FINAL

ACTION MEMORANDUM

FOR

FIRING RANGE 5 AND CONSTRUCTION DEBRIS PILE REMOVAL ACTION

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
PLUM BROOK STATION
SANDUSKY, OHIO

Prepared for:

NASA Glenn Research Center
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July 17, 2020

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NATIONAL AERONAUTICS SPACE ADMINISTRATION
JOHN H. GLENN RESEARCH CENTER

MEMORANDUM

DATE: July 17, 2020

SUBJECT: Approval and Funding for a Non-Time-Critical Removal Action at Firing Range 5 and Construction Debris Pile, NASA Plum Brook Station, Sandusky, Erie County, Ohio

FROM: Christie J. Myers, Acting Chief
Environmental Management Office
NASA Glenn Research Center

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THROUGH: Susan L. Kevdzija, Deputy Director
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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ATTACHMENTS

ACRONYMS AND ABBREVIATIONS

ACM	Asbestos-Containing Material
AM	Action Memorandum
ARAR	Applicable or Relevant and Appropriate Requirement
BGSU	Bowling Green State University
bgs	Below Ground Surface
CDP	Construction Debris Pile
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CIP	Community Involvement Plan
COC	Chemical of Concern
COMETS	Construction, Maintenance, Environmental and Testing Services
cPAH	Carcinogenic Polycyclic Aromatic Hydrocarbon
EE/CA	Engineering Evaluation/Cost Analysis
EO	Executive Order
ESV	Ecological Screening Value
FE	Federal Endangered
FT	Federal Threatened
GRC	Glenn Research Center
HQ	Hazard Quotient
ID	Identifier
LBP	Lead-Based Paint
LDR	Land Disposal Restriction
MCL	Maximum Contaminant Level
mg/kg	Milligrams per Kilogram
NACA	National Advisory Committee for Aeronautics
NASA	National Aeronautics and Space Administration
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
NTCRA	Non-Time-Critical Removal Action
OAC	Ohio Administrative Code
Ohio EPA	Ohio Environmental Protection Agency
ORAM	Ohio Rapid Assessment Method
PA	Preliminary Assessment
PAH	Polycyclic Aromatic Hydrocarbon
PBOW	Plum Brook Ordnance Works
PFAS	Per- and Polyfluoroalkyl Substances
PBS	Plum Brook Station
PRG	Preliminary Remediation Goal
PVC	Polyvinyl Chloride
RA	Removal Action
RAO	Removal Action Objective
RAWP	Removal Action Work Plan
RCI	Reactivity, Corrosivity, and Ignitability
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
RSE	Removal Site Evaluation
RSL	Regional Screening Level
SAIC	Science Applications International Corporation

ACRONYMS AND ABBREVIATIONS (Continued)

SEC	Space Environments Complex
SEMS	Superfund Enterprise Management System
SI	Site Investigation
SPF	Space Power Facility
SVOC	Semivolatile Organic Compound
SWMU	Solid Waste Management Unit
TCLP	Toxicity Characteristic Leaching Procedure
URS	URS Corporation
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VSI	Visual Site Inspection
yd3	Cubic Yard

OVERVIEW

A PURPOSE

The National Aeronautics and Space Administration (NASA), in accordance with its delegated authority under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 104 and Executive Order (EO) 12580, has agreed to proceed with a non-time-critical removal action (NTCRA) for polycyclic aromatic hydrocarbon (PAH)-contaminated soil at the earthen backstop and construction debris interspersed with asbestos-containing material (ACM) and lead-based paint (LBP) at Firing Range 5 and the Construction Debris Pile (CDP) located at the Plum Brook Station (PBS) in Sandusky, Ohio.

This Action Memorandum (AM) was prepared by Leidos under the Construction, Maintenance, Environmental and Testing Services (COMETS) Contract Number 80GRC018C0022, Subcontract Number FA8-1-S1, Task Order Number E124. This AM is the primary decision document in establishing the Administrative Record for selecting the NTCRA responses per Section 113(k) of CERCLA and provides the following in accordance with the *Superfund Removal Guidance for Preparing Action Memoranda* (USEPA 2009):

- Determines the need for a CERCLA removal action (RA),
- Authorizes the RA,
- Identifies the action and cleanup levels (if applicable), and
- Explains the rationale for the removal response.

B NON-TIME-CRITICAL REMOVAL ACTION

The NTCRA can provide substantial risk reduction at a site by addressing specific problems without requiring time-consuming investigation and decision-making (USEPA 1992). The NTCRA generally attempts to control the source of contamination and can be used to remediate a site completely (DOE 1998). The purpose of the NTCRA at Firing Range 5 and the CDP is to remove the sources of contamination, allowing for potential future unrestricted use.

This NTCRA process follows the Administrative Record requirements presented in Exhibit 2 of the *Superfund Removal Guidance for Preparing Action Memoranda* (USEPA 2009) and shown in **Figure 1**. NASA is the lead agency responsible for implementing the NTCRA and developed the *Revised Final Firing Range 5 and Construction Debris Pile Removal Site Evaluation Report* (Leidos 2019) that contains all of the requirements of, and is equivalent to, an Engineering Evaluation/Cost Analysis (EE/CA) in accordance with *Guidance for Conducting Non-Time-Critical Removal Actions under CERCLA* (USEPA 1993).

C PUBLIC NOTIFICATION AND COMMENT PERIOD

Section 113(k)(2) of CERCLA provides for involving communities affected by response decisions at Superfund sites. To ensure public involvement of this NTCRA, NASA issued a notice of availability for the Firing Range 5 and the CDP Removal Site Evaluation (RSE) Report on January 17, 2020, seeking public input of the final remedy selection. The notice of availability was published in the local newspaper, the *Sandusky Register*, on the same date mentioned above. The RSE Report and other project-related documents were made available to the public in the Information Repository maintained at the Bowling Green State University (BGSU) Firelands Library located at 1 University Drive, Huron, Ohio. No written comments were received during the public comment period.

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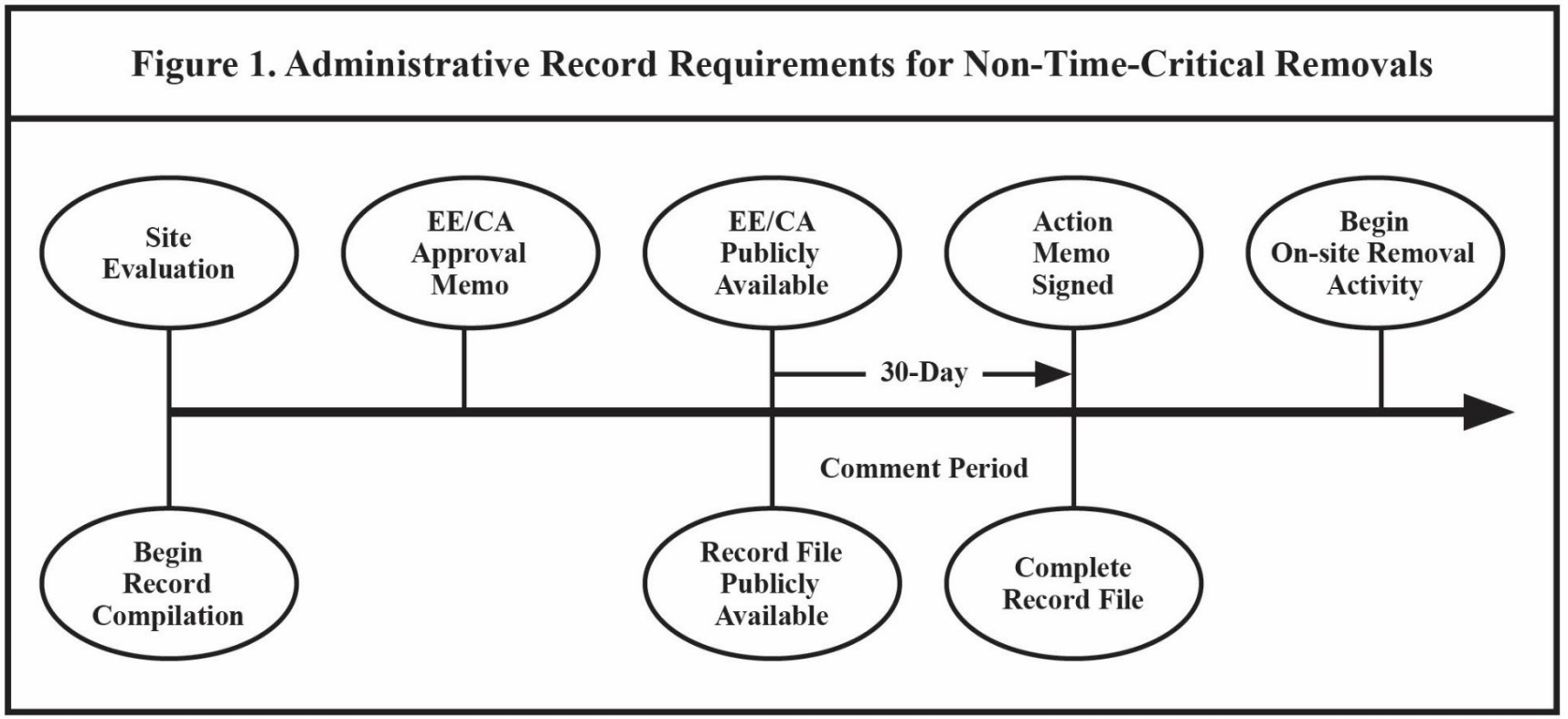

Figure 1. Administrative Record Requirements for Non-Time-Critical Removals

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NASA is developing a Community Involvement Plan (CIP) for seven sites at PBS under the CERCLA process, including Firing Range 5 and the CDP, to ensure the public has convenient access to information regarding project progress. The NASA PBS community relations program interacts with the public through news releases and public meetings with local officials, interest groups, and the general public.

D ACTION MEMORANDUM ORGANIZATION

This document meets the AM purpose and follows the basic AM outline, as presented in the *Superfund Removal Guidance for Preparing Action Memoranda* (USEPA 2009).

E NASA CERCLA AUTHORITY

Section 104 of CERCLA provides broad response action authority to the President. The President has delegated this authority to the heads of Executive departments and agencies by EO 12580 (President of the United States of America, January 29, 1987), *Superfund Implementation*, as amended. In general, EO 12580 delegated to NASA response authority "…with respect to remedial actions for releases or threatened releases which are not on the National Priorities List ("the NPL") and removal actions other than emergencies, where either the release is on or the sole source of the release is from any facility or vessel under the jurisdiction, custody or control of ..." NASA.

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PART I: PURPOSE

The purpose of this AM is to request and document approval of the selected RA of PAH-contaminated soil at the earthen backstop and construction debris interspersed with ACM and LBP at Firing Range 5 and the CDP located at the NASA PBS in Sandusky, Ohio.

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PART II: SITE CONDITIONS AND BACKGROUND

PBS is located in southern Erie County, Ohio, approximately 3 miles south of Sandusky, Ohio, and approximately 50 miles west of the NASA John H. Glenn Research Center (GRC) at Lewis Field in Cleveland, Ohio (**Figure 2**). The PBS facility encompasses approximately 6,740 acres (Leidos 2018). Most of PBS is in Perkins and Oxford Townships, with some lands in Huron and Milan Townships.

NASA is implementing an NTCRA process to address human health risk identified in the soil present in the Firing Range 5 Target Area and CDP interspersed with ACM and LBP materials at PBS. The selected action will remove the PAH-contaminated soil and debris piles interspersed with ACM and LBP materials to protect human receptors.

The U.S. Environmental Protection Agency (USEPA) site identifier (ID) for PBS is OH3800015379. Firing Range 5 and the CDP do not have a specific site ID assigned. The following subsections present the site conditions and background of the proposed removal area.

A SITE DESCRIPTION

Firing Range 5 and the CDP are co-located near the Space Environments Complex (SEC), formerly known as the Space Power Facility (SPF), in the southeastern portion of PBS (**Figure 3**). The bullet impact area utilized at the firing range is an earthen berm. The majority of the CDP is crushed concrete and steel reinforcements (e.g., rebar); however, grit from a sand blasting operation is also associated with the debris pile (Leidos 2016b).

Firing Range 5 was constructed in 1982 and used by private security staff for practice and yearly qualification until 1986 (URS 1996). The backstop is constructed of earth and is approximately 146 feet long and 8 feet high. Targets were located approximately 5 feet from the backstop. Shooting areas were set up at 75 and 150 feet. Subsequently, the firing range was used as a dumping ground. Sand blasting grit, concrete rubble, reinforcing steel, and other construction debris have been deposited along the front edge of the backstop, the southern edge of the range, and in front of the 150-foot shooting area (Leidos 2016b).

The CDP was generated in the late 1970s during modification of the SEC Building. The pile is approximately 8 feet high and covers approximately 1 acre (Leidos 2016b). The pile was identified in the 1998 *Preliminary Assessment/Visual Site Inspection (PA/VSI) Report for NASA Plum Brook Station* (TechLaw 1998) as "solid waste management units (SWMUs) 8-Space Power Facility Rubble Pile." In addition, a 1991 Preliminary Assessment (PA) report (SAIC 1991) identified sand blasting grit containing paint chips, asphalt, and metal debris at the end of the concrete pile. A portion of the debris pile also serves as the backstop for Firing Range 5. No other information is available about the pile. The firing range and the construction pile are currently overgrown with small trees and brush.

A.1 Removal Site Evaluation

Multiple environmental investigations have been conducted at NASA PBS for numerous sites across the facility. These investigations provided limited information on Firing Range 5 and the CDP and no environmental sample analytical results.

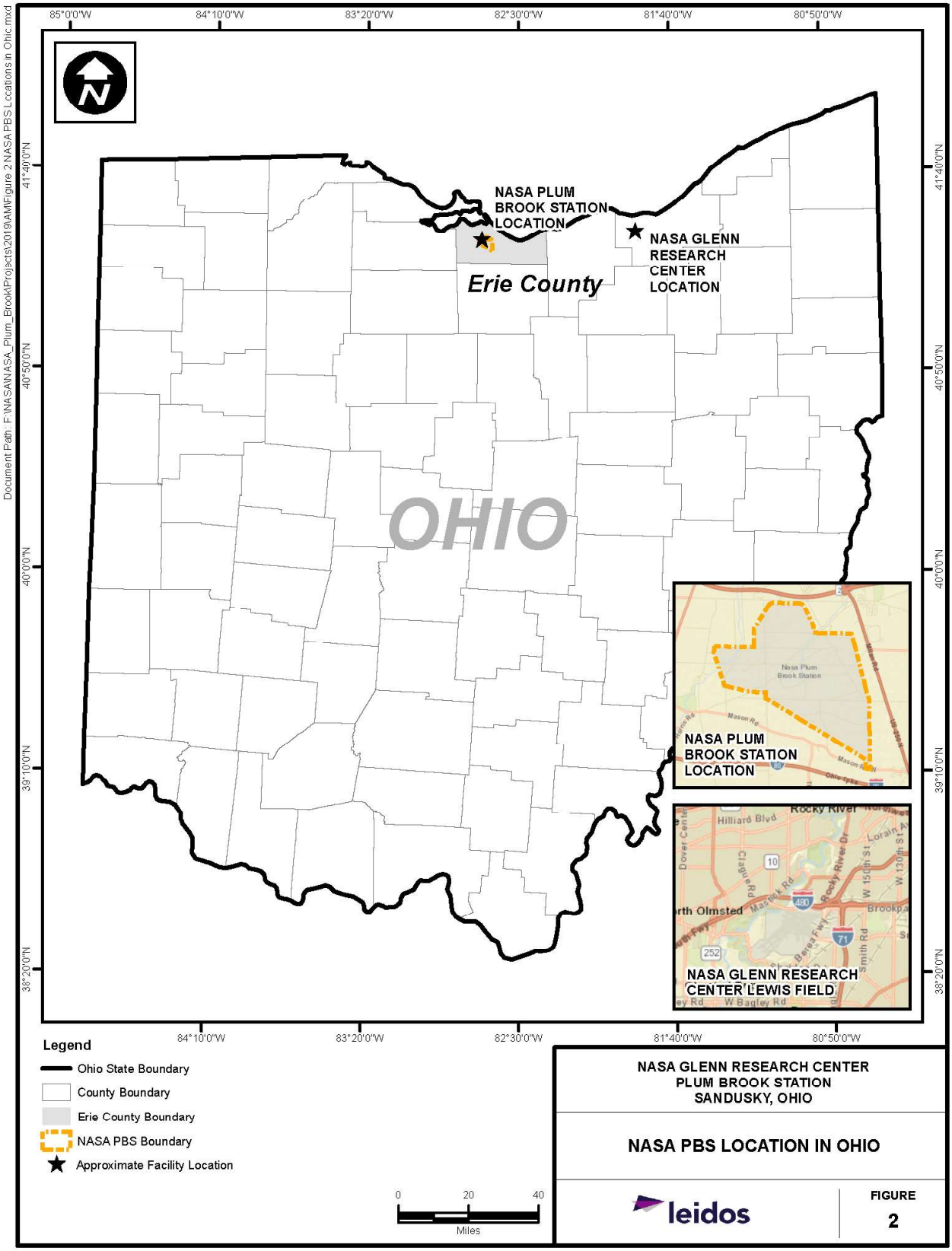

Figure 2. NASA PBS Location in Ohio

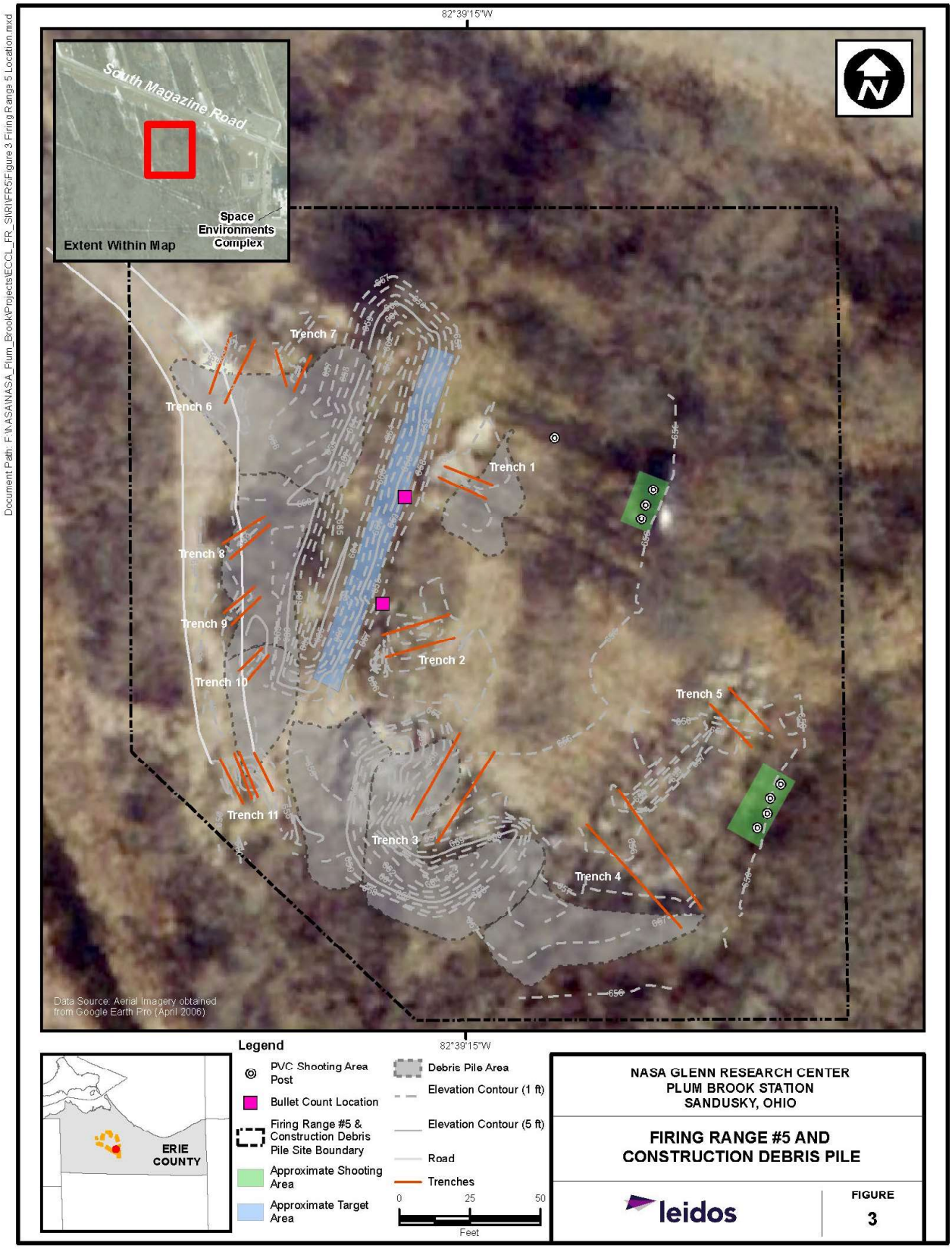

Figure 3. Firing Range 5 and Construction Debris Pile

These reports included:

- The *Plum Brook Station Preliminary Assessment* was conducted by Science Applications International Corporation (SAIC) in 1991 in accordance with USEPA regulations and guidance promulgated under CERCLA/Superfund Amendments and Reauthorization Act authority to determine if any release of hazardous substances from the facility had occurred that posed a potential threat to human health and the environment. The PA included recommendations for further investigations for 13 Operable Units (SAIC 1991) but did not include a recommendation for the firing ranges. In addition, the PA identified sand blasting grit containing paint chips, asphalt, and metal debris at the end of the concrete debris pile, of which a portion serves as the backstop for Firing Range 5.
- In 1996, URS Corporation (URS) prepared the *Work Plan for Site Investigation of Plum Brook Station Firing Ranges* (URS 1996). The work plan provided information on the physical setting and history of the firing ranges and identified concrete rubble, large reinforcing steel, and other soil debris dumped along the front edge of the Firing Range 5 backstop, along the southern edge of the range, and in front of the 150-foot shooting area.
- The PA/Visual Site Investigation (VSI) Report (TechLaw 1998) presents cursory information on Firing Range 5 and the CDP. A history of the operations at PBS and regulatory actions is included in the PA/VSI (TechLaw 1998). The PA/VSI included recommendations for further investigation for 20 SWMUs.

The first investigation to collect detailed information (including analytical data) on Firing Range 5 and the CDP was the Site Investigation (SI) conducted by SAIC in 2006. The SI was conducted under one field investigation, as described in the approved *Site Investigation of NASA Plum Brook Station Firing Ranges Sampling and Analysis Plan* (SAIC 2006), and the results are presented in the *NASA Plum Brook Station Firing Ranges and Construction Debris Pile Site Investigation Report* (SAIC 2010, Leidos 2016b).

The results of the 2006 SI soil samples collected within the vicinity of Firing Range 5 provide evidence of lead-impacted soil associated with the 75-foot shooting position firing lanes (SAIC 2010, Leidos 2016b). Soil results from samples collected in the impact berm resulted in lead exceedances of the site-specific background concentration (51.2 milligrams per kilogram [mg/kg]) at several locations within the 75-foot shooting position firing lanes, which represent the primary impact area. Considering the extensive sampling that was conducted to characterize the soil in the vicinity of the impact berm, additional investigative sampling was not recommended in the SI. However, based on the results of the characterization sampling, further remedial action was anticipated. The results of soil characterization for semivolatile organic compounds (SVOCs) indicated PAH contamination potentially associated with a combination of asphalt debris, ubiquitous anthropogenic sources, and range activities (i.e., clay target fragments). Because of PAH results above Preliminary Remediation Goals (PRGs)/Regional Screening Levels (RSLs) available at the time the SI was completed, clay target fragments and asphalt debris were identified as a concern at Firing Range 5.

The CDP was trenched with a backhoe to the underlying soil surface in 11 locations to expose the profile of the pile and the soil surface (SAIC 2006). In addition, five soil boring locations were sampled from areas adjacent to the CDP. The borings were located based on field observations such as stressed vegetation, ground discoloration, and/or debris materials outside of the pile. Soil samples were collected from the 0- to 1-foot depth interval, resulting in five samples for analysis of metals and SVOCs. The CDP was visually inspected to determine general content and to evaluate potential lead and asbestos contamination. Debris material samples were collected from suspected painted surfaces and suspected ACM during the initial walkover of the CDP. Lead-covered asbestos panels were found throughout the CDP. A total of 20 paint chip samples were collected from the CDP and analyzed for LBP. The debris piles were land surveyed

during the SI (SAIC 2010, Leidos 2016b). The CDP was divided into three sub-piles. The first pile contains approximately 667 cubic yards (yd^3) of all of the concrete rubble at the CDP. The second pile, located in front of the impact berm, contains approximately 34 yd^3 of sand/grit. The third pile, located behind the impact berm, contains approximately 370 yd^3 of sand/grit. The total amount of sand/grit is about 404 yd^3.

The results of the 2006 SI visual and land survey, and the debris samples collected from the CDP, provided evidence that ACM and LBP items are interspersed throughout the debris pile and that the sand blasting grit has been contaminated with residual lead from LBP (SAIC 2010, Leidos 2016b). The 2016 SI Report concluded that the presence of these contaminants throughout the debris pile will need to be thoroughly assessed prior to final disposal or reuse. The 2016 SI Report stated soil sampling within the trenches, completed through the CDP and adjacent to the debris pile, resulted in generally low-level detections of metals. A single exceedance of the mercury background concentration was noted; however, this concentration was well below the Region 9 residential PRG. In addition, several PAH exceedances were noted in CDP trench samples in the 2016 SI Report (Leidos 2016b). The CDP is known to contain sand blasting grit containing paint chips, asphalt, and metal debris. The 2016 SI Report stated the PAH exceedances can likely be attributed to the presence of the debris material (e.g., asphalt). It was recommended that further evaluation (i.e., a Remedial Investigation [RI] or an RSE) be performed for Firing Range 5 soils, the CDP underlying soils, and ACM (SAIC 2010, Leidos 2016b).

The RSE was conducted at Firing Range 5 and the CDP in February 2017 and updated in December 2019 in accordance with the *Multi-Site Remedial Investigation Sampling and Analysis Plan* (Leidos 2016a). A total of 20 soil and 3 groundwater samples were collected, including 4 duplicates (2 each for groundwater and soil) during the RSE. Sample locations were selected based on SI analytical results in order to further evaluate potential risk to ecological receptors and human health and further define the extent of contamination. Soil samples collected during the RSE were analyzed for metals and/or PAHs. Three pilot borings were installed (two borings to 10 feet below ground surface [bgs] at Firing Range 5, and one boring to 7.75 feet bgs at the CDP) into unconsolidated soils using a Geoprobe®. No saturated zones were identified in the Firing Range 5 boreholes. A saturated zone was identified at 5.1 feet bgs in the CDP borehole. Temporary wells consisting of 1-inch polyvinyl chloride (PVC) with 5-foot screens were installed in the boreholes. The wells at Firing Range 5 were dry when inspected the day after installation, so they were allowed 5 days to accumulate water before attempting to sample. Groundwater samples collected from Firing Range 5 during the RSE were analyzed for PAHs only. The groundwater samples collected from the CDP were analyzed for metals (filtered and unfiltered) and PAHs (Leidos 2019).

Streamlined risk assessments were conducted in accordance with USEPA's Guidance for Conducting NTCRAs (USEPA 1993). Soil SI and RSE sampling results were compared to background values (IT 1998), USEPA residential RSLs published in May 2019 (USEPA 2019) and adjusted for a target risk of 1E-05 and target hazard quotient (HQ) of 1, and USEPA ecological screening values (ESVs) (USEPA 2003 and 2010). Groundwater sample results were compared to USEPA RSLs (USEPA 2019), USEPA Maximum Contaminant Levels (MCLs) (USEPA 2019), and Ohio Water Quality Standards (Ohio EPA 2009).

Soil at Firing Range 5 and the CDP was aggregated into five exposure units based on past use (Firing Range 5 Shooting Area, Firing Range 5 Target Area, Firing Range 5 Off-Set Area, CDP Pile Trench Debris, and CDP Soil) during the human health risk evaluation. The human health risk evaluation concluded no chemicals of concern (COCs) requiring remediation are present in the soil at the Firing Range 5 Shooting Area, Firing Range 5 Off-Set Area, CDP Trench Debris, and CDP Soil. However, COCs requiring remediation in soil are present on top of and to the west of the impact berm of the Firing Range 5 Target Area (carcinogenic PAHs [cPAHs]). **Figure 4** presents the residential RSL exceedances for benzo(a)pyrene (cPAH) that are primarily limited to the target area (i.e., the top of the earthen backstop berm and its immediate western vicinity). The human health risk evaluation concluded no COCs requiring remediation are present in the groundwater at Firing Range 5 and the CDP (Leidos 2019).

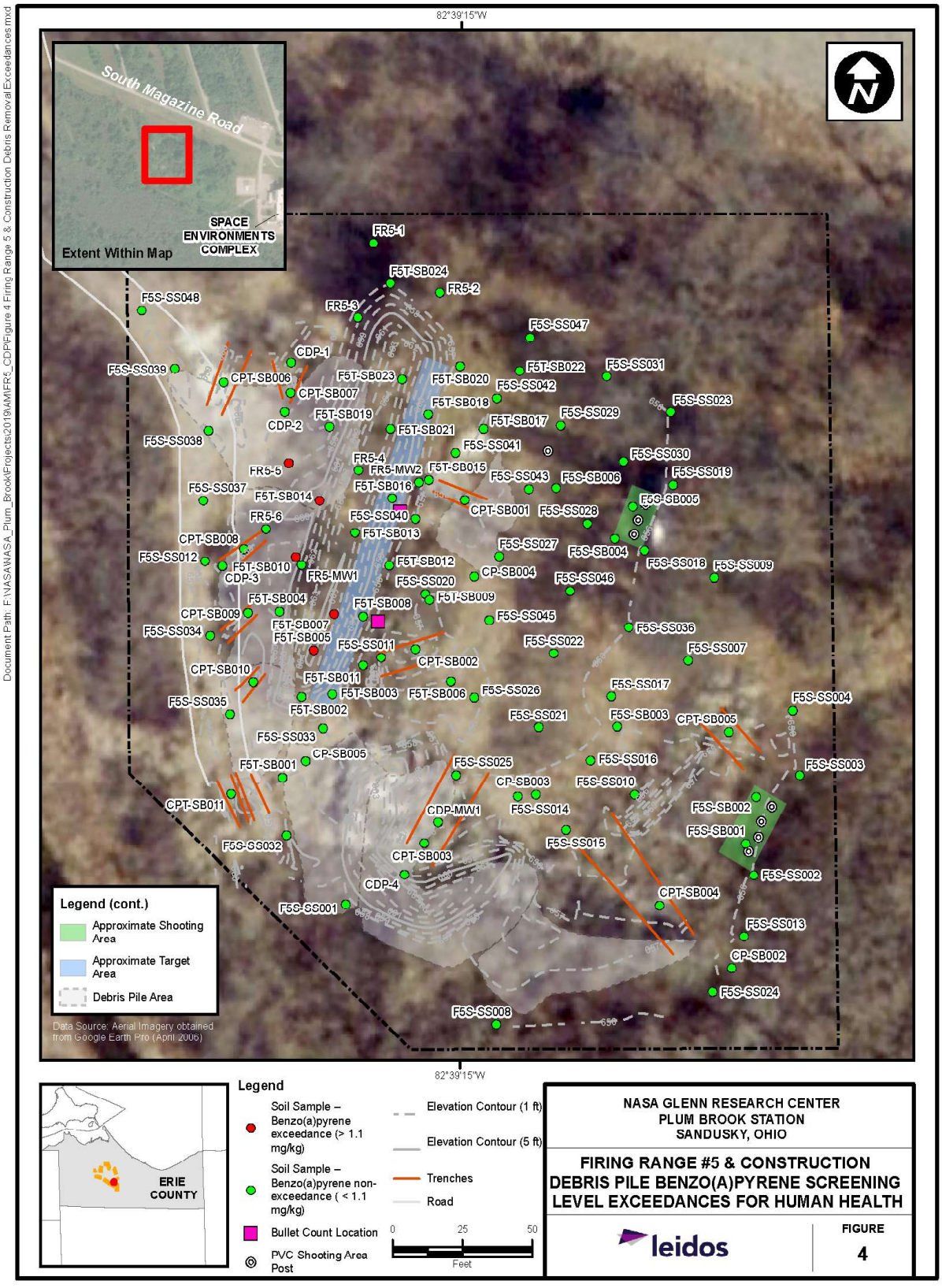

Figure 4. Firing Range 5 and Construction Debris Pile Benzo(a)pyrene Screening Level Exceedances for Human Health

The ecological evaluation concluded no COCs requiring remediation are present in soil at Firing Range 5 and the CDP. Although the evaluation concluded no direct remediation of soil is recommended for protection of ecological receptors at Firing Range 5 and the CDP, removal of the CDP and removal of soil exhibiting benzo(a)pyrene concentrations above human health screening criteria at the Firing Range 5 Target Area would secondarily protect ecological receptors (Leidos 2019).

A.2 Physical Location

Firing Range 5 and the CDP are co-located in the southeastern portion of PBS. PBS is located in southern Erie County, Ohio, approximately 3 miles south of Sandusky, Ohio, and approximately 50 miles west of the NASA GRC at Lewis Field in Cleveland, Ohio (**Figure 2**). The PBS facility encompasses approximately 6,740 acres (Leidos 2018) and is depicted in two adjacent U.S. Geological Survey (USGS) 7.5-minute series topographic maps: Sandusky Quadrangle (northern portion of the facility) and Kimball Quadrangle (southern portion of the facility). Most of PBS is in Perkins and Oxford Townships, with some lands in Huron and Milan Townships. The site boundaries are Bogart Road to the north, Mason Road to the south, U.S. Highway 250 to the east, and County Road 43 to the west. The northernmost point is at latitude 41°23'39"N, and the southernmost point is at 41°20'04"N. The westernmost point is at longitude 82°43'12"W, and the easternmost point is at 82°38'39"W (MK 1994).

PBS is situated in an area known for its agricultural productivity and is bordered by farmland, some of which is leased to local farmers by NASA. The area surrounding PBS is largely rural and agricultural, with some recent development. Some food processing facilities are located in the area, including dairy and meat processing operations. Tourism and recreation are important economic influences in the Sandusky area. The Erie County Perkins School District currently uses certain former NASA facilities, located near the former PBS main gate on Columbus Avenue and outside the fenced area, for transportation and storage purposes. Intensive commercial development, consisting of highway-oriented uses (e.g., motels, restaurants, and service stations) and shopping malls, predominate immediately to the north and east along U.S. Highway 250 and its intersections with Bogart Road and State Highway 2 in Sandusky. A U.S. Army Reserve Center is situated adjacent to the southeastern corner, just off Mason Road (Leidos 2018).

An 8-foot security fence surrounds approximately 5,845 acres of PBS (Leidos 2018). Most of the land at PBS consists of forestland and old fields with several streams that run across the property. An estimated 75 percent of NASA's property at PBS is considered unused. The remaining land is used for offices, test facilities, roads, and infrastructure. Public access is restricted at PBS, and access to the site is gained through the security guard house located on East Scheid Road, which was newly constructed in 2016. The guard house is staffed by armed guards 24 hours per day (Leidos 2016b). The former main gate, which is located on Columbus Avenue, is only open for exiting traffic at peak afternoon hours.

The population in Erie County in the 2016 Census estimate was 75,107 with 37,679 total housing units (Leidos 2018). The largest city is Sandusky, with a population of approximately 25,000 (Leidos 2018). The population distribution within a 2-mile radius of the PBS boundary is listed in **Table 1**.

Table 1. Estimated Population Distributions in PBS Vicinity

Distance (miles)	Population
0 to 0.25	600
0.25 to 0.50	450
0.50 to 1.0	2,150
1.0 to 2.0	5,500

Source: U.S. Census Bureau 2016.
PBS = Plum Brook Station.

A site-wide species survey occurred at PBS in the fall of 2016 (EnviroScience 2017). The *Final Protected Species Management Strategy for NASA Glenn Research Center at Lewis Field and Plum Brook Station, Volumes I–III* (EnviroScience 2017) is an update to the original 2002 report (ODNR 2002). Three federally listed fauna species have been recorded to occur at PBS, but only one was noted in the 2016 surveys. In addition, 5 state endangered, 3 state threatened, and 21 state species of interest or concern have been noted since 1994 (EnviroScience 2017). Four state endangered, 6 state threatened, and 10 state potentially threatened flora species were recorded in the 2016 survey. One state threatened and one state potentially threatened species were note noted in the 2016 survey (EnviroScience 2017). However, no rare or endangered species were observed at Firing Range 5.

In 2011 and 2012, comprehensive wetlands and waterways delineations were conducted at PBS. The wetland delineations were completed in accordance with methods described in the *Corps of Engineers Wetlands Delineation Manual* (USACE 1987) and the *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region* (USACE 2012a). Results of the delineations were presented in the *Wetlands and Other Waters Delineation Report* (EnviroScience 2012). Wetlands also were categorized using version 5 of Ohio Rapid Assessment Method (ORAM) for Wetlands. According to the *Wetlands and Other Waters Delineation Report* (EnviroScience 2012), a total of 421.958 acres of waterways and wetlands were delineated within PBS, including 1,050 wetlands; 373 waterways totaling 308,726 linear feet; and 15 ponds totaling 14.908 acres. As of 2013, the delineated wetland boundaries and ORAM quality scores have not been verified by the U.S. Army Corps of Engineers (USACE) or the Ohio Environmental Protection Agency (Ohio EPA), respectively (Leidos 2016c). No wetlands exist at Firing Range 5 and the CDP; however, two wetlands are delineated near the western boundary (0.372 and 0.135 acres) and one wetland is delineated near the eastern boundary (0.448 acres) of the site (presumably ditches) (EnviroScience 2012 and 2017).

NASA contacted the Ohio Historic Preservation Office to determine if any of the landmarks and/or structures onsite would be considered historically significant. Letters documenting NASA's request for consultation and responses from the Ohio Historic Preservation Office are included in Attachment 1. No historical landmarks and/or structures with historical significance were identified at Firing Range 5 and the CDP. In addition, the Nottawaseppi Huron Band of Potawatomi, the Forest County Potawatomi Community of Wisconsin, and the Miami Tribe of Oklahoma Native American Tribes were consulted pursuant to Section 106 of the National Historic Preservation Act. The Nottawaseppi Huron Band of the Potawatomi and Miami Tribe of Oklahoma Native American Tribes responded that no Native American tribal interests are at the site. The Forest County Potawatomi Community of Wisconsin did not provide interests within the 30-day period. Letters documenting NASA request for tribal consultation are included in Attachment 1.

A.3 Site Characteristics

PBS is operated as a satellite facility (or component installation) of the NASA GRC. Use of PBS by the Federal Government began in 1941 when the U.S. Army established Plum Brook Ordnance Works (PBOW) for the manufacture of munitions and related materials, including trinitrotoluene, dinitrotoluene, and pentolite (MK 1994). Munitions production was conducted from 1941 to 1945, after which buildings and production lines were decontaminated and decommissioned. In 1956, the National Advisory Committee for Aeronautics (NACA) (later NASA) obtained 500 acres in the northern portion of the site for construction of a nuclear test reactor (MK 1994). Between 1958 and 1960, NASA demolished hundreds of buildings, renovated approximately 41 buildings, and utilized 99 magazines (Gray & Pape 2008). In 1963, NASA acquired an additional 6,000 acres of PBOW and took control over what is now referred to as PBS (MK 1994). From 1967 through 1971, NASA purchased approximately 2,000 acres outside of the fence line from local farmers as "buffer." On April 18, 1978, NASA declared approximately 2,152 acres of PBS as excess. This excess included approximately 1,500 acres outside the fence and was sold as farmland (Leidos 2018). NASA currently operates PBS as a space research facility in support of the NASA GRC. Most of the aerospace testing facilities built in the 1960s at PBS have been demolished or are currently on

standby or inactive status. Additional tenants at PBS include the U.S. Department of Agriculture, the U.S. Department of the Interior, the Federal Bureau of Investigation, and the Ohio Air National Guard.

Firing Range 5 was constructed in 1982 and used by private security staff for practice and yearly qualification until 1986 (URS 1996). The approximately 146-foot-long and 8-foot-high backstop was constructed of earthen materials, and the targets were located approximately 5 feet from the backstop. Subsequently, piles of sand blasting grit, concrete rubble, reinforcing steel, and other construction debris were deposited along the front edge of the backstop, the southern edge of the range, and in front of the 150-foot shooting area (Leidos 2016b).

Restoration activities at PBS are managed by the NASA GRC Environmental Management Office. This will be the first RA at Firing Range 5 and the CDP. The CDP was generated in the late 1970s during modification of the SEC Building. The pile was identified in the 1998 PA/VSI Report (TechLaw 1998) as "solid waste management units (SWMUs) 8-Space Power Facility Rubble Pile." In addition, sand blasting grit containing paint chips, asphalt, and metal debris at the end of the concrete pile was identified in the 1991 PA Report (SAIC 1991). A portion of the debris pile also served as the backstop for Firing Range 5. No other information is available about the pile.

A.4 Release or Threatened Release into the Environment of a Hazardous Substance, Pollutant, or Contaminant

Available historical documents detail the disposal of the construction debris in the late 1970s during modification of the SEC Building (Leidos 2016b). The pile was identified in the 1998 PA/VSI Report (TechLaw 1998) as "solid waste management units (SWMUs) 8-Space Power Facility Rubble Pile." A 1991 PA Report (SAIC 1991) identified sand blasting grit containing paint chips, asphalt, and metal debris at the end of the concrete pile (now known to contain ACM and LBP materials). In addition, PAH-contaminated soils were identified in the Firing Range 5 Target Area that pose a threat to human health exposure.

Estimated quantities of contaminated soil and construction debris piles are presented in **Tables 2 and 3**. The RSE Report (Leidos 2019) presents a cost estimate of $697,035 for the RA. The evaluation, handling, and disposal of ACM waste will be conducted by an Asbestos Hazard Abatement Evaluation Specialist licensed by Ohio EPA. Based on the land survey results and mapping conducted during the SI, it is estimated that approximately 1,267 tons of concrete rubble debris will be generated for offsite disposal, out of which 5 percent (63 tons) is estimated to be segregated for ACM disposal and 1,203 tons will be disposed of as non-hazardous waste. It is estimated that approximately 545 tons of sand blasting grit waste will be generated for disposal as hazardous waste. It is anticipated that non-hazardous construction debris (i.e., concrete rubble) from the CDP will be disposed of offsite at the Erie County Landfill in Huron, Ohio, and hazardous waste (i.e., sand blasting grit and ACM) will be disposed of offsite at the Envirosafe facility located approximately 60 miles from NASA PBS.

Table 2. Estimated Soil Volumes Requiring Removal at Firing Range 5

Media	Height (ft)	Width (ft)	Length (ft)	Volume (ft^3)	Volume (yd^3)	Tons
Earthen Backstop	8	10	125	10,000	370	500
Soil Hot Spot Excavation (F5T-SB005, -SB007)	4	10	25	1,000	37	50
Soil Hot Spot Excavation (F5T-SB010, -SB014)	2	10	30	600	22	30
Soil Hot Spot Excavation (FR5-5)	2	15	15	450	17	22
			Total	**13,300**	**493**	**602**

ft = Feet.
ft^3 = Cubic Feet.
yd^3 = Cubic Yard.

Table 3. Estimated Construction Debris Volume Requiring Removal at Construction Debris Piles

Media	Volume* (ft^3)	Volume (yd^3)	Tons
Debris Pile 1 (Concrete Construction Rubble with ACM and LBP Materials)	18,000	667	1,267
Debris Pile 2 (Sand Blasting Grit with LBP)	10,000	370	500
Debris Pile 3 (Sand Blasting Grit with LBP)	905	34	45
Total	**28,905**	**1,071**	**1,812**

*Debris pile volume estimates based on land survey results conducted during the SI and ArcGIS mapping in SI Report.
ACM = Asbestos-Containing Material.
ArcGIS = Aeronautical Reconnaissance Coverage Geographic Information System.
ft^3 = Cubic Feet.
LBP = Lead-Based Paint.
SI = Site Investigation.
yd^3 = Cubic Yard.

A low likelihood of past and present contaminant migration exists, as sampling results presented in the RSE Report indicate that the contaminated soils are limited to the Firing Range 5 Target Area and localized "hot spots" (Leidos 2019). Potential future release or migration of contaminants will be eliminated by the NTCRA by achieving the removal action objective (RAO) and confirmed with confirmation sampling.

A.5 NPL Status

Firing Range 5 and the CDP are not on USEPA's National Priorities List (NPL). The NPL is a list of hazardous waste sites that are prioritized for cleanup. PBS is not included in USEPA's Superfund Enterprise Management System (SEMS) database. SEMS contains information on hazardous waste sites, potential hazardous waste sites, and remedial activities across the nation.

B OTHER ACTIONS TO DATE

B.1 Previous Actions

No previous government or private actions have been undertaken specific to the PAH contamination within Firing Range 5 and the ACM and LBP materials interspersed within the CDP other than investigations discussed in this AM.

B.2 Current Actions

No government or private actions are currently being performed specific to the PAH contamination within Firing Range 5 and the ACM and LBP materials interspersed within the CDP.

C STATE AND LOCAL AUTHORITIES' ROLE

C.1 State and Local Actions to Date

State and/or local governments did not request USEPA's assistance to address contaminated media. Likewise, Ohio EPA determined the Consent Order with NASA self-terminated in 2000 and did not request involvement in the ongoing CERCLA activities. NASA continues to notify the Ohio EPA of remedial activities at PBS by submitting all primary CERCLA documents.

NASA is developing a CIP for seven sites at PBS under the CERCLA process to ensure the public has convenient access to information regarding project progress. News releases and public meetings with local officials, interest groups, and the general public are conducted as part of the NASA PBS community relations program.

PART III: THREATS TO PUBLIC HEALTH, PUBLIC WELFARE, OR THE ENVIRONMENT

In accordance with Section 300.410 (b) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), the RSE included an evaluation to determine whether an RA was necessary. NASA elected to use its CERCLA Section 104 authority for the site to determine if a release of hazardous substances has occurred or if the potential exists for a release or threat of release of CERCLA hazardous substances (Leidos 2019).

Actual or potential exposure to nearby populations, animals, or the food chain from hazardous substances, pollutants, or contaminants: As summarized in the human health and ecological risk evaluations in the RSE Report (Leidos 2019), a viable potential exists for human health exposure to PAH-contaminated soil contained at the earthen backstop berm at Firing Range 5. While the SI and RSE sampling results indicate the presence of metals and PAH concentrations in the soil in the immediate vicinity of the earthen berm, the primary driver for RA is the contaminated soil exceeding residential RSLs for benzo(a)pyrene. The presence of bullet fragments and any potential residual metals and PAH contamination in the earthen backstop also provides a basis for removal of the earthen berm to prevent future impact to soil and groundwater media at the site.

Actual or potential contamination of drinking water supplies or sensitive ecosystems: No surface water bodies or wetlands were identified at Firing Range 5 and the CDP (Leidos 2019). While the majority of residents of Erie County receive water from public utilities whose primary sources are surface water, surface water in Erie County is prohibited from use as private drinking water in accordance with Ohio Administrative Code (OAC) 3701-28. Groundwater at PBS is not utilized for drinking water purposes, and no human health concerns are associated with any potential contamination in groundwater at PBS. The limited quantity and poor quality of groundwater encountered at the site is consistent with previous groundwater findings at other sites at NASA PBS (USACE 2012b).

Hazardous substances or pollutants or contaminants in drums, barrels, tanks, or other bulk storage containers that may pose a threat of release: No evidence of any drums, barrels, tanks, or other bulk storage containers was found at Firing Range 5 and the CDP. However, the site contains the earthen backstop berm, which has been contaminated during historical operations at Firing Range 5. The CDP is composed of three distinct piles containing concrete rubble and sand blasting grit that are interspersed with ACM and LBP materials (Leidos 2019).

High levels of hazardous substances, pollutants, or contaminants in soils largely at or near the surface that may migrate: Although a majority of the soil sampling results indicated contaminant concentrations below residential RSLs, a few "hot spot" locations exhibit benzo(a)pyrene exceedances above the residential RSLs and pose a threat to human health exposure. The presence of the contaminated earthen backstop and the CDP also poses a threat of potential future migration of contaminants and threat to human health exposure, if left unaddressed (Leidos 2019).

Weather conditions that may promote migration of hazardous substances: No unusual weather conditions have occurred that may promote migration of hazardous substances. However, a potential does exist for migration of contaminants via overland flow/runoff toward any low-lying surface features around the site (Leidos 2019).

Threat of fire or explosion: No known threat of fire or explosion exists.

Availability of other appropriate Federal or state response mechanisms to respond to the release: NASA will coordinate and engage with Ohio EPA, as necessary, with regard to NASA's continuing obligations under CERCLA.

Other situations or factors that may pose threats to public health, public welfare, or the environment: The isolated contamination "hot spots" exceeding residential RSLs, the earthen berm impacted by historical operations at Firing Range 5, and the CDP interspersed with ACM and LBP materials at the CDP pose a threat to human health and the environment. While access to the site is limited and restricted per the NASA PBS facility requirements, a potential for current and future receptors to be exposed to this contamination exists. Thus, it is recommended that an appropriate RA (i.e., an NTCRA) be conducted to attain soil concentrations below the applicable RSLs and prevent future exposure threats from the earthen backstop berm and CDP and potentially allow for subsequent unrestricted reuse of the site (Leidos 2019).

PART IV: ENDANGERMENT DETERMINATION

Actual or threatened releases of contaminants (PAHs, ACM, and LBP) from Firing Range 5 and the CDP, if not addressed by implementing the response action selected in this AM, may present an imminent and substantial endangerment to public health, public welfare, or the environment.

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PART V: PROPOSED ACTIONS AND COST ESTIMATES

A PROPOSED ACTIONS

The RSE Report (Leidos 2019) was prepared in accordance with USEPA and Ohio EPA guidance to develop and evaluate RA alternatives. The RSE Report developed the following RAOs to protect the environment:

- Minimize the risk associated with soil contamination (benzo[a]pyrene) in and around the earthen backstop berm at Firing Range 5, and
- Minimize the potential risk and hazard associated with the debris piles that are interspersed with ACM and LBP materials.

The RSE Report (Leidos 2019) was provided for public review and comment from January 17 to February 17, 2020. The Nottawaseppi Huron Band of Potawatomi, the Forest County Potawatomi Community of Wisconsin, and the Miami Tribe of Oklahoma were consulted pursuant to Section 106 of the National Historic Preservation Act.

A.1 Proposed Action Description

The RSE Report identified RA alternatives and evaluated the alternatives based on effectiveness, implementability, and cost (Leidos 2019). The no action alternative was eliminated during the individual analysis due to the lack of effectiveness. The selected RA alternative is to remove soil at the isolated "hot spots" and the earthen backstop berm at the Firing Range 5 Target Area such that residential RSLs are attained for benzo(a)pyrene contamination in soil, and removal of the CDP interspersed with ACM and LBP. In order to achieve the RAOs, all ACM and LBP materials must be removed and benzo(a)pyrene (used to represent cPAH concentrations) soil concentrations must be below the residential RSL of 1.15 mg/kg. Completion of the RA will allow potential future unrestricted reuse at Firing Range 5 and the CDP. The following sections describe the components of the selected RA.

Pre-Removal Activities—Prior to mobilizing for Phase 1 construction activities, detailed planning efforts will be undertaken to include updates to existing site-specific plans (e.g., health and safety plan, quality assurance project plans); procurement of necessary subcontracts (e.g., waste disposal facilities, analytical laboratory services, major construction equipment rental); and completion of a pre-removal readiness review, dig permits, and utility clearances. A Removal Action Work Plan (RAWP) will be developed prior to initiating RAs. This plan will outline the construction requirements, site preparation activities (e.g., staging and equipment storage areas, truck routes, and stormwater controls), extent of soil excavation, extent of debris materials, sequence of excavation activities, decontamination, and transportation and disposal of the waste. Erosion controls and health and safety controls will be developed as part of the RAWP to ensure protection of site workers and the environment.

RA Activities – Phase 1—Prior to initiating removal of the earthen backstop berm and the sand blasting grit piles, waste characterization sampling will be conducted for the soil contained within the berm and the sand blasting grit materials. Five-part composite samples will be collected from the soil in the earthen berm and sand blasting grit piles at a frequency of 1 sample per 100 yd^3. The samples will be submitted for laboratory analysis (Toxicity Characteristic Leaching Procedure [TCLP] SVOCs; TCLP volatile organic compounds; TCLP metals; polychlorinated biphenyls; paint filter liquids test; and reactivity, corrosivity, and ignitability [RCI] analysis) for hazardous waste determination. Any painted concrete will be sampled and tested in the laboratory for TCLP metals for hazardous waste determination. In addition, waste characterizations samples will be analyzed for per- and polyfluoroalkyl substances (PFAS), since Firing Range 5 and the CDP were determined to be a potential area of concern for PFAS.

Site preparation will involve vegetation clearing around the blast wall to facilitate efficient removal and set-up of erosion controls (e.g., filter logs, silt fences), as necessary, to protect surface drainage features. To protect the critical habitat for two bat species, the Indiana bat (Federal Endangered [FE]) and northern long-eared bat (Federal Threatened [FT]), tree clearing will be conducted outside of the restricted time frame of April 1st through September 30th; therefore, clearing may be expedited.

RA Activities – Phase 2—The removal activities will begin with removal and segregation, as needed, of the CDP. The appropriate equipment (e.g., excavator with hydraulic extension, skid steer, soil sifting machine) will be mobilized to the site for the duration of the removal activities. The evaluation, handling, and disposal of ACM waste will be conducted by an Asbestos Hazard Abatement Evaluation Specialist licensed by Ohio EPA.

Following removal of the CDP, the removal activities will then proceed to removal of "hot spot" excavations and the earthen berm at Firing Range 5. Note that two out of the three "hot spot" excavations are currently within the footprint of Debris Pile 2 (see **Figure 5**). Under 40 Code of Federal Regulations (CFR) 261.6(a)(3)(ii), recycled scrap metal is classified as "recyclable material" that is not subject to requirements for generators, transporters, and storage facilities of hazardous wastes. Any metal fragments reclaimed from the firing range earthen berm would qualify as "scrap metal" for recycling as per 40 CFR 261.6(a)(3)(ii) (62 Federal Register 6631, February 12, 1997). Non-contaminated concrete removed during removal activities will be processed onsite for recycling.

Waste Management—Based on the CDP land survey results and mapping conducted during the SI, it is estimated that approximately 1,267 tons of concrete rubble debris will be generated for offsite disposal, of which 5 percent (63 tons) is estimated to be segregated for ACM disposal and 1,203 tons will be disposed of as non-hazardous waste. It is estimated that approximately 545 tons of sand blasting grit waste will be generated for disposal as hazardous waste. It is anticipated that non-hazardous construction debris (i.e., concrete rubble) from the CDP will be transported offsite to the Erie County Landfill in Huron, Ohio, and be recycled. Hazardous waste (i.e., sand blasting grit and ACM) will be disposed of offsite at the Envirosafe facility located approximately 60 miles from NASA PBS. The Envirosafe facility is a Resource Conservation and Recovery Act (RCRA) Subtitle C Treatment and Disposal facility that accepts both non-hazardous and RCRA hazardous wastes, including ACM wastes. Any waste determined to be contaminated with PFAS will be segregated and stored onsite until NASA identifies a proper disposal method.

Based on the dimensions of the earthen berm and hot spot excavations to address benzo(a)pyrene exceedances at Firing Range 5, an estimated approximately 602 tons of soil waste will be generated for offsite disposal. It is anticipated that all non-hazardous soil waste generated from removal of the earthen berm and hot spot soil excavations will be disposed of at the Erie County Landfill located approximately 5 miles from NASA PBS.

Confirmation Sampling—Following completion of removal activities at the site, confirmation soil sampling will be conducted at the hot spot excavation locations at Firing Range 5. Up to five discrete soil confirmation samples will be collected for analysis of benzo(a)pyrene from below the total depth at each hot spot excavation. Samples will be generally collected at an approximate spacing of one sample per every 25-foot length of excavation, but final confirmation sample locations will depend on actual field observations during the RA. The confirmation soil sampling will determine whether the RA was fully successful in attaining residential RSLs. Depending on the initial confirmation results, the potential need for extending the excavation footprint will be evaluated. Given that the historical soil sampling results for sample locations within the earthen berm footprint at Firing Range 5 and the CDP sample locations showed no RSL exceedances for any COCs, confirmation soil sampling is not necessary after removal of the earthen berm and debris piles.

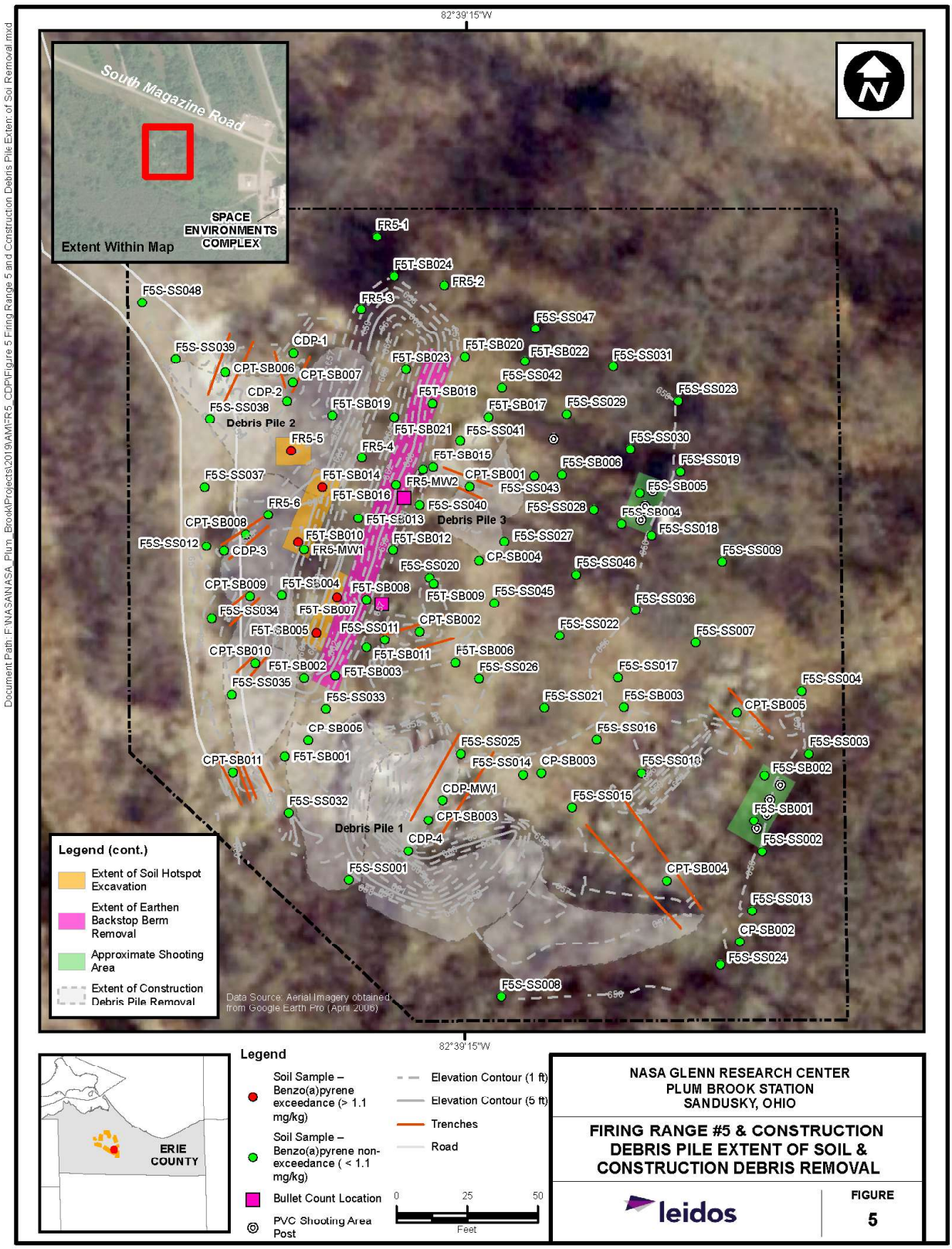

Figure 5. Firing Range 5 and Construction Debris Pile Extent of Soil and Construction Debris Removal

Site Restoration Activities and Reporting—Following completion of removal activities at the site, site restoration will be completed to include seeding the backfilled area with clean fill material obtained from a NASA-approved location with NASA-approved seed mixture, removal of erosion controls, and post-removal inspection. An RA Completion Report will be prepared to document in detail the removal activities at Firing Range 5 and the CDP.

A.2 Contribution to Remedial Performance

The RA will meet the RAOs and will achieve quick, protective results at Firing Range 5 and the CDP. The time period to complete this RA is relatively short, and no further action will be required once the RA is complete.

A.3 Engineering Evaluation/Cost Analysis

The RSE Report presented the parameters, assumptions, and estimated cost to implement the RA (Leidos 2019). The estimated total cost for RA is $697,035. No written comments were received during the public comment period for the RSE Report, and this will be documented in the Responsiveness Summary in the Administrative Record.

A.4 Applicable or Relevant and Appropriate Requirements

USEPA classifies applicable or relevant and appropriate requirements (ARARs) as chemical-, action-, and location-specific to provide guidance for identifying and complying with ARARs (USEPA 1988). The RSE Report identified the following ARARs for the RA at Firing Range 5 and the CDP (Leidos 2019).

Chemical-specific ARARs—Chemical-specific ARARs include the USEPA residential RSLs and ESVs discussed in the human health and ecological risk evaluations.

Action-specific ARARs—Under the recommended RA of the earthen backstop berm at Firing Range 5 and the CDP, the following action-specific ARARs are considered:

- Because the RA at the earthen backstop berm and the CDP would include generating and managing contaminated environmental media and materials, RCRA requirements would be considered potential ARARs for this activity. The RCRA requirements mandate that a generator must determine whether a material is (or contains in the case of environmental media) hazardous waste under OAC 3745-52-11. If a material is determined to be or contain a listed hazardous waste, or exhibits a hazardous waste characteristic, additional management requirements under RCRA must be followed as an ARAR under CERCLA.
- Shipments of contaminated soils and materials will comply with Federal, state, and local rules, laws, and regulations. In addition to the identified ARARs for the selected action, NASA will comply with requirements applicable to offsite actions, including RCRA hazardous waste transportation requirements under OAC 3745-52-20 through OAC 3745-52-33, offsite treatment prior to land disposal as required by RCRA's land disposal restrictions (LDRs) under OAC 3745-270, and alternative LDR treatment standards for contaminated soil under OAC 3745-270-49.
- Implementing excavation activities also would trigger potential ARARs associated with land disturbance and emission controls. OAC 3745-15-07 requires that nuisance air pollution emissions be controlled. This includes controlling potential fugitive dust from the earthen backstop berm removal and soil excavation activities. In addition, any construction (i.e., soil disturbance activities that would encompass more than 1 acre) would trigger the stormwater requirements contained in 40 CFR Part 450. These requirements mandate that erosion and sedimentation control

measures be designed and implemented to control erosion and sediment runoff. The proposed RA is anticipated to disturb more than 1 acre; therefore, erosion controls and best management practices will be developed in a stormwater pollution prevention plan and utilized during the RA.

- The removal of ACM encountered in the CDP also will trigger the requirements of OAC 3745-20-01 through 3745-20-05 as ARARs for asbestos emission control, demolition procedures, and standards for asbestos waste handling and disposal. Requirements under OAC 3745-22 also would be applicable to ensure that removal, handling, and disposal of ACM is conducted under the supervision of an appropriately licensed Asbestos Hazard Abatement Specialist. These regulations require that wastes containing asbestos must be handled in a manner to prevent fugitive emissions from waste handling and must be transported to disposal in a sealed or contained manner (either sealed containers or transported in bulk by leak-tight transport vehicles or containers as required by subparagraph (B)(2) of the above-referenced rule). In addition, a relevant and appropriate requirement can be invoked for this activity under OAC 3745-20-07(A)(1-3) to ensure either: 1) no visible emissions are discharged to the outside air; 2) asbestos-containing waste material is covered with at least 6 inches of compacted non-ACM, and a cover of vegetation is grown and maintained on the area to adequately prevent exposure of the asbestos-containing waste material; or 3) the asbestos-containing waste material is covered with at least 2 feet of compacted non-ACM, and the cover is maintained to prevent exposure of the asbestos-containing waste material. In accordance with OAC 3745-20-03, OAC 3745-22-04(C)(4), and 40 CFR 61.145(b), notification is required to the Ohio EPA Central Office – Division of Air Pollution Control a minimum of 10 working days before the RA ("abatement") begins. "Abatement" refers to any asbestos hazard abatement activity involving the removal, renovation, enclosure, repair, or encapsulation of reasonably related friable ACMs in an amount greater than 50 linear feet or 50 square feet.
- In the event solid waste material is found to be contaminated but not a RCRA hazardous waste, management and disposal of this material would be subject to the requirements associated with managing and disposing of solid waste within the State of Ohio. The OAC 3745-27-05 requirements would be potential ARARs for disposing of non-hazardous contaminated waste material generated during excavation and subsequent disposal at an offsite location.

***Location-specific ARARs*—**Location-specific requirements include those established for potential removal activities conducted within wetlands, within a floodplain area, or with respect to threatened and/or endangered species. Firing Range 5 and the CDP are not within a floodplain area. While a few wetlands have been delineated in the vicinity of the site, no wetlands exist within the site boundary, and no surface water is present at the site. No additional delineation survey is planned for this site (Leidos 2019).

Under 50 CFR Part 17, "Endangered and Threatened Wildlife and Plants," action, including consultation with the Department of the Interior, to conserve ecosystems, habitats, and endangered and threatened species is required. In addition, Ohio Revised Code 1531.25 and 1501:31-23 provide protections for endangered and threatened species in Ohio. To protect the critical habitat for two bat species (Indiana bat [FE] and northern long-eared bat [FT]), tree clearing must be conducted outside of the restricted time frame of April 1st through September 30th.

Part III.2.C of Ohio EPA National Pollutant Discharge Elimination System Permit Number 2IO0000*LD (to-be-considered) requires effluent shall, at all times, be free of substances in amounts that will alter the natural color or odor of the receiving water to such a degree as to create a nuisance. If discolored water (i.e., red) is observed in any excavation, the NASA GRC Technical Manual will be notified immediately.

A.5 Project Schedule

The RSE Report was submitted in December 2019 (Leidos 2019), and the public notification and comment period was conducted from January 17 to February 17, 2020. Upon development, review, and approval of the RAWP, NASA will begin implementing the NTCRA at Firing Range 5 and the CDP. The RA is anticipated to be completed over a duration of approximately 4.5 weeks followed by a post-removal inspection. An RA Completion Report will be prepared to document the RAs.

B ESTIMATED COSTS

A cost analyses is provided in the RSE Report (Leidos 2019). This analysis includes an estimate of the capital cost in dollars and indicates the period of time to complete the proposed action.

The estimated cost to complete the recommended RA at Firing Range 5 and the CDP is $697,035. These costs include implementing the removal, offsite disposal, site restoration, and reporting. The time period to complete this RA is relatively short (4.5 weeks) and does not include an operations and maintenance period to assess impacts from excavating PAH-contaminated soils and the construction debris, as potential future unrestricted reuse at Firing Range 5 and the CDP will be achieved.

PART VI: EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

If no action or a delayed action occurs, PAH-contaminated soil, ACM, and LBP materials would remain in place. Therefore, this scenario would not provide for overall protection of the environment. Removal goals would not be achieved, as this scenario provides for no long-term effectiveness and permanence. No mitigation of potential risks to human receptors from PAHs in soil, ACM, and LBP materials would exist under this scenario.

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PART VII: OUTSTANDING POLICY ISSUES

No outstanding policy issues are applicable to Firing Range 5 and the CDP located at NASA PBS.

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PART VIII: ENFORCEMENT

NASA is the lead agency that will oversee this NTCRA. The RSE Report (Leidos 2019) has been prepared following current USEPA guidance documents and was shared with Ohio EPA.

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PART IX: RECOMMENDATION

This AM documents the selected RA for Firing Range 5 and the CDP at PBS in Sandusky, Ohio, developed in accordance with CERCLA as amended, and is consistent with the NCP. This decision is based on the Administrative Record for the site.

Conditions at Firing Range 5 and the CDP meet the NCP Section 300.415(b)(2)(i–viii) criteria for an NTCRA. The total project cost of approximately $697,035 is approved by the undersigned.

AUTHORIZING SIGNATURE:

JOEL KEARNS Digitally signed by JOEL KEARNS
Date: 2020.07.23 21:21:01 -04'00'

7/23/20

Joel K. Kearns, Director
Facilities, Test, and Manufacturing Directorate
NASA Glenn Research Center

Date

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ATTACHMENT 1.

OHIO HISTORIC PRESERVATION OFFICE AND NATIVE AMERICAN CONSULTATION DOCUMENTATION

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National Aeronautics and
Space Administration

John H. Glenn Research Center
Lewis Field
Cleveland, OH 44135-3191

March 2, 2020

Reply to Attn of: FXP

Ohio Historic Preservation Office
Attn: Ms. Joy Williams
Project Reviews Manager
800 East 17th Avenue
Columbus, OH 43211

Subject: Remediation of Firing Range 5 and Construction Debris Pile at NASA Glenn Research Center's (GRC) Plum Brook Station (PBS)

In accordance with Section 106 of the National Historic Preservation Act of 1966 as amended, NASA GRC is consulting with your office regarding the proposed remediation of Firing Range 5 and the Construction Debris Pile at NASA GRC's PBS in Erie County, Ohio.

The NASA GRC is also consulting with your office under Stipulation III, Archaeology, B within the enclosed Programmatic Agreement between NASA and the Ohio Historic Preservation Office (OHPO) regarding Facilities, Infrastructure, and Sites at NASA GRC's PBS. The Stipulation states NASA GRC must consult the OHPO prior to land-disturbing activities where no previous survey has occurred. No previous survey has occurred in the area where the remediation work is located.

I am requesting your concurrence with NASA GRC's determination of No Adverse Effect based on the enclosed background information. If you have any questions, please contact me at (216) 433-8960 or thomas.m.yohe@nasa.gov.

Thomas M. Yohe
Cultural Resource Manager

3 Enclosures:
Background Information
Site Photographs
Programmatic Agreement

April 19, 2020

In reply, please refer to:
2020-ERI-47903

Thomas M. Yohe, Cultural Resources Manager
NASA Glenn Research Center
Facilities Division
21000 Brookpark Road, Mail Stop 21-1
Cleveland, Ohio 44135

RE: Remediation of Firing Range 5 at NASA Glenn Research Center's Plum Brook Station, Erie County, Ohio

Dear Mr. Yohe:

This letter is in response to correspondence received on March 19, 2020. Our comments are made pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, the associated regulations at 36 CFR Part 800, and guided by the terms established in the *Programmatic Agreement Between the National Aeronautics and Space Administration and the Ohio State Historic Preservation Office Regarding Facilities, Infrastructure, and Sites at the National Aeronautics and Space Administration's Plum Brook Station, Erie County, Ohio*.

The John H. Glenn Research Center (GRC), a U.S. National Aeronautics and Space Administration (NASA) facility, is proposing the remediation of Firing Range 5 at GRC's Plum Brook Station (PBS) in Erie County, Ohio.

Firing Range 5 was constructed in 1982 and is located west of the Space Environments Complex along South Magazine Road. Firing Range 5 is recommended as not eligible for inclusion in the National Register of Historic Places. Our office agrees with the recommendation regarding eligibility.

We concur with your finding that the undertaking as proposed will have no adverse effect on historic properties. No further coordination with this office is necessary, unless the undertaking changes or archaeological remains are unexpectedly discovered. In such a situation, our office should be contacted as per Stipulation IV of the above-referenced Programmatic Agreement.

If you have any questions, please contact me at jwilliams@ohiohistory.org or (614) 298-2000. Thank you for your cooperation.

Sincerely,

Joy Williams

Joy Williams, Project Reviews Manager
Resource Protection and Review

"Please be advised that this is a Section 106 decision. This review decision may not extend to other SHPO programs."

RPR Serial No: 1083534

National Aeronautics and
Space Administration

John H. Glenn Research Center
Lewis Field
Cleveland, OH 44135-3191

March 12, 2020

Reply to Attn of: FXP

Mr. Fred Jacko
Tribal Historic Preservation Officer
Nottawaseppi Huron Band of Potawatomi
1485 Mno-Bmadzewen Way
Fulton, MI 49052

Dear Mr. Jacko:

Pursuant to Section 106 of the National Historic Preservation Act and its implementing regulations, 36 Code of Federal Regulations Section 800, NASA Glenn Research Center is consulting with you on an environmental remediation project at our Plum Brook Station facility.

The undertaking's objective is to minimize risks and hazards associated with soil contamination in and around the backstop of Firing Range 5 and a Construction Debris Pile (CDP) to protect human and ecological receptors. The CDP was generated during the late 1970s during facilities modifications, and contains crushed concrete rubble, reinforcing steel bars, asbestos-containing materials, lead-based paint chips, asphalt, and metal debris. A portion of the CDP also served as the backstop of Firing Range 5.

The clean-up effort of Firing Range 5 and the CDP consists of the removal of soil in and under the CDP, while the CDP itself will be segregated into hazardous and non-hazardous materials and disposed of accordingly. Prior to disposal of the soil, it will be sifted to remove any debris and recover bullets or bullet fragments for recycling as scrap metal. Excavated areas will be backfilled and reseeded.

Past archaeological surveys indicate a moderate potential for archaeological resources in the remediation project area. If you have any questions, please contact me at (216) 433-8960 or thomas.m.yohe@nasa.gov.

Sincerely,

Thomas M. Yohe
Cultural Resource Manager

3 Enclosures
Map of Plum Brook Station
Archaeological Sensitivity Map
Firing Range 5 and CDP Site Photographs

National Aeronautics and
Space Administration

John H. Glenn Research Center
Lewis Field
Cleveland, OH 44135-3191

May 5, 2020

Reply to Attn of: FXP

Mr. Ned Daniels
Chairman
Forest County Potawatomi Community of Wisconsin
P.O. Box 340
Crandon, WI 54520

Dear Mr. Daniels:

Pursuant to Section 106 of the National Historic Preservation Act and its authority, Title 36 Code of Federal Regulations Part 800, Protection of Historic Properties, NASA Glenn Research Center is consulting with you on an environmental remediation project at our Plum Brook Station facility.

The undertaking's objective is to minimize risks and hazards associated with soil contamination in and around the backstop of Firing Range 5 and a Construction Debris Pile (CDP) to protect human and ecological receptors. The CDP was generated during the late 1970s during facilities modifications, and contains crushed concrete rubble, reinforcing steel bars, asbestos-containing materials, lead-based paint chips, asphalt, and metal debris. A portion of the CDP also served as the backstop of Firing Range 5.

The cleanup effort of Firing Range 5 and the CDP consists of the removal of soil in and under the CDP, while the CDP itself will be segregated into hazardous and non-hazardous materials and disposed of accordingly. Prior to disposal of the soil, it will be sifted to remove any debris and recover bullets or bullet fragments for recycling as scrap metal. Excavated areas will be backfilled and reseeded.

Past archaeological surveys indicate moderate potential for archaeological resources in the area. If you have any questions, please contact me at (216) 433-8960 or thomas.m.yohe@nasa.gov.

Sincerely,

THOMAS YOHE

Digitally signed by THOMAS YOHE
Date: 2020.05.05 11:22:06 -04'00'

Thomas M. Yohe
Cultural Resources Manager

3 Enclosures
Map of Plum Brook Station
Archaeological Sensitivity Map
Firing Range 5 and CDP Site Photographs

bcc:
FX/S. M. Ahmed
FXP/T. M. Yohe
FX/Official File
FXP/Official File

National Aeronautics and
Space Administration

John H. Glenn Research Center
Lewis Field
Cleveland, OH 44135-3191

March 12, 2020

Reply to Attn of: FXP

Ms. Diane Hunter
Tribal Historic Preservation Officer
Miami Tribe of Oklahoma
P.O. Box 1326
Miami, OK 74355

Dear Ms. Hunter:

Pursuant to Section 106 of the National Historic Preservation Act and its implementing regulations, 36 Code of Federal Regulations Section 800, NASA Glenn Research Center is consulting with you on an environmental remediation project at our Plum Brook Station facility.

The undertaking's objective is to minimize risks and hazards associated with soil contamination in and around the backstop of Firing Range 5 and a Construction Debris Pile (CDP) to protect human and ecological receptors. The CDP was generated during the late 1970s during facilities modifications, and contains crushed concrete rubble, reinforcing steel bars, asbestos-containing materials, lead-based paint chips, asphalt, and metal debris. A portion of the CDP also served as the backstop of Firing Range 5.

The clean-up effort of Firing Range 5 and the CDP consists of the removal of soil in and under the CDP, while the CDP itself will be segregated into hazardous and non-hazardous materials and disposed of accordingly. Prior to disposal of the soil, it will be sifted to remove any debris and recover bullets or bullet fragments for recycling as scrap metal. Excavated areas will be backfilled and reseeded.

Past surveys indicate a moderate potential for archaeological resources in the remediation project area. If you have any questions, please contact me at (216) 433-8960 or thomas.m.yohe@nasa.gov.

Sincerely,

Thomas M. Yohe
Cultural Resource Manager

3 Enclosures
Map of Plum Brook Station
Archaeological Sensitivity Map
Firing Range 5 and CDP Site Photographs