U	ng/l	M	EPA 537
IMCOM	USAG-Natick	MA213820556	Town of Hudson	2	2141000	19,000	SW & GW	Housing, 1B Bruen Dr	Natick Bruen	1-Dec-16	PFHxS	U	ng/l	12	ng/l	N	U	ng/l	-	EPA 537
IMCOM	USAG-Natick	MA213820556	Town of Hudson	2	2141000	19,000	SW & GW	Housing, 1B Bruen Dr	Natick Bruen	1-Dec-16	PFHpA	5.8	ng/l	4.6	ng/l	N	U	ng/l	JM	EPA 537
IMCOM	USAG-Natick	MA213820556	Town of Hudson	2	2141000	19,000	SW & GW	Housing, 1B Bruen Dr	Natick Bruen	1-Dec-16	PFBS	U	ng/l	48	ng/l	N	U	ng/l	-	EPA 537

APPENDIX H

Compiled Research Log

Appendix H
Research Log
Per- and Polyfluoroalkyl Substances Preliminary Assessment
Natick Soldier Systems Center, MA

Document Location	Document Date	Document Name	Author	Description of Information
Administrative Record MA-SSC.pd.pdf	29 October 2013	Army Defense Environmental Restoration Program Installation Action Plan	NSSC	NRDEC-05 - T25 Bulk Haz Waste Storage Area: The area immediately south and extends southwest of building T-25 was used to store untreated bulk waste, petroleum, solvents, antifreeze, and Freon 113 in drums from 1970-1984. Leakage onto the pavement occurred. NRDEC-11 - Post Drinking Water Wells: groundwater contaminated with TCE likely associated with Building 2 and/or Building 45. NCTRF (Navy Clothing & Textile Research Facility)- presently has a laboratory present in Building 7. Established in 1967, the facility conducts research, design, development of all protective clothing, dress uniforms, and utility garments worn by most Navy and Coast Guard personnel. Additional tenants located on post include: The Coast Guard, Bureau of Engraving and Printing, and the US Army Research Institute of Environmental Medicine. Post Drinking Water wells: two private drinking water supply wells approx. 50' bgs located on a peninsula on the south end of the post, exiting into Lake Cochituate.
Project Files	Reviewed May 2018	Current Assets List	USAEC	Rotary Wing Landing Pad Land Vehicle Fueling Facility Liquid Propane Gas Storage Tank, Above Ground Liquid Storage Nonpropellant Flammable Material Storehouse, Installation Sanitary Sewer
Administrative Record ASS100049.pdf	January 2007	First Five-Year Review Report for U.S. Army Soldier Systems Center Natick, Massachusetts	ICF Consulting, Inc.	The facility is located approximately 2,500 ft southeast of the town of Natick's Springvale Municipal Water Supply Well Field (Springvale Well Field). The ground water beneath the entire SSC facility has been designated as a Zone II for the town of Natick Springvale Well Field System.
Administrative Record 2016 CCR.pdf	2016	Annual Water Quality Report water Testing Performed in 2016	Natick Water Division	Reviews the water quality for 2016 sampling, including UCMR3.
Website Link: http://www.mwra.com/04water/html/wsupdate.htm	Reviewed May 2018	Water Supply and Demand Massachusetts Water Resources Authority	Massachusetts Water Resources Authority	Information on Massachusetts water distribution districts.
Website Link: http://www.natickma.gov/331/Water-Sewer	Reviewed May 2018	Town of Natick Sewer/Water Division	Town of Natick	Information regarding Town of Natick water distribution system.

Appendix F
Research Log
Per- and Polyfluoroalkyl Substances Preliminary Assessment
Natick Soldier Systems Center, MA

Document Location	Document Date	Document Name	Author	Description of Information
Administrative Record ASS100013.pdf	23 March 2004	Final, Long-Term Monitoring Plan T-25 Area (Operable Unit-1) Ground Water Treatment System U.S. Army Soldier Systems Center Natick, Massachusetts	ICF Consulting, Inc.	Information about the groundwater extraction and treatment system (OU-1). Groundwater extraction and treatment system operating at the T-25 Area since November 1997. Currently four-well extraction system (previously 2, then in spring 2003, three additional brought on and one taken out).
Administrative Record 282_Final Second Five-Year Review Report for U.S. Army Natick Soldier Systems Center	30 April 2012	Final Second Five Year Review Report For U.S. Army Natick Soldier Systems Center	ECC	Discusses remedial actives that took place on site.
Administrative Record 04112017 Final Natick FYR_signed	April 2017	Final 2017 Third Five-Year Review Report	U.S. Army Corps of Engineers New England District Concord, Massachusetts	Discusses remedial actives that took place on site.
NSSC BUILDING 7 CURRENT INVENTORY	Reviewed May 2018	Building 7 Current Inventory	Provided by NSSC	Chemical Inventory List within Building 7, the Navy Clothing and Textile Research Facility.
NSSC Analysis of Existing Facilities_Environmental Assessment Report_1977_11	November 1977	Analysis of Existing Facilities/Environmental Assessment Report	Natick Solider System Center	Summary of activities on installation as well as general installation wide information including wastewater, fire protection, and storm drainage.
NSSC Hudson Water Confidence Report CY17	2017	2017 Annual Drink Water Quality Report	Town of Hudson	Public report issued to town water consumers, shows analytical for PFAS detections
NSSC Hudson Water SWAP report	July 2002	Source Water Assessment and Protection (SWAP) Report	Massachusetts Department of Environmental Protection	Description of Water System, Land Use within protection areas, source water protection.

Appendix F
Research Log
Per- and Polyfluoroalkyl Substances Preliminary Assessment
Natick Soldier Systems Center, MA

Document Location	Document Date	Document Name	Author	Description of Information
Administrative Record Installation Assessment of US Army Natick Research and Development Command_1980_05	May 1980	Installation Assessment of US Army Natick Research and Development Command	US Army	Installation-Wide assessment, includes site wide information such as geology, climate
NSSC Natick Annual Water Quality Report 2017	2017	Town of Natick 2017 Annual Drink Water Quality Report	Natick Water Division	Public report issued to Natick town water customers.
NSSC Natick Water SWAP report	2017	Source Water Assessment and Protection (SWAP) Report	Natick Water Division	Description of Water System, Land Use within protection areas, source water protection.
NSSC USArmy_Master_Plan	January 1993	Master Environmental Plan for the US Army Natick Research, Development, and Engineering Center, Natick Massachusetts	US Army Corps of Engineers	Phase 1 Toxic and Hazard material report.
NSSC Memorandum of Agreement_Natick Fire Department_NSSC	26 September 2016	Memorandum of Agreement Commander, Headquarters United States Army Garrison Natick and the Natick Fire Department	US Army	Mutual Aid Agreement between NSSC and Town of Natick Fire Department

Appendix F
Research Log
Per- and Polyfluoroalkyl Substances Preliminary Assessment
Natick Soldier Systems Center, MA

Document Location	Document Date	Document Name	Author	Description of Information
Administrative Record Draft 2017 Event 75 GWETS Annual Report	May 2018	Groundwater Monitoring Event 75 and 2017 Groundwater Extraction and Treatment System Annual Report	Plexus Scientific Corpora	Summarizes activities and results from 2017 Fall semi-annual groundwater monitoring event (event 75). Also, performance data generated from operation and maintenance of the groundwater extraction and treatment system.
NSSC Mercury Reduction System Bldg 42 schematic	30 April 2009	Upgrade to the Pretreatment System	NSSC	Schematic of the treatment system
NSSC MWRA Discharge Permit Exp 15FEB2019	06 March 2017	Permit # 22001808 MWRA Category: 01 SIU Permit Expiration Date: 02/15/2019	Massachusetts Water Resources Authority	Discharge permit for NSSC
NSSC Natick Fire Suppression Systems	Reviewed June 2018	List of Fire Suppression Systems at NSSC	NSSC	There are no AFFF fire suppression systems
NSSC Natick SSC Final ICRMP Report	February 2012	United State Army Natick Soldier Systems Center Integrated Cultural Resources Management Plan	PAL	Information on cultural resources for the management of NSSC, not including the four housing areas
NSSC nrmp_final_021607	February 2007	Integrated Natural Resources Management Plan	MACTEC Engineering and Consulting, Inc.	Natural resource conservation measures at army installation
NSSC permit_final_ms4	18 April 2003	Natural Pollutant Discharge Elimination System General Permit for Storm Water Discharges for Small Municipal Separate Storm Sewer Systems	USEPA	Discharge permit
NSSC Stormwater Plan Color 2016	01 May 2003	Storm Water Management Plan	NSSC	Stormwater management and controls

Notes:
AFFF= aqueous film forming foam
NSSC= Natick Soldier Systems Center
OU= operable unit
UCMR3= The Third Unregulated Contaminant Monitoring Rule
USAEC= United States Army Environmental Command

APPENDIX I

Compiled Interview Logs

ARCADIS Design consultancy for natural and built

Interview Log

Installation: Natick Soldier Systems Center **State:** Massachusetts

Date/Time: 19 June 2018 0900
Interviewer(s): A. Gupta, A. Thomas, M. Baker, D. Simmes
Other Attendees:

Person(s) Interviewed

Name	Title/Rank/Role	Time at Installation (or Other Affiliation)	Time in Current Role	Previously Held Roles (and Time period)	Contact Phone/Email	Other Notes
James Connolly	Environmental Restoration					CERCLA responsibility has GIS info
Richard Vellicourt	RCRA manager				(508) 233-5582 richard.a.vellicourt.civ@mail.mil	RCRA, Haz waste, drinking water, sanitary, solid waste
Terry Garrahan	Environmental Engineer	1993-present	24 years		g.t.garrahan.civ@mail.mil	POC for Natural, Cultural, stormwater CAA, NEPA Compliance

Potential Areas of Potential Interest Discussed

- Bldg 7: Navy textile facility. POC = Tom Hart (508) 233-1351
  - ↳ 3/4 washing machines
  - ↳ have permitted discharge affects to sewer. Sampled routinely. Right into sewer system
  - ↳ Use off-the-shelf detergent
  - ↳ Washing/testing of clothing/uniform components. All material comes pretreated (waterproof, fire retardant)
  - ↳ Deer Island treatment
  - ↳ Bench scale operations
- Bldg 5: Army textile facility. Similar to Navy
  - ↳ clothings, tents, other fabrics → everything received is already pretreated
  - ↳ insect repellant testing (permethrin)
  - ↳ larger scale (5/16) washers, but still bench scale (2" x 2"?)

USAEC P[illegible]PA Program
Interview

ARCADIS Design & Consultancy for natural and built

Installation: NSSC Interviewee: RV, JC, JG Date: 19 June 2018

Tanya Quigley of dpw from Town of Natick fire dept

General Knowledge Discussed

- Stormwater system
  - water goes through an oil/water separator, → lake
- Sanitary system
  - Sewage piped from 50-60 buildings all go to Deer Island treatment plant (26 miles away from NSSC) (State owned)
- NSSC has permitted outfalls (sewer use permit) for treatment systems
- NSSC does not generate much sludge, tanks cleared annually
- Bldg 5 houses Army textile operations and fabrication shop (↑Shop supervisor, Stevenson)
- Bldg 7 = Navy textile research (see front for more information)
- Bldg 5 = includes Army textile research operations (see front for more information)
  - → Both wash for durability, flame retardant testing
  - → no chemical application of waterproofing materials
- Drinking water wells
  - Got off drinking water wells (on post) in 1995, since 1995 been on Town of Natick water
  - Wells closed (still exist) because of maintenance issues.
  - Estimated 1953-1995 2 wells on post used for drinking water,
  - painted at that red well on figure 13 where [illegible] air conditioning plant 13
- ANSUL
  - system in 90 day hazwaste, 93, 95 (bldgs)
- Bldg 16A = Stored fuel (2-4 drums) no [illegible] Fire Suppression Systems
- Bldg 2A - No fuels
- Bldg 94 pump & treat
- Mercury treatment → carbon vessels changed at least 2/yr → ion exchange system

Fire Inspector
Current: Dave McCarthy: never used AFFF on post
Former: Joe Murphy, retired in 2016 15 years at least

- Previous PFAS investigation
  - → Mass currently proposing standard (MDEP)
  - → previously had to go through checklist, to sample (Army)
  - → PFOA/PFAS sampling in 2016
  - → Did find PFAs in Hudson Housing, area not supplied by town of Natick (Hudson built in 60s)
  - → State of Mass. fire academy placed in Revere Sudbury annex (historical)
- Helipad, Bldg 32
  - parking lot by day. Not utilized frequently for flying
- Bldg 95 (gal or less)
- Bldg 93 (gal → more) HAZ waste storage
- Bldg 70, 69 = 2 USTs (old tanks removed)
- Bldg 76: 1000 tot

ARCADIS Design & Consultancy for natural and built

Installation: Interviewee: Date:

Documents Obtained

None during interviews. Will follow up to obtain

From Rich
- Bldg 5 chemical inventory
- Bldg 42 mercury reduction system
- Discharge permits

From Terry
- Pesticide usage data
- ICRMP
- NRMP
- Stormwater management plan

From James
- Town of Hudson Annual Drinking Water Report
- Natick water quality report

Data Gaps or Items for Follow-Up

- Do we need to dive deeper into the textile washing? Residuals in that discharge water?
- Chemical inventories from Melissa (currently on vacation)
- Ask James more about fuel spills in NE portion of site (peaty material)
- Bldg 94 pump & treat site recon
- Real Property: condition of properties for all 3 washing areas. Ft. Devens wells on Hudson property

ARCADIS Desi[illegible] for [illegible] built [illegible] Consultancy [illegible]nd

Interview Log

Installation: Natick Soldier Systems Center **State:** Massachusetts

Date/Time: 19 June 2018
Interviewer(s): A. Thomas, M. Barker, A. Gupta, D. Simmers
Other Attendees: R. Valcart

Person(s) Interviewed

Name	Title/Rank/Role	Time at Installation (or Other Affiliation)	Time in Current Role	Previously Held Roles (and Time period)	Contact Phone/Email	Other Notes
David McCrillis	Fire Protection Inspector	<2 years	<2 years	—	(508) 233-4365 david.a.mccrillis.civ@mail.mil	

Potential Areas of Potential Interest Discussed

None.

ARCADIS Desi[illegible]sultancy for [illegible]nd built[illegible]

Installation: Interviewee: Date:

General Knowledge Discussed

No fire department on the installation.
Inergen in all computer rooms.
Kitchen hoods use a dry chemical (Barracks?) CO_2 systems (Bldg 36)
Ansel systems, CO_2 systems, no AFFF fire suppression systems used on the installation.

There have been a few fires on post, all responded to by Town of Natick fire department.
↳ Bldg 45 had fire in 2012, AFFF was not used to extinguish.

Town of Natick FD contact info (508) 647-9559 (Chief)

ARCADIS Desk[illegible]onsultancy for[illegible]nd built[illegible]

Installation: Interviewee: Date:

Documents Obtained

Mutual aid agreement between ~~NA~~ (1) NSSC and Town of Natick fire department.

Data Gaps or Items for Follow-Up

Will send us list of fire suppression systems on post.
Will try to get Joe Murphy's contact information.

ARCADIS Design & Consultancy for natural and built assets

Interview Log

Installation: Natick Soilder Systems Center *State:* Massachusetts

Date/Time: 06/13/2018 | 15:00
Interviewer(s): Molly Barker, Amar Wadhawan, Matthew Blower
Other Attendees:

Person(s) Interviewed

Name	Title/Rank/Role	Time at Installation (or Other Affiliation)	Time in Current Role	Previously Held Roles (and Time)	Contact Phone/Email	Other Notes
John McHugh	Environmental Chief	1979-1985 1992-Present	18 Years	1994-2000 Superfund Coordinator	john.j.mchugh.civ@mail.mil	1979-1985 - Chief of Buildings

Potential Areas of Potential Interest Discussed

-246 Kansas Street - House fire, Town of Natick FD responded. Would have records on incident. No knowledge of AFFF use there.
-Transformer explosion (~1985) - Large transformer filled with PCB exploded, FD may have responded, no further knowledge of incident.
-Building 5 - Army controlled textile testing facility.
-Building 7 - Navy controlled textile testing facility. On Army land, leasing agreement does exist (contact Lewis Martin, Real Property Manager for document details). Navy paid for building construction.
-Buildings 93 and 95 - Hazardous Waste accumulation area. Dry chemical suppressant system. John to send info on chemical used as suppressant.

General Knowledge Discussed

No knowledge of AFFF use on post

Not aware of large scale chrome plating operations on post. Old supervisor in charge passed away, John will send contact information for current supervisor.

Used Halon on post, no mist or foam suppressants to his knowledge. Water used to deal with large gas pressure accident (date unknown)

Town of Natick responds to all fire/emergency/prevention incidents.

Waste water: Disposed through Massachusetts Water Resources Authority (MWRA). Sewer system runs through Town of Natick, then into the MWRA. MWRA has NSSC permit separately from Town of Natick.

Extensive textile research at NSSC. All types of military uniforms are tested by both Army and Navy. Lots of exotic chemicals used, but NSSC only tracks materials that are considered hazardous. Arcadis staff to ask for list of hazardous chemicals during site visit. Contact info for Army and Navy POCs to be forwarded by John McHugh.

NSSC has hazardous waste accumulation area, buildings 93 and 95. Haz Waste stored for max of 90 days, then disposed of by contractor (Blue Stone Environmental). NSSC has waste manifests on file.

Oil spill response: Spill areas were cleaned, but not responded to by fire department for fire prevention.

Documents Obtained

None.

Data Gaps or Items for Follow-Up

Data Gaps:

-Permit information for NSSC sewer use with MWRA
-Land agreements for Navy Building 6
-List of chemicals used for textile testing
-Waste disposal manifests

Action Items

-Mr. McHugh to send contact info for supervisor to provide information on chrome plating activities.
-Mr. McHugh to provide contact info for Army and Navy textile POCs
-Arcadis to coordinate with Army and Navy POCs to attend in-brief
-Mr. McHugh to research chemical suppressant used at Haz. Waste accumulation areas.

ARCADIS Design & Consultancy for natural and built

Interview Log

Installation: Natick Soldier Systems Center **State:** Massachusetts

Date/Time: 20 June 2018
Interviewer(s): Ankit Gupta
Other Attendees: Abbey Thomas

Person(s) Interviewed

Name	Title/Rank/Role	Time at Installation (or Other Affiliation)	Time in Current Role	Previously Held Roles (and Time period)	Contact Phone/Email	Other Notes
Captain Joseph Mortarelli	Captain at Town of Natick Fire Department	NA			(508) 647-9556	Telephonic interview

Potential Areas of Potential Interest Discussed

Sitewide at NSSC.

ARCADIS Desi[illegible] Consultancy for r[illegible]nd built.

Installation: NSSC Interviewee: Captain Joseph Martarelli Date: 20 June 2019

General Knowledge Discussed

As recommended by Jim Connolly and Terry Garrahan, Arcadis contacted the Town of Natick Fire Department to discuss a records file kept for Natick Soldier Systems center to confirm ~~no~~ responses to the installation with AFFF.

Ankit Gupta called Captain Joseph Martarelli, who reviewed the records file and did not see any mention of AFFF at all. File goes back to 2011, but senior guys within the fire department were asked about any recollection of AFFF use at NSSC. None of the senior members remember any activity at NSSC. They do have AFFF, but rarely use it. The last time that they remember using AFFF was a response incident on the Massachusetts Turnpike.

Installation: NSSL Interviewee: Captain Joseph McTwelly Date: 20 June 2018

Documents Obtained

None

Data Gaps or Items for Follow-Up

None

APPENDIX J

Site Reconnaissance Photo Log

PHOTOGRAPH LOG

USAEC
Natick Soldier System Center PFAS PA

Photograph: 1

Description:
Fire Suppression System located outside of Small Hazardous Waste Storage Area.

Location:
Natick Soldier System Center

Photograph taken by:
ARCADIS

Date: 6/19/2018

Photograph: 2

Description:
Condition of floor near fire suppression system located outside of Small Hazardous Waste Storage Area.

Location:
Natick Soldier System Center

Photograph taken by:
ARCADIS

Date: 6/19/2018

Photograph: 3

Description:
Fire Suppression System descriptor tag on fire suppression system located outside of Small Hazardous Waste Storage Area.

Location:
Natick Soldier System Center

Photograph taken by:
ARCADIS

Date: 6/19/2018

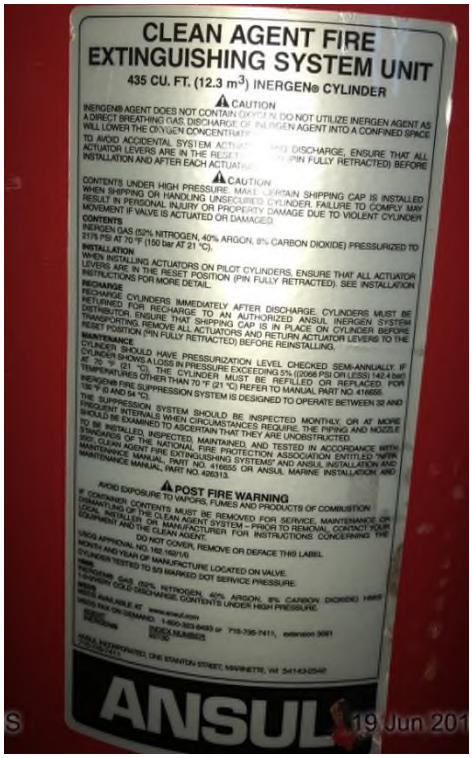
Photograph: 4

Description:
Small Hazardous Waste Storage Area

Location:
Natick Soldier System Center

Photograph taken by:
ARCADIS

Date: 6/19/2018



Photograph: 5

Description:
Fire Suppression System-Cylinder on fire suppression system located outside of Small Hazardous Waste Storage Area.

Location:
Natick Soldier System Center

Photograph taken by:
ARCADIS

Date: 6/19/2018

Photograph: 6

Description:
Mercury reduction treatment system with carbon filtration and ion exchange resin.

Location:
Natick Soldier System Center

Photograph taken by:
ARCADIS

Date: 6/19/2018

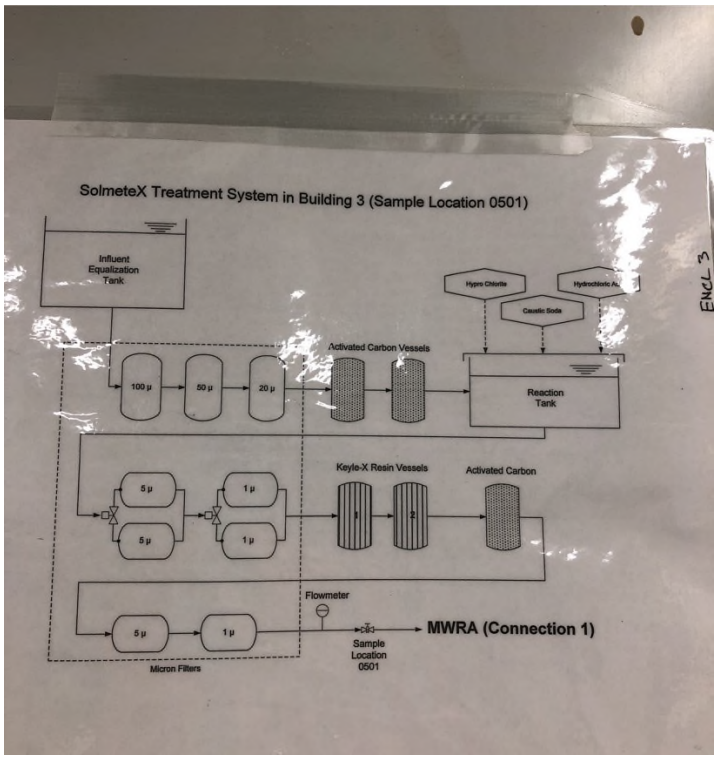
Photograph: 7

Description:
Mercury reduction treatment system with carbon filtration and ion exchange resin.

Location:
Natick Soldier System Center

Photograph taken by:
ARCADIS

Date: 6/19/2018



Photograph: 8

Description:
Mercury reduction treatment system with carbon filtration and ion exchange resin.
System layout.

Location:
Natick Soldier System Center

Photograph taken by:
ARCADIS

Date: 6/19/2018

Photograph: 9

Description:
Mercury reduction treatment system with carbon filtration and ion exchange resin.

Location:
Natick Soldier System Center

Photograph taken by:
ARCADIS

Date: 6/19/2018

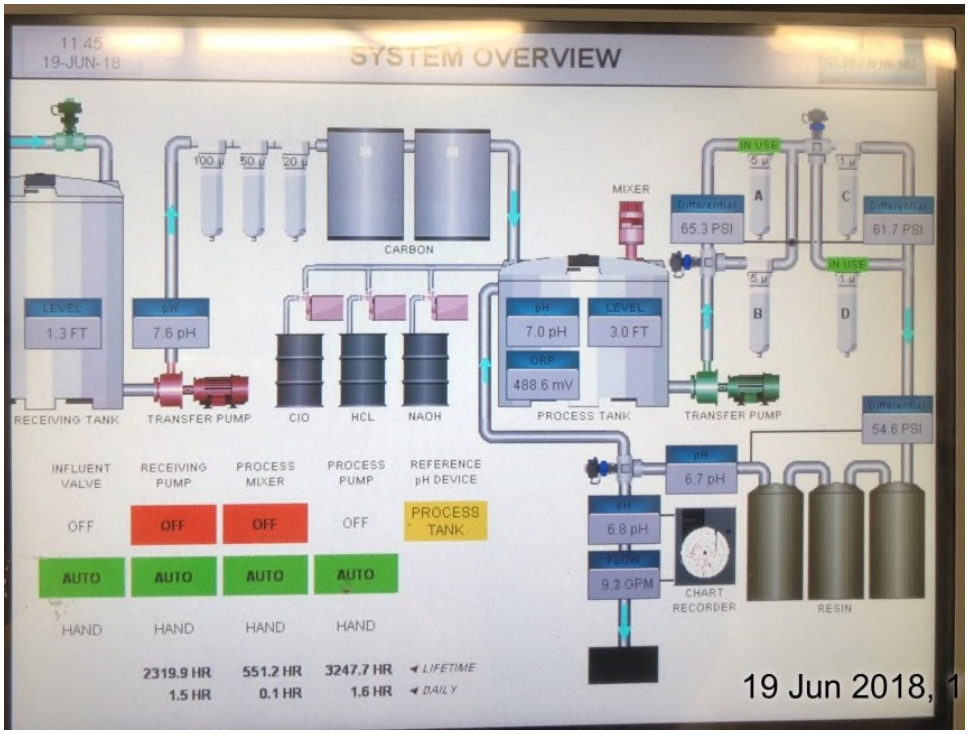
Photograph: 10

Description:
Mercury reduction treatment system with carbon filtration and ion exchange resin.
Carbon filters.

Location:
Natick Soldier System Center

Photograph taken by:
ARCADIS

Date: 6/19/2018



Photograph: 11

Description:
Mercury reduction treatment system with carbon filtration and ion exchange resin.
System overview.

Location:
Natick Soldier System Center

Photograph taken by:
ARCADIS

Date: 6/19/2018

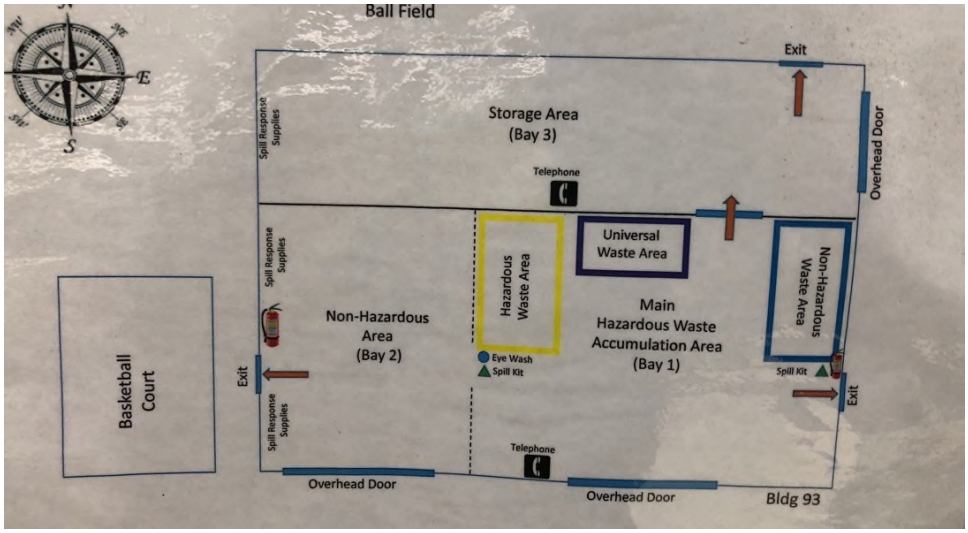
Photograph: 12

Description:
Mercury reduction treatment system with carbon filtration and ion exchange resin.
Floor condition.

Location:
Natick Soldier System Center

Photograph taken by:
ARCADIS

Date: 6/19/2018



Photograph: 13

Description:
Bulk Hazardous Waste Storage Facility Building layout.

Location:
Natick Soldier System Center

Photograph taken by:
ARCADIS

Date: 6/19/2018

Photograph: 14

Description:
Bulk Hazardous Waste Storage Facility.

Location:
Natick Soldier System Center

Photograph taken by:
ARCADIS

Date: 6/19/2018

Photograph: 15

Description:
Bulk Hazardous Waste Storage Facility.
Floor sumps.

Location:
Natick Soldier System Center

Photograph taken by:
ARCADIS

Date: 6/19/2018

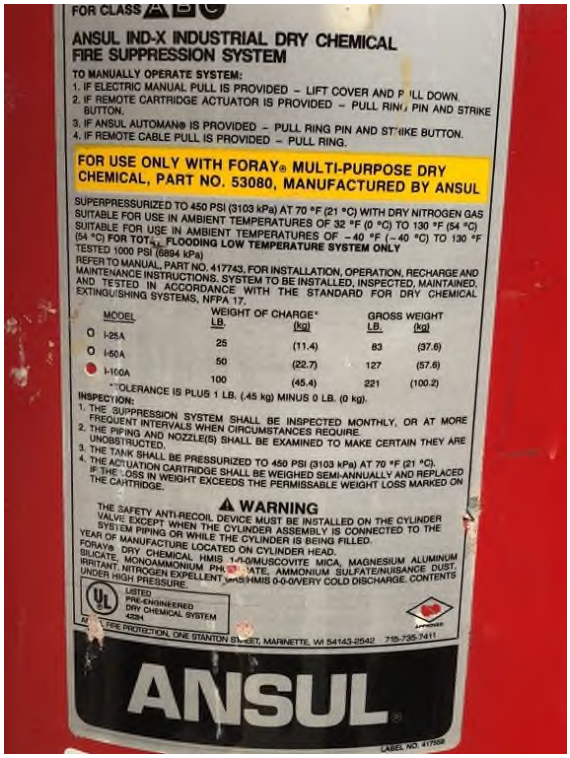
Photograph: 16

Description:
Bulk Hazardous Waste Storage Facility. Fire Suppression System.

Location:
Natick Soldier System Center

Photograph taken by:
ARCADIS

Date: 6/19/2018



Photograph: 17

Description:
Bulk Hazardous Waste Storage Facility. Fire Suppression System.

Location:
Natick Soldier System Center

Photograph taken by:
ARCADIS

Date: 6/19/2018

Photograph: 18

Description:
Bulk Hazardous Waste Storage Facility. Fire Suppression System.

Location:
Natick Soldier System Center

Photograph taken by:
ARCADIS

Date: 6/19/2018

Photograph: 19

Description:
Bulk Hazardous Waste Storage Facility. Fire Suppression System.

Location:
Natick Soldier System Center

Photograph taken by:
ARCADIS

Date: 6/19/2018

Photograph: 20

Description:
Tank in CERCLA Site Groundwater Extraction and Treatment System (GWETS) Building.

Location:
Natick Soldier System Center

Photograph taken by:
ARCADIS

Date: 6/19/2018

Photograph: 21

Description:
CERCLA Site Groundwater Extraction and Treatment System (GWETS) Building.

Location:
Natick Soldier System Center

Photograph taken by:
ARCADIS

Date: 6/19/2018

Photograph: 22

Description:
CERCLA Site Groundwater Extraction and Treatment System (GWETS) Building.

Location:
Natick Soldier System Center

Photograph taken by:
ARCADIS

Date: 6/19/2018

Photograph: 23

Description:
CERCLA Site Groundwater Extraction and Treatment System (GWETS) Building. Floor condition.

Location:
Natick Soldier System Center

Photograph taken by:
ARCADIS

Date: 6/19/2018

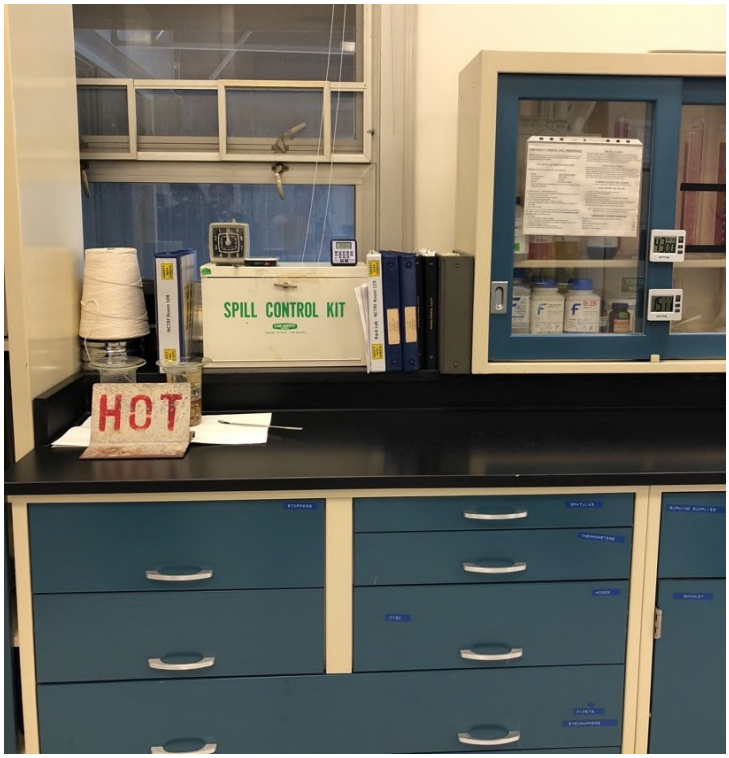
Photograph: 24

Description:
Navy Clothing and Textile Research Facility Laboratory

Location:
Natick Soldier System Center

Photograph taken by:
ARCADIS

Date: 6/19/2018



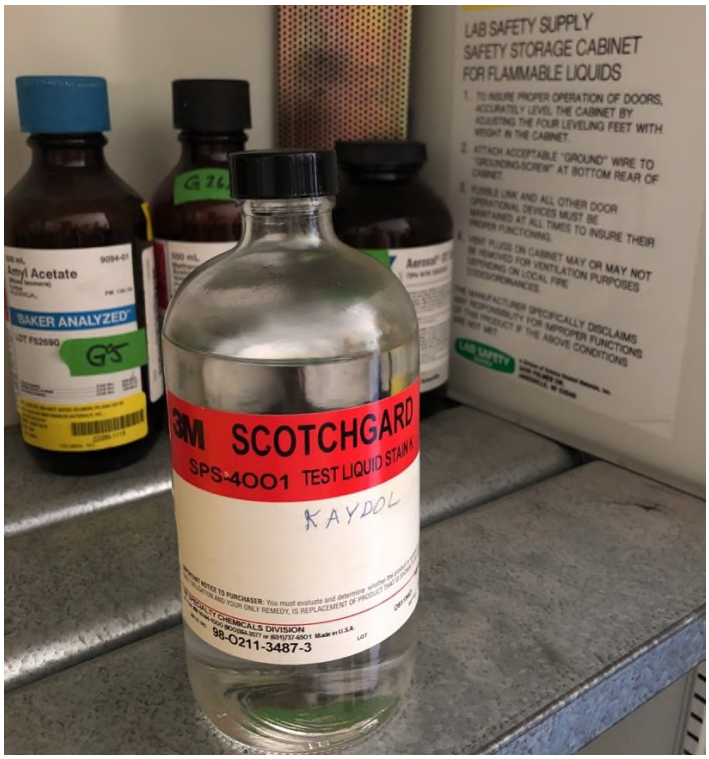
Photograph: 25

Description:
Navy Clothing and Textile Research Facility Laboratory

Location:
Natick Soldier System Center

Photograph taken by:
ARCADIS

Date: 6/19/2018



Photograph: 26

Description:
Scotchgard Test Kit Bottle in Navy Clothing and Textile Research Facility Laboratory to test fabrics on small scale level.

Location:
Natick Soldier System Center

Photograph taken by:
ARCADIS

Date: 6/19/2018

Photograph: 27

Description:
Scotchgard Test Kit Bottle in Navy Clothing and Textile Research Facility Laboratory to test fabrics on small scale level.

Location:
Natick Soldier System Center

Photograph taken by:
ARCADIS

Date: 6/19/2018

Photograph: 28

Description:
Laundry machines in Navy Clothing and Textile Research Facility Laboratory.

Location:
Natick Soldier System Center

Photograph taken by:
ARCADIS

Date: 6/19/2018

Photograph: 29

Description:
Laundering Materials in Navy Clothing and Textile Research Facility Laboratory.

Location:
Natick Soldier System Center

Photograph taken by:
ARCADIS

Date: 6/19/2018

Photograph: 30

Description:
Laundering Materials in Navy Clothing and Textile Research Facility Laboratory.

Location:
Natick Soldier System Center

Photograph taken by:
ARCADIS

Date: 6/19/2018

Photograph: 31

Description:
Laundry machine in the Army Clothing and Textile Research Facility.

Location:
Natick Soldier System Center

Photograph taken by:
ARCADIS

Date: 6/19/2018

APPENDIX K

Compiled Site Reconnaissance Logs

ARCADIS Design & Consultancy for natural and built assets

Site Reconnaissance Log

Installation: Natick Soldier Systems Center **State:** MA

Date: 19 June 2018
Potential AOPI Name: Building 3
Latitude/Longitude: 42°17'16" N, 71°21'54" W
Field Personnel: D. Summers, A. Gupta, M. Barker, A. Thomas
Site Contact/Title: Richard Valcourt, RCRA Manager
Weather: 80's, sunny

Sources

Recognized Primay Source (circle):

Fire, Fire training, Fire station, Nozzle testing, Crash site, Metal coating/plating, Hanger/AFFF suppression system, Auto maintenance, Photoprocessing, Fuel spill, Pesticide/insecticide use, Wash rack, Other:

When/Frequency: NA
Product Released & Volume:
Other Notes: ↓ No AFFF or metal plating use/operations here.

Recognized Secondary Source(s) (circle):

Stormwater or Sewer System Components, Wastewater Treatment Plants, Landfills, Remediated Soil Application Sites, Surface Water Flow Pathway, Potential for Groundwater Infiltration, Other:

When: No release of AFFF, but this is a water treatment system.
Migration Potential: Discharged to sanitary sewer system.
Other Notes: Only of concern if PFAs release on installation, NA.

Physical Setting of Potential AOPI

Topography and Floor/Ground Surface (note vegetation/pavement, soil composition/color/staining, how surface may influence sampling access, and evidence of erosion especially near point of possible release):

In basement of building

Infrastructure (note entry to sewer system via drop inlets/storm drains/sanitary sewer/WWTP, pavement, buildings, etc):

This water treatment facility discharges into the sewer system.

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On- or Off-Installation Monitoring or Drinking Water Wells (number and proximity to potential AOPI, note access and condition of wells):

NA

Surface Water Bodies (proximity to and relative drainage direction and receptor, note ponding or standing water nearby):

NA

Surface Drainage within or adjacent to (natural or manmade, flow direction, lining [stone, vegetation, other], blockages):

NA.

Site Status (current or past IRP and decision [NFA, MNA, system, etc.], previous remedial actions or other PFAS investigations):

Mercury reduction groundwater treatment system with carbon filtration and ion exchange resin.

Miscellaneous Notes

No history of leaking tanks.

Health and Safety Considerations

* Please note any H&S Concerns here (access, overhead/buried utilities, steep terrain, biological hazards, etc.)

None.

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Site Reconnaissance Log

Installation: Natick Soldier Systems Center **State:** MA

Date: 19 June 2018
Potential AOPI Name: Building 5
Latitude/Longitude: 42°17'25"N 71°21'51"W
Field Personnel: A. Gupta, D. Simmers, M. Barker, A. Thomas
Site Contact/Title: Richard Valcourt, RCRA Manager
Weather: 80s, sunny

Sources

Recognized Primay Source (circle):

Fire, Fire training, Fire station, Nozzle testing, Crash site, Metal coating/plating, Hanger/AFFF suppression system, Auto maintenance, Photoprocessing, Fuel spill, Pesticide/insecticide use, Wash rack, Other:

When/Frequency: NA
Product Released & Volume:
Other Notes: No AFFF, metal coating use/operations here

Recognized Secondary Source(s) (circle):

Stormwater or Sewer System Components, Wastewater Treatment Plants, Landfills, Remediated Soil Application Sites, Surface Water Flow Pathway, Potential for Groundwater Infiltration, Other:

When: NA
Migration Potential:
Other Notes:

Physical Setting of Potential AOPI

Topography and Floor/Ground Surface (note vegetation/pavement, soil composition/color/staining, how surface may influence sampling access, and evidence of erosion especially near point of possible release):

Inside building 5, sealed floor.

Infrastructure (note entry to sewer system via drop inlets/storm drains/sanitary sewer/WWTP, pavement, buildings, etc):

Waste water discharges to mercury ~~treat~~ reduction groundwater treatment system.

On- or Off-Installation Monitoring or Drinking Water Wells (number and proximity to potential AOPI, note access and condition of wells):

NA

Surface Water Bodies (proximity to and relative drainage direction and receptor, note ponding or standing water nearby):

NA

Surface Drainage within or adjacent to (natural or manmade, flow direction, lining [stone, vegetation, other], blockages):

NA

Site Status (current or past IRP and decision [NFA, MNA, system, etc.], previous remedial actions or other PFAS investigations):

NA

Miscellaneous Notes

Army Textile & Research Laboratory performs testing on small swatches of materials (pre-treated) to send data to Army. Launder waterproof and fire retardant items (swatches). NO application here. Materials include tents, boots, parachutes. Home washing machines and larger capacity machines (commercial) for washing

Health and Safety Considerations

* Please note any H&S Concerns here (access, overhead/buried utilities, steep terrain, biological hazards, etc.)

None.

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Site Reconnaissance Log

Installation: Natick Soldier Systems Center **State:** MA

Date: 19 June 2018
Potential AOPI Name: Building 7 - Navy Clothing and Textile Research Facility (NCTRF)
Latitude/Longitude: 42°17'20"N 71°21'32"W
Field Personnel: A. Gupta, M. Barker, A. Thomas
Site Contact/Title: Richard Valicenti, RCRA Manager; Tom Hart, Textile Engineer
Weather: 80s, sunny

Sources

Recognized Primay Source (circle):

Fire, Fire training, Fire station, Nozzle testing, Crash site, Metal coating/plating, Hanger/AFFF suppression system, Auto maintenance, Photoprocessing, Fuel spill, Pesticide/insecticide use, Wash rack, Other:

When/Frequency: NA
Product Released & Volume:
Other Notes: No AFFF, metal coating use / operations here.

Recognized Secondary Source(s) (circle):

Stormwater or Sewer System Components, Wastewater Treatment Plants, Landfills, Remediated Soil Application Sites, Surface Water Flow Pathway, Potential for Groundwater Infiltration, Other:

When: NA
Migration Potential:
Other Notes:

Physical Setting of Potential AOPI

Topography and Floor/Ground Surface (note vegetation/pavement, soil composition/color/staining, how surface may influence sampling access, and evidence of erosion especially near point of possible release):

Inside building 7, sealed floor.

Infrastructure (note entry to sewer system via drop inlets/storm drains/sanitary sewer/WWTP, pavement, buildings, etc):

Have permitted discharge outfalls to the sanitary sewer, ↑ sampled routinely. Sanitary sewer system to Deer Island treatment facility ~25 miles away.

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On- or Off-Installation Monitoring or Drinking Water Wells (number and proximity to potential AOPI, note access and condition of wells):

NA

Surface Water Bodies (proximity to and relative drainage direction and receptor, note ponding or standing water nearby):

NA

Surface Drainage within or adjacent to (natural or manmade, flow direction, lining [stone, vegetation, other], blockages):

NA

Site Status (current or past IRP and decision [NFA, MNA, system, etc.], previous remedial actions or other PFAS investigations):

NA.

Miscellaneous Notes

NCTRF been tenant since 1970's. Perform bench-scale testing/research on 3"x10" 10gram swatches (burn w/ bunson burner to test five retardant ~~materials~~), All tested materials come pre-treated (waterproof or fire retardant), no application done on the installation. Small quantities of Scotchguard in lab, used for water testing (no widespread use). Launder materials w/ store bought detergents, large ship water washing machines (2) approximately 15 other washing machines

Health and Safety Considerations

* Please note any H&S Concerns here (access, overhead/buried utilities, steep terrain, biological hazards, etc.)

None.

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Site Reconnaissance Log

Installation: Natick Soldier Systems Center **State:** MA

Date: 19 June 2018
Potential AOPI Name: Building 93 - Bulk Hazardous Waste Storage Facility
Latitude/Longitude: 42° 17' 19" N, 71° 21' 44" W
Field Personnel: D. Summers, A. Gupta, M. Barker, A. Thomas
Site Contact/Title: Richard Valicia, RCRA Manager
Weather: 80's, sunny

Sources

Recognized Primay Source (circle):

Fire, Fire training, Fire station, Nozzle testing, Crash site, Metal coating/plating, Hanger/AFFF suppression system, Auto maintenance, Photoprocessing, Fuel spill, Pesticide/insecticide use, Wash rack, Other:

When/Frequency: No release. No PFAs chemicals stored.
Product Released & Volume: no release.
Other Notes: Fire suppression system is IND-X Industrial Dry Chemical - Ansul.

Recognized Secondary Source(s) (circle):

Stormwater or Sewer System Components, Wastewater Treatment Plants, Landfills, Remediated Soil Application Sites, Surface Water Flow Pathway, Potential for Groundwater Infiltration, Other:

When: NA
Migration Potential:
Other Notes:

Physical Setting of Potential AOPI

Topography and Floor/Ground Surface (note vegetation/pavement, soil composition/color/staining, how surface may influence sampling access, and evidence of erosion especially near point of possible release):

unsealed floor within building, concrete. floor drain in center of building that leads to sumps (contained).

Infrastructure (note entry to sewer system via drop inlets/storm drains/sanitary sewer/WWTP, pavement, buildings, etc):

Floor drains to sumps, not sewer system.

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On- or Off-Installation Monitoring or Drinking Water Wells (number and proximity to potential AOPI, note access and condition of wells):

NA

Surface Water Bodies (proximity to and relative drainage direction and receptor, note ponding or standing water nearby):

NA

Surface Drainage within or adjacent to (natural or manmade, flow direction, lining [stone, vegetation, other], blockages):

Sealed floor, sumps under building that do not go to the sewer system, but to a collection chamber.

Site Status (current or past IRP and decision [NFA, MNA, system, etc.], previous remedial actions or other PFAS investigations):

NA, no previous PFAs investigations here.

Miscellaneous Notes

No PFAs chemicals stored here.
If spill occurs, clean Havbas would respond.

Health and Safety Considerations

* Please note any H&S Concerns here (access, overhead/buried utilities, steep terrain, biological hazards, etc.)

NA

ARCADIS Design & Consultancy for natural and built assets

Site Reconnaissance Log

Installation: Natick Soldier Systems Center **State:** MA

Date: 19 June 2018
Potential AOPI Name: Building 94
Latitude/Longitude: 42°17'30"N 71°21'52"W
Field Personnel: A. Gupta, A. Thomas, M. Barker
Site Contact/Title: Richard Valcourt, RCRA Manager
Weather: 80's, sunny

Sources

Recognized Primay Source (circle):

Fire, Fire training, Fire station, Nozzle testing, Crash site, Metal coating/plating, Hanger/AFFF suppression system, Auto maintenance, Photoprocessing, Fuel spill, Pesticide/insecticide use, Wash rack, Other:

When/Frequency: NA
Product Released & Volume:
Other Notes: No AFFF or metal plating use/operations here.

Recognized Secondary Source(s) (circle):

Stormwater or Sewer System Components, Wastewater Treatment Plants, Landfills, Remediated Soil Application Sites, Surface Water Flow Pathway, Potential for Groundwater Infiltration, Other:

When: No release of AFFF, but this is a water treatment system.
Migration Potential: Discharged to the lake after oil/water separator. First used as grey water.
Other Notes: Only of concern if PFAs release on installation. NA.

Physical Setting of Potential AOPI

Topography and Floor/Ground Surface (note vegetation/pavement, soil composition/color/staining, how surface may influence sampling access, and evidence of erosion especially near point of possible release):

Water treatment system inside building 94. Sealed, concrete floor (some cracks but in average condition). No floor drains.

Infrastructure (note entry to sewer system via drop inlets/storm drains/sanitary sewer/WWTP, pavement, buildings, etc):

Treated water used as grey water (HVAC, irrigation) or nonpotable uses. If not used here, then discharged to ~~storm~~ AFI lake following oil/water separator.

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On- or Off-Installation Monitoring or Drinking Water Wells (number and proximity to potential AOPI, note access and condition of wells):

NA

Surface Water Bodies (proximity to and relative drainage direction and receptor, note ponding or standing water nearby):

Discharged to Lake Cochinate.

Surface Drainage within or adjacent to (natural or manmade, flow direction, lining [stone, vegetation, other], blockages):

NA, no floor drains within sealed floor.

Site Status (current or past IRP and decision [NFA, MNA, system, etc.], previous remedial actions or other PFAS investigations):

Premus remedial actions T-25 Area
CERCLA site, groundwater extraction & treatment system OU-I

Miscellaneous Notes

Would be of concern if PFAs release on installation, not applicable.
Treatment system includes: sandfilters, stockfilter, carbon filters, VOCs, equilization tank, backwash tank, tetrasolve filtration.

Health and Safety Considerations

* Please note any H&S Concerns here (access, overhead/buried utilities, steep terrain, biological hazards, etc.)

None

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Site Reconnaissance Log

Installation: Natick Soldier Systems Center **State:** MA

Date: 19 June 2018
Potential AOPI Name: Building 95 - Small Hazardous Waste Storage
Latitude/Longitude: 42°17'21" N, 71°21'43" W
Field Personnel: D. Summers, A. Gupta, M. Barker, A. Thomas
Site Contact/Title: Rich Valcourt, ~~Env. Engineer~~ RCRA Manager
Weather: 80's, sunny

Sources

Recognized Primay Source (circle):

Fire, Fire training, Fire station, Nozzle testing, Crash site, Metal coating/plating, Hanger/AFFF suppression system, Auto maintenance, Photoprocessing, Fuel spill, Pesticide/insecticide use, Wash rack, Other:

When/Frequency: In last 9 years, no memory of use (fire suppression).
Product Released & Volume: no release
Other Notes: Fire suppression system is Inergen - Ansul

Recognized Secondary Source(s) (circle):

Stormwater or Sewer System Components, Wastewater Treatment Plants, Landfills, Remediated Soil Application Sites, Surface Water Flow Pathway, Potential for Groundwater Infiltration, Other:

When: NA
Migration Potential:
Other Notes:

Physical Setting of Potential AOPI

Topography and Floor/Ground Surface (note vegetation/pavement, soil composition/color/staining, how surface may influence sampling access, and evidence of erosion especially near point of possible release):

In basement, concrete floor.
Sealed floor/matted.

Infrastructure (note entry to sewer system via drop inlets/storm drains/sanitary sewer/WWTP, pavement, buildings, etc):

NA

ARCADIS Design & Consultancy for natural and built assets

On- or Off-Installation Monitoring or Drinking Water Wells (number and proximity to potential AOPI, note access and condition of wells):

NA

Surface Water Bodies (proximity to and relative drainage direction and receptor, note ponding or standing water nearby):

NA

Surface Drainage within or adjacent to (natural or manmade, flow direction, lining [stone, vegetation, other], blockages):

NA

Site Status (current or past IRP and decision [NFA, MNA, system, etc.], previous remedial actions or other PFAS investigations):

Small hazardous waste storage (1 gal or less)
No storage of PFAs chemicals.

Miscellaneous Notes

Fire suppression system is Inergen-Ansul.

NA= Not applicable.

Health and Safety Considerations

* Please note any H&S Concerns here (access, overhead/buried utilities, steep terrain, biological hazards, etc.)

None.

APPENDIX L

Memorandum of Agreement between Town of Natick Fire Department and Natick Soldier Systems Center

W038AA-16153-005

MEMORANDUM OF AGREEMENT

COMMANDER, HEADQUARTERS UNITED STATES ARMY GARRISON NATICK

AND THE

NATICK FIRE DEPARTMENT

This Memorandum of Agreement, entered unto on the 28 day of SEPT, 2016 by and between Fire Chief Richard A. White, as the executive and administrative head of the Town of Natick Fire Department (NFD), and Lieutenant Colonel Ryan L. Raymond, Garrison Commander, United States Army Garrison (USAG) Natick, Solider Systems Center (collectively "the parties").

The parties agree to this Memorandum of Agreement as follows:

1. At the request of USAG Natick, the NFD shall provide the following services:

   a. 911 emergency and routine Fire, Hazardous Material and Medical response services to USAG Natick Main Installation and two Army Family Housing (AFH) locations, Heritage Lane and 2-6 General Greene Avenue, located within the Town of Natick, Massachusetts.

2. General Terms

   a. The NFD assistance provided to USAG Natick shall be at no cost to the United States.

   b. Notification to the USAG Natick Police Operations Desk will be made as soon as possible to 508-233-4201/4202 when an emergency or routine call for service has been received.

   c. To the extent permitted by law, each party to this agreement agrees to hold the other harmless, legally and otherwise, from any damages or injuries arising from or occurring during periods of support on USAG Natick.

   e. While the Garrison Commander, USAG Natick retains command and control over activities on the installation, the Garrison Commander has the discretion to appoint the senior member of any NFD response as the Incident Commander, as warranted and appropriate.

   f. This agreement becomes effective immediately upon signature of both parties. It shall remain in full force and for three years of the signed date; however, either party may terminate this agreement upon ninety (90) days written notice. Amendments and modifications to this agreement may be made upon written agreement by all parties thereto.

Date: 9/28/16

Ryan L. Raymond
LTC, AG, USA
Commander

Date: 08-25-16

Richard A. White
Fire Chief
Town of Natick, Massachusetts

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