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NASJRB WILLOW GROVE  
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COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION AND LIABILITY ACT  
TIME-CRITICAL ACTION MEMORANDUM NAS WILLOW GROVE PA  
9/29/2015  
BASE REALIGNMENT AND CLOSURE PROGRAM MANAGEMENT OFFICE EAST



DEPARTMENT OF THE NAVY  
BASE REALIGNMENT AND CLOSURE  
PROGRAM MANAGEMENT OFFICE EAST  
4911 SOUTH BROAD STREET  
PHILADELPHIA, PA 19112-1303

**CERCLA TIME-CRITICAL ACTION MEMORANDUM**

Date: 29 September 2015

From: Willington Lin, BRAC Environmental Coordinator, Naval  
Facilities Engineering Command, BRAC Program Management  
Office, East

Subj: Time-Critical Removal Action, Perfluorinated Compounds in  
Groundwater, Naval Air Station Joint Reserve Base, Willow  
Grove, PA. NPL Site ID # PAD987277837

**I. PURPOSE**

The purpose of this Action Memorandum is to document the decision by the Department of the Navy (Navy) to conduct a time-critical removal action (TCRA) to mitigate potential public exposure to perfluorinated compounds (PFCs) in drinking water at the location of, and communities surrounding, the former Naval Air Station Joint Reserve Base (NAS JRB), Willow Grove, Pennsylvania (the Site).

The actions completed, underway, or planned are in response to discovery of two perfluorinated compounds in samples from groundwater supply wells north and west of the Site. Public health of nearby residents will be protected by completing the actions described in this Action Memorandum.

The Department of Defense (DoD) has the authority to undertake Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) response actions, including removal actions, under Title 42 of the United States Code (U.S.C.) Section (§) 9604, 10 U.S.C. § 2705, and federal Executive Orders 12580 and 13016.

A Federal Facilities Agreement (FFA) was finalized June 27, 2005 between the Navy, the U.S. Environmental Protection Agency (EPA), and the Pennsylvania Department of Environmental Protection (PADEP). The FFA ensures that environmental impacts associated with the sites at NAS JRB Willow Grove are fully investigated, and that proper response actions are taken. The FFA also requires preparation and annual updates via a Site Management Plan (SMP).

**II. SITE CONDITIONS AND BACKGROUND**

Former NAS JRB Willow Grove (EPA ID PAD987277837) is located in Horsham Township, Montgomery County in southeastern Pennsylvania. The primary mission of NAS JRB Willow Grove was to provide support for operations involving aviation training activities and to train Navy reservists. NAS JRB Willow Grove has supported DoD tenants such as the Marine Corps

Reserve and the Army Reserve, and shared facilities/services with the Air Force Reserve.

NAS JRB Willow Grove was officially disestablished on March 30, 2011; in September 2011, it was transferred to Navy Base Realignment and Closure (BRAC) Program Management Officer (PMO) and entered caretaker status. Structures at the Site included runways, taxiways, hangars, industrial facilities, and administrative buildings. All structures are currently vacant and awaiting redevelopment.

**A. Site Description**

**1. Removal site evaluation**

Discharges of Aqueous Film Forming Foam (AFFF) may have occurred during firefighter training activities and spills of AFFF during airfield operations. Perfluorooctanoic Acid (PFOA) and/or Perfluorooctane Sulfonate (PFOS) may be components of some AFFF solutions. In 2011, PFOA and PFOS were detected in groundwater at Installation Restoration Program (IRP) Site 5 - Former Fire Fighting Training Area (Operable Unit [OU]-2), per the 2012 Site 5 Record of Decision for OU-2. Attachment 1 is the Site Location Map, taken from the Fiscal Year 2014 Site Management Plan.

In July 2014, the Navy initiated sampling of a representative set of existing monitoring wells at the Site for PFOA and PFOS, which are emerging contaminants with recently established Provisional Health Advisory (PHA) levels. The Navy conducted the sampling in accordance with DOD Instruction 4715.18 (Emerging Contaminants) because the contaminants could be present based on Site history. PFOA and PFOS were reported in a majority of the wells sampled.

Analytical results from samples collected by Horsham Water and Sewer Authority (HWSA) under the United States Environmental Protection Agency (USEPA) Unregulated Contaminant Monitoring Rule 3 (UCMR3) for public drinking water systems identified PFOS at concentrations exceeding the PHA levels in Municipal Supply Wells #26 and #40, and below the PHA levels in Well #21. HWSA ceased operation of Wells #26 and #40 on July 30, 2014; and provided notice to their customers in early August 2014.

**2. Physical location**

- The Site is located in Horsham Township, PA, approximately 20 miles north of the city of Philadelphia. The Site occupies approximately 900 acres of 1,100 total acres the Department of Defense (DoD) maintained at the Air Station. The Horsham Air Guard Station (HAGS) occupies approximately 200 acres of land in the northeastern section of the Air Station and shared common facilities with the NAS JRB. The Site comprises flat to slightly rolling terrain and is generally bounded by State Route 611 to the east, State Route 463 to the southwest, and Keith Valley Road to the

north. The Site is surrounded by residential, commercial, and industrial property. Drinking water in the surrounding area is provided by both private and municipal wells.

**3. Site characteristics**

- Surface water discharges from numerous outfalls around the perimeter of the Site, eventually discharge to Pennypack Creek to the southwest and Park Creek to the north.
- The nature of groundwater flow is complex, but flows generally to the west and northwest from the Navy portions of the Site. The water table occurs within the bedrock at depths of about 20 to 25 feet, at the former fire-fighting training area (Site 5).

**4. Release or threatened release into the environment of a hazardous substance, or pollutant or contaminant.**

- This TCRA is intended to address PFOA and PFOS, which are not list hazardous substances as defined by section 101(14) of CERCLA, but are considered pollutants or contaminants as defined by section 101(33) of CERCLA. However, other CERCLA hazardous substances are being addressed at the Site under the IRP, including solvents, metals, PCBs, pesticides, herbicides, and dioxins.
- Preliminary sampling has shown PFOA and PFOS at or above the PHA levels in approximately 30 on-Site wells, 36 residential wells, and 2 municipal wells. Attachment 2, dated September 1, 2015, shows the locations of off-Site private wells with PHA detections.
- Discharges of AFFF in firefighter training and hangar areas have likely resulted in the widespread distribution of PFOA and PFOS in groundwater at the Site. Off-Site migration has been documented, and is likely exacerbated by historical pumping of off-Site wells. PFOA and PFOS are highly mobile in groundwater, highly stable, and not subject to significant degradation.

**5. National Priorities List (NPL) Status**

NAS JRB Willow Grove is on the NPL and is being investigated under the DoD's Installation Restoration Program (IRP). A total of 12 IRP sites at NAS JRB Willow Grove are in various stages of the multi-step process toward final disposition that the Navy is pursuing jointly with state and Federal regulatory agencies.

**B. Other Actions To-Date**

A list of NAS JRB Willow Grove IRP sites, status, and locations are presented in Attachment 3 and 4, taken from the Fiscal Year 2014 Site Management Plan.

**C. State and Local Authorities' Roles**

**1. State and local actions to-date**

- The Navy is the lead federal agency at the Site pursuant to the Defense Environmental Restoration Act at 10 U.S.C §§ 2701 through 2710 and CERCLA, the National Contingency Plan (NCP), and the delegation of Presidential authority under federal Executive Orders 12580 and 13016. Pursuant to 10 U.S.C. § 2705, the Navy is required to ensure that state and local officials be given timely opportunity to review and comment on the Navy's proposed response actions. State and local authorities have not undertaken any removal actions at the Site; however, they provide oversight of studies and actions conducted by the Navy. The Pennsylvania Department of Environmental Protection (PADEP) provides oversight of actions and review of documents for the Site.
- The local community of Horsham Township is actively engaged and is supportive of the Navy's actions to protect their citizens.
- The Restoration Advisory Board meets quarterly to discuss ongoing cleanup issues at the Site. Meetings are held at the Horsham Township Library and are open to the public.
- Horsham Water and Sewer Authority has suspended pumping from the impacted Municipal Wells #26 and #40, and has notified its customers of the sampling results at or above the PHA levels.

**2. Potential for continued State/local response**

The Navy is in negotiations with HWSA to install treatment on impacted municipal wells and to extend public water to residences with impacted private wells. This will be further evaluated and presented in a future CERCLA Environmental Evaluation/Cost Analysis (EE/CA).

**III. THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES**

This Site meets the requirement of a threat to public health or welfare or a threat to the environment for initiating a removal action due to

the potential exposure of nearby human populations to pollutants at levels exceeding the USEPA PHA levels. PFOA and PFOS have been found in both municipal and private water supply wells at levels exceeding respective PHA levels.

#### **IV. ENDANGERMENT DETERMINATION**

Actual or threatened releases of pollutants and contaminants from this Site may present an imminent and substantial endangerment to public health, or welfare, or the environment.

#### **V. PROPOSED ACTIONS AND ESTIMATED COSTS**

Proposed actions include sampling of private wells and providing bottled water temporarily to residences with wells impacted by PFOA/PFOS at or above the PHA levels. The estimated cost for these actions is \$908,000. These actions have been or will be implemented through Interagency Agreements between US EPA Region 3 and the Navy.

##### **A. Proposed Actions**

###### **1. Proposed action description**

- Identify residences with private wells potentially impacted by PFOA/PFOS from the Site and conduct groundwater sampling, laboratory analysis, and data validation for PFOA/PFOS.
- Residences with validated results at/above the PHA levels for PFOA and/or PFOS will be immediately provided temporary bottled water service for drinking and cooking purposes.
- Private residential wells having validated PFOA/PFOS results greater than 25% of the PHA, but below the PHA, will be monitored.

These actions will mitigate potential human exposure to potable water impacted by PFOA/PFOS at/above the PHA levels in the most expeditious and cost effective manner. A Remedial Investigation (RI) that is currently underway will fully evaluate the nature and extent of PFOA/PFOS contamination both on- and off-Site. The need for additional remedial actions will be determined after evaluating the data gathered during the RI. The RI began in 2015 and is expected to be completed in 2016.

###### **2. Contribution to remedial performance**

The proposed actions will contribute to the efficient performance of the expected long-term remedial action with respect to the release of PFOA and PFOS to groundwater. A long-term remedial action is anticipated,

but this TCRA will mitigate the immediate threat to human health by reducing further potential exposure to drinking water impacted by PFCs in groundwater.

**3. Applicable or relevant and appropriate requirements (ARARs)**

This TCRA complies with the following ARARs:

Federal

- Safe Drinking Water Act (SDWA)
- Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)
- Resource Conservation and Recovery Act (RCRA), Solid and Hazardous Waste Management Regulations
- USEPA Provisional Health Advisory levels for PFOA and PFOS
- Department of Defense Instruction 4715.18, dated June 11, 2009, "Emerging Contaminants (EC)"

State

- Pennsylvania Solid and Hazardous Waste Management regulations

**4. Project schedule**

Provision of bottled water commences immediately upon receipt of validated laboratory results at or above the PHA levels for PFOA and/or PFOS. The provision of bottled water for drinking and cooking purposes will continue until a permanent response action can occur.

**B. Estimated Costs**

<b>EXHIBIT 1. REMOVAL ACTION PROJECT CEILING COST ESTIMATE</b>	
<u>Interagency Agreement with USEPA:</u>	
Private Well Sampling with provision of Temporary Bottled Water	\$757,000
Subtotal	\$757,000
Contingency 20%	<u>\$151,000</u>
<b>TOTAL REMOVAL ACTION PROJECT CEILING</b>	<b>\$908,000</b>

**VI. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN**

Delay or failure to take action would increase public health risks due to potential prolonged exposure to drinking water at or above the PHA levels for PFOA and/or PFOS.

**VII. OUTSTANDING POLICY ISSUES**

The removal involves addressing contamination based on USEPA drinking water PHA levels, rather than a CERCLA risk assessment.

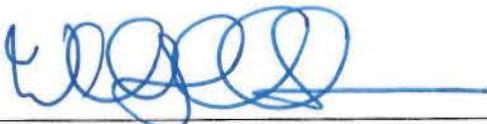
**VIII. ENFORCEMENT**

This TCRA is being undertaken voluntarily by the Navy in accordance with CERCLA and the FFA for NAS JRB Willow Grove. The regulatory agencies are anticipated to remain in an oversight role for the duration of the TCRA, reviewing sampling results to ensure compliance with regulations under CERCLA.

**IX. RECOMMENDATION**

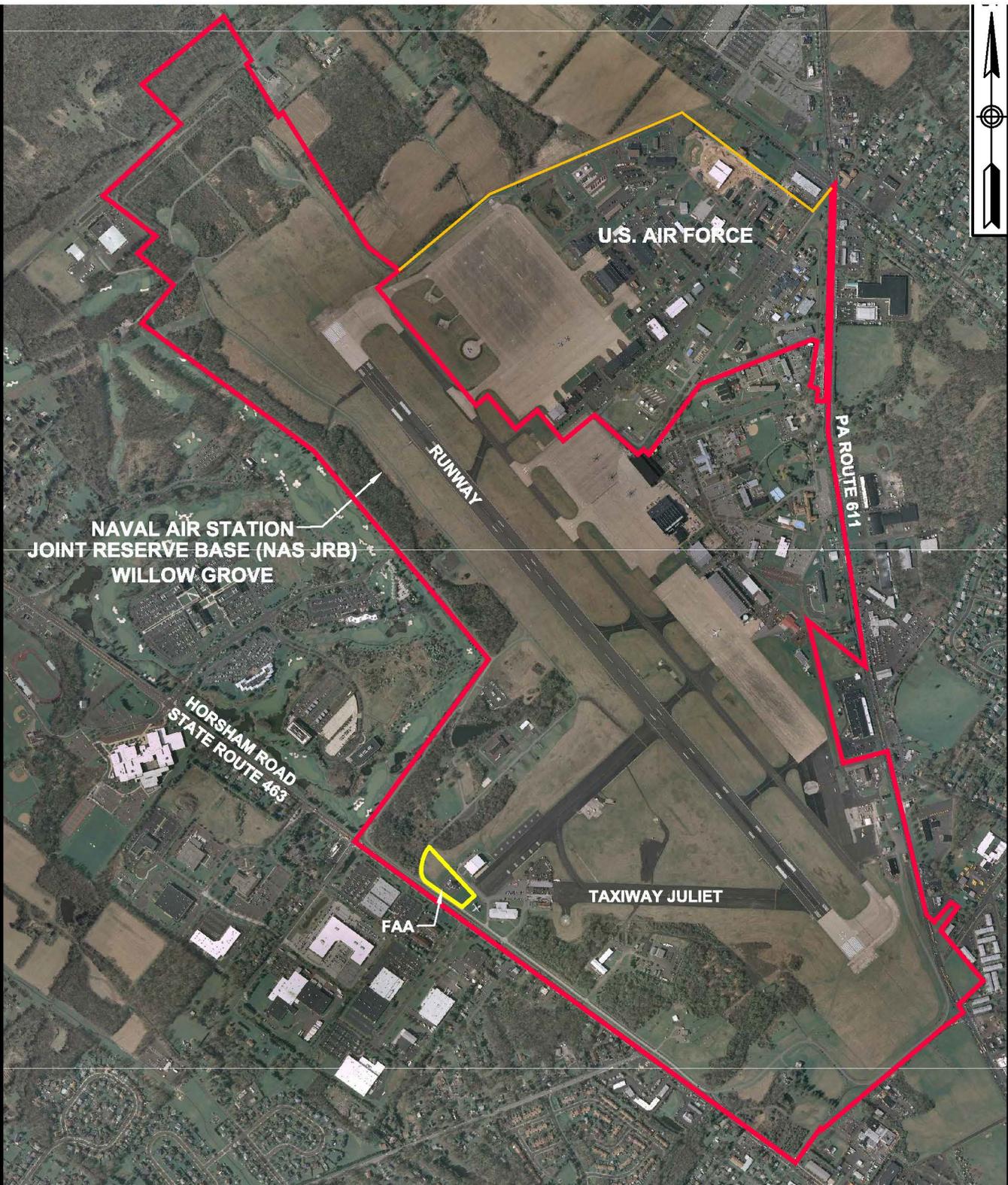
- This Action Memorandum represents the selected removal action for the Site, developed in accordance with CERCLA as amended, and is consistent with the NCP. This decision is based on the administrative record for the Site.
- The provision of clean drinking water will reduce the potential human health risks from exposure to PFOA/PFOS within and in the areas surrounding NAS JRB Willow Grove. The Navy therefore recommends implementing this proposed TCRA.

Approvals:

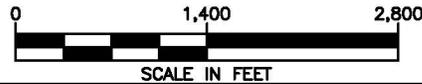


Willington Lin  
BRAC Environmental Coordinator  
BRAC Program Management Office East  
By Direction

Date: 29 SEP 2015

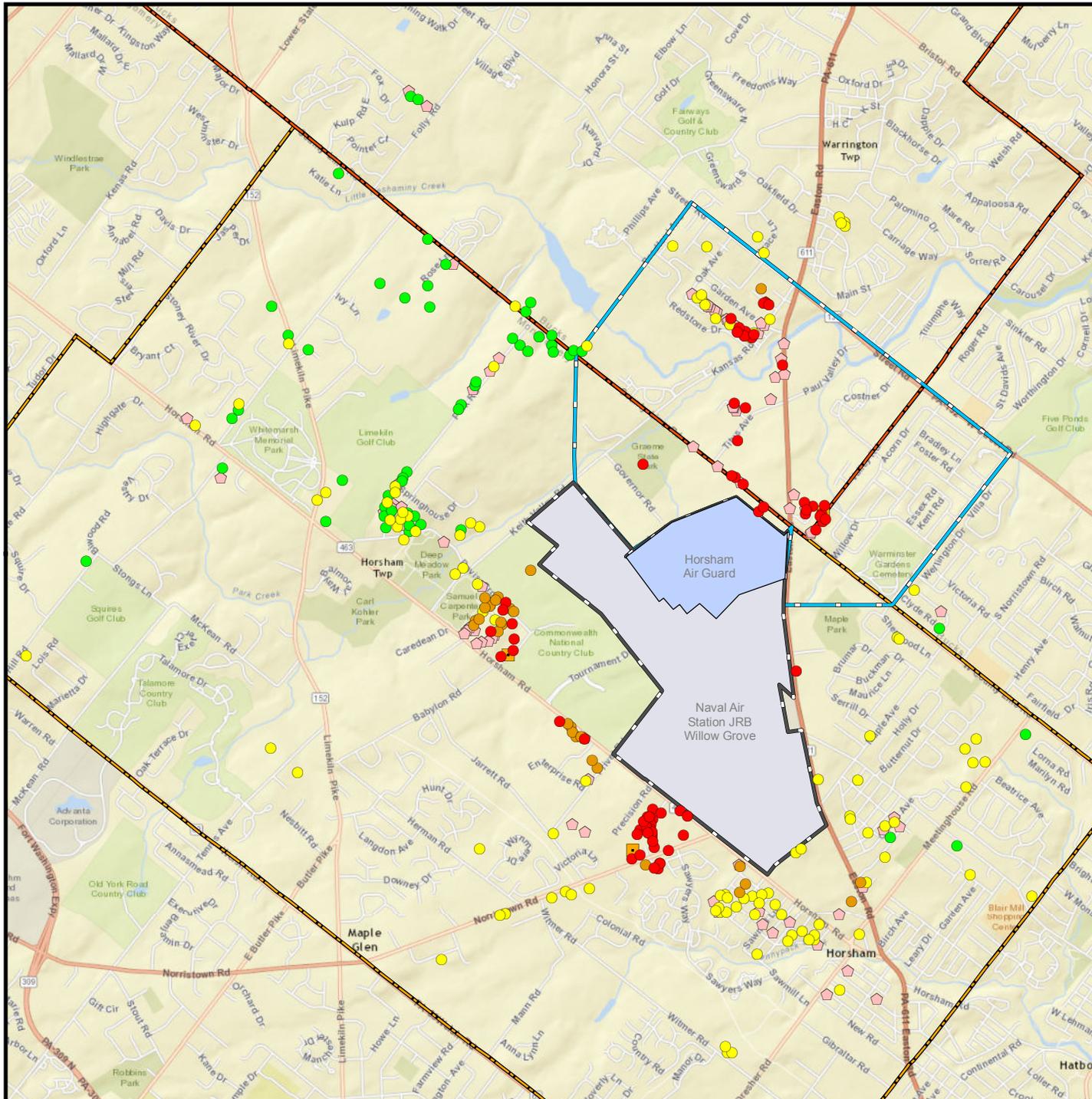


AERIAL BASE MAP PROVIDED BY THE PAMAP PROGRAM,  
 PA DEPARTMENT OF CONSERVATION AND NATURAL  
 RESOURCES, BUREAU OF TOPOGRAPHIC AND GEOLOGIC SURVEY



FACILITIES LOCATION MAP  
 NAS JRB WILLOW GROVE  
 WILLOW GROVE, PENNSYLVANIA

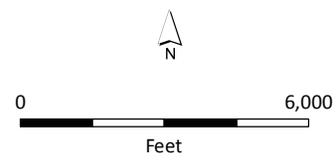
SCALE AS NOTED	
FILE 112G02014BM01	
REV 0	DATE 06/14/13
FIGURE NUMBER FIGURE 1-1	



- Legend**
- Provisional Health Advisory Level (PHAL)  
PFOA 0.4 µg/L, PFOS 0.2 µg/L
  - PFOS and/or PFOA detected at/above the PHALs
  - PFOS and/or PFOA detected at/above ¼ the PHALs
  - PFOS and/or PFOA detected at/above ¼ the PHALs (supplied water)
  - PFOS and/or PFOA detected but below ¼ the PHALs
  - Non-detect for PFOS or PFOA
  - Location sampled (no results yet)
  - ◇ Not scheduled for sampling yet
  - Horsham Air Guard
  - Former NAS JRB Willow Grove
  - Air Force Administrative Order Boundary
  - Horsham Township
  - Warrington Township

Imagery: ESRI, GeoEye,  
Digital Globe 2013  
Sample Data: Weston Generated

**Coordinate System:**  
WGS84 UTM Zone 18N Feet



Willow Grove Naval Air Station Site

**Figure 1**  
PFC Sample Location Map  
as of 09/01/2015

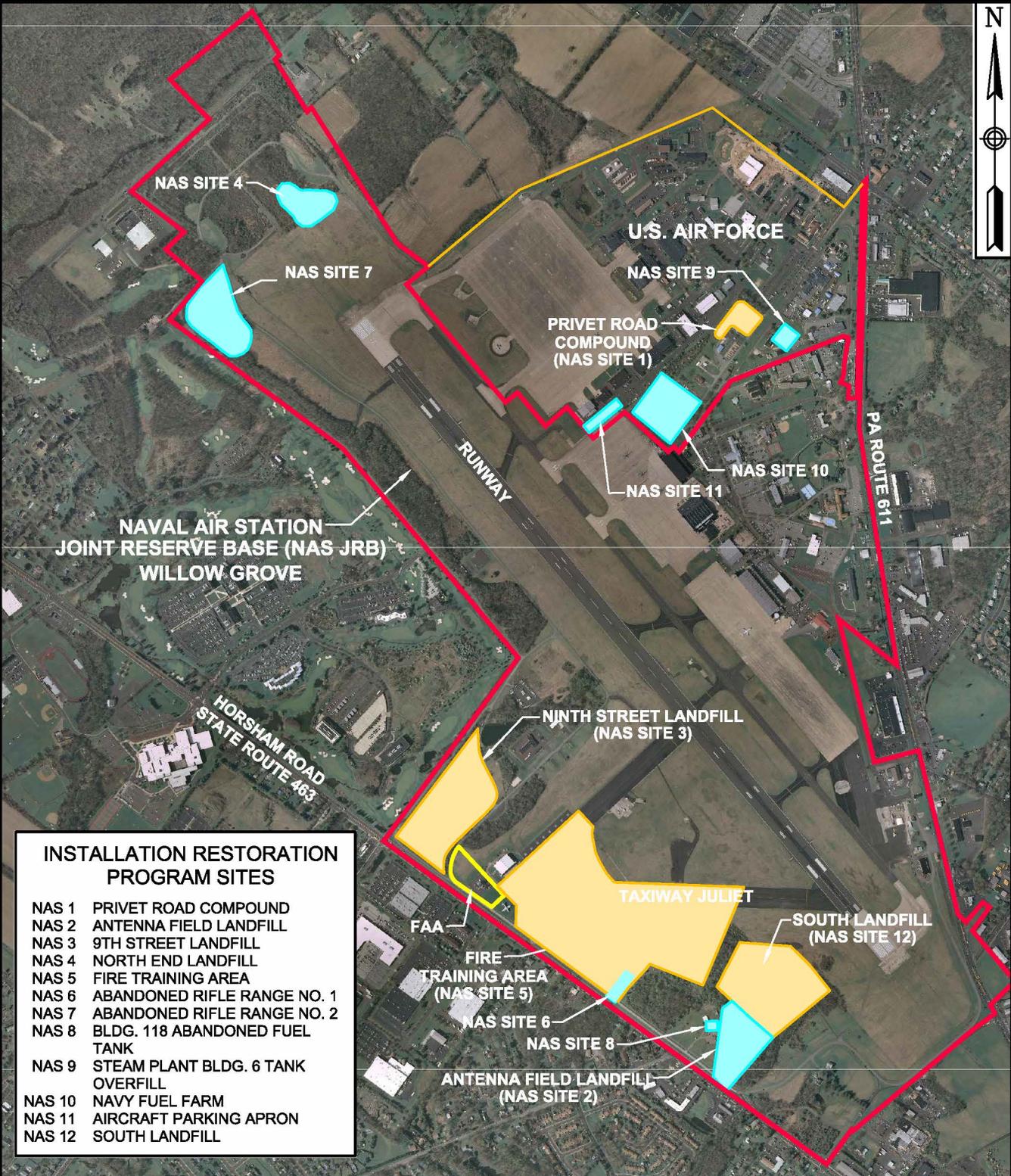
TDD#: W501-15-07-022/027  
Contract: EP-S3-15-02  
Prepared: 9/3/2015



File: Y:\EPA\_Region\_III\Willow\_Grove\_PFOA\MXD\Sample\_loc\_map\_09012015\_landscape.mxd, 9/3/2015 10:00:20 AM, ricks

**TABLE 1-1**  
**SITE SUMMARY**  
**INSTALLATION RESTORATION PROGRAM**  
**NAS JRB WILLOW GROVE**  
**WILLOW GROVE, PENNSYLVANIA**

<b>SITE</b>	<b>NAME</b>	<b>OPERABLE UNIT (OU)</b>	<b>STATUS</b>
1	Privet Road Compound	Soil - OU 1 Groundwater - OU 3	Soil (OU 1) NFA ROD signed September 2006. Groundwater (OU 3) Interim ROD signed September 2008. Groundwater (OU-3) IRACR Signed December 2011.
2	Antenna Field Landfill	Soil - OU 5 Groundwater- OU 9	No Action ROD Signed June 17, 2010
3	Ninth Street Landfill	Soil - OU 6 Groundwater- OU 10	RI completed October 2011/FS Pending
4	North End Landfill	---	Consensus Agreement for No Action Jan. 2009
5	Fire Training Area	Soil - OU 4 Groundwater - OU 2	Soil (OU 4) NFA ROD signed Sept. 2007 Groundwater (OU 2) ROD signed Sept. 2012. Groundwater (OU2) RACR Signed September, 2014
6	Abandoned Rifle Range No. 1	---	Consensus Agreement for No Action December 2007
7	Abandoned Rifle Range No. 2	---	Consensus Agreement for No Action August 2008
8	Building 118 Abandoned Fuel Tank	---	NFA Agreement October 2006
9	Steam Plant Building 6 Tank Overfill	---	NFA Agreement October 2006
10	Navy Fuel Farm	---	NFA at this time Property transferred to Air Force
SSA 11	Aircraft Parking Apron	---	Eliminated From Consideration
12	South Landfill	OU 11	Final RI February 2014, FS to Follow



**INSTALLATION RESTORATION PROGRAM SITES**

NAS 1	PRIVET ROAD COMPOUND
NAS 2	ANTENNA FIELD LANDFILL
NAS 3	9TH STREET LANDFILL
NAS 4	NORTH END LANDFILL
NAS 5	FIRE TRAINING AREA
NAS 6	ABANDONED RIFLE RANGE NO. 1
NAS 7	ABANDONED RIFLE RANGE NO. 2
NAS 8	BLDG. 118 ABANDONED FUEL TANK
NAS 9	STEAM PLANT BLDG. 6 TANK OVERFILL
NAS 10	NAVY FUEL FARM
NAS 11	AIRCRAFT PARKING APRON
NAS 12	SOUTH LANDFILL

**LEGEND**

	ACTIVE SITE
	COMPLETED SITE*
* SEE TABLE 1	



AERIAL BASE MAP PROVIDED BY THE PAMAP PROGRAM, PA DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES, BUREAU OF TOPOGRAPHIC AND GEOLOGIC SURVEY

0 1,400 2,800  
SCALE IN FEET



**LOCATION OF IR SITES  
NAS JRB WILLOW GROVE  
WILLOW GROVE, PENNSYLVANIA**

SCALE AS NOTED	
FILE 112G02014BM01-1	
REV 0	DATE 06/14/13
FIGURE NUMBER FIGURE 3-1	