Naval Facilities Engineering Systems Command
Southeast
Jacksonville, Florida

Final
Fifth Five-Year Review Report

Naval Air Station Pensacola
Pensacola, Florida

September 2023

FINAL
FIFTH FIVE-YEAR REVIEW REPORT

NAVAL AIR STATION PENSACOLA
PENSACOLA, FLORIDA

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

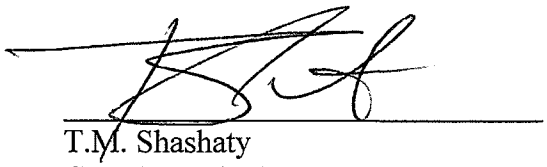
Department of the Navy
Naval Facilities Engineering Systems Command Southeast
Building 135N Ajax Street
Naval Air Station Jacksonville
Jacksonville, Florida 32212-0030

CONTRACT NUMBER N6247016D9008
CONTRACT TASK ORDER SE210538

SEPTEMBER 2023

AUTHORIZING SIGNATURE

By my signature below, I approve the issuance of this Fifth Five-Year Review Report for Naval Air Station Pensacola, Florida.



T.M. Shashaty
Captain, United States Navy
Commanding Officer
Naval Air Station Pensacola

21 SEP 2023

Date

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List of Abbreviations and Acronyms

ACM	Asbestos-containing material
ARAR	Applicable or Relevant and Appropriate Requirement
bgs	Below ground surface
BRA	Baseline Risk Assessment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	Contaminant of concern
COPC	Contaminant of potential concern
CSM	Conceptual site model
CTL	Cleanup Target Level
CVOC	Chlorinated volatile organic compound
DDD	Dichlorodiphenyldichloroethane
DDE	Dichlorodiphenyldichloroethene
DDT	Dichlorodiphenyltrichloroethane
DoD	Department of Defense
DoE	Department of Energy
ESD	Explanation of Significant Differences
F.A.C.	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FO-DTS	Fiber optic distributed temperature survey
FPDWS	Florida Primary Drinking Water Standard
FS	Feasibility Study
FTMR	Field Task Modification Request
GCTL	Groundwater Cleanup Target Level
GWPS	Groundwater Protection Standard
HHRA	Human health risk assessment
HI	Hazard Index
ILCR	Incremental Lifetime Cancer Risk
IRA	Interim Remedial Action
IRP	Installation Restoration Program
ISDB	Industrial Sludge Drying Bed
ITS	Interceptor trench system
IWTP	Industrial Wastewater Treatment Plant
LTM	Long-term monitoring
LUC	Land use control
LUCIP	Land Use Control Implementation Plan
LUC RD	Land Use Control Remedial Design
MCL	Maximum Contaminant Level
mg/kg	Milligram per kilogram
MiHPT	Membrane interface hydraulic profiling tool
MNA	Monitored natural attenuation

MOA	Memorandum of Agreement
NAS	Naval Air Station
NAVFAC	Naval Facilities Engineering Systems Command
O&M	Operations and maintenance
OU	Operable Unit
PA	Preliminary Assessment
PAH	Polynuclear aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PCE	Tetrachloroethene
PDI	Pre-Design Investigation
PFAS	Per- and polyfluoroalkyl substances
pCi/g	Picocurie per gram
PDWS	Primary Drinking Water Standard
PQL	Practical quantitation limit
PRG	Preliminary remediation goal
PWD	Public Works Department
RAB	Restoration Advisory Board
RACR	Remedial Action Completion Report
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RI	Remedial Investigation
ROD	Record of Decision
RSL	Regional Screening Level
SAP	Sampling and Analysis Plan
SCTL	Soil Cleanup Target Level
SI	Site Inspection
SQAG PEC	Sediment Quality Assessment Guidelines Probable Effects Concentration
SWCTL	Surface Water Cleanup Target Level
SWMU	Solid Waste Management Unit
TCE	Trichloroethene
T-SC	Temperature and specific conductance
µg/kg	Microgram per kilogram
µg/L	Microgram per liter
U.S. EPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UST	Underground storage tank
UU/UE	Unlimited use and unrestricted exposure
VA	Veterans Administration
VISL	Vapor Intrusion Screening Level
VOC	Volatile organic compound

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site Name: Naval Air Station Pensacola		
EPA ID: FL9170024567		
Region: 4	**State:** FL	**City/County:** Pensacola/Escambia

SITE STATUS	
NPL Status: Final	
Multiple OUs? Yes	**Has the site achieved construction completion?** No

REVIEW STATUS
Lead agency: Other Federal Agency ***[If "Other Federal Agency", enter Agency name]*:** United States Navy
Author name (Federal or State Project Manager): Naval Facilities Engineering Systems Command
Author affiliation: Lead Agency
Review period: 8/16/2021 - 12/2/2022
Date of site inspection: 04/17/2022
Type of review: Statutory
Review number: 5
Triggering action date: 9/13/2018
Due date *(five years after triggering action date)*: 8/13/2023

Issues/Recommendations
OU(s) without Issues/Recommendations Identified in the Five-Year Review:
16, 18
Issues and Recommendations Identified in the Five-Year Review:

OU: 1, 2, 4, 10, 13, 19	**Issue Category: Monitoring**
	Issue: Groundwater sampling results exceed PFAS risk-based screening levels (U.S. EPA RSLs).
	Recommendation: Complete an RI to refine the CSM and evaluate the magnitude and extent of PFAS. Document the investigation and implement appropriate follow-on actions in accordance with Navy Policy and CERCLA.

Affect Current Protectiveness	Affect Future Protectiveness	Party Responsible	Oversight Party	Milestone Date
No	Yes	Federal Facility Navy	EPA/State	11/20/2026

OU: 11	**Issue Category: Changed Site Conditions**			
	Issue: Erosional damage to the southern shoreline needs to be assessed to ensure that the remedy remains protective			
	Recommendation: Assess areas of shoreline damage relative to areas with residual contamination and implement corrective actions as needed, with any necessary corrective actions designed considering the likelihood of future hurricane damage.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	Federal Facility Navy	EPA/State	8/14/2024
OU: 1	**Issue Category: Operations and Maintenance**			
	Issue: The ROD established an RAO for iron in surface water at Wetland 3. The interceptor trench system was decommissioned, and the Navy is completing supplemental assessment to determine a revised Wetland 3 surface water remedial action.			
	Recommendation: Complete the FS, Proposed Plan, and ROD/ROD Amendment and select a remedy as necessary to address iron discharge from groundwater to surface water.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	Federal Facility Navy	EPA/State	3/6/2026
OU: 2	**Issue Category: Other**			
	Issue: Unacceptable ecological risks were estimated for sediment in Wetland 64.			
	Recommendation: Complete the FS, Proposed Plan, and ROD Amendment and select a remedy as necessary to address COCs in Wetland 64 sediment.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	Federal Facility Navy	EPA/State	11/20/2025
OU: 11	**Issue Category: Changed Site Conditions**			
	Issue: Erosional damage to the southern shoreline needs to be assessed to ensure that the remedy remains protective			
	Recommendation: Assess areas of shoreline damage relative to areas with residual contamination and implement corrective actions as needed, with any necessary corrective actions designed considering the likelihood of future hurricane damage.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	Federal Facility Navy	EPA/State	8/14/2024

OU 11	**Issue Category: Changed Site Conditions**
	Issue: Groundwater sampling results exceed PFAS risk-based screening levels (U.S. EPA RSLs).
	Recommendation: Collect additional SI data and complete an RI to refine the CSM and evaluate the magnitude and extent of PFAS. Implement appropriate follow-on actions in accordance with Navy Policy and CERCLA.

Affect Current Protectiveness	Affect Future Protectiveness	Party Responsible	Oversight Party	Milestone Date
No	Yes	Federal Facility Navy	EPA/State	11/20/2026

Protectiveness Statements

Operable Unit:	***Protectiveness Determination***:	***Addendum Due Date***:
1	Short-term Protective	NA

Protectiveness Statement: *The selected remedy for OU 1 is protective of human health and the environment in the short term. LUCs have been successful in preventing exposure to contaminants by restricting groundwater use and intrusive activities. Groundwater monitoring results show that natural attenuation has been effective at reducing contaminant concentrations in shallow/intermediate groundwater, and contaminant concentrations remain relatively stable. Based on RI Addendum results, Wetland 3 will be addressed in the ongoing FS to evaluate remedial alternatives for removal of iron in surface water to prevent adverse impacts to downgradient ecological receptors. To ensure long-term protectiveness, the Navy plans to identify a remedy to address iron discharge from groundwater to surface water at Wetland 3. Risks for OU 1 wetlands other than Wetland 3 are being evaluated and will be addressed as documented in the forthcoming ROD/ROD Amendment. In addition, OU 1 groundwater PFAS sample results exceed CERCLA risk-based screening levels. A PFAS RI will be completed to refine the CSM and to evaluate the magnitude and extent of PFAS. Thereafter, appropriate follow-on actions should be implemented in accordance with Navy policy and CERCLA guidance.*

Operable Unit:	***Protectiveness Determination***:	***Addendum Due Date***:
2	Short-term Protective	NA

Protectiveness Statement: *The selected remedy for OU 2, as documented in the ROD and modified by the ROD Amendment, is protective of human health and the environment in the short term. Soil excavation, soil cover placement/enhancement, and LUCs have been successful in preventing exposure to soil and groundwater contaminants. Excavation of contaminated soil eliminated unacceptable industrial risks and potential future migration of soil contaminants to groundwater at concentrations of concern, and the soil cover at Site 11 prevents exposure to landfilled materials. LUCs prevent unacceptable risks by prohibiting residential site use and exposure to residual contaminated soil and by preventing use of groundwater until cleanup goals are achieved. Groundwater monitoring results show that natural attenuation has been effective at reducing contaminant concentrations and that significant downgradient migration is not occurring. The OU 2 remedial actions that have been completed (soil excavation, soil cover construction, and LUC implementation) and that are ongoing (MNA and GSI Investigations) are operating as designed and meet the RAOs. Ongoing LUC inspections and groundwater monitoring confirm the continued effectiveness of the remedy. Based on the completed and ongoing activities, the intent and goals of the OU 2 ROD and ROD Amendment have been or will be met. Based on RI Addendum results, Wetland 64 sediment will be addressed in an FS to evaluate remedial alternatives to prevent adverse impacts to ecological receptors. To ensure long-term*

protectiveness, the Navy will implement a remedy for Wetland 64 sediment as determined and documented via the CERCLA process. In addition, OU 2 groundwater PFAS sample results exceed CERCLA risk-based screening levels. A PFAS RI will be completed to refine the CSM and to evaluate the magnitude and extent of PFAS. Thereafter, appropriate follow-on actions should be implemented in accordance with Navy policy and CERCLA guidance.

Operable Unit:	***Protectiveness Determination***:	***Addendum Due Date***:
4	Short-term Protective	NA

Protectiveness Statement: *The selected remedy for OU 4 is protective of human health and the environment in the short term. Soil excavation and off-site disposal have been successful in preventing exposure to contaminants at concentrations exceeding industrial remedial goals in soil. LUCs prevent residential exposure to residual soil contamination and prevent exposure to groundwater contamination that could result in unacceptable risks. LTM results show that arsenic concentrations in groundwater are stable or decreasing and that arsenic is not migrating to off-site groundwater. The OU 4 remedial actions that have been completed (excavation and off-site disposal of contaminated soil, LUC implementation, and monitoring) are operating as designed and meet the RAOs. Ongoing LUC inspections and groundwater monitoring confirm the continued effectiveness of the remedy. Based on the completed and ongoing activities, the intent and goals of the OU 4 ROD and ESD have been or will be met. However, because OU 4 groundwater PFAS sample results exceed CERCLA risk-based screening levels, a PFAS RI will be completed to refine the CSM and to evaluate the magnitude and extent of PFAS. Thereafter, appropriate follow-on actions should be implemented in accordance with Navy policy and CERCLA guidance.*

Operable Unit:	***Protectiveness Determination***:	***Addendum Due Date***:
10	Short-term Protective	NA

Protectiveness Statement: *Remedial actions implemented at OU 10 are protective of human health and the environment in the short-term. Soil excavation addressed contaminants in soil at concentrations exceeding residential criteria, and groundwater treatment was completed as required by the ROD. LUCs prevent exposure to remaining contaminants in site groundwater, and monitoring results indicate that the plumes are stable and that contaminated groundwater is not migrating off site. The OU 10 remedial actions that have been completed (excavation of contaminated soil, active groundwater treatment, and LUC implementation) and that are ongoing (groundwater monitoring) are operating as designed and meet the RAOs. Ongoing LUC inspections and groundwater monitoring confirm the effectiveness of the remedy. Based on the completed and ongoing activities, the intent and goals of the OU 10 ROD have been or will be met. However, because OU 10 groundwater PFAS sample results exceed CERCLA risk-based screening levels, an RI is recommended to refine the CSM and nature and extent. Thereafter, appropriate follow-on actions should be implemented in accordance with Navy policy and CERCLA guidance.*

Operable Unit:	***Protectiveness Determination***:	***Addendum Due Date***:
11	Short-term Protective	NA

Protectiveness Statement: *The selected remedy for OU 11 is protective of human health and the environment in the short term. LUCs prevent residential exposure to residual soil contamination, require maintenance of existing covers preventing exposure to and leaching of underlying contaminated soil, and prevent exposure to groundwater contamination that could result in unacceptable risks. Soil excavation and off-site disposal have been successful in preventing exposure to contaminants in soil. Post-ROD evaluations confirmed that residual leachability concerns were adequately addressed by excavation activities. LTM results show that the contaminant plume remains stable and contained to the shallow aquifer on site. Plume stability suggests that MNA and infiltration limited by surface covers are sufficiently controlling the mobility of COCs from soil to groundwater. The OU 11 remedial actions that*

have been completed (excavation of contaminated soil, LUC implementation, and monitoring) are operating as designed and meet the RAOs. Ongoing LUC inspections and groundwater monitoring are used to confirm the continued effectiveness of the remedy. Based on the completed and ongoing activities, the intent and goals of the OU 11 ROD have been or will be met. However, to ensure long-term protectiveness, potential impacts to the remedy from hurricane-related shoreline erosion need to be assessed and, if necessary, repaired. In addition, because groundwater PFAS sample results in the Building 604 area exceed CERCLA risk-based screening levels, an RI is recommended to refine the CSM and nature and extent. Thereafter, appropriate follow-on actions should be implemented in accordance with Navy policy and CERCLA guidance.

Operable Unit:	***Protectiveness Determination***:	***Addendum Due Date***:
13	Short-term Protective	NA

Protectiveness Statement: *The selected remedy at OU 13 is protective of human health and the environment in the short term. LTM results show continued reductions in COC concentrations, stable or decreasing trends over the majority of the plume, and containment of contaminants within site boundaries. LUCs prohibit use of surficial groundwater from the site util remedial goals are achieved. Ongoing LUC inspections and groundwater monitoring confirm the continued effectiveness of the remedy. The OU 13 remedial actions that have been completed (LUC implementation) and that are ongoing (monitoring) are operating as designed and meet the RAOs. Based on the completed and ongoing activities, the intent and goals of the OU 13 ROD have been or will be met. However, because OU 13 groundwater PFAS sample results exceed CERCLA risk-based screening levels, a PFAS RI will be completed to refine the CSM and to evaluate the magnitude and extent of PFAS. Thereafter, appropriate follow-on actions should be implemented in accordance with Navy policy and CERCLA guidance.*

Operable Unit:	***Protectiveness Determination***:	***Addendum Due Date***:
16	Will Be Protective	NA

Protectiveness Statement: *The remedy at OU 16 is expected to be protective of human health and the environment upon completion.*

Operable Unit:	***Protectiveness Determination***:	***Addendum Due Date***:
18	Protective	NA

Protectiveness Statement: *The selected remedy for OU 18 is protective of human health and the environment. Soil excavation and off-site disposal to meet industrial remedial goals and installation and maintenance of engineering controls at hot spot A8 have been successful in preventing exposure to contaminants in soil. LUCs prevent residential exposure to residual soil contamination and confirm that engineering controls continue to prevent exposure to soil associated with potentially unacceptable risks. Groundwater monitoring results confirmed that lead concentrations had decreased to less than the remedial goal. The OU 18 remedial actions that have been completed (soil excavation, installation of engineering controls, LUC implementation, and groundwater monitoring) are operating or operated as designed and meet the RAOs. Ongoing LUC inspections confirm the continued effectiveness of the remedy. Based on the completed and ongoing activities, the intent and goals of the OU 18 ROD have been or will be met.*

Operable Unit/Site:	***Protectiveness Determination***:	***Addendum Due Date***:
19	Short-term Protective	NA

Protectiveness Statement: *The selected remedy for OU 19 is protective of human health and the environment in the short term. Soil excavation and off-site disposal have been successful in preventing exposure to contaminants exceeding Industrial SCTLs in soil. LUCs prevent residential exposure to residual soil contamination and prevent exposure to groundwater contamination that could result in*

unacceptable risks until remedial goals are achieved. Groundwater monitoring results show that the TCE plume is stable and that natural attenuation process are active. The OU 19 remedial actions that have been completed (excavation and off-site disposal of contaminated soil and LUC implementation) and that are ongoing (groundwater monitoring) are operating as designed and meet the RAOs. Ongoing LUC inspections and groundwater monitoring confirm the continued effectiveness of the remedy. Based on the completed and ongoing activities, the intent and goals of the OU 19 ROD have been or will be met. However, because OU 19 groundwater PFAS sample results exceed CERCLA risk-based screening levels, an RI is recommended to refine the CSM and nature and extent. Thereafter, appropriate follow-on actions should be implemented in accordance with Navy policy and CERCLA guidance.

1.0 INTRODUCTION

The United States Navy, Naval Facilities Engineering Systems Command (NAVFAC) Southeast, as Lead Agency, prepared this five-year review pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, consistent with the National Oil and Hazardous Substances Contingency Plan, 40 Code of Federal Regulations Section 300.430(f)(4)(ii), and considering United States Environmental Protection Agency (U.S. EPA) policy.

CERCLA provides authority to the President of the United States to respond to releases of hazardous substances, pollutants, or contaminants (§ 104(a) of CERCLA, 42 United States Code § 9604(a)). The President delegated authority to the Secretary of Defense in Executive Order 12580, as amended, for responding to releases of CERCLA hazardous substances, pollutants, or contaminants where the release is on, or the sole source of the release is from, Department of Defense (DoD) sites.

The National Oil and Hazardous Substances Pollution Contingency Plan, CERCLA's implementing regulation, establishes DoD as the lead federal agency for specific CERCLA response actions in its definition of "lead agency": "In the case of a release of a hazardous substance, pollutant, or contaminant, where the release is on, or the sole source of the release is from, any facility or vessel under the jurisdiction, custody, or control of DoD or Department of Energy (DoE), then DoD or DoE will be the lead agency." (40 Code of Federal Regulations [CFR] Part 300.5). DoD has in turn re-delegated most of this authority to the Department of the Navy to respond to releases of hazardous substances, pollutants, or contaminants on/from Navy property.

The purpose of a five-year review is to evaluate the implementation and performance of a remedy to determine if the remedy is and will continue to be protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in Five-Year Review Reports such as this one. In addition, Five-Year Review Reports identify issues found during the review that impact the protectiveness of remedies, if any, and document recommendations to address them.

This is the fifth five-year review for the Naval Air Station (NAS) Pensacola Superfund Site. The initial triggering event for five-year reviews at NAS Pensacola was initiation of remedial action at Operable Unit (OU) 10, which began on 3 November 1997. The triggering action for this fifth statutory review was 13 August 2018, the signature date of the Fourth Five-Year Review Report.

Five-year reviews are conducted because hazardous substances, pollutants, or contaminants remain at the facility in excess of levels that allow for unlimited use and unrestricted exposure (UU/UE).

The NAS Pensacola Superfund Site five-year review was led by NAVFAC Southeast. Other participants included U.S. EPA and Florida Department of Environmental Protection (FDEP). The review began on 18 February 2022, and only data available prior to this date were assessed as part of the five-year review. Table 1-1 lists NAS Pensacola sites and corresponding OUs included in this five-year review (see Figure 1-2), and Table 1-2 identifies the NAS Pensacola sites and corresponding OUs that are not included in this five-year review and provides the rationales for their exclusion.

NAS Pensacola occupies approximately 5,800 acres on a peninsula in southern Escambia County in the panhandle of Northwest Florida, approximately 5 miles west of the City of Pensacola, as shown on Figure 1-1. NAS Pensacola is bordered to the south and east by Pensacola Bay and to the north by Bayou Grande. The primary access routes to NAS Pensacola are Interstate 10, U.S. Route 98, and U.S. Route 90. The official mission of NAS Pensacola is to provide facilities, service, and support for the operation and maintenance of Naval weapons and aircraft to operating forces of the Navy as designated by the Chief of Naval Operations.

Currently, land use at NAS Pensacola consists of various aviation-related military housing, training, and support facilities. NAS Pensacola is often referred to as the mainside complex south of Navy Boulevard and excludes special outlying areas that include (but are not limited to) Naval Technical Training Center Corry Station, Saufley Field, and Bronson Field.

Table 1-1: Sites Included in the Five-Year Review

OU	Site Number and Name	Use Restrictions	Selected Remedy	Remedy in Place?
1	Site 1 — Former Sanitary Landfill	• Restrict groundwater (surficial aquifer) use • Limit intrusive activities See Sections 2.1.2 and 2.1.3	• Groundwater interception/treatment system (not currently operating) • Land use controls • Monitored natural attenuation • Long-term groundwater monitoring	Yes(1)
2	Site 11 — North Chevalier Field Disposal Area Site 12 — Scrap Bins Site 25 — Radium Spill Area Site 26 — Supply Department Outside Storage Area Site 27 — Radium Dial Shop Sewer Site 30 — Complex of Industrial Buildings and Industrial Wastewater Treatment Plant Sewer Line	• Prohibit residential uses • Prohibit unauthorized excavation • Limit occupational exposure to groundwater • Restrict groundwater (surficial aquifer) use See Sections 3.1.2 and 3.1.3	<u>All Sites (11, 12, 25, 26, 27, and 30)</u> • Excavation of soil such that concentrations based on the 95-percent upper confidence limit meet the lesser of FDEP Industrial and Leachability SCTLs • Monitored natural attenuation • Land use controls	Yes
			<u>Site 11 Only</u> • Place soil to ensure 2 feet of cover • Maintain and inspect added soil cover to ensure integrity	Yes
4	Site 15 — Pesticide Rinsate Disposal Area	• Prohibit residential uses • Restrict groundwater (surficial aquifer) use See Sections 4.1.2 and 4.1.3	• Excavation of soil exceeding FDEP Industrial SCTLs with off-site disposal • Monitored natural attenuation • Groundwater monitoring • Land use controls	Yes
10	Site 32 — Former Industrial Sludge Drying Beds Site 33 — Former Wastewater Treatment Plant Ponds Site 35 — Miscellaneous Industrial Wastewater Treatment Plant Solid Waste Management Units	• Restrict groundwater (surficial aquifer) use See Sections 5.1.3	• Groundwater remediation under RCRA (completed) • Excavation and disposal of soil contaminated above residential remedial goals • Leachability study with soil excavation and disposal as a contingency remedy • Groundwater monitoring	Yes

OU	Site Number and Name	Use Restrictions	Selected Remedy	Remedy in Place?
11	Site 38 — Facility Hazardous Waste Storage (Buildings 71 and 604) and Industrial Wastewater Treatment Plant Sewer Line	• Prohibit residential uses • Prohibit unauthorized excavation • Restrict groundwater (surficial aquifer) use See Sections 6.1.2 and 6.1.3	• Excavation of exposed surface soil exceeding three times FDEP Industrial and Leachability SCTLs with off-site disposal • Maintain existing pavement as a cap • Monitored natural attenuation • Land use controls	Yes
13	Site 8 — Rifle Range Disposal Area Site 24 — DDT Mixing Area	• Restrict groundwater (surficial aquifer) use See Sections 7.1.2 and 7.1.3	• Groundwater monitoring • Land use controls	Yes
16	Site 41 – NAS Pensacola Wetlands	None	• Excavation and off-site disposal of contaminated sediment • Wetland restoration • Wetland restoration monitoring	No
18	Site 43 — Demolition Debris Disposal Area	• Restrict site to non-residential uses • Prohibit uncontrolled soil disturbance/ excavation • Maintain the integrity of the current 40,000-square-foot parking lot • Maintain the integrity of all existing or future onsite soil remedy components including the concrete pad, pavers, and sidewalk • Prohibit groundwater (surficial aquifer) use See Sections 9.1.2 and 9.1.3	• Excavation of surface and subsurface soil exceeding FDEP Industrial SCTLs with off-site disposal(2) • Groundwater monitoring(3) • Land use controls	Yes
19	Site 44 — Building 3221 Underground Storage Tank/Solvent Site	• Restrict site to non-residential uses • Prohibit uncontrolled soil disturbance/ excavation • Prohibit groundwater use See Sections 10.1.2 and 10.1.3	• Limited excavation and off-site disposal for soil exceeding FDEP Industrial SCTLs • Monitored natural attenuation relative to trichloroethene and daughter products and plume stability • Land use controls	Yes

1 The groundwater interceptor trench system was in operation until May 2010, when it was discontinued due to its inability to effectively reduce iron impacts to Wetland 3. The Navy completed investigations to support remedy selection to address iron discharge from groundwater to surface water at Wetland 3, and a Feasibility Study is in preparation.

2 Because all soil contaminated with industrial exceedances could not be removed, the NAS Pensacola Partnering Team agreed to install concrete and pavers to prevent exposure to underlying soil. This was documented in a Remedial Action Completion Report (AGVIQ-CH2M HILL, 2017).

3 Groundwater monitoring was discontinued after five quarterly monitoring events, as approved by FDEP and U.S. EPA, and in February 2016, groundwater land use controls were removed from the Land Use Control Remedial Design.

Table 1-2: Sites Not Included in the Five-Year Review

Site Number	Operable Unit	Site Name	Description
2	3	Waterfront Sediments	No Further Action
3	--	Crash Crew Training Area	Transferred to FDEP Petroleum Program
4	--	Army Rubble Disposal Area	No Further Action
5	--	Borrow Pit	No Further Action
6	--	Fort Redoubt Rubble Disposal Area	No Further Action
7	--	Firefighting Training School	No Further Action
9	6	Navy Yard Disposal	No Further Action
10	--	Commodore's Pond	No Further Action
13	--	Magazine Point Rubble Disposal Area	No Further Action
14	--	Dredge Spoil Fill Area	No Further Action
16	--	Brush Disposal Area	No Further Action
17	14	Transformer Storage Yard	No Further Action
18	--	Polychlorinated Biphenyl Spill at Substation A	No Further Action
19	--	Fuel Farm Pipeline Lead	Transferred to FDEP Petroleum Program
20	--	Pier 303 Pipeline Leak	Transferred to FDEP Petroleum Program
21	--	Sludge At Fuel Tanks	Transferred to FDEP Petroleum Program
22	--	Refueler Repair Shop	Transferred to FDEP Petroleum Program
23	--	Chevalier Field – Pipe Leak	No Further Action
28	--	Transformer Accident	No Further Action
29	6	Soil South of Building 3460	No Further Action
34	--	Solvent North of Building 3557	No Further Action
36	--	Industrial Wastewater Treatment Plant Sewer Line	No Further Action
37	--	Sherman Field Fuel Farm	Transferred to FDEP Petroleum Program
39	12	Oak Grove Campground	No Further Action
40	15	Bayou Grande	No Further Action
42	17	Pensacola Bay	No Further Action
45	20	Building 603 Lead Site	Ongoing; ROD not signed
46	21	Former Building 72	Ongoing; ROD not signed

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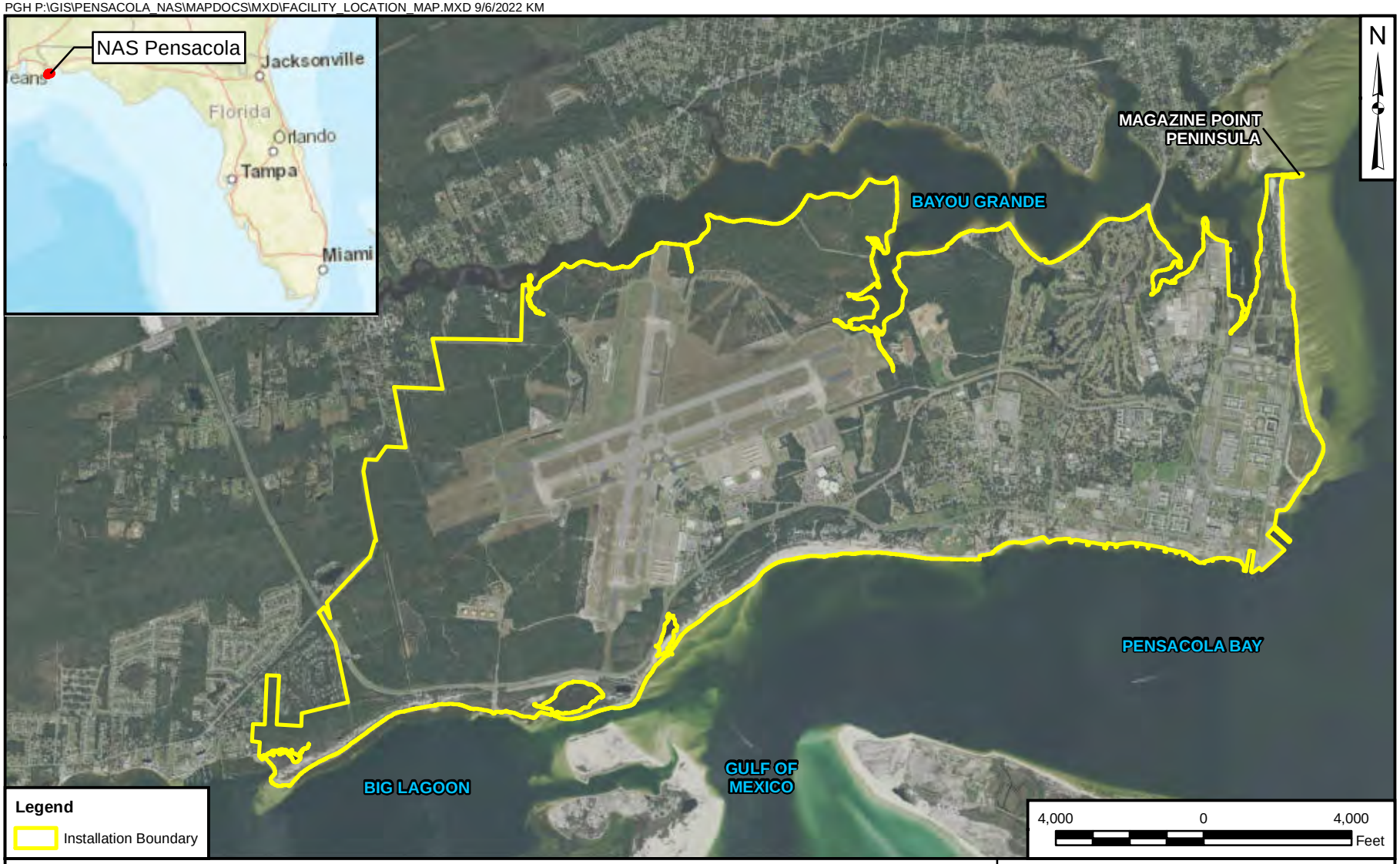

FACILITY LOCATION MAP
NAVAL AIR STATION PENSACOLA
PENSACOLA, FLORIDA

NAVFAC
Naval Facilities Engineering Systems Command

DRAWN BY	DATE	CTO
K. MOORE	09/06/22	N6945021F0538
CHECKED BY	DATE	FIGURE NUMBER
R. MILLER	09/06/22	1-1

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Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2019 ESRI and its data suppliers).

N

OU 1, SITE 1

OU 4, SITE 15

OU 2, SITE 11

OU 2, SITE 26

OU10, SITES 32,33 &35

OU 2, SITE 12

OU 2, SITE 30

OU 2, SITE 25

OU 2, SITE 27

OU 16, Site 41 (Wetland 12)

OU 16, Site 41 (Wetland W2)

OU 13, SITE 24

OU 13, SITE 8

OU 18, SITE 43

OU 19, SITE 44

OU 11, SITE 38

OU 16, Site 41 (Wetland 48)

2,000 0 2,000 Feet

Legend

- OU 16 Wetlands
- Installation Boundary

OPERABLE UNIT AND SITE LOCATION MAP
NAVAL AIR STATION PENSACOLA
PENSACOLA, FLORIDA

NAVFAC Naval Facilities Engineering Systems Command

DRAWN BY	DATE	CTO
K. MOORE	09/06/22	N6945021F0538
CHECKED BY	DATE	FIGURE NUMBER
R. MILLER	09/16/22	1-2

2.0 OPERABLE UNIT 1, SITE 1

OU 1, Site 1 is the Former Sanitary Landfill that encompasses an approximately 80-acre area located approximately 0.5 mile east of Forrest Sherman Airfield (Figure 2-1). The Former Sanitary Landfill received household and industrial wastes generated by NAS Pensacola from the early 1950s to 1976. The area was excavated to receive waste products during its active years and was then covered with soil (Navy, 2000b). The southern segment of the landfill was used in the 1950s, and the larger northern segment was constructed in the 1960s. The central portion of the landfill operated from the 1960s to the 1970s, until the landfill was officially closed on 1 October 1976. The landfill surface is currently densely vegetated with pine trees and scrub brush that serve to stabilize cover materials (at least 2 feet of clean soil cover). Multiple wetlands are present near the landfill. After 6 of the 81 wetlands at the facility (Wetlands 1B, 3, 4D, 15, 18A, and 18B) were reassigned from OU 16 (see Section 8) to OU 1 (the associated terrestrial OU), additional investigation was required for these wetlands. An RI Addendum was finalized in September 2021 to further evaluate the extent of contamination and to refine risks for the wetlands associated with OU 1 (Resolution Consultants, 2021).

The inactive landfill has limited recreational areas and designated nature trails. North of the landfill are a nature trail, picnic area, recreational Buildings 3553 and 3487, and two tidal-inlet ponds with associated wetlands. Future use is not expected to change because LUCs prevent intrusive activities, such as those associated with new construction, on the landfill.

Approximately 50 acres of uplands south and southwest of OU 1 were transferred to the Veterans Administration (VA) in May 2002. The purposes of the transfer were to facilitate expansion of the Barrancas Military Cemetery and construction of administrative and facility maintenance buildings (NAVFAC, 2013b). The property was not transferred by deed; it was an administrative federal-to-federal (Navy to VA) transfer of jurisdiction within the United States government. It was effected by the Bureau of Land Management, which was involved because the parcel is on withdrawn public land under its oversight. The VA has not assumed Installation Restoration Program (IRP) site management responsibility but has agreed to follow the LUCs and allow the Navy to continue IRP management of the site. In January 2022, a VA representative confirmed to the Navy that the VA is aware of the LUCs associated with their property and the processes to be followed to request any disturbances of the soil or groundwater (LeChance, 2022). The Navy has maintained IRP responsibilities for the part of OU 1 transferred to the VA since 2002.

2.1 RESPONSE ACTION SUMMARY

The primary source of contamination at OU 1 is associated with landfilled waste materials. The landfill was used from the early 1950s until 1976 for disposal of solid and industrial wastes generated at NAS Pensacola and outlying Navy installations. The site received various wastes such as polychlorinated biphenyls (PCBs), solvents, pesticides, oils, plating solutions, mercury, asbestos, paint chips and sludge, medical waste, pressurized cylinders, and household garbage. During the early years of disposal (1950s to late 1960s), landfilled materials were burned prior to burial. In addition, a tar pit identified along the western boundary of the landfill was removed in 1998 (73 tons of material were excavated and properly disposed of during removal).

2.1.1 Basis for Taking Action

The Remedial Investigation (RI) human health risk assessment (HHRA) determined that risks associated with exposure to contaminants in OU 1 soil were less than 1E-06 (carcinogenic risks) and 1 (non-carcinogenic risks, based on the hazard index [HI]) for both the site trespasser and site worker scenarios. Under a future resident scenario, soil posed a potential risk via ingestion of 3E-06, which exceeded the lower bound of U.S. EPA's acceptable risk range and exceeded FDEP's target risk threshold of 1E-06. However, excess risk was attributed to beryllium in one sample at a single sample location and therefore beryllium was not retained as a soil contaminant of concern (COC) in the Record of Decision (ROD). Non-carcinogenic risk due to soil ingestion under the future residential scenario was less than 1.

Excess groundwater risk (in shallow/intermediate zones) was identified for future residents based on both the ingestion and inhalation pathways. Excess cancer risk was 4E-04 based on the ingestion pathway, with arsenic, benzene, and vinyl chloride identified as the primary contributors. Non-cancer risk was 5, with benzene, manganese, and arsenic as the primary drivers. For the inhalation pathway, excess cancer risk was 3E-05, and non-cancer risk was 2 (NAVFAC, 1998).

Ecological risks were determined to be inconsequential for flora and fauna from contaminated soil (NAVFAC, 1998). The only wetland where appreciable ecological effects were expected from groundwater discharges was Wetland 3. Wetland 3 was the only wetland associated with OU 1 that was included in the OU 1 ROD because other wetlands were being addressed as part of OU 16. The planned ROD/ROD Amendment (see Section 2.1.2) will incorporate the other OU 1-related wetlands.

2.1.2 Response Actions

A tar pit identified during the RI posed a physical hazard to site trespassers (EnSafe/Allen & Hoshall, 1996a). To remove the physical hazard and potential for a release to the environment, 73 tons of landfill soil and debris that contained the tar substance were excavated in January 1998. The tar, characterized as a non-hazardous waste using Toxicity Characteristic Leaching Procedure analysis, was disposed of off site (NAVFAC, 1998).

The Final OU 1 ROD was signed by the Navy in August 1998 and by U.S. EPA in September 1998. The following Remedial Action Objectives (RAOs) were established at OU 1, by medium, to prevent current or future unacceptable exposure to contaminated soil and groundwater and to reduce the migration of contaminants to surface water (NAVFAC, 1998):

- Waste – Protect groundwater from leachable compounds across the entire landfill (estimated 700,000 cubic yards) that may be leaching contaminants to groundwater.

- Groundwater – Restore site groundwater to Maximum Contaminant Levels (MCLs) and prevent further contamination of shallow/intermediate groundwater in the central, northern, western, and eastern portions of Site 1 (210 million gallons) where groundwater concentrations exceed MCLs.

- Surface Water – Prevent further contamination of surface water in Wetland 3 in the eastern portion of Site 1 (1.156 million gallons) where surface water exceeds surface water quality standards for iron.

Table 2-1 lists remedial goals for the groundwater COCs identified in the ROD. The ROD requires groundwater monitoring until COC concentrations decrease to less than the ROD-specified criteria (Resolution Consultants, 2015). Arsenic was not identified in the ROD because all detected concentrations were less than the then-current MCL of 50 micrograms per liter (µg/L); however, the MCL and FDEP Public Drinking Water Standard (FPDWS) was subsequently lowered to 10 µg/L by U.S. EPA in 2001 and FDEP in 2005, respectively. Arsenic was detected at concentrations greater than 10 µg/L in groundwater during the RI; therefore, it will be added as a COC in the forthcoming ROD/ROD Amendment.

Table 2-1: Operable Unit 1, Site 1 – Groundwater COCs and Remedial Goals

COC	Remedial Goal (µg/L)
Nickel	100
Benzene	1
Chlorobenzene	100
Vinyl chloride	1

Remedial goals are the lesser of FPDWSs or federal MCLs.
COCs differ from the risk drivers identified during the HHRA because the NAS Pensacola Partnering Team considered multiple risk management factors in the selection of performance standards for OU 1.
An evaluation to resolve the discrepancy between groundwater COCs listed in the Proposed Plan and ROD is ongoing.

The selected remedy for OU 1 included groundwater treatment, monitored natural attenuation (MNA), groundwater monitoring, and land use controls (LUCs).

The groundwater treatment component of the remedy included the following:

- Installation of a groundwater interception system designed to capture contaminated groundwater upgradient of Wetland 3. As documented in a 2012 Explanation of Significant Differences (ESD), system operations ended in 2010.

- Treatment of intercepted groundwater to reduce iron levels less than the applicable water quality standard.

- Reintroduction of treated groundwater into Wetland 3. As documented in a 1999 ESD (1999), treated groundwater was redirected to the Navy's wastewater treatment system.

Under the MNA component of the remedy, concentrations of organic compounds present in groundwater and surface water will be reduced through natural attenuation resulting from naturally occurring biotic and abiotic processes that take place in the groundwater and surface water systems.

The groundwater monitoring component of the selected remedy includes:

- A groundwater monitoring program to ensure that natural attenuation processes are effective.

- Reviews during which the Navy determines whether groundwater performance standards continue to be appropriate and if natural attenuation processes are effective.

- Continued groundwater monitoring at regular sampling intervals after performance standards are attained to show that the remedy remains protective of human health and the environment.

LUCs were implemented in accordance with the Land Use Restriction Agreement among the Navy, U.S. EPA, and FDEP to:

- Restrict groundwater use of the surficial zone of the Sand-and-Gravel Aquifer within 300 feet of the site.

- Restrict intrusive activities within the landfill boundary without prior approval from the NAS Pensacola Environmental Office.

- Annually review and certify the LUCs to determine whether the controls should remain in place or be modified to reflect changing site conditions.

The Land Use Restriction Agreement refers to the Memorandum of Agreement (MOA) signed in September 1999 by the Navy, U.S. EPA, and FDEP. Appendix B of the MOA provides Land Use Control Implementation Plans (LUCIPs) for each site covered under the agreement, including OU 1. The LUCIP identifies LUC objectives and controls relied upon to achieve the LUC objectives (Navy, 1999b). A LUC Remedial Design (RD) for OU 1 is currently in the planning process.

1999 Explanation of Significant Difference

An ESD to modify the treated effluent discharge option for the interceptor trench system (ITS) (discussed in Section 2.1.3) was signed by the Navy and approved by U.S. EPA in 1999.

2012 Draft Explanation of Significant Difference

The Navy issued a draft ESD in March 2012 that described the rationale for discontinuing active operation of the ITS and revised groundwater and surface water monitoring procedures. However, based on the comments from FDEP and U.S. EPA, the Navy agreed that an ESD was insufficient, and the 2013 Five-Year Review Report included a recommendation for a ROD Amendment for OU 1 (NAVFAC, 2013b). Associated investigations were still in progress at the time of the 2018 five-year review. In accordance with the recommendation of the 2018 Five-Year Review Report and subsequent discussions, the ROD/ROD Amendment is in preparation and will address the following:

- Decommissioning of the ITS.

- Documentation of the revised Wetland 3 surface water remedial action and point of compliance.

- Revision of groundwater and surface water RAOs.

- Re-evaluation of the list of groundwater COCs to resolve the discrepancy between COCs listed in the Proposed Plan and ROD.

- Documentation of the existing LUC implementation policy and completion of a LUC RD to update the LUC remedy.

- Re-evaluation of Applicable or Relevant and Appropriate Requirements (ARARs), including the change in the arsenic MCL from 50 µg/L to 10 µg/L.

- Documentation of the selected remedy for OU 1 wetlands sediment (at Wetlands 15, 18A, and 18B) based on the results of the OU 1 wetlands investigation.

The RI Report Addendum documenting the OU 1 wetlands investigation was completed in September 2021 (Resolution Consultants, 2021), and the Feasibility Study (FS) is in preparation and scheduled to be finalized in March 2023. The FS will include a human health risk evaluation to finalize groundwater COCs. A draft ROD/ROD Amendment to address the concerns identified above is scheduled to be submitted in November 2023.

2.1.3 Status of Implementation

Groundwater Treatment

The ITS was designed, constructed, and placed into operation in 1999. Groundwater with dissolved-phase ferrous iron passed through and reacted with alkaline limestone to form insoluble ferric iron, which precipitated from the groundwater. The ITS, originally designed to discharge treated effluent to Wetland 3, was redesigned to redirect the discharge to the Navy's wastewater treatment system. The redesign was documented in the 1999 ESD.

A 2008 Optimization Study determined that the ITS contributed to decreasing iron concentrations in shallow groundwater but was not having an appreciable effect on iron concentrations in Wetland 3 surface water because of the prevalence of iron in upgradient, sidegradient, and downgradient shallow groundwater (Tetra Tech, 2008a). A Reconnaissance Phase Flow Control Pilot Study was conducted to evaluate the effectiveness and impacts of blocking the culvert that connects Wetland 3 and 4D to determine if they could be isolated from Waters of the State; thereby creating an infiltration area within the wetland. The study determined that blocking the culvert would cause flooding of John Tower Road. The 2008 Five Year Review concluded (1) the design and subsequent performance of the trench did not appear to be sufficient to capture and extract iron contamination migrating to the wetland, (2) the prevalence of iron within the shallow groundwater upgradient, sidegradient, and downgradient of the ITS would make achievement of the RAOs for surface water in Wetland 3 impractical, and (3) the system was not meeting, or expected to meet, the reductions necessary for cleanup. Based on the findings and recommendations of both studies and the 2008 Five-Year Review Report, the ITS was decommissioned in May 2010.

Long-Term Groundwater Monitoring

Groundwater monitoring is being conducted at OU 1 in accordance with the 2014 Sampling and Analysis Plan (SAP) (Resolution Consultants, 2014a) and subsequent FTMRs to evaluate the

effectiveness of the MNA portion of the remedy. The current monitoring program includes semiannual sampling of 19 wells, one piezometer, and three surface water locations. Monitoring well samples are analyzed for select volatile organic compounds (VOCs), select metals, and natural attenuation indicator parameters, and piezometer and surface water samples are analyzed for total iron. Piezometer data are intended to focus on the direction and magnitude of iron contaminant migration to Wetland 3 and the potential for migration to Wetland 4. The surface water sampling is a biased design to monitor that Bayou Grande does not receive an influx of iron contamination from the landfill.

Land Use Controls

LUCs have been implemented at OU 1 in accordance with the OU 1 LUCIP included as Appendix B of the 1999 MOA. A LUC RD for OU 1 to replace the LUCIP is in the planning process. LUC inspections are conducted annually to confirm continued implementation of LUCs and compliance with the LUC objectives described in the LUCIP. Table 2-2 provides a summary of LUCs implemented for OU 1.

Table 2-2: Summary of Implemented LUCs – OU 1, Site 1

Media, engineered controls, and areas that do not support UU/UE based on current conditions	LUCs Needed	LUCs Called for in the Decision Documents	Impacted Parcel(s)	LUC Objective	Title of LUC Instrument Implemented and Date
Soil	Yes	Yes	Site 1	Limit intrusive activities within the landfill boundary without prior approval from NAS Pensacola Environmental Office	*Land Use Control Implementation Plan, Appendix B of 1999 MOA*
Groundwater	Yes	Yes	Site 1	Restrict use of groundwater use of the surficial zone of the Sand-and-Gravel Aquifer within 300 feet of the site	

2.1.4 Systems Operations/Operation and Maintenance

No system operations and maintenance (O&M) is occurring because the ITS has been decommissioned. Monitoring well maintenance is implemented as part of routine long-term monitoring (LTM), and well integrity is evaluated during ongoing groundwater sampling.

2.2 PROGRESS SINCE LAST FIVE-YEAR REVIEW

This section includes the protectiveness determination and statement from the last five-year review as well as the recommendations from the last Five-Year Review Report and the current status of those recommendations.

Based on the results of the fourth five-year review, the remedial actions implemented at OU 1 were determined to be short-term protective. The protectiveness statement from the Fourth Five-Year Review Report was as follows:

The selected remedy at Operable Unit 1 is protective of human health and the environment in the short term. Institutional controls (as measured by Land Use Control inspections) have been successful in preventing exposure to contaminants. Long-term monitoring shows natural attenuation has been effective at reducing contaminant concentrations in shallow/intermediate groundwater plumes and the contaminant plume remains stable. Iron was not retained as a human health contaminant of concern in groundwater; it is currently being evaluated as an ecological contaminant of potential concern in sediment and surface water during ongoing investigations at Wetland 3. To ensure long-term protectiveness, the Navy plans to identify a remedy to address iron discharge from groundwater to surface water at Wetland 3.

Status updates on issues identified in the 2018 report as impacting the protectiveness of the OU 1 remedy are provided in Table 2-3.

Table 2-3: Status of OU 1 Recommendations from 2018 Five-Year Review

Issue	Recommendation	Current Status	Current Implementation Status Description	Completion Date
The ROD established an RAO for iron in surface water at Wetland 3. The interceptor trench system was decommissioned, and the Navy is completing supplemental assessment to determine if additional remedy optimization is required.	Complete the assessment and select a remedy as necessary to address iron discharge from groundwater to surface water.	Ongoing	The RI Report Addendum for the OU 1 wetlands investigation was finalized in September 2021 and recommended an FS for Wetlands 3 to evaluate alternatives for removal of iron in surface water to prevent adverse impacts to downgradient receptors. A ROD/ROD Amendment will be prepared to document the selected remedy. The draft ROD/ROD Amendment is scheduled for submittal in November 2023.	11/17/2023

In addition, two issues and associated recommendations were identified in the previous five-year review but do not affect protectiveness, and both of these issues are being addressed as part of the upcoming ROD/ROD Amendment process. The first issue was that the inspection frequency (quarterly) requirement of the LUCIP is not being followed, and the LUCIP includes language related to continued operation of the interceptor trench system as an institutional control to prevent aquatic exposure to groundwater migrating to adjacent surface waters. The recommendation was that the Navy will address LUC management, including updated conditions related to inspection frequency and the interceptor trench system, in the LUC Remedial Design that will be implemented following the ROD Amendment. The second issue was that the federal MCL and FDEP GCTL for arsenic changed in 2001 and 2005, respectively, and that arsenic concentrations at OU 1 have exceeded the revised ARAR. The recommendation was that the ROD Amendment will re-evaluate remedy-specific ARARs and will integrate the change in federal and state action levels for arsenic.

2.3 FIVE-YEAR REVIEW PROCESS

2.3.1 Community Notification, Involvement, and Site Interviews

A public notice announcing the initiation of this five-year review was published in the *Pensacola News Journal* and on the NAS Pensacola Facebook page on 19 June 2022 (see Appendix C). No public comments were received in response to the public notice. A second public notice will be published announcing the completion of the Fifth Five-Year Review Report and the availability in the Administrative Record of the report and a fact sheet summarizing the results of the review. The fact sheet will also be distributed to the Restoration Advisory Board (RAB) and any other interested persons or organizations. The Administrative record can be accessed online at

https://www.navfac.navy.mil/Business-Lines/Environmental/Products-and-Services/Environmental-Restoration/Southeast/Pensacola-NAS/Administrative-Record/

Interview questionnaires were sent to two members of the NAS Pensacola Restoration Advisory Board, and the completed questionnaire received in response is included in Appendix C.

2.3.2 Data Review

Figure 2-1 shows the locations of monitoring wells and surface water sampling points in the active monitoring program. Analytical results for annual groundwater and surface water monitoring activities were provided in their respective annual reports. Monitoring is conducted to evaluate natural attenuation processes and to ensure that COCs are not migrating to surface water at concentrations of concern. During this five-year review period, LTM at OU 1 was conducted in May and November 2017, November 2018, November 2019, and June and November 2021. OU 1 did not have an approved updated SAP in 2020; therefore, LTM activities were put on hold. In 2021, a Field Task Modification Request (FTMR) form was approved that allowed continued LTM sampling. The current sampling program includes semiannual sampling of 19 monitoring wells, one piezometer, and three surface water locations. The 2017 LTM events only included sampling of 17 wells because two wells were installed and added to the monitoring program in 2018. Monitoring well samples are analyzed for select VOCs, select metals, and natural attenuation indicator parameters; piezometer and surface water samples are analyzed for iron only.

Table 2-4 summarizes COC exceedances of remedial goals during the current five-year review period. This table includes only the COCs documented in the ROD and arsenic because it will be added as a COC in the ROD/ROD Amendment. Detailed results and evaluations for these COCs and other LTM parameters are presented in the annual monitoring reports. As discussed in Section 2.1.2, the upcoming ROD/ROD Amendment will document an updated groundwater COC list, based on the results of a human health risk evaluation to be conducted as part of the ongoing FS, to resolve the discrepancy between groundwater COC lists in the Proposed Plan and ROD.

Table 2-4: Summary of OU 1 Groundwater COC and Arsenic Concentrations Exceeding Remedial Goals

Well	Detections of COCs > Remedial Goals[1], 2017 to 2021[2]
Upgradient	
01UPGW02	None
Interior Wells (source area)	
01GGM33	Benzene (May and November 2017, 2018, 2019) Chlorobenzene (2019) Arsenic (2019)
01GS64	Benzene (May 2017, 2018)
01GI59	Benzene (May 2017, 2019, June and November 2021)
01GI65	Benzene (May and November 2017, 2018, 2019, June and November 2021) Vinyl chloride (May 2017)
01GM39 (not sampled in 2017)	Benzene and arsenic (2018, 2019, June and November 2021)
01GI75 (installed in 2018)	Benzene (2018, 2019, June and November 2021) Arsenic (November 2021)
Outboard Wells (between interior and perimeter wells)	
01GI32	Arsenic (May and November 2017, 2018, 2019, June and November 2021)
01GI36	None
01GI41	Benzene (May and November 2017, 2019, June and November 2021) Arsenic (June 2021)
Perimeter Wells (most downgradient/indicative of potential COC migration)[3]	
01GS57	None
01GS62	None
01GS71	None; only sampled in 2017
01GS72	None; only sampled in 2017
01GS73[4]	None
01GI74[4]	Vinyl chloride (May 2017) Arsenic (May and November 2017, 2018, 2019, and June and November 2021)
01GGM04 (not sampled in 2017)	None
01GI43	Benzene (May and November 2017, 2019, June and November 2021) Arsenic (May and November 2017, 2018, 2019)
01GI44	Arsenic (May and November 2017, 2018, 2019, June and November 2021)
01GI46	Arsenic (May and November 2017, 2018, 2019, June 2021)
01GI76 (installed in 2018)	Arsenic (2018, 2019, June and November 2021)

1 For arsenic, comparison is made to the anticipated remedial goal in the forthcoming ROD/ROD Amendment.

2 In 2020, OU 1 did not have an approved updated SAP; therefore, groundwater monitoring activities were put on hold. In 2021, a FTMR was approved that allowed continued LTM sampling.

3 Nine perimeter wells were sampled during each event, but the list of perimeter wells sampled in 2017 was slightly different.

4 Paired wells 01GS73 and 01GI74 are located closest to Bayou Grande. Arsenic concentrations in 01G174 exceeded the anticipated groundwater remedial goal but did not exceed the saltwater Surface Water Cleanup Target Level (SWCTL) of 50 µg/L. Comparison to saltwater SWCTLs is used as a measure of protectiveness at this location given the connection of upwelling groundwater to Bayou Grande surface water.

Results for other monitoring parameters are discussed in the annual LTM reports.

During this review period, VOCs were detected at concentrations exceeding remedial goals mainly in source area and outboard wells. VOC remedial goal exceedances in perimeter wells during this review period were limited to benzene at 01GI43 during five of six LTM events and vinyl chloride at 01GI74 during one event. At 01GS43, benzene concentrations have exceeded the remedial goal during all events since sampling began in 1993, at concentrations ranging from 1.21 to 77 µg/L. Concentrations during this five-year review period ranged from 1.21 to 1.80 µg/L, and concentrations are decreasing at a confidence level greater than or equal to 80 percent at this well (EnSafe, 2022a). Benzene concentrations at 01GI43 have never exceeded the saltwater SWCTL of 71.28 µg/L. At 01GI74, vinyl chloride concentrations exceeded the remedial goal during 9 of 12 events between 2010 and May 2017 but have remained less than the remedial goal during the five events since then. Vinyl chloride concentrations at 01G174 exceeded the saltwater SWCTL of 2.4 µg/L from 2010 to 2012, but subsequent detections were less than the SWCTL. Vinyl chloride concentrations at 01GI74 during this review period ranged from 0.44 to 1.07 µg/L.

During this review period, geochemical data (dissolved oxygen and oxidation-reduction potential data) suggest reducing conditions in OU 1 groundwater, and concentrations of methane, chloride, carbon dioxide, and alkalinity suggest that degradation of VOCs has occurred or is occurring in the aquifer. Carbon substrate available in the aquifer is sufficient for degradation to occur; however, the concentration of electron acceptors is low. Natural attenuation of organic COCs is occurring, but the rate may be reduced because anaerobic degradation is a slow process and because of the lack of electron acceptors in the aquifer. Due to the variety of minerals present in the subsurface, abiotic degradation may also have a role in VOC degradation at the site (EnSafe, 2022a).

Arsenic concentrations exceeded the current MCL and FDEP FPDWS of 10 µg/L in interior, outboard, and perimeter wells during this five-year review period. Perimeter wells with arsenic exceedances included 01GS43, 01GI44, 01GI46, 01GI74, and 01GI76, and concentrations at these wells have been greater than the MCL/FPDWS during most events. Trend evaluations as summarized in the 2021 LTM report, indicate that arsenic concentrations at 01G144 and 01GI74 are increasing at a confidence level of greater than or equal to 80 percent and are decreasing at a confidence level of greater than or equal to 80 percent at 01GI43 and 01GI46 (EnSafe, 2022a). Well 01GI76 was installed in 2018 and has only been sampled during four events; insufficient data are available to determine trends. Arsenic concentrations have never exceeded the saltwater SWCTL of 50 µg/L at any perimeter wells.

Natural attenuation has been effective at reducing the concentrations of the VOC COCs. Concentrations of COCs, other LTM parameters, and arsenic are generally stable or decreasing in OU 1 wells, and concentrations in perimeter wells do not indicate migration of groundwater contaminants other than iron (which is being evaluated and will be addressed as part of the ongoing wetlands ROD/ROD Amendment process) to surface water at concentrations of concern.

Iron results from piezometers and surface water sample locations for this five-year review period are summarized in Table 2-5. The upcoming ROD/ROD Amendment will document the selected remedial action to address iron in Wetland 3 surface water and will identify the associated point of compliance.

Table 2-5: Summary of OU 1 Iron Concentrations in Piezometer and Surface Water Samples Exceeding the SWCTL, 2017 to 2021

Location	Detections > SWCTL, 2017 to 2021[1]
Piezometers[2]	
01PZ01	May and November 2017, 2018; NS in 2019 or 2021
01PZ06	May and November 2017, 2018, 2019, June and November 2021
01PZ06A	June 2021; NS in 2019 or November 2021
01PZ07	May and November 2017, 2018; NS in 2019 or 2021
01PZ07A	May and November 2017, 2018; NS in 2019 or 2021
01PZ07B	None; NS in 2019 or 2021
01PZ08	May and November 2017, June 2021; NS in 2019 or November 2021
01PZ10 (upgradient)	November 2017, 2018, June 2021; NS in 2019 or November 2021
Surface Water	
01SW01 (seep in Wetland 3)	November 2017, 2018, June and November 2021; dry in May 2017 and 2019
01SW02 (stream in Wetland 3)	May and November 2017, 2018, 2019, June and November 2021
01SW03 (compliance point in Wetland 4D)	2018, June and November 2021[3]

1 In 2020, OU 1 did not have an approved updated SAP; therefore, groundwater monitoring activities were put on hold. In 2021, an FTMR was approved that allowed continued LTM sampling.
2 Because the piezometers were installed to assess the effectiveness of the ITS, the NAS Pensacola Team agreed that, beginning in November 2021, only the piezometer with the maximum iron concentrations, 01PZ06, would be sampled during future events.
3 Iron concentrations exceeded the SWCTL but not the background concentrations (2,360 µg/L for freshwater and 5,862 µg/L for saltwater).

2.3.3 Site Inspection

The inspection of the site was conducted on 14 April 2022 by Tetra Tech. The purpose of the inspection was to assess the protectiveness of the OU 1 remedy. No issues impacting the current or future protectiveness of the OU 1 remedy were identified during the inspection. Five-year review inspection checklists are included in Appendix E.

2.4 TECHNICAL ASSESSMENT

2.4.1 QUESTION A: Is the remedy functioning as intended by the decision documents?

With the exception of iron in surface water, which is being evaluated and will be addressed as part of the ongoing ROD/ROD Amendment process, the results of the five-year review indicate that the other components of the OU 1 remedy are functioning as intended by the ROD. Implementation of LUCs prevents exposure to contaminated soil and groundwater, and groundwater monitoring results indicate that contaminant concentrations in groundwater are generally stable or decreasing and that migration to surface water at concentrations of concern is not occurring (except for iron, as previously discussed).

The remedial actions are being implemented as designed, with the exception of operation of the ITS, and include measures that prevent exposure. The OU 1 remedial actions that have been completed (LUC implementation) and actions that are ongoing (LTM) are operating as designed and meet the waste and groundwater RAOs. A revised remedial action for Wetland 3 surface

water and remedial actions for sediment at Wetlands 15, 18A, and 18B is being determined via the ongoing CERCLA process and will be documented in the upcoming ROD/ROD Amendment.

Based on the completed and ongoing activities, the intent and goals of the OU 1 ROD have been or will be met, and there are no deficiencies or early indicators of potential remedy failure.

2.4.2 QUESTION B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?

There have been no changes in physical conditions, exposure pathways, or land use that would affect the protectiveness of the OU 1 remedy. The exposure assumptions, cleanup levels for COCs in the ROD, toxicity data, and RAOs for the site used at the time of the remedy selection are still valid.

Arsenic was not identified in the ROD because detected concentrations were less than the then-current MCL of 50 µg/L; however, the MCL and FPDWS was subsequently lowered to 10 µg/L by U.S. EPA in 2001 and FDEP in 2005, respectively. Because arsenic was detected at concentrations greater than 10 µg/L in groundwater during the RI, arsenic will be added as a COC in the forthcoming ROD/ROD Amendment. ARARs and groundwater COCs will also be re-evaluated for inclusion in the ROD/ROD Amendment.

A Per- and Polyfluoroalkyl Substances (PFAS) Preliminary Assessment (PA) was completed at NAS Pensacola in September 2021 and recommended that OU 1, Site 1 be evaluated further in a PFAS Site Inspection (SI). Preliminary PFAS SI sampling results, as reported in the draft SI Report, indicate exceedances of the May 2022 updated U.S. EPA tap water Regional Screening Levels (RSLs) in groundwater at OU 1, and the SI Report recommends that OU 1 proceed to an RI for PFAS (Tetra Tech, 2022f).

The Navy is currently conducting a base-wide radiological PA/SI to address base-wide radiological issues that are within the CERCLA framework. The Navy submitted the final PA Report to the regulators on 23 September 2021 and is in the process of preparing the planning documents for SI activities. Twenty-seven areas at NAS Pensacola, including OU 1, were identified as having potential radiological releases and will be investigated as part of the SI. SI field activities are tentatively scheduled for early 2023, after the SI planning documents are approved. The SI portion of the investigation is not intended to be a full-scale study of the nature or extent of radiological contamination. Rather, its purpose is to augment the data/information collected during the PA and to determine whether further response action or an RI is necessary, or if no further investigation is appropriate.

2.4.3 QUESTION C: Has any other information come to light that could call into question the protectiveness of the remedy?

No additional information has come to light that could call into question the protectiveness of the remedy. There are no newly identified human health or ecological risks, and there have been no impacts from human activities, weather-related events, or natural disasters.

As a result of the effects of climate change, storm events have been increasing in magnitude with time. The Navy conducts annual LUC inspections that would identify any storm-related impacts

that might impact protectiveness. If any such impacts are identified, the Navy will address the impacts as required to ensure continued protectiveness.

2.5 ISSUES/RECOMMENDATIONS

The following table summarizes the issues that affect current or future protectiveness and provides recommendations for future action.

OU 1	**Issue Category: Operations and Maintenance**
	Issue: The ROD established an RAO for iron in surface water at Wetland 3. The ITS was decommissioned, and the Navy is completing supplemental assessment to determine a revised Wetland 3 surface water remedial action.
	Recommendation: Complete the FS, Proposed Plan, and ROD/ROD Amendment and select a remedy as necessary to address iron discharge from groundwater to surface water.

Affect Current Protectiveness	Affect Future Protectiveness	Party Responsible	Oversight Party	Milestone Date
No	Yes	Federal Facility Navy	EPA/State	3/6/2026

OU 1	**Issue Category: Monitoring**
	Issue: Groundwater sampling results exceed PFAS risk-based screening levels (U.S. EPA RSLs).
	Recommendation: Complete an RI to refine the CSM and evaluate the magnitude and extent of PFAS. Document the investigation and implement appropriate follow-on actions in accordance with Navy Policy and CERCLA.

Affect Current Protectiveness	Affect Future Protectiveness	Party Responsible	Oversight Party	Milestone Date
No	Yes	Federal Facility Navy	EPA/State	11/20/2026

Other Findings

As part of the ROD/ROD Amendment, an RAO should be added to the OU 1 remedy to account for the need to prevent exposure to landfill contents and associated soil under the existing soil cover. In addition to the existing LUC objective of restricting intrusive activities within the landfill boundary (see Section 2.1.2), a LUC objective should be added to the LUC RD, to be prepared in accordance with the ROD/ROD Amendment, to prohibit residential and use and to require maintenance of the soil cover over the landfill. These changes do not affect the protectiveness of the OU 1 remedy.

2.6 PROTECTIVENESS STATEMENT

Protectiveness Statement	
Operable Unit: 1	*Protectiveness Determination:* Short-term Protective
***Protectiveness Statement**: The selected remedy for OU 1 is protective of human health and the environment in the short term. LUCs have been successful in preventing exposure to contaminants by restricting groundwater use and intrusive activities. Groundwater monitoring results show that natural attenuation has been effective at reducing contaminant concentrations in shallow/intermediate groundwater, and contaminant concentrations remain relatively stable. Based on RI Addendum results, Wetland 3 will be addressed in the ongoing FS to evaluate remedial alternatives for removal of iron in surface water to prevent adverse impacts to downgradient ecological receptors. To ensure long-term protectiveness, the Navy plans to identify a remedy to address iron discharge from groundwater to surface water at Wetland 3. Risks for OU 1 wetlands other than Wetland 3 are being evaluated and will be addressed as documented in the forthcoming ROD/ROD Amendment. In addition, OU 1 groundwater PFAS sample results exceed CERCLA risk-based screening levels. A PFAS RI will be completed to refine the CSM and to evaluate the magnitude and extent of PFAS. Thereafter, appropriate follow-on actions should be implemented in accordance with Navy policy and CERCLA guidance.*	

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N

Wetland 15
Wetland 16
Wetland 17
Wetland 18B
Wetland 18A
Wetland 3
Wetland 4D
Wetland 4C
Wetland 4B
Wetland 4A
Wetland 1A
Wetland 1B

01GS76
01GS73
01GI74
01GI46
01GS57
01GI32
01GI75
01SW03 (SW POC)
01GS71
01GI72
01GI59
01GGM33
01GI44
01GM39
01SW02
01GI43
01GI41
01GS64
01GI65
01PZ06
01PZ06A
01PZ07
01PZ07A
01PZ07B
01PZ01
01GI36
01SW01
01PZ10
01PZ08
01GS62
01UPGW2

SITE 1
SITE 15
SITE 16
SITE 24

Legend

- Interior Well
- Outboard Well
- Perimeter Well
- Piezometer Location
- Surface Water Sample Location
- Building
- Cemetery Property Line
- Site Boundary
- OU 1 Wetlands
- Groundwater LUC
- Soil LUC
- Installation Boundary

500 0 500 Feet

OU 1 SITE 1 LAYOUT
NAVAL AIR STATION PENSACOLA
PENSACOLA, FLORIDA

NAVFAC Naval Facilities Engineering & Systems Command

DRAWN BY	DATE	CTO
K. MOORE	09/06/22	N6945021F0538
CHECKED BY	DATE	FIGURE NUMBER
R. MILLER	11/14/22	2-1

3.0 OPERABLE UNIT 2, SITES 11, 12, 25, 26, 27, AND 30

OU 2 includes the following six individual sites grouped together because of their proximity and location within the same watershed (NAVFAC, 2008a) (see Figure 3-1):

- Site 11 – North Chevalier Field Disposal Area.
- Site 12 – Scrap Bins.
- Site 25 – Radium Spill Area.
- Site 26 – Supply Department Outside Storage Area.
- Site 27 – Radium Dial Shop Sewer.
- Site 30 – Complex of Industrial Buildings and Industrial Wastewater Treatment Plant (IWTP) Sewer Line.

The sites comprising OU 2 are north and northwest of the former Chevalier Field, near Murray Road, and west of Pensacola Bay. Chevalier Field is now the Naval Technical Training Center training complex. The approximately 68-acre OU 2 is almost entirely paved or covered by buildings. The extensive pavement at OU 2 generally inhibits percolation of rainfall through site soil; however, infiltration does occur in some exposure areas. Rainwater from OU 2 tends to flow over gravel and paved surfaces into the existing storm water sewer system. As shown on Figure 3-1, Sites 11, 12, and 26 are contiguous and Sites 25, 27, and 30 are contiguous. Table 3-1 summarizes the current and former uses, sizes, and locations of the sites in OU 2.

Wetlands 5A, 6 (northern end), 7 (southern end), and 64 Complex (comprising Wetland 64, the northern end of Wetland 7, and Wetland 8) were reassigned from OU 16 (see Section 8) to OU 2 (the associated terrestrial OU) An RI Report Addendum was finalized in July 2022 for these wetlands to assess the extent of contamination and to refine associated risks (EnSafe, 2022c).

Table 3-1: Operable Unit 2 – Site Summaries

Site, Size, and Location	Former Use and Contamination History	Improvements and Current Use
Site 11 – North Chevalier Field Disposal Area; 20 acres southwest of Yacht Basin, crossed by Pat Bellinger Road	North Chevalier Field Disposal Area is a former landfill where industrial and municipal wastes (including fuels, solvents, and waste oil from aircraft engine overhauls) were disposed of and burned from the late 1930s to mid-1940s.	Buildings 3627, 3628, 3445, and outdoor storage of boats, trucks, and heavy equipment. Building 3445 is used to store outdated office equipment.
Site 12 – Scrap Bins; located south of Building 780, east of Building 781, and west of Warehouse Road and Site 26	From the early 1930s to the 1940s, wet garbage was stored at Site 12 before being hauled off for livestock feed. The site has since been used to store scrap metal by the Defense Reutilization and Marketing Office Recyclable Materials Center.	Enclosed by a chain-link fence and covered with a large concrete pad used as a heavy equipment storage area; Buildings 455 and 3821 are storage warehouses.

Site, Size, and Location	Former Use and Contamination History	Improvements and Current Use
Site 25 – Radium Spill Area; 50-foot by 50-foot concrete-paved area and larger grassy area east of Site 27 and Building 780, north of Building 225, between Page and Farrar Roads	In 1978, approximately 25 gallons of low-level radium paint waste spilled in an area between the radium decontamination building (Building 780) and former helicopter scrap yard.	Building 780 houses the Joint Oil Analysis Laboratory used for quality assurance analysis of oil from aircraft and vehicles; Navy Exchange parks truck trailers in the grassy area east of Building 780.
Site 26 – Supply Department Outside Storage Area; 150-foot by 200-foot area south of Building 684/684A, between Sites 11 and 12	The Supply Department formerly used the site to store incoming paint strippers and acids, which occasionally leaked.	Unimproved and unused heavily vegetated area that south-adjoins Hazardous Waste Storage Building 684/684A.
Site 27 – Radium Dial Shop Sewer; concrete foundation of former Building 709, approximately 150 feet west of Building 780, bound by Farrar and Murray Roads on the south and west	Former Building 709 was constructed in 1941 and used for carburetor repair, propeller repair, painting and maintenance, various instrument shops (including a radium paint room), and a plating shop. From 1946 to 1965, worn and damaged luminous instrument dials were soaked in benzene, scraped in a benzene or water bath, or dry-scraped and painted. After 1965, the items were stripped with paint stripper and a lye-nitric acid solution. Building 709 also housed a large plating operation from 1941 to 1970 involving use of 50 solution tanks.	The Building 709 foundation is a parking lot with adjoining asphalt and gravel-and-shell parking lots.
Site 30 – Complex of Industrial Buildings and IWTP Sewer Line; 35 acres adjoined on the south by Wetland 5A, east by Murray Road, and east of A.C. Read Golf Course	The Building 649 complex was used by the Naval Aviation Depot Dynamic Component Division and several aircraft component repair functions. Operations of concern included: aircraft and parts painted in booths using various thinners (1940); tin-cadmium plating shop (mid-1940s to early 1960s); 15 tanks (200 to 500 gallons) contained tin, cadmium, and cyanide; 250-gallon trichloroethene (TCE) aboveground storage tank; and 500-gallon waste oil underground storage tank that occasionally drained into a ditch that emptied into Wetland 5A. Sewer line investigations included lines at Sites 25, 27, and 30; the feeder line from Building 3220; the main line to the IWTP; and a portion of the sewer line from the Building 649 complex to the IWTP.	The Building 649 complex includes interconnected Buildings 648, 649, and 3815, and smaller, separate buildings 2667, 3833, 3483, and 2691. Site 30 is mostly vacant and unoccupied, with some areas used for storage and maintenance/repair activities.

3.1 RESPONSE ACTION SUMMARY

3.1.1 Basis for Taking Action

The HHRA conducted as part of the 1997 RI identified unacceptable risks for future site residents, current and future site workers, and adolescent trespassers exposed to soil and groundwater at the sites included in OU 2. Table 3-2 summarizes the human health risk results as presented in the ROD.

Table 3-2: Operable Unit 2 – Human Health Risk Summary

Site	Surface Soil (all pathways summed)						Groundwater (all pathways summed)			
	Future Resident[(1)]		Site Worker		Trespasser		Future Resident[(1)]		Site Worker	
	ILCR	HI	ILCR	HI	ILCR	HI	ILCR	HI	ILCR	HI
Site 11	5E-05	2	1E-05	0.1	2E-06	0.04	3E-03	27	9E-04	4
Site 12	9E-05	9	2E-05	0.5	3E-06	0.2	4E-05	0.9	1E-05	0.1
Site 25	4E-06	2	7E-06	1.0	1E-06	0.05	3E-04	1	9E-05	0.2
Site 26	3E-06	ND	7E-07	ND	1E-07	ND	1E-04	3	4E-05	0.5
Site 27	2E-05	0.6	4E-06	0	7E-07	0.02	7E-04	29	3E-04	4
Site 30	3E-05	0.4	5E-06	0.02	1E-06	0.01	1E-03	22	5E-04	3

Summarized from the ROD (NAVFAC, 2008b), Tables 2-15 through 2-30.
1 Future resident hazard index shown represents future child non-cancer risks.
ICLR Incremental lifetime cancer risk.

Quality habitat is not available throughout most of OU 2 because most of the area is paved or occupied by buildings. Based on the very limited amount of habitat and its low quality, no unacceptable risks to ecological receptors from soil or groundwater at OU 2 were identified during the RI.

3.1.2 Response Actions

In 1994, the NAS Pensacola Public Works Center removed an aircraft engine shipping container from Wetland 5A, immediately southeast of Building 649 (NAVFAC, 2008). The shipping container, referred to as the waste receiving structure, had been used as an oil-water separator. No other Interim Remedial Actions (IRAs) were conducted at OU 2 sites prior to remedy selection in the ROD.

2008 ROD

The final OU 2 ROD (NAVFAC, 2008) was signed by the Navy and U.S. EPA in September 2008. The OU 2 RAOs presented in the 2008 ROD are as follows:

- Protect human health by eliminating or preventing exposure to contamination in surface soil by COCs that exceed FDEP Residential and Commercial/Industrial Soil Cleanup Target Levels (SCTLs).

- Eliminate a continuing contamination source to groundwater by eliminating COCs in subsurface soil at concentrations that exceed FDEP SCTLs for leachability.

- Reduce human health risk from exposure to groundwater by reducing groundwater contamination at OU 2 to meet FDEP Groundwater Cleanup Target Levels (GCTLs).

The selected remedy as documented in the 2008 ROD included the following:

- Excavation of contaminated soil such that average soil concentrations based on the 95-percent upper confidence limit (UCL) met the lesser of FDEP Industrial SCTLs and Leachability SCTLs. Excavation of vadose zone soil with COC concentrations greater than Leachability SCTLs was also included.

- Natural attenuation relying on naturally occurring processes within the surficial aquifer to reduce contaminant concentrations in groundwater.

- LTM consisting of periodic collection and analysis of groundwater samples to evaluate whether contaminant migration is occurring within the surficial aquifer and to assess the natural attenuation of groundwater contamination.

- LUCs to prevent unacceptable exposure to residual soil and groundwater contamination remaining after soil excavation.

As part of the groundwater monitoring component of the remedy, the ROD stipulated that "the groundwater/surface water interface (GSI) would be investigated to obtain additional information and details concerning the hydraulic interaction between groundwater and surface water to optimize the extent of the areas which would require land use controls." The GSI investigation was to be completed in two phases. Phase I was to include an investigation of groundwater contamination at Sites 11 and 30 and installation of nested monitoring wells. Based on Phase I results, the Phase II GSI investigation was to be conducted in areas of groundwater discharge into nearby wetlands (Wetlands 5A, 7, and 64) to investigate groundwater flow patterns and the interface between surface water and groundwater (NAVFAC, 2008). The GSI investigations are discussed in Section 3.1.3.

The contingency remedy in the 2008 ROD was as follows: If results show that (1) the implemented excavation, LUCs, and/or natural attenuation have failed to prevent unacceptable risks from exposure to onsite soil and/or groundwater contamination; (2) contaminated groundwater has migrated to an unacceptable degree, or (3) contamination in groundwater is not attenuating as expected, additional remedial measures may be evaluated and implemented.

2015 ROD Amendment

As discussed in Section 3.1.3, modifications to the 2008 OU 2 remedy were required based on unanticipated conditions identified during soil excavation activities conducted per the 2008 ROD. Asbestos-containing material (ACM) and landfill contents were identified near the ground surface at Site 11. In addition, although Radium-226 had been identified as a contaminant in soil at Sites 12 and 27 and addressed through removal actions in 2011 and 2013 (see Section 3.1.3), Radium-226 was never formally documented as a COC for these sites. The ROD Amendment, signed by the Navy in October 2015 and by U.S. EPA in November 2015, to address these issues, listed the following RAOs:

- Prevent human exposure to asbestos in surface soils and eliminate contamination in surface and subsurface soils from Radium-226 that exceed pertinent federal and state ARARs.

- Within the boundaries of the Site 11 landfill, prevent human and ecological exposure(s) to buried wastes.

The amended remedy included the following components:

- Adding Radium-226 as a COC for soil at Sites 12 and 27. Based on soil excavations conducted at Sites 12 and 27 and prior groundwater investigations conducted at OU 2, the ROD Amendment did not identify Radium-226 as a groundwater COC at Sites 12 and 27. The Navy is conducting additional investigation of the drain line along demolished Building 709 near Site 27. The administrative process required to implement any additional action deemed necessary after completion of the investigation will be evaluated based on the nature and extent of contamination.

- Adding asbestos as a COC for soil at Site 11.

- Modifying the selected soil remedy for Site 11 by adding at least 2 feet of soil cover in areas as necessary (to prevent exposure to landfill contents) and by adding additional LUCs that require maintenance of the integrity of the native soil cover and associated stormwater drainage structures at Site 11.

The revised selected remedy included excavation and off-site disposal within seven identified hot spot areas (retained from the 2008 OU 2 ROD) and also included enhancement of the existing soil cover to ensure that at least 2 feet of soil cover exists over wastes within the landfill footprint and LUCs to prohibit residential use or intrusive activities, to avoid potential future exposure to landfill contents, including asbestos, and to ensure the integrity of the added soil cover through regular maintenance and site inspections. The ROD Amendment made no changes to the Sites 25, 26, or 30 soil remedies and did not modify the OU 2 groundwater remedy.

The ROD Amendment also addressed changes to ARARs by adding or modifying applicable state and federal ARARs. No modifications to the OU 2 groundwater remedy and no modifications to the Sites 25, 26, and 30 remedy were included in the OU 2 ROD Amendment.

The soil and groundwater COCs from the ROD are listed in Table 3-3 and Table 3-4, respectively, and the tables also identify at which site(s) each COC applies (NAVFAC, 2008c). Table 3-3 also includes the soil COCs added in the ROD Amendment (NAVFAC, 2015b). Although it was clearly stated that the ROD Amendment makes no changes to the groundwater remedy, the ROD Amendment included a table of Sites 11, 12, and 27 groundwater COCs that does not match the groundwater COCs for these sites in the ROD. Therefore, these COCs are not included in Table 3-4, although analysis during LTM events includes the additional parameters in addition to the COCs required by the ROD to be monitored. The discrepancies between the groundwater COCs listed in the ROD and ROD Amendment and current LTM parameter list are currently being evaluated.

Table 3-3: Operable Unit 2 – Soil Contaminants of Concern and Cleanup Goals

COC	Cleanup Goal (mg/kg except as noted)	Basis	Applicable to Site					
			11	12	25	26	27	30
Aluminum	Not available[(1)]	—	X	X	X		X	X
Antimony	5	FDEP Leachability SCTL		X				
Arsenic	12	FDEP Industrial SCTL	X	X	X		X	X
Beryllium	63	FDEP Leachability SCTL		X	X		X	X
Cadmium	7.5	FDEP Leachability SCTL	X	X	X		X	X

COC	Cleanup Goal (mg/kg except as noted)	Basis	Applicable to Site					
			11	12	25	26	27	30
Chromium	38	FDEP Leachability SCTL	X	X	X		X	X
Copper	89,000	FDEP Industrial SCTL		X				
Manganese	43,000	FDEP Industrial SCTL		X	X		X	X
Mercury	2.1	FDEP Leachability SCTL			X		X	
Silver	17	FDEP Leachability SCTL			X		X	
Zinc	6,000	Value from 2008 ROD			X			
Aroclor-1242	2.6[(2)]	FDEP Industrial SCTL						X
Aroclor-1254	2.6[(2)]	FDEP Industrial SCTL	X	X	X			X
Aroclor-1260	2.6[(2)]	FDEP Industrial SCTL	X	X	X			X
Dieldrin	2 µg/kg	FDEP Leachability SCTL			X		X	X
Benzo(a)pyrene Equivalents	0.7	FDEP Industrial SCTL	X	X	X	X	X	X
Asbestos[(3)]	Not applicable	—	X					
Radium-226[(3)]	5 pCi/g above background	40 CFR Part 192.12(a)(2)		X			X	

1 The only SCTL available is the Residential SCTL of 72,000 milligrams per kilogram (mg/kg).
2 SCTL is for the total mixture of Aroclors.
3 COC added in the ROD Amendment (NAVFAC, 2015). A site-specific derived concentration guideline limit for Radium-226 of 1.61 picocuries per gram (pCi/g) was also developed for Sites 12 and 27.
µg/kg – Microgram per kilogram.

Table 3-4: Operable Unit 2 – Groundwater COCs and Cleanup Goals

COC	Cleanup Goal (µg/L)	Basis	Marine SWCTL[(1)] (µg/L)	Applicable to Site						
				11	12	25	26	27	30[(2)]	
									West	East
Aldrin	0.002	GCTL	--	X						
Aroclor-1260	0.5	GCTL	0.000045		X					
Arsenic	10	GCTL	50	X			X		X	X
Barium	2,000	GCTL	NA	X					X	X
Benzene	1	GCTL	71.28	X					X	X
Beryllium	4	GCTL	0.13	X						
Cadmium	5	GCTL	9.3	X			X		X	X
Carbon tetrachloride	3	GCTL	4.42							X
Chlorobenzene	100	GCTL	17						X	X
Chloroform	70	GCTL	470.8	X	X	X		X	X	X
Chromium	100	GCTL	50	X				X	X	
1,4-Dichlorobenzene	75	GCTL	3					X	X	X
1,1-Dichloroethane (DCA)	70	GCTL	NA					X		
1,2-Dichloroethane (DCE)	3	GCTL	37	X					X	X
1,1-DCE	7	GCTL	3.2	X	X	X		X	X	X
cis-1,2-DCE	70	GCTL	NA	X						
1,2-DCE (total)	70[(3)]	GCTL	7,000	X				X		
1,2-Dichloropropane	5	GCTL	14	X						
Dieldrin	0.002	GCTL	0.00014	X	X		X	X		
Heptachlor epoxide	0.2	GCTL	0.00004		X					X

COC	Cleanup Goal (µg/L)	Basis	Marine SWCTL[1] (µg/L)	Applicable to Site						
				11	12	25	26	27	30[2]	
									West	East
Mercury	2	GCTL	0.025			X				
Methylene chloride	5	GCTL	70							X
4-Methylphenol	3.5	GCTL	1,580						X	
Naphthalene	14	GCTL	26	X						
Pentachlorophenol	1	GCTL	7.9						X	
1,1,2,2-Tetrachloroethane	0.2	GCTL	10.8	X						
Tetrachloroethene (PCE)	3	GCTL	8.85	X		X	X	X	X	X
1,1,1-Trichloroethane	200	GCTL	270					X	X	X
TCE	3	GCTL	80.7	X		X	X	X	X	X
Vanadium	49	GCTL	NA	X						
Vinyl chloride	1	GCTL	2.4	X		X	X	X	X	X

1 The more stringent of FDEP GCTLs or marine SWCTLs are the cleanup goals for wells immediately adjacent to marine wetlands. This currently applies to wells 11GS47R, 11GS07, and 11GI10R only.
2 COCs were identified separately for wells east and west of Murray Road.
3 Based on the GCTL for cis-1,2-DCE.
X Indicates that the COC is applicable to the site.

3.1.3 Status of Implementation

Soil Remedial Activities

As documented in the Soil Remedial Action Completion Report (RACR), remedial activities to address soil COCs at Sites 12, 25, 27, and 30 were conducted between August 2010 and July 2014 (AGVIQ, 2018). The scope of remedial activities at these sites included sampling to refine the delineation of excavation extents, placement of impermeable covers over hot spots at Sites 12 and 27, and soil excavation, backfilling and site restoration. In accordance with the RD, excavation was initially planned for seven hot spots at Site 12, two hot spots at Site 25, three hot spots at Site 27, and seven hot spots at Site 30 (Tetra Tech, 2010b). Excavation was not required at Site 26 because no soil COC concentrations exceeded FDEP Industrial or Leachability SCTLs. After the modifications discussed below, soil excavation activities were completed at a total of seven hot spots (one each at Sites 12 and 25, two at Site 27, and three at Site 30). Excavation to at least 2 feet below ground surface (bgs) within previously delineated areas of soil contamination was competed at Site 12 in February 2011, at Sites 25 and 27 in September 2012, and at Site 11 in June and July 2014. Remedial activities for Site 11 soil were completed after the 2015 ROD Amendment was signed, as discussed below.

Because six of the hot spot areas planned for excavation (five at Site 12 and one at Site 25) are located below impermeable surfaces such as concrete or asphalt, it was determined that excavation would not be conducted for these areas and that exposure associated with potentially unacceptable risk would be addressed via LUCs requiring maintenance of the impermeable surfaces. One hot spot at Site 12 was found to be partially covered with asphalt pavement, and after evaluation of associated data, the NAS Pensacola Partnering Team decided to place new asphalt over this area rather than remove the existing asphalt and underlying soils. Asphalt cover placement at this hot spot was completed in February 2011. At one of the Site 27 hot spots, the

NAS Pensacola Partnering Team decided that placement of an impermeable cover was preferred to removal of impacted soil because of concentrated buried utilities in the area. The impermeable cover was placed in this area in September 2010. At Site 30, based on 2013 groundwater monitoring data, it was determined that soil at four of the seven hot spots at the site (which had only exceedances of leachability SCTLs) did not have an adverse impact to groundwater from pre-excavation concentrations in these areas. Therefore, the Partnering Team agreed that no excavation was warranted at these four Site 30 hot spots. These decisions are discussed in more detail in the Soil RACR (AGVIQ-CH2MHILL, 2018).

At Site 11, soil remedial activities began in 2010. During pre-excavation utility locating activities at Site 11, brick/mortar, tile, and ACM were discovered in soil at the site. As a result, soil remedial activities were halted pending amendment of the FS to include evaluation of alternatives to address the newly discovered ACM and landfill contents. Due to the friable condition of the ACM, identifying the extent of ACM throughout landfilled areas was not considered feasible because of the potential health hazard to workers and associated costs.

In 2012 and 2013, a soil cover thickness investigation was conducted at Site 11, including cover thickness measurements at hand augured locations in a grid pattern across the upland portion of Site 11 and at select locations within the wetlands totaling approximately 13 acres. These measurements were used to identify areas at Site 11 with less than 24 inches of existing soil cover. From November 2016 to April 2017, approximately 9,722 cubic yards of native fill and 6,180 cubic yards of topsoil were placed over identified areas at Site 11 to ensure that a minimum of 2-foot native soil cover (including 6 inches of topsoil to facilitate vegetative growth) is present over wastes within the landfill footprint to prevent direct exposure to asbestos and other landfill contents present near the surface. Soil excavation and backfilling activities at Site 11 were conducted in seven areas from March 2017 to March 2018.

As summarized in the 2015 ROD Amendment, historical investigations at Sites 12 and 27 identified Radium-226-impacted soils at concentrations that presented unacceptable human health risks. Radium-226-impacted soil removal actions were completed between 2010 and 2013 under the direction of the Navy's Radiological Affairs Support Office, and post-excavation Multi-Agency Radiation Survey and Site Investigation Manual (MARRSIM) surveys and Final Status Survey samples from the excavated areas did not exceed the site-specific derived concentration guideline limit for Radium-226 of 1.61 pCi/g or natural background radiation levels. Therefore, the Navy, FDEP, and U.S. EPA concurred with radiological release of Sites 12 and 27 for unrestricted use with respect to Radium-226, although remedial actions were required for other COCs.

Former Building 709 Drain Lines Investigation

Previous investigations of the potentially impacted drain lines were performed in the parking lot area in 2015 and 2016. Phase I activities were conducted in April and May, June and July, and August and September 2015, and Phase II activities were conducted in July and August and October 2016. The work was performed in accordance with the approved Work Plan and Sampling and Analysis Plan (AWS, 2010a and 2010b).

Approximately 415 linear feet of radiologically impacted piping was removed during Phase I activities, and approximately 555 linear feet of radiologically impacted piping was removed

during Phase II activities. The work was performed in phases to keep sections of the parking lot open for personnel working in buildings in the vicinity of the area. Further details regarding the Phase I and Phase II investigations can be found in the Final Status Survey Report (AWS, 2017).

The Phase III work was performed from 11 June 11through 6 July 6 and from 20 through 29 August 2018 and removed approximately 170 linear feet of impacted piping. A minimal amount of soil was removed to provide bedding and fill void spaces inside of the B-25 waste containers. Four B-25 containers containing a total of 360 cubic feet of waste were generated during the Phase III activities. During and following drain line removal, gamma scan surveys were conducted, and systematic and biased soil samples were collected. All of the gamma scan survey and soil sample results indicated that the areas where the piping was removed had levels of Radium-226 less than the derived concentration guideline limit specified in the ROD Amendment and levels of surface activity less than release criteria. All work was performed in accordance with the approved Work Plan and Sampling and Analysis Plan (AWS, 2015a, 2015b, and 2018).

Land Use Controls

As required by the 2008 OU 2 ROD, LUCs were implemented for Sites 11, 12, 25, 26, 27, and 30 in accordance with the 2010 LUC RD, to prohibit residential use of the sites, to prohibit unrestricted soil disturbance or removal, to prohibit potable use of groundwater at the sites, and to prevent unacceptable occupational exposure to groundwater. The 2018 LUC RD Amendment supplements the 2010 LUC RD by documenting additional LUC objectives and LUCs required for Site 11 to comply with the 2015 ROD Amendment. Table 3-5 lists LUC performance objectives from both the LUC RD and LUC RD Amendment. Annual physical inspections are conducted to confirm continued implementation of LUCs and compliance with LUC performance objectives described in the LUC RD.

Table 3-5: Summary of Implemented LUCs, OU 2

Media, engineered controls, and areas that do not support UU/UE based on current conditions	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented and Date
Soil	Yes	Yes	Sites 11, 12, 25, 26, 27, and 30	Restrict future use of the site to non-residential land uses unless prior written approval is obtained from U.S. EPA, and FDEP. Non-residential land use restrictions will prohibit residential or residential-like uses including, but not limited to, any form of housing, and kind of school (including pre-schools, elementary schools, and secondary schools), childcare facilities, playgrounds, and adult convalescent or nursing care facilities.	*Land Use Controls Remedial Design at Operable Unit 2, Sites 11, 12, 25, 26, 27, and 30* February 2010 and *Final Land Use Control Remedial Design Amendment for Operable Unit 2, Sites 11, 12, 25, 26, 27, and 30* September 2018

Media, engineered controls, and areas that do not support UU/UE based on current conditions	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented and Date
				Prohibit the excavation, disturbance, and removal of soil unless prior written approval is obtained from the facility's Environmental Coordinator. At Site 11, prohibit any excavation or other disturbance of existing areas with contamination surface and subsurface soils (exceeding residential SCTLs) at the site unless prior written approval is obtained from U.S. EPA, FDEP, and NAS Pensacola Public Works Department (PWD).	
				Maintain the integrity of any existing or future monitoring or remediation system(s). At Stie 11, maintain the integrity of all existing or future on-site soil remedy components including the native soil cover placed on top of landfill wastes, drainage swales, and stormwater conveyance channels constructed during soil remedial actions.	
Groundwater	Yes	Yes	Sites 11, 12, 25, 26, 27, and 30	Prohibit potable uses of groundwater from the surficial aquifer underlying the site, including but not limited to, drinking, washing, cooking, cleaning, and turf irrigation without prior written approval from the Navy, U.S. EPA, and FDEP.	
				Prevent unacceptable occupational exposure to contaminated groundwater in the surficial aquifer by requiring use of personal protective equipment and monitoring equipment for excavation that may encounter groundwater.	

Monitored Natural Attenuation/Long-Term Groundwater Monitoring

Site-wide LTM began in March 2013. The current groundwater monitoring program includes 24 wells (17 shallow and 7 intermediate) across OU 2 sampled for combinations of VOCs, semivolatile organic compounds, pesticides, PCBs, and metals (Tetra Tech, 2022e). LTM will continue at OU 2 to establish and evaluate trends and ensure that the MNA remedy remains effective. A review of LTM analytes compared to the groundwater COCs identified for each site

in Table 3-4 suggests that a broader list of analytes is analyzed for each site than may be necessary. Evaluation is ongoing to determine an updated groundwater COC list, if required.

The 2010 LTM Plan proposed installing additional monitoring wells at a later date to monitor groundwater downgradient of Site 30 (Tetra Tech, 2010a). In 2014 and 2015, five downgradient intermediate/shallow monitoring well pairs (30MW174I/S through 30MW178I/S) were installed as part of the Site 30 Groundwater Surface Water Interface (GSI) Investigation. The 10 Site 30 GSI wells were sampled on 2 March 2015 to evaluate baseline conditions and the results were included in the 2016/2017 Annual LTM Report (AGVIQ-CH2MHILL, 2018). The 10 GSI wells were sampled again during the March 2018 and April 2019 LTM events and included in the 2018/2019 LTM Report (Tetra Tech, 2022a). Since that time, these wells have been evaluated as part of the OU 2 Site 30 chlorinated volatile organic compound (CVOC) Investigation that was initiated in November 2020 and completed in April 2022 and have not been included in the OU 2 LTM program. The OU 2 Site 30 CVOC Investigation consisted of membrane interface hydraulic profiling tool (MiHPT) screening in November 2020; low-flow groundwater sampling in March 2021; and MiHPT screening, well installation, and low-flow groundwater sampling in April 2022. The OU 2 Site 30 CVOC Investigation report is under preparation and will make recommendations for changes to the OU 2 Site 30 LTM program as appropriate.

GSI Investigations

Phase I of the GSI Investigation was completed for Site 11 in September 2014 and included sampling of groundwater via direct-push technology (DPT), pore water, and surface water (Tetra Tech, 2016a). The initial DPT investigation and groundwater sampling determined the Site 11 landfill boundaries extended to the shorelines of Wetlands 7, 8 and 64, indicating that sentry monitoring wells placed within the landfill (as proposed in the GSI SAP) would not optimally represent concentrations of analytes discharging from groundwater to surface water in the wetlands. As a result, the NAS Pensacola Partnering Team decided that pore and surface water samples would be collected to evaluate whether COCs were discharging to surface water and selected locations to characterize areas where VOCs and inorganic constituents may migrate in groundwater from Site 11 to Wetlands 7, 8, and 64. In addition, the team determined (based on the GSI SAP and groundwater data showing exceedances of state or federal surface water quality criteria) which VOC and inorganic parameter analyses would be performed on the filtered and unfiltered pore water and surface water samples. Pore water and surface water analytical results were compared to applicable federal and state MCLs and/or surface water quality criteria. The filtered and unfiltered pore water and surface water analytical results suggest that groundwater from Site 11 does not adversely affect surface water (Tetra Tech, 2016a).

U.S. EPA comments on the Site 11 GSI Technical Memorandum indicated that questions remain with regard to the effect of Site 11 on the surrounding wetlands; it may take a more concentrated effort with groundwater and ecological experts to design a process to give the long-term answer to the question of protectiveness. U.S. EPA provided comments on the draft report but did not require responses or revisions. Instead, the comments were included as part of the conclusion and recommendations. U.S. EPA requested that unfiltered pore water results be compared to groundwater criteria to develop conclusions and recommendations because U.S. EPA considers pore water to be groundwater. U.S. EPA comments stated that although drinking water can be seen as an exposure of less importance because there are no drinking water receptors due to LUCs, returning groundwater to its beneficial use is always the ultimate long-term goal. U.S.

EPA concurred with the report's recommendation to design a groundwater monitoring program and asked that the program make an effort to find and monitor seeps from groundwater to surface water. Additionally, U.S. EPA recommended that ecological and groundwater teams meet together to determine the best manner to assess potential concerns.

The Site 11 GSI Technical Memorandum also concluded that LUC boundaries could not be optimized because the Site 11 landfill boundaries extend to the shorelines of Wetlands 7, 8, and 64, and any groundwater plume boundary would likely extend to the hydraulically downgradient wetlands. The Technical Memorandum recommended that the NAS Pensacola Partnering Team convene to select locations for monitoring wells that are to be placed at the upland/wetland interface and/or pore water sample locations within the wetlands to provide long-term sentry locations for MNA processes.

Based on the Site 11 Phase I GSI Investigation results, the Site 11 Phase II GSI Investigation was conducted in areas of groundwater discharge into the surface water of Bayou Grande and to study the behavior of the GSI along the shoreline of Site 11. The Site 11 Phase II GSI Investigation fieldwork was performed by a team from the United States Geological Survey (USGS) with considerable experience performing GSI studies.

The objectives of the Site 11 Phase II GSI investigation were as follows (Tetra Tech, 2021b):

- Investigation and identification of areas of focused groundwater discharge (i.e., seeps) from the subsurface of Site 11 into the surface waters of Bayou Grande via an infrared camera survey and a fiber optic distributed temperature survey (FO-DTS) mission.

- Investigation of the GSI behavior along the shoreline of Site 11 with Bayou Grande via measurements of temperature and specific conductance profiles (i.e., horizontally and vertically) near the shoreline.

Groundwater seepage mapping was performed along the shoreline of Site 11 using thermal infrared cameras, FO-DTS, and visual observations. The data gathered from both the visual observations of groundwater seeps during low tide, locations of freshwater vegetation along the shoreline, and the areas with mature trees and shrubs along the northern portion of Site 11 provided a clear indication of groundwater discharge patterns and areas with a consistent supply of freshwater (i.e., groundwater). These indicators together with the temperature gradients measured by the FO-DTS provided the multiple lines of evidence to guide the selection of candidate locations to conduct a study of continuous recordings of temperature and specific conductance (T-SC) along the Site 11 shoreline (Tetra Tech, 2021b).

The T-SC study commenced after the FO-DTS deployment and measurements were completed. The objectives of the T-SC study were to collect T-SC readings at groundwater discharge locations identified during the groundwater seepage mapping phase and to evaluate the behavior of the freshwater-saline water interface both vertically and horizontally across the seasons of the year, including hurricane or tropical storm events that are common each year in the Pensacola area. The T-SC study identified a dynamic demarcation line (i.e., the freshwater- surface water interface to represent the GSI) on whose upland side, a constant lens of freshwater (groundwater) is available for groundwater quality measurement without saltwater intrusion. Upland of this

demarcation line, permanent groundwater monitoring wells can be placed to measure the quality of groundwater from Site 11 as it discharges into the surface water of Bayou Grande (Tetra Tech, 2021b).

The results of the Site 11 Phase II GSI Investigation were presented in a Technical Memorandum that recommended four new monitoring wells be installed at Site 11 to monitor the groundwater-to-surface water discharge along the shoreline of Bayou Grande (Tetra Tech, 2021b). The Draft Site 11 Phase II GSI Technical Memorandum was submitted in July 2021 but has not yet been finalized. Once finalized, the Site 11 LTM program will be updated as appropriate.

Phase I of the Site 30 GSI Investigation was conducted in the area surrounding Wetlands 5A, 5B, and the southern portion of Wetland 6. The objective of the Site 30 Phase I GSI Investigation was to determine whether Site 30 COCs are migrating in groundwater and exerting an adverse effect on downgradient wetland surface water (Tetra Tech, 2014). The Site 30 Phase I GSI Investigation fieldwork was initially performed in June and September 2014 and consisted of DPT Hydropunch groundwater sampling. Based on the results from the initial DPT Hydropunch sampling, five permanent monitoring well pairs were installed and sampled in March 2015. The results of the Site 30 Phase I GSI Investigation have not yet been documented in a formal report or technical memorandum and the Site 30 Phase II GSI Investigation has not been initiated.

3.1.4 Systems Operations/Operation and Maintenance

There are no active remediation systems requiring O&M at OU 2. Monitoring well maintenance is implemented as part of routine LTM. Monitoring well integrity is reviewed during ongoing annual groundwater monitoring.

3.2 PROGRESS SINCE THE LAST REVIEW

This section includes the protectiveness determination and statement from the last five-year review as well as the recommendations from the last Five-Year Review Report and the current status of those recommendations.

Based on the results of the fourth five-year review, the protectiveness determination for OU 2 was “will be protective.” The protectiveness statement from the Fourth Five-Year Review Report was as follows:

> The remedy at Operable Unit (OU) 2 is expected to be protective of human health and the environment upon completion of soil excavation and soil cover placement activities, implementation of cover inspection and maintenance, and completion of required groundwater/surface water investigations. In the interim, OU 2 remedial activities completed to date have addressed exposure pathways that could result in unacceptable risks. Soil removal actions at Sites 12, 25, 27, and 30 have been completed. Institutional controls (as measured by associated Land Use Control inspections) have been successful in preventing residential and groundwater uses and limiting occupational exposure to contaminants. Groundwater monitoring results document ongoing natural attenuation.

Table 3-6: Status of OU 2 Recommendations from the 2018 Five-Year Review

Issue	Recommendations	Current Status	Current Implementation Status Description	Completion Date
Elements required by the ROD and ROD Amendment have not been completed due to the number of ongoing investigations (e.g., Phase I GSI and other remedial actions (Site 11 soil excavation and landfill cover installation).	The Naval Air Station Pensacola Partnering Team should continue to prioritize investigations and other remedial actions at OU 2 to close data gaps and determine necessary remedy modifications to ensure long-term protectiveness.	Ongoing	Site 11 soil remedial actions were completed in 2018. The Draft Site 11 Phase II GSI Technical Memorandum was submitted in July 2021 but has not yet been finalized. The results of the 2014 and 2015 Site 30 Phase I GSI Investigation have not yet been documented in a report or technical memorandum, and the Site 30 Phase II GSI has not been initiated.	18 September 2018(1)

1 Proposed date for finalizing the RACR for OU 2-related wetlands, which will document the results of ongoing investigations and remedial actions, per the 2018 Federal Facility Agreement Site Management Plan Extension Request 2018-007 (NAVFAC, 2018).

3.3 FIVE-YEAR REVIEW PROCESS

3.3.1 Community Notification, Involvement, and Site Interviews

A public notice announcing the initiation of this five-year review was published in the *Pensacola News Journal* and on the NAS Pensacola Facebook page on 19 June 2022 (see Appendix D). No public comments were received in response to the public notice. A second public notice will be published announcing the completion of the Fifth Five-Year Review Report and the availability in the Administrative Record of the report and fact sheet summarizing the results of the review. The fact sheet will also be distributed to the RAB and any other interested persons or organizations. The Administrative record can be accessed online at

https://www.navfac.navy.mil/Business-Lines/Environmental/Products-and-Services/Environmental-Restoration/Southeast/Pensacola-NAS/Administrative-Record/

Interview questionnaires were sent to two members of the NAS Pensacola Restoration Advisory Board, and the completed questionnaire received in response is included in Appendix C.

3.3.2 Data Review

Figure 3-1 shows the locations of monitoring wells in the OU 2 LTM program. The current groundwater monitoring program includes 24 wells (17 shallow and 7 intermediate) across OU 2 (Tetra Tech, 2022e). Analytical results for LTM were provided in their respective annual reports. Monitoring is conducted to confirm that migration is not occurring and that reductions in contaminant concentrations are occurring through naturally occurring processes such as biodegradation, advection, hydraulic dispersion, and adsorption. During this five-year review period, LTM at OU 2 was conducted in February, May/June, and November 2017, March 2018,

April 2019, and March and September 2021. Only one sampling event was conducted in 2018 and 2019 because of contractual issues with the LTM contractor at that time. OU 2 did not have an updated approved SAP in 2020; therefore, LTM activities were not conducted that year. In November 2020, an FTMR form was approved that allowed continued LTM sampling (Tetra Tech, 2020). Monitoring well samples are analyzed for the site-specific COCs listed in Table 3-4 and MNA parameters, in addition to additional LTM parameters as listed in the LTM reports.

Table 3-7 summarizes COC exceedances of remedial goals during the current five-year review period. This table includes only the COCs documented in the ROD. Detailed results and evaluations for these COCs and other LTM parameters are presented in the annual monitoring reports. As discussed above, evaluations are ongoing to determine an updated groundwater COC list, if required.

Table 3-7: Summary of OU 2 COC Concentrations Exceeding Cleanup Levels

Well	Detections of COCs > Cleanup Levels, 2017 to 2021[(1)]
Site 11	
11GI02	PCE (February, May/June, and November 2017) TCE (February, May/June, and November 2017, 2018, 2019, March and September 2021)
11GI10/11GI10R	Arsenic (February 2017, 2018, 2019, March and September 2021) 1,2-DCA (March 2021)
11GI12	TCE (February 2017)
11GI14	cis-1,2-DCE (February, May/June, and November 2017, 2018, 2019, March and September 2021) Vinyl chloride (February, May/June and November 2017, 2018, March 2021)
11GS07	Arsenic (2019) Cadmium (February and November 2017)
11GS13	Arsenic (February and November 2017, 2018, 2019, September 2021) Cadmium (November 2017) Vinyl chloride (February and November 2017, 2018, 2019)
11GS47R	Dieldrin[(2)] (February 2017, April 2019)
11GS52	Arsenic (February, May/June, and November 2017, 2018, 2019, March and September 2021) cis-1,2-DCE (February and May/June 2017, 2019) TCE (February, May/June, and November 2017, 2018, 2019, March and September 2021) Aldrin[(2)] (May/June 2017)
Site 12	
12GS08	Dieldrin (2018)
Site 25	
25GI01	TCE (February and May/June 2017, 2019, March and September 2021)
Site 26	
26GS03	Dieldrin[(2)] (February, May/June, and November 2017, 2018, 2019, March 2021)
26GS04	Dieldrin[(2)] (March 2021)
Site 27	
27GS10	Chromium (May/June and November 2017)
27GS19	Vinyl chloride (February, May/June, and November 2017, 2018)

Well	Detections of COCs > Cleanup Levels, 2017 to 2021[1]
Site 30[3]	
30GI111	Arsenic (February, May/June, and November 2017, 2018, 2019, March and September 2021) 1,4-Dichlorobenzene (2018, 2019, March 2021)) Chlorobenzene (February, May/June, and November 2017, 2018, 2019, March and September 2021) Vinyl chloride (February, May/June, and November 2017, 2018, 2019)
30GI170	TCE (February 2017, 2018, 2019, September 2021)
30GS06	None
30GS103	Cadmium (February and May/June 2017)
30GS111	Benzene (March and September 2021) Chlorobenzene (September 2021)
30GS126	TCE (May/June 2017)
30GS174	Cadmium (February, May/June 2017, and November 2017, 2018, 2019)
30GS22	None
30GS27	Chlorobenzene (November 2017)
30GS46	Cadmium (2019) PCE (February, May/June, and November 2017, 2018, 2019) TCE (November 2017, 2018, September 2021)

1 As discussed above, no LTM was conducted in 2020, and only one event each was conducted in 2018 and 2019.

2 Because aldrin and dieldrin limits of detection are greater than GCTLs, concentrations are also compared to FDEP practical quantitation limits (PQLs) in LTM reports. FDEP PQLs can be used as alternative GCTLs if limits of detection are greater than GCTLs but less than PQLs.

3 The COCs were defined separately in the ROD for Site 30 wells east and west of Murray Road, but the lists were combined for LTM.

Data indicate that concentrations of VOCs have decreased since the historically highest concentrations observed in 2001 or 2003. VOC concentrations in the upgradient portion of OU 2 (wells 30GS111, 30GS46, 30GS22, 30GS27, and 30GS06) have decreased significantly, with some decreasing to less than cleanup levels during the most recent sampling events. VOC concentrations have also further decreased within OU 2 and in wells designated to monitor VOCs downgradient, although concentrations of one or more VOCs continue to exceed cleanup levels in these wells. Based on natural attenuation parameter data collected to date, it is expected that VOC concentrations will continue to decrease through natural attenuation.

In general, concentrations of metals and pesticide also appear to be decreasing in groundwater across OU 2 over time, although attenuation of these constituents is less predictable, and results are dependent on multiple factors including pH, localized oxidizing or reducing conditions in groundwater, and turbidity during sample collection. Continued monitoring will provide data to establish consistent trends for further evaluation of metals concentrations at OU 2.

Groundwater monitoring results continue to provide evidence that concentrations of most COCs in OU 2 groundwater are attenuating over time and that significant migration downgradient is not occurring. LTM data to date demonstrate that groundwater flow and quality is relatively stable over time and that natural attenuation is effectively reducing contaminants in groundwater at most site locations. In addition, significant increases in contaminant concentrations or areas of potentially significant contaminant migration were not identified.

Site 11

Site 11 LTM results confirm reductions in COC concentrations, with stable geochemical conditions that result in metals concentrations within historically defined ranges and pesticide concentrations less than their FDEP PQLs. LTM results to date support the effectiveness of the OU 2 selected remedy at Site 11.

Site 11 wells monitored to evaluate the performance of natural attenuation processes for historically elevated concentrations of VOCs include 11GI02, 11GI10R, and 11GS47R. At 11GI02, concentrations of cis-1,2-DCE, TCE, and PCE have decreased by an order of magnitude since previous maximum concentrations in 2003. During the four most recent LTM events, only TCE was detected at concentrations exceeding its cleanup level, and the TCE concentration during the most recent event (3.9 µg/L) only slightly exceeded the cleanup level of 3 µg/L. At 11GI10R, chosen to monitor previous 1,2-DCA cleanup level exceedances, 1,2-DCA concentrations decreased and remained less than the cleanup goal from April 2014 to March 2018. Concentrations in April 2019 and March 2021 (3.1 and 3.3 µg/L, respectively) slightly exceeded the cleanup level of 3 µg/L, but 1,2-DCA was not detected during the September 2021 event. At 11GS47R, VOCs have not been detected at concentrations greater than cleanup levels since 2016.

Site 11 wells monitored to evaluate historically elevated metals concentrations include 11GS07 and 11GS13. At 11GS07, barium concentrations have fluctuated over time but have decreased and remained less than the cleanup level of 2,000 µg/L since the historical maximum of 2,150 µg/L in 2013. Barium concentrations during the most recent two events were 13.7 and 710 µg/L, respectively. Cadmium concentrations have fluctuated at levels greater than and less than the cleanup level of 5 µg/L since the maximum detection of 105 µg/L in 2014, but concentrations during four of the last five events were less than the cleanup level. Arsenic was detected for the first time in excess of its cleanup level in April 2019 (it had not been detected previously since 2013), but arsenic was not detected during the next event in March 2021. At 11GS13, barium concentrations exceeded the cleanup level of 2,000 µg/L during all but one event before 2016 but have been less than the cleanup level since that time (concentrations from 2016 to 2021 ranged from 142 to 987 µg/L.) Cadmium concentrations exceeded its cleanup level of 5 µg/L only one time at 11GS13, in November 2017 (6.5 µg/L), but cadmium has either not been detected since that time or concentrations have been less than the cleanup level. Arsenic concentrations were less than its cleanup level of 10 µg/L until November 2017 but increased to exceed the cleanup level in five of the last seven events (at concentrations ranging from 8.1 to 27.3 µg/L).

Site 11 wells monitored to confirm that significant migration of VOCs is not occurring include 11GI12, 11GI14, and 11GS52. At 11GI12, VOC concentrations have not exceeded cleanup levels since June 2017, and since 2013, only sporadic low-level TCE exceedances have been detected (no exceedances during 10 of the previous 15 events). At 11GI14, concentrations of degradation products cis-1,2-DCE and vinyl chloride have exceeded cleanup levels during this five-year review period, but concentrations have decreased significantly. The maximum cis-1,2-DCE concentration of 360 µg/L was detected in 2003, and since then concentrations have fluctuated but haven been less than 150 µg/L since February 2016. The concentration during the most recent event was 82 µg/L. The maximum vinyl chloride concentration of 88 µg/L was detected in 1995, and concentrations have been less than 5 µg/L since April 2014 and less than

2 µg/L since November 2017. At 11GS52, PCE concentrations have been less than the cleanup level since 1995. TCE concentrations continue to exceed the cleanup level, but since the maximum of 50 µg/L in 1995, TCE concentrations have ranged from 4.91 to 15 µg/L and have been less than 10 µg/L during the last 14 events.

In addition, COC concentrations in three wells, 11GI10R, 11GS07, and 11GS47R, are compared to marine SWCTLs (see Table 3-4) because they are adjacent to marine wetlands. COC concentrations at 11GI10R have never exceeded marine SWCTLs. At 11GS07, the only COC detected at concentrations exceeding marine SWCTLs is cadmium, although concentrations have been less than the SWCTL during 7 of 15 events and during five of the most recent events (since June 2017). COCs detected at 11GS47R at concentrations exceeding marine SWCTLs include vinyl chloride, naphthalene, and dieldrin, although only dieldrin concentrations have exceeded the SWCTL during this five-year review period. Dieldrin was detected at 11GS47R during 5 of 15 sampling events, with a maximum concentration of 0.00632 µg/L in September 2016, and all dieldrin detections exceeded the SWCTL of 0.00014 µg/L. During this review period, dieldrin was detected at 11GS47R in February 2017 at 0.00131 µg/L and in April 2019 at 0.00213 µg/L, although dieldrin was not detected in the duplicate sample collected at this location. Vinyl chloride concentrations have been less than the SWCTL since 2013, and naphthalene concentrations have been less than the SWCTL since 2003.

Site 12

Since sampling began, the only COC detected at Site 12 well 12GS08 at a concentration greater than the cleanup level was dieldrin at 0.00235 µg/L in March 2018 (the detected concentration was less than the FDEP PQL of 0.1 µg/L). The concentration in the duplicate sample was less than the cleanup level of 0.002 µg/L. The only other COC detection during this review period was Aroclor-1260 in November 2017 (at 0.133 µg/L, less than the cleanup level of 0.5 µg/L). Aroclor-1260 was not detected in the duplicate sample collected during this event or in any other samples during this review period. Groundwater monitoring results to date support the effectiveness of MNA, the selected remedy at OU 2, Site 12.

Site 25

TCE is the only VOC COC detected at Site 25 well 25GI01 during the current review period. TCE concentrations have ranged from 2.37 to 6.17 µg/L since LTM began in 2013, decreased to less than the cleanup goal of 3 µg/L in November 2017 and March 2018, and then increased in 2019 and 2021 to concentrations exceeding the cleanup level. Results from this well are used to evaluate VOC migration. The maximum TCE concentration of 17 µg/L was detected in 2003, and until 2021, concentrations fluctuated but were less than 10 µg/L (and less than 5 µg/L in all but two events) until concentrations increased in March and September 2021 to 16 and 14 µg/L, respectively. Mercury has not been detected at Site 12 well 25GI01 since sampling began in 2013. Overall, Groundwater monitoring results to date support the effectiveness of MNA, the selected remedy at OU 2, Site 25.

Site 26

Dieldrin concentrations at both Site 26 wells, 26GS03 and 26GS04, exceeded the cleanup level of 0.002 µg/L during this five-year review period. November 2021 dieldrin results for both wells were rejected during validation and are not usable. During this review period, dieldrin concentrations at 26GS03 ranged from 0.00224 to 0.0082 µg/L (greater than the cleanup level

during all events), and at 26GS04, dieldrin was only detected during the March 2021 event in the sample and associated duplicate at 0.0029 and 0.0025 µg/L, respectively. None of the dieldrin concentrations exceeded the FDEP PQL of 0.1 µg/L. No other Site 26 COCs were detected at concentrations exceeding cleanup levels during this review period. Results from wells 26GS03 and 26GS04 are used to monitor elevated VOC and metals concentrations. VOC concentrations at these wells have been less than cleanup levels since sampling began in 2013, and the only metal detected in excess of its cleanup level was arsenic in 2013 and 2016. Overall, Groundwater monitoring results to date support the effectiveness of MNA, the selected remedy at OU 2, Site 26.

Site 27

Vinyl chloride and chromium were the only COCs detected at concentrations exceeding cleanup levels at Site 27 during this five-year review period. Vinyl chloride concentrations at 27GS19 exceeded the cleanup goal of 1 µg/L in February and May 2017 (12.8 µg/L in February and 4.38 and 3.55 µg/L, respectively, in the May sample and duplicate) and March 2018 (1.7 µg/L). Vinyl chloride was not detected in November 2017 or during 2019 or 2021 events. Chromium concentrations at 27GS10 exceeded the cleanup level of 100 µg/L in May and November 2017 (119 and 125 µg/L, respectively) but were less than the cleanup level during subsequent events. Well 27GS19 is monitored to evaluate elevated VOC concentrations, and 27GS10 is monitored to evaluate elevated metals concentrations. At 27GS19, PCE and TCE concentrations exceeded cleanup levels in 1993, 1995, and 2003 but then decreased to less than detection limits for most of the subsequent events. Concentrations of vinyl chloride, a PCE and TCE daughter product, were less than the cleanup level of 1 µg/L in 1993, 1995, and 2003 but increased to greater than 1 µg/L during 12 of the 14 subsequent events, at concentrations ranging from 1.7 to 17.7 µg/L. Concentrations of vinyl chloride decreased again, and this COC was not detected during 2019 or 2021 events. At 27GS10, chromium concentrations have sporadically exceeded the cleanup level, but concentrations during the most recent four events have been less than the cleanup level. LTM results to date support the effectiveness of the OU 2 selected remedy at Site 27.

Site 30

Site 30 LTM results confirm reductions in VOC concentrations at Site 30, with stable geochemical conditions that result in detected metals concentrations within historically defined ranges. LTM results to date support the effectiveness of the OU 2 selected remedy at Site 30.

During this five-year review period, COCs were detected in excess of cleanup levels at 8 of 10 Site 30 wells, including vinyl chloride, 1,4-dichlorobenzene, benzene, PCE, and arsenic at one well each and chlorobenzene, TCE, and cadmium at three wells each.

During the current review period, COCs detected at 30GI111 at concentrations exceeding cleanup levels included vinyl chloride, 1,4-dichlorobenzene, chlorobenzene, and arsenic. This well is monitored to evaluate previous elevated VOC concentrations. The maximum vinyl chloride concentration of 20 µg/L at 30GI111 was detected in 1995, and concentrations decreased but continued to exceed the cleanup level of 1 µg/L during most subsequent events (it was not detected in June 2016 and March 2021 and was detected at a concentration equal to the cleanup level in September 2021). Concentrations have been less than 3 µg/L since February 2016. 1,4-Dichlorobenzene concentrations at 30GI111 have fluctuated over time, with concentrations exceeding the cleanup level of 75 µg/L during 6 of 14 events. Exceedances

during this review period included 123 µg/L in March 2018 and 140 µg/L in March 2021, the maximum to date. The 1,4-dichlorobenzene concentration decreased during the following event to 58 µg/L. Chlorobenzene concentrations have decreased from a maximum of 620 µg/L in 1995 but have been greater than the cleanup level of 100 µg/L during all subsequent events except June 2016 (19 µg/L). During this five-year review period, chlorobenzene concentrations ranged from 118 to 210 µg/L. The maximum arsenic concentration at 30GI111 was 27 µg/L in 2003; concentrations have decreased since that time but have been greater than the cleanup level of 10 µg/L during all subsequent events except June 2016. Arsenic concentrations during this review period ranged from 11.7 to 14.6 µg/L.

At 30GI170, the only COC detected during this five-year review period at concentrations greater than cleanup levels was TCE during four of seven events. TCE was not detected during two events and was detected at 2.9 µg/L during one event, less than the cleanup level of 3 µg/L. The well is monitoring to confirm that there is no significant downgradient migration of VOCs. In addition to TCE, VOC COCs previously detected in excess of cleanup levels include vinyl chloride and PCE. Vinyl chloride was only detected once, in 2003 at 3.8 µg/L, greater than the cleanup level of 1 µg/L. Vinyl chloride was not detected during subsequent events. PCE was detected at 3.28 µg/L in January 2014, but concentrations during all over events were less than the 3 µg/L cleanup level.

At 30GS06, no cleanup level exceedances were detected during the current five-year review period. This well is monitored to evaluate previous elevated VOC concentrations. VOC COCs detected at concentrations greater than cleanup levels at this well include methylene chloride at 12 µg/L in 1993 and benzene at 250, 2, and 2.6 µg/L in 1993, 1995, and 2003, respectively. Neither were detected during subsequent events.

At 30GS103, the only COC detected in excess of cleanup levels during this five-year review period was cadmium in February and June 2017 at 10.3 and 5.3 µg/L, respectively, greater than the cleanup level of 5 µg/L. This well is monitored to evaluate previous elevated metals concentrations. Arsenic and cadmium were previously detected at concentrations greater than cleanup levels at 30GS103. The maximum concentration of arsenic, 13.8 µg/L, was detected in March 2013, but subsequent detections (during 7 of 13 events) ranged from 1.8 to 5.7, less than the cleanup level of 10 µg/L. Cadmium concentrations have fluctuated, with the maximum concentration of 10.3 µg/L detected in February 2017 and other exceedances detected in 1995, 2013, 2014, and 2017.

Well 30GS111 is monitored to evaluate previous elevated VOC concentrations. The only COC exceedances at 30GS111 during this review period were benzene at 4.5 and 6.3 µg/L in March and September 2021, respectively, and chlorobenzene at 320 µg/L in September 2021. The only other benzene exceedance was 9.8 µg/L in 2003, and the only other chlorobenzene exceedances were 720 µg/L in 1993 and 830 µg/L in 2003. Between 2003 and 2021, benzene was only detected during 11 of 12 events (March 2018 at 0.639 µg/L). Chlorobenzene was detected during 12 of 13 events between March 2013 and March 2021 at concentrations ranging from 2.36 to 320 µg/L.

Well 30GS126 is monitored to evaluate previous elevated VOC and metals concentrations. The only COC detected at a concentration greater than its cleanup level during the current five-year

review period was TCE at 4.72 µg/L in June 2017. The only other TCE exceedance was in 2013 (4.16 µg/L). TCE was either not detected or detected at concentrations less than the cleanup level of 1 µg/L during all other events. Cadmium is the only other COC that has been detected in excess of its cleanup level at 30GS126. The maximum cadmium concentration of 21.8 µg/L was detected in 1995, and other exceedances were detected in March 2013 (7.53 µg/L) and April 2014 (11.2 µg/L). Cadmium concentrations during this review period ranged from 0.37 to 4.13 µg/L.

Well 30GS174 is monitored to evaluate previous elevated VOC and metals concentrations. This well was not sampled during 2021 event because it was not accessible. The only COC detected at 30GS126 at concentrations greater than cleanup levels during this review period was cadmium. The maximum cadmium concentration was 14 µg/L in 2003, concentrations exceeded the cleanup level of 5 µg/L during that event and all subsequent events, and concentrations during this review period ranged from 5.82 to 7.95 µg/L. The only other COC detected in excess of its cleanup level at this well was benzene at 3 µg/L in 1993. Benzene was not detected during subsequent events.

Well 30GS22 is monitored to evaluate previous elevated VOC concentrations. COC concentrations at this well during the current review period were less than cleanup levels. Previous VOC exceedances included 1,1-DCE in 1993 and 1995 at 170 and 68 µg/L, respectively; 1,1,1-TCA at 1,400 and 2,100 µg/L in 1993 and 1995, respectively; and PCE at 10, 13, and 4.2 µg/L in 1993, 1995, and 2003. These COCs were either not detected or detected at concentrations less than cleanup levels during all subsequent events. 1,1-DCE was not detected during the current five-year review period, and 1,1,1-TCA was detected once at 0.62 µg/L and PCE was detected during five of seven events this period at concentrations ranging from 0.639 to 1.8 µg/L.

Well 30GS27 is monitored to evaluate previous elevated VOC concentrations. The only COC detected during this five-year review period at concentrations exceeding cleanup levels was chlorobenzene at 123 µg/L in November 2017. Chlorobenzene concentrations during other events this period ranged from 1.6 to 4.6 µg/L. Previous chlorobenzene exceedances included 115 µg/L in November 2013 and 163 in October 2016. Five other VOC COCs (1,1-DCE, 1,1,1-TCA, 1,2-DCA, chloroform, and TCE) were detected at concentrations exceeding cleanup goals in 1993 and/or 1995 but not during subsequent events. None of these five COCs were detected at 30GS27 during the current review period.

Well 30GS46 is monitored to evaluate previous elevated VOC concentrations. During this five-year review period, TCE concentrations at this well exceeded the cleanup level during three events, and PCE concentrations exceeded the cleanup level during five of seven events. The maximum TCE concentration of 58 µg/L was detected at this well in 1995, and concentrations were less than the cleanup level of 3 µg/L during all subsequent events until November 2017. TCE concentrations were 4.11 and 4.38 µg/L in the sample and duplicate, respectively, in November 2017; 5.49 and 5.65 µg/L in the sample and duplicate, respectively, in March 2018; and 3.4 and 2.9 µg/L in the sample and duplicate, respectively, in September 2021. TCE was not detected in February 2017, May 2017, April 2019, or March 2021. The maximum PCE concentration of 1,100 µg/L was detected at this well in 1995, and concentrations during 11 of the 15 subsequent events exceeded the cleanup level of 3 µg/L but at significantly lower

concentrations ranging from 4.42 to 40.7 µg/L. PCE concentrations during the current review period ranged from 1.4 to 40.7 µg/L. Also during this five-year review period, cadmium was detected in excess of its cleanup level of 5 µg/L for the first time since sampling began, at 33 µg/L in April 2019. The previous maximum cadmium concentration was 2.85 µg/L in 2013. During this review period, cadmium was detected during five of seven events at concentrations ranging from 1 to 1.8 µg/L. Other metals were also detected at unexpectedly elevated concentrations during the April 2019 event, so this exceedance may be anomalous.

Site 30 CVOC Investigation

In 2014 and 2015, five downgradient intermediate/shallow monitoring well pairs (30MW174I/S through 30MW178I/S) were installed as part of the Site 30 GSI Investigation. During this five-year review period, the downgradient well pairs were sampled during the March 2018 and April 2019 LTM events and the March 2021 CVOC Investigation low-flow groundwater sampling (monitoring well pair 30MW178I/S was not sampled in March 2021). Monitoring wells 30GI07, 30GI126, 30GI164, 30GI19, 30GI58, 30GS123, 30GS162, 30GS164, 30GS170, 30GS18, 30GS32, 30GS32A, and 30GS57 were also sampled during the March 2021 CVOC Investigation low-flow groundwater sampling because these wells had not been sampled since the RI (Tetra Tech, 2022d). During each of the sampling events, the monitoring wells were sampled for PCE, TCE, cis-1,2-DCE, and VC. The March 2021 CVOC Investigation low-flow groundwater sampling also included trans-1,2-DCE.

For all wells except 30MW176I and 30MW1781, all CVOCs were either not detected or detected at concentrations less than cleanup levels. At monitoring well 30MW176I, TCE was detected at concentrations greater than the cleanup level (3 µg/L) in March 2018 (199 µg/L) and March 2021 (1,000 µg/L in both the sample and duplicate). At monitoring well 30MW178I, TCE was detected at a concentration greater than the cleanup level in March 2018 only. There were no other 30MW176I or 30MW178I results exceeding cleanup levels (Tetra Tech, 2022d).

Concentrations of TCE at 30MW176I have ranged from 199 to 1,020 µg/L between March 2015 and March 2021. cis-1,2-DCE was also detected at 30MW176I between March 2015 and March 2021 at concentrations ranging from 30.2 to 69 µg/L, suggesting that anaerobic reductive dechlorination is occurring at this location (NAVFAC, 2021b).

For well 30MW178I, TCE has only been detected at concentrations greater than the cleanup level in March 2015 (4.34 µg/L), November 2017 (3.92 µg/L), and March 2018 (15 µg/L). cis-1,2-DCE was also detected at 30MW178I between March 2015 and April 2019 at concentrations ranging from 0.305 to 1.1 µg/L, suggesting that anaerobic reductive dechlorination is occurring at this location. PCE has also been sporadically detected at 30MW178I between March 2015 and April 2019, with concentrations ranging from 0.262 to 0.774 µg/L, suggesting that PCE may have been the original contaminant at this location.

3.3.3 Site Inspection

The inspection of the site was conducted on 14 April 2022 by Tetra Tech. The purpose of the inspection was to assess the protectiveness of the OU 2 remedy. No issues impacting the current or future protectiveness of the OU 2 remedy were identified during the inspection. Five-year review inspection checklists are included in Appendix E.

3.4 TECHNICAL ASSESSMENT

3.4.1 QUESTION A: Is the remedy functioning as intended by the decision documents?

The results of the five-year review indicate that the OU 2 remedy is functioning as intended by the ROD. The remedial actions are being implemented as designed and include measures that prevent exposure. The OU 2 remedial actions that have been completed (soil excavation, soil cover placement, and implementation of LUCs) and that are ongoing (MNA and GSI Investigations) are operating as designed and meet the RAOs. The results of groundwater monitoring confirm that migration is not occurring and that COC concentrations are being reduced via natural attenuation processes, and these results and the results of ongoing LUC inspections confirm the continued effectiveness of the remedy.

Wetlands 5A, 6, 7, and 64 were not part of OU 2 at the time the ROD or ROD Amendment were signed, but after reassignment of these wetlands to OU 2 and completion of an RI Addendum, it was determined that sediment at Wetland 64 poses ecological risk. An FS will be completed, and a remedy to address the unacceptable risks will be determined and documented via the ongoing CERCLA process.

Based on the completed and ongoing activities, the intent and goals of the OU 2 ROD have been or will be met, and there are no deficiencies or early indicators of potential remedy failure.

3.4.2 QUESTION B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?

There have been no changes in physical conditions, exposure pathways, or land use that would affect the protectiveness of the OU 2 remedy. The exposure assumptions, cleanup levels, toxicity data, and RAOs for the site used at the time of the remedy selection are still valid.

A PFAS PA was completed at NAS Pensacola in September 2021 and recommended that OU 2 be evaluated further in a PFAS SI. Preliminary PFAS SI sampling results, as reported in the draft SI Report indicate exceedances of the May 2022 updated U.S. EPA tap water RSLs in groundwater at two areas within OU 2, and the SI Report recommends that OU 2 proceed to an RI for PFAS (Tetra Tech, 2022f). The two areas at OU 2 with PFAS exceedances are Former Industrial Building Complex Plating Shops (Site 30, Buildings 649, 755, and 648) and Former Electroplating Shop, Building 709.

The Navy is currently conducting a base-wide radiological PA/SI to address base-wide radiological issues that are within the CERCLA framework. The Navy submitted the final PA Report to the regulators on 23 September 2021 and is in the process of preparing the planning documents for SI activities. Twenty-seven areas at NAS Pensacola, including OU 2, were identified as having potential radiological releases and will be investigated as part of the SI. SI field activities are tentatively scheduled for early 2023, after the SI planning documents are approved. The SI portion of the investigation is not intended to be a full-scale study of the nature or extent of radiological contamination. Rather, its purpose is to augment the data/information collected during the PA and to determine whether further response action or an RI is necessary, or if no further investigation is appropriate.

3.4.3 QUESTION C: Has any other information come to light that could call into question the protectiveness of the remedy?

No additional information has come to light that could call into question the protectiveness of the remedy. There are no newly identified human health or ecological risks, and there have been no impacts from human activities, weather-related events, or natural disasters.

As a result of the effects of climate change, storm events have been increasing in magnitude with time. The Navy conducts annual LUC inspections that would identify any storm-related impacts that might impact protectiveness. If any such impacts are identified, the Navy will address the impacts as required to ensure continued protectiveness.

3.5 ISSUES/RECOMMENDATIONS

The following table summarizes the issues that affect current or future protectiveness and provides recommendations for future action.

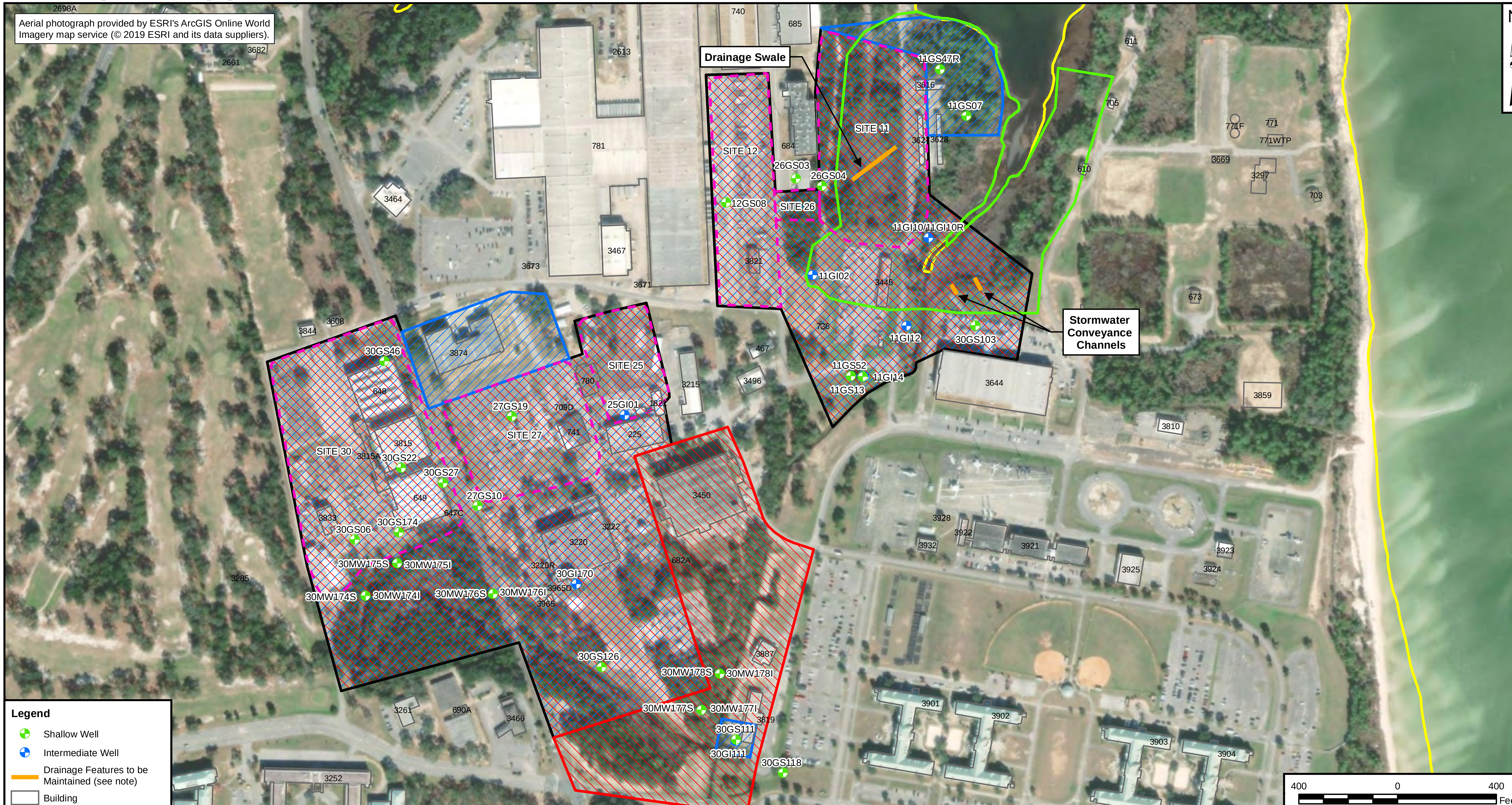
OU 2	**Issue Category: Changed Site Conditions**			
	Issue: Groundwater sampling results exceed PFAS risk-based screening levels (U.S. EPA RSLs).			
	Recommendation: Complete an RI to refine the CSM and evaluate the magnitude and extent of PFAS. Document the investigation and implement appropriate follow-on actions in accordance with Navy Policy and CERCLA.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	Federal Facility Navy	EPA/State	11/20/2026
OU 2	**Issue Category: Other**			
	Issue: Unacceptable ecological risks were estimated for sediment in Wetland 64.			
	Recommendation: Complete the FS, Proposed Plan, and ROD Amendment and select a remedy as necessary to address COCs in Wetland 64 sediment.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	Federal Facility Navy	EPA/State	11/21/2025

3.6 PROTECTIVENESS STATEMENT

Protectiveness Statement	
Operable Unit: 2	*Protectiveness Determination:* Short-term Protective

Protectiveness Statement*: The selected remedy for OU 2, as documented in the ROD and modified by the ROD Amendment, is protective of human health and the environment in the short term. Soil excavation, soil cover placement/enhancement, and LUCs have been successful in preventing exposure to soil and groundwater contaminants. Excavation of contaminated soil eliminated unacceptable industrial risks and potential future migration of soil contaminants to groundwater at concentrations of concern, and the soil cover at Site 11 prevents exposure to landfilled materials. LUCs prevent unacceptable risks by prohibiting residential site use and exposure to residual contaminated soil and by preventing use of groundwater until cleanup goals are achieved. Groundwater monitoring results show that natural attenuation has been effective at reducing contaminant concentrations and that significant downgradient migration is not occurring. The OU 2 remedial actions that have been completed (soil excavation, soil cover construction, and LUC implementation) and that are ongoing (MNA and GSI Investigations) are operating as designed and meet the RAOs. Ongoing LUC inspections and groundwater monitoring confirm the continued effectiveness of the remedy. Based on the completed and ongoing activities, the intent and goals of the OU 2 ROD and ROD Amendment have been or will be met. Based on RI Addendum results, Wetland 64 sediment will be addressed in an FS to evaluate remedial alternatives to prevent adverse impacts to ecological receptors. To ensure long-term protectiveness, the Navy will implement a remedy for Wetland 64 sediment as determined and documented via the CERCLA process. In addition, OU 2 groundwater PFAS sample results exceed CERCLA risk-based screening levels. A PFAS RI will be completed to refine the CSM and to evaluate the magnitude and extent of PFAS. Thereafter, appropriate follow-on actions should be implemented in accordance with Navy policy and CERCLA guidance.*

PGH P:\GIS\PENSACOLA_NAS\MAPDOCS\MXD\OU2_LUC_MAP.MXD 11/21/2022 SP



Legend

- Shallow Well
- Intermediate Well
- Drainage Features to be Maintained (see note)
- Building
- Site Boundary
- Groundwater and Soil LUCs
- Groundwater LUCs Only
- Soil LUCs Only
- Area of Site 11 Additional LUCs (see note)
- Installation Boundary

Note: Per the 2018 LUC RD Amendment, additional LUCs are required in this area, including prohibiting excavation or other disturbance of existing areas with contaminated surface and subsurface soils (exceeding residential SCTLs) at the site unless prior written approval is obtained from U.S. EPA, FDEP, and NAS Pensacola PWD and maintaining the integrity of the native soil cover placed on top of landfill wastes, drainage swales, and stormwater conveyance channels constructed during soil remedial actions.

OU 2, SITES 11, 12, 25, 26, 27, AND 30 LAYOUT
NAVAL AIR STATION PENSACOLA
PENSACOLA, FLORIDA

NAVFAC Naval Facilities Engineering Systems Command

DRAWN BY	DATE	CTO
K. MOORE	09/06/22	N6945021F0538
CHECKED BY	DATE	FIGURE NUMBER
R. MILLER	11/21/22	3-1

4.0 OPERABLE UNIT 4, SITE 15

OU 4, Site 15, Pesticide Rinsate Disposal Area (Figure 4-1) includes portions of golf course maintenance facilities, three concrete and two asphalt wash-down pads, equipment storage buildings, and several buildings in use by golf course employees. The site formerly included a pesticide/drum storage building and underground storage tank (UST) that received pesticide and herbicide residue waste (Resolution Consultants, 2016b). OU 4 is surrounded by the A.C. Read Golf Course and accessible from the north and west by unpaved Reed Road. Surface cover at OU 4 is soil, grass, and gravel. There are no surface water features within OU 4; several water hazards, Wetland 4D, and the shoreline of Bayou Grande are within 1,000 feet of the site.

Since 1963, fertilizer, pesticide, and herbicide products for golf course application have been stored and mixed at the golf course maintenance facility. Application equipment (e.g., tractors, sprayer tanks) were also rinsed at the facility's wash-down pads (Resolution Consultants, 2016b). Before construction of the wash racks, equipment cleaning at the asphalt wash-down pad released diluted rinsate solutions (containing organic phosphates, chlorinated hydrocarbons, carbaryl, and carbamates) directly onto the ground surface, where the products infiltrated the soil. A sink outside Building 3586 and a floor drain in a concrete pad north of that building collected pesticide and herbicide residue wastes and discharged them to an underground storage tank (UST). The UST was removed in 1993, and the contents of the tank were spread across the ground surface approximately 200 feet north-northwest of Building 3447, beyond the dirt access road (NAVFAC, 2015).

OU 4, Site 15 is used to manage and store equipment, fertilizer, and pesticides for application at the golf course. Future site use is not expected to change (NAVFAC, 1999d).

4.1 RESPONSE ACTION SUMMARY

The primary sources of contamination at OU 4, Site 15 are presumed to be associated with equipment storage and rinsing of pesticide and herbicide application equipment.

4.1.1 Basis for Taking Action

Potentially exposed populations are current and hypothetical future site workers; hypothetical future site residents were also evaluated as a potentially exposed population (EnSafe, 1997c). The RI Baseline Risk Assessment (BRA) assumed all surface locations were unpaved, workers were continuously exposed to surface sample locations, and groundwater was used as a potable source. Risks to current workers exposed to site soil (ingestion and dermal contact) were 2E-05 and 0.1 for cancer and non-cancer risks, respectively. Risks posed to hypothetical future site residents due to site soil were 9E-05 and 1.6. Groundwater risks for both site workers and hypothetical future residents, assuming potable use of groundwater, exceeded the upper bound (1E-04) of U.S. EPA's risk threshold (NAVFAC, 1999d). The RI determined that arsenic was the primary risk driver in groundwater.

Based on conservative assumptions, the ecological risk evaluation (which included the eastern cottontail rabbit and American robin because no endangered species were identified on site) indicated potential sublethal effects to those species from maximum detected arsenic, mercury, and possibly pesticide surface soil concentrations (NAVFAC, 1999d). Downgradient surface

water, sediment, and biota (within Bayou Grande and Wetland 65) were not at risk given their distance, shallow groundwater quality adjacent to the water bodies, and nature and limited extent of site impacted groundwater.

4.1.2 Response Actions

The OU 4 ROD was signed by the Navy in 1999 and approved by U.S. EPA in 2000. Neither the Proposed Plan nor the ROD listed RAOs. The following RAOs were identified in the 2013 Five-Year Review Report and Interim RACR (Resolution Consultants, 2014c):

- Soil – Prevent future unacceptable exposure to contaminated soil based on an industrial target risk level of 1E-06.

- Groundwater – Monitor groundwater to ensure that contamination is not migrating off site, achieving compliance with the remedial goal and LUCs.

Table 4-1 lists OU 4, Site 15 soil COCs and remedial goals, which were threshold values used to estimate excavation volumes based on industrial use and implementation of LUCs.

Table 4-1: Operable Unit 4, Site 15 – Surface Soil COCs and Remedial Goals

COC	Remedial Goal (mg/kg)
Arsenic	3.7
Benzo(a)pyrene equivalents	0.5
Dieldrin	0.3

The ROD identified a performance standard (cleanup level) of 50 µg/L for arsenic in groundwater (modified via the 2015 ESD to a cleanup level 10 µg/L); no other groundwater COCs were identified.

The remedial actions selected for OU 4, Site 15 soil and groundwater were independent of each other because the RI showed no correlation between contamination in surface soil and groundwater (NAVFAC, 1999d).

The major components of the soil remedy include:

- Excavation and removal of soil posing a risk greater than 1E-06 to industrial receptors.

- Annual review of the LUCs and certification that they should remain in place or be modified to reflect changing site conditions.

The following components constitute the remedial action for OU 4 groundwater:

- LUCs imposed in accordance with a LUCIP (referred to as a Land Use Control Assurance Plan in the ROD) to restrict groundwater use of the surficial zone of the Sand-and-Gravel Aquifer within 300 feet of the site.

- Implementation of a groundwater monitoring program in accordance with a Groundwater Monitoring Plan to monitor compliance with the performance standard for arsenic.

4.1.3 Status of Implementation

Soil

Source removal activities between April and May 2002 included excavation and off-site disposal of approximately 754 cubic yards of soil with COC concentrations exceeding Industrial SCTLs (Trinity, 2015a). Completion of the soil source area removal action is documented in the 2006 RACR (CH2M Hill, 2006).

Groundwater

Groundwater monitoring was initiated at OU 4 in accordance with a Groundwater Monitoring Plan (included as part of the Interim RACR), which specified semiannual sampling of 14 wells (Resolution Consultants, 2014c). Baseline groundwater sampling was conducted in 2001, followed by two semiannual sampling events in June 2002 and January 2003. LTM has been optimized periodically since that time, with the number of monitoring wells sampled for chemical analysis reduced. The current groundwater monitoring program includes annual sampling of eight wells for arsenic analysis and water level measurements at 11 wells.

Land Use Controls

The following LUCs were initially implemented in 2000 in accordance with the LUCIP (referred to as a Land Use Control Assurance Plan in the ROD) included as an appendix to the MOA:

- Prohibition on the use of groundwater from the surficial zone of the Sand-and-Gravel Aquifer within 300 feet of the site boundaries.

- Restriction of site use to industrial.

- Submittal of an annual review of LUCs and certification that the controls should remain in place or be modified to reflect changing site conditions.

As part of the 2015 ESD (see below), the LUCIP was replaced by a LUC RD (Resolution Consultants, 2016b). OU 4 soil and groundwater LUC objectives per the 2016 LUC RD are summarized in Table 4-2. LUC inspections are conducted annually, and annual LUC certification letters for this five-year review period are provided in Appendix C.

Table 4-2: Summary of Implemented LUCs, OU 4 – Site 15

Media, engineered controls, and areas that do not support UU/UE based on current conditions	LUCs Needed	LUCs Called for in the Decision Documents	Impacted Parcel(s)	LUC Objective	Title of LUC Instrument Implemented and Date
Soil	Yes	Yes	Site 15	Prohibit reuse of the site for residential or residential-like uses.	*Land Use Control Remedial Design, Operable Unit 4 – Site 15, Pesticide Rinsate Disposal Area* November 2016
Groundwater	Yes	Yes	Site 15	Prohibit all uses of groundwater from the surficial aquifer underlying the site (including, but not limited to, human consumption, dewatering, irrigation, heating/cooling purposes,	

Media, engineered controls, and areas that do not support UU/UE based on current conditions	LUCs Needed	LUCs Called for in the Decision Documents	Impacted Parcel(s)	LUC Objective	Title of LUC Instrument Implemented and Date
				and industrial processes) without prior written approval from the U.S. EPA and FDEP.	

Remedy Modification

A 2015 ESD documented the following changes to the OU 4 remedy:

- Modification of the cleanup goal for arsenic in groundwater from the FPDWS of 50 µg/L (applicable at the time the ROD was issued) to the current U.S. EPA MCL and FPDWS of 10 µg/L (adopted in January 2001 and January 2005, respectively).

- Addition of a groundwater RAO to restore OU 4 groundwater (classified as G-II) to its potential beneficial use as a drinking water source throughout the plume by attaining drinking water standards (i.e., FPDWS). Groundwater restoration will generally be considered complete when well-specific monitoring data provide a scientific basis to conclude that the groundwater has met and will continue to meet cleanup levels for arsenic in the future. Monitoring of groundwater can be discontinued with concurrence of U.S. EPA and FDEP. This remedy modification will increase the time needed to achieve site restoration (NAVFAC, 2015c).

- Replacement of the LUCIP with a LUC RD (to maintain consistency with more recent RODs) to document the LUC components of the remedy. The LUC RD was finalized in 2016.

4.1.4 Systems Operations/Operation and Maintenance

There are no active remediation systems requiring O&M at OU 4. Monitoring well maintenance is implemented as part of routine LTM. Monitoring well integrity is reviewed during ongoing annual groundwater monitoring.

4.2 PROGRESS SINCE THE LAST REVIEW

This section includes the protectiveness determination and statement from the last five-year review as well as the recommendations from the last Five-Year Review Report that affected remedy protectiveness and the current status of those recommendations.

Based on the results of the fourth five-year review, the remedial actions implemented for OU 4 were determined to be protective. The protectiveness statement from the Fourth Five-Year Review Report was as follows:

> The remedy at Operable Unit 4, Site 15 is protective of human health and the environment. Institutional controls (as measured by associated Land Use Control inspections) have been successful in preventing exposure to contaminants. The arsenic plume exceeding FDEP Primary Drinking Water Standard and United States

Environmental Protection Agency Maximum Contaminant Level remains stable and is not migrating offsite.

No issues affecting current or future protectiveness were identified in the Fourth Five-Year Review Report for OU 4.

4.3 FIVE-YEAR REVIEW PROCESS

4.3.1 Community Notification, Involvement, and Site Interviews

A public notice announcing the initiation of this five-year review was published in the *Pensacola News Journal* and on the NAS Pensacola Facebook page on 19 June 2022 (see Appendix D). No public comments were received in response to the public notice. A second public notice will be published announcing the completion of the Fifth Five-Year Review Report and the availability in the Administrative Record of the report and fact sheet summarizing the results of the review. The fact sheet will also be distributed to the RAB and any other interested persons or organizations. The Administrative record can be accessed online at

https://www.navfac.navy.mil/Business-Lines/Environmental/Products-and-Services/Environmental-Restoration/Southeast/Pensacola-NAS/Administrative-Record/

Interview questionnaires were sent to two members of the NAS Pensacola Restoration Advisory Board, and the completed questionnaire received in response is included in Appendix C.

4.3.2 Data Review

Figure 4-1 shows the locations of monitoring wells in the OU 4 LTM program. Analytical results for annual groundwater monitoring activities were provided in their respective annual reports. Monitoring is conducted to evaluate natural attenuation processes and to ensure that arsenic is not migrating off site at concentrations of concern. LTM was conducted semiannually from 2004 through 2018 and annually thereafter. The current sampling program includes annual sampling of eight monitoring wells and water level measurements at 11 wells. During this five-year review period, LTM at OU 4 was conducted in June and November 2017, May/June and November 2018, and November 2019, 2020, and 2021. Table 4-3 summarizes exceedances of the arsenic remedial goal during the current five-year review period. Detailed results and evaluations are presented in the annual monitoring reports.

Table 4-3: Summary of OU 4 Arsenic Concentrations in Groundwater Exceeding the Remedial Goal During this Review Period

Well	Arsenic Detections > Remedial Goal, 2017 to 2021
Source Area Wells	
15GR03RR/15GR03R3[(1)]	June and November 2017, May/June and November 2018, 2019, 2020
15GR04R	June 2017
15GR65R	November 2017, November 2018
15GR66R	November 2017, May/June and November 2018, 2019, 2020
15MW74	None
15MW75	None
15MW77	November 2017, May/June 2018, 2019

Well	Arsenic Detections > Remedial Goal, 2017 to 2021
Downgradient Compliance Well	
15MW72	None

1 Well 15GR03RR was not sampled in 2021 because it was damaged; replacement well 15GR03R3 was installed and sampled in February 2022.

During 2021 annual sampling (including the February 2022 sampling of replacement well 15GR03R3), concentrations of arsenic were less than the remedial goal of 10 µg/L in all wells sampled. Arsenic concentrations in the downgradient compliance well, 15MW72, have been less than the remedial goal since sampling began. Five of the seven source area wells have had arsenic exceedances during this review period (see Table 4-3). At 15GR04R, the June 2017 concentration exceeded the 10 µg/L, but subsequent concentrations were less than the remedial goal. At the location with the greatest historical arsenic concentrations, 15GR03R3 (installed in 2022 to replace 15GR03RR), concentrations have fluctuated but show a decreasing trend at a 95-percent confidence interval. Concentrations have decreased from a maximum of 870 µg/L in 2008 to 7.3 µg/L in 2022. At 15GR65R, concentrations have fluctuated and have been less than the remedial goal since 2019. At 15GR66R, concentrations have fluctuated but have a decreasing trend. Arsenic concentrations at 15MW77 have generally been consistent except for a spike in 2017. Concentrations were less than the remedial goal during three of the last four LTM events.

Monitoring results document that arsenic contamination has not migrated off site; concentrations at 15MW72, 15MW74, 15MW75, and 15GR04R (downgradient wells within the LUC boundary) remain less than the remedial goal. Groundwater elevation data suggest that downgradient compliance wells in the northern and eastern areas of the site remain downgradient relative to source wells, and attenuation of arsenic is expected to be primarily via immobilization through precipitation and adsorption (EnSafe, 2022f).

4.3.3 Site Inspection

The inspection of the site was conducted on 14 April 2022, by Tetra Tech. The purpose of the inspection was to assess the protectiveness of the OU 4 remedy. No issues impacting the current or future protectiveness of the OU 4 remedy were identified during the inspection. Five-year review inspection checklists are included in Appendix E.

4.4 TECHNICAL ASSESSMENT

4.4.1 QUESTION A: Is the remedy functioning as intended by the decision documents?

The results of the five-year review indicate that the OU 4 remedy is functioning as intended by the ROD as modified by the ESD. Soil with COC concentrations greater than industrial remedial goals was removed, and LUCs have been implemented to prevent exposure to soil with residential exceedances and to contaminated groundwater. Groundwater monitoring results indicate that contaminant concentrations in groundwater are stable or decreasing and that migration off site is not occurring.

The remedial actions are being implemented as designed and include measures that prevent exposure. OU 4 remedial actions that have been completed (excavation and off-site disposal of

contaminated soil, groundwater monitoring, and LUC implementation) are operating as designed and meet the RAOs. Based on the completed and ongoing activities, the intent and goals of the OU 4 ROD have been or will be met, and there are no deficiencies or early indicators of potential remedy failure.

4.4.2 QUESTION B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?

There have been no changes in physical conditions, exposure pathways, or land use that would affect the protectiveness of the OU 4 remedy. The exposure assumptions, cleanup levels, toxicity data, and RAOs for the site used at the time of the remedy selection, or remedy modification in the case of arsenic in groundwater, are still valid. Industrial SCTLs for OU 4 COCs (arsenic, benzo(a)pyrene, and dieldrin) have changed since the ROD was signed, but current SCTLs are equal to or greater than the values in the ROD, so the remedy is still protective.

A PFAS PA was completed at NAS Pensacola in September 2021 and recommended OU 4, Site 15 be evaluated further in a PFAS SI. Preliminary PFAS SI sampling results, as reported in the draft SI Report indicate exceedances of the May 2022 updated U.S. EPA tap water RSLs in groundwater at OU 4, and the SI Report recommends that OU 4 proceed to an RI for PFAS (Tetra Tech, 2022f).

4.4.3 QUESTION C: Has any other information come to light that could call into question the protectiveness of the remedy?

No additional information has come to light that could call into question the protectiveness of the remedy. There are no newly identified human health or ecological risks, and there have been no impacts from human activities, weather-related events, or natural disasters.

As a result of the effects of climate change, storm events have been increasing in magnitude with time. The Navy conducts annual LUC inspections that would identify any storm-related impacts that might impact protectiveness. If any such impacts are identified, the Navy will address the impacts as required to ensure continued protectiveness.

4.5 ISSUES/RECOMMENDATIONS

The following table summarizes the issues that affect current or future protectiveness and provides recommendations for future action.

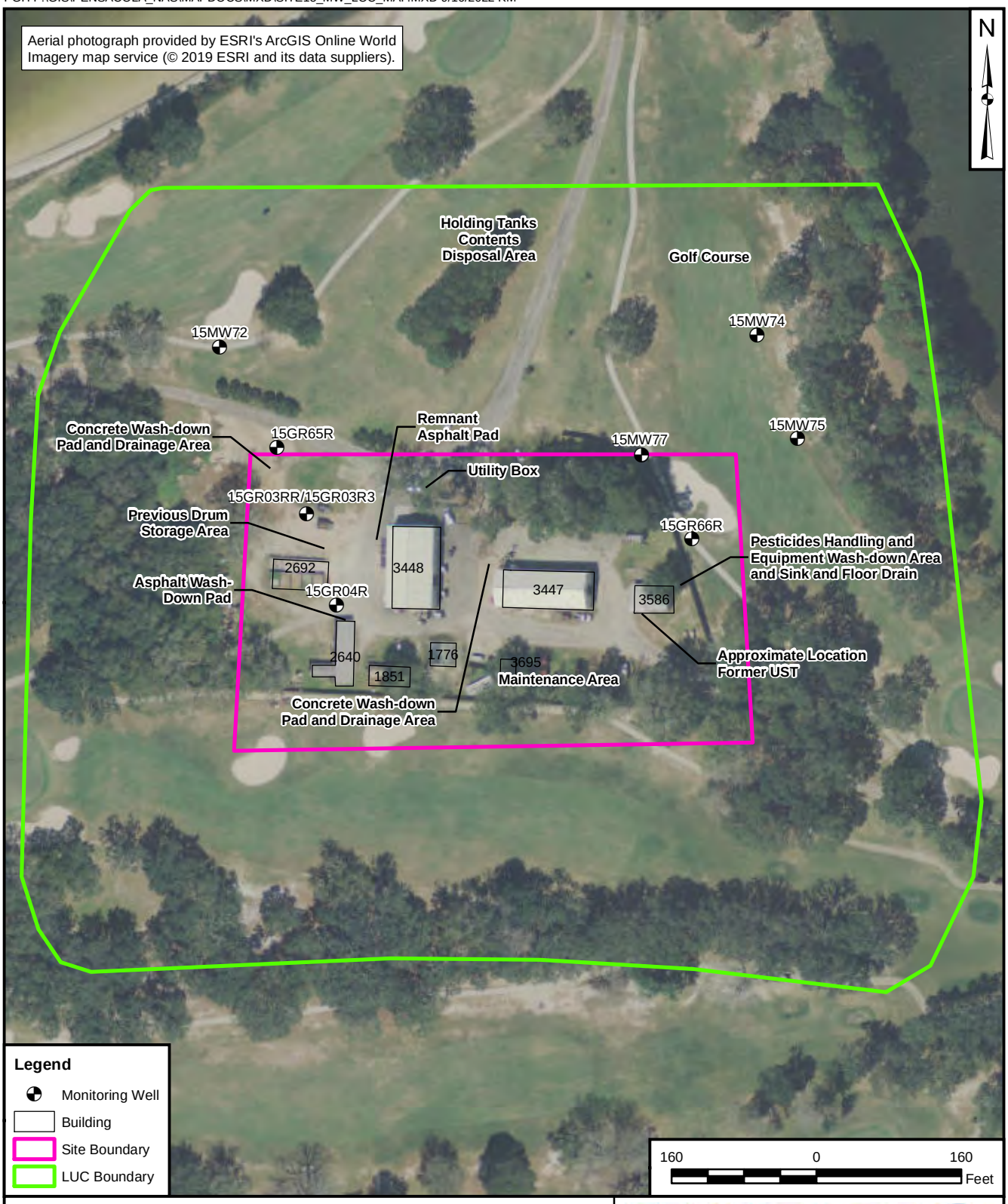
OU 4	**Issue Category: Changed Site Conditions**			
	Issue: Groundwater sampling results exceed PFAS risk-based screening levels (U.S. EPA RSLs).			
	Recommendation: Complete an RI to refine the CSM and evaluate the magnitude and extent of PFAS. Document investigation implement appropriate follow-on actions in accordance with Navy Policy and CERCLA.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**

No	Yes	Federal Facility Navy	EPA/State	11/20/2026

4.6 PROTECTIVENESS STATEMENT

Protectiveness Statement	
Operable Unit: 4	*Protectiveness Determination:* Short-term Protective
***Protectiveness Statement**: The selected remedy for OU 4 is protective of human health and the environment in the short term. Soil excavation and off-site disposal have been successful in preventing exposure to contaminants at concentrations exceeding industrial remedial goals in soil. LUCs prevent residential exposure to residual soil contamination and prevent exposure to groundwater contamination that could result in unacceptable risks. LTM results show that arsenic concentrations in groundwater are stable or decreasing and that arsenic is not migrating to off-site groundwater. The OU 4 remedial actions that have been completed (excavation and off-site disposal of contaminated soil, LUC implementation, and monitoring) are operating as designed and meet the RAOs. Ongoing LUC inspections and groundwater monitoring confirm the continued effectiveness of the remedy. Based on the completed and ongoing activities, the intent and goals of the OU 4 ROD and ESD have been or will be met. However, because OU 4 groundwater PFAS sample results exceed CERCLA risk-based screening levels, a PFAS RI will be completed to refine the CSM and to evaluate the magnitude and extent of PFAS. Thereafter, appropriate follow-on actions should be implemented in accordance with Navy policy and CERCLA guidance.*	

PGH P:\GIS\PENSACOLA_NAS\MAPDOCS\MXD\SITE15_MW_LOC_MAP.MXD 9/16/2022 KM



OU 4 SITE 15 LAYOUT
NAVAL AIR STATION PENSACOLA
PENSACOLA, FLORIDA

NAVFAC
Naval Facilities Engineering Systems Command

DRAWN BY	DATE	CTO
K. MOORE	09/06/22	N6945021F0538
CHECKED BY	DATE	FIGURE NUMBER
R. MILLER	09/16/22	4-1

5.0 OPERABLE UNIT 10 – SITES 32, 33, AND 35

OU 10 comprises three sites formerly associated with the IWTP, Site 32 (Former Industrial Sludge Drying Beds [ISDBs], Site 33 (Former Wastewater Treatment Plant Ponds), and Site 35 (Miscellaneous IWTP Solid Waste Management Units [SWMUs]). OU 10 is discussed as four areas: A (west of closed ISDBs), B and C (swales), and D (north of Operations Building 3297). Figure 5-1 shows the OU 10 layout and Areas A through D. The former IWTP is identified as SWMU 1 in the FDEP Resource Conservation and Recovery Act (RCRA) Post-Closure Permit, and the Navy is conducting post-closure care and corrective actions at the former sludge drying beds and surge pond at the former IWTP in accordance with the permit. Corrective actions are being conducted in compliance with the NAS Pensacola RCRA permit (permit 0154498-005-HF, renewed 13 March 2017 as 0154498-007-HF, modified June 2021 as 0154498-008-HF). The groundwater remediation portion of the OU 10 remedy was deferred from CERCLA to RCRA, but OU 10 soils and LUCs continue to be addressed by the CERCLA program, and five-year reviews of the soil and groundwater portions of the remedy will continue.

OU 10 encompasses approximately 26 acres on NAS Pensacola Magazine Point Peninsula, which is bordered by Bayou Grande to the north and west and Pensacola Bay to the east. OU 10 is bounded by thick vegetation and trees to the north and south. Access to the east and west is limited by Pensacola Bay and Bayou Grande. Magazine Point is currently used to store ordnance and munitions.

Wastewater treatment within Magazine Point began in 1941. Prior to 1971, the facility received industrial waste from paint and plating operations, which were processed with domestic wastewater. The facility was upgraded in 1971 to treat both domestic and industrial wastes separately. The IWTP ceased operating in 1988, and the former IWTP structures were demolished in 2020. Some of the IWTP exterior structures contained lead paint that was observed to be in deteriorating condition during a hazardous materials survey performed prior to demolition. Based on regulator concerns regarding potential lead in soil from the deteriorating lead paint within the footprint of the former IWTP, a SAP is being prepared for CERCLA Preliminary Site Characterization soil sampling for lead in this area. A Preliminary Site Characterization Report will be prepared to document the associated activities and results.

5.1 RESPONSE ACTION SUMMARY

The general source of contamination at SWMU 1 is associated with former processing and treatment of domestic sewage and industrial waste at the IWTP. Industrial waste included organic solvents (chlorinated ethenes, benzene, and chlorobenzenes), phenols, chromium electroplating wastes (cyanide and heavy metals), and waste from the chemical conversion process for aluminum. While in operation, the unlined stabilization, surge, and polishing ponds leaked industrial waste containing chlorinated solvents and metals into the subsurface.

5.1.1 Basis for Taking Action

Human health and ecological risk assessments were conducted as port of the OU 10 RI (EnSafe/Allen & Hoshall, 1995). In the HHRA, risks were estimated for site workers, trespassers, and hypothetical future residents exposed to contaminants in surface soil, surface water, surface sediment, and groundwater.

Risks associated with exposure to all individual environmental media and combinations of media were acceptable for current site workers and potential trespassers. Soil risk (combined ingestion and dermal contact pathways) posed to hypothetical future residents was unacceptable (risk of 6E-06 and HI of 3). For future site workers, soil risks were less than the FDEP threshold of 1E-06 and a HI of 1. For hypothetical future site residents, risk from exposure to shallow/ intermediate groundwater and deep groundwater was shown to exceed acceptable risk goals. Estimated risks were acceptable for exposure to site contaminants in surface water and sediment at the site.

Potential impacts to adjoining surface water bodies and wetlands were evaluated as part of OU 16 (see Section 8). Ecological assessments performed during the RI focused on soil and concluded that soil contaminant concentrations do not pose an unacceptable risk to the environment (NAVFAC, 1997).

5.1.2 Response Actions

Initial remedial actions at the IWTP were conducted under RCRA. In 1985, a RCRA groundwater assessment identified and delineated the lateral and vertical extent of groundwater contamination attributable to the surge ponds. A groundwater recovery system was designed and installed at the IWTP in 1986 to remediate contaminated groundwater; the system began operating in 1987 and ceased operation in 1997.

The RCRA permit to operate the surge pond, issued in September 1987, stipulated continued operation of the corrective action system (recovery wells) and implementation of two quarterly groundwater monitoring programs, including point of compliance monitoring at the surge pond and corrective action monitoring to determine the effectiveness of ongoing groundwater remediation.

In 1988, the Navy began RCRA-permitted closure of Sites 32 and 33. Based on sampling results, FDEP assigned clean closure status for the Site 33 polishing and stabilization ponds. The Site 32 ISDBs and Site 33 surge pond required capping with low-permeability covers (asphalt and clay, respectively). A groundwater monitoring program was developed to ensure the effectiveness of the caps.

In 1992, regulatory focus of environmental investigation at the IWTP shifted to include the CERCLA program, and an RI was conducted between 1992 and 1995.

The Final OU 10 ROD was signed by the Navy in June 1997 and approved by U.S. EPA in May 1997 (NAVFAC, 1997). The following RAOs were established for soil and groundwater at OU 10:

- Eliminate human health risk above 1E-06 for residential land use due to concentrations of benzo(a)pyrene and dibenz(a,h)anthracene above risk levels (Area A).

- Protect groundwater from leachable compounds due to chlorinated benzenes and naphthalene above performance standards (Areas B, C, and D).

The selected remedy included source control and groundwater remediation and monitoring.

The major components of the source control portion of the selected remedy are as follows:

- Excavation and disposal of soil above residential soil preliminary remediation goals in Area A.

- Leachability study on Areas A, B, C, and D to verify that contaminants remaining in soil are not leaching to groundwater.

- Contingency remedial action of Areas B, C, and D to include excavation and disposal of soil that the leachability study verifies as a source of groundwater contamination. (Based on the results of the leachability study, no soil excavation was required at Areas B, C, or D.)

Remediation goals for the Area A soil excavation were established in the ROD for benzo(a)pyrene and dibenz(a,h)anthracene based on acceptable risk assuming combined ingestion and skin contact with soil. The goals were 1.3 mg/kg for each COC.

Major components of the groundwater remediation and monitoring portion of the selected remedy are as follows:

- Implementation of a groundwater remediation system that meets performance standards listed in the ROD. The remedial design for groundwater treatment was developed in the Corrective Action Plan for the RCRA permit modification.

- Continued groundwater monitoring at sampling intervals established during the remedial design in the Corrective Action Plan for the RCRA permit modification until a five-year review concludes that the remedy has continuously attained the groundwater performance standards and remains protective of human health and the environment.

Groundwater performance standards were listed for 10 COCs in the ROD, but the list of monitored parameters has changed based on subsequent permit modifications. Table 5-1 lists the performance standards included in the OU 10 ROD and notes for each parameter whether it is still included in the current monitoring program. Table 5-2 is the list of current OU 10 monitoring parameters and their performance standards, now referred to as Groundwater Protection Standards (GWPSs), per the RCRA permit (EnSafe, 2022b).

Table 5-1: Operable Unit 10, Sites 32, 33, and 35 – COCs and Groundwater Performance Standards

COC	Performance Standard (µg/L)	Current Status
Benzene	1	Retained as a monitoring parameter
bis(2-Ethylhexyl) phthalate	6	Removed as a monitoring parameter in 2017 permit update; not detected from 2012 to 2015
1,2-Dichlorobenzene	600	Removed as a monitoring parameter in 2017 permit update; not detected from 2012 to 2015
1,3-Dichlorobenzene	10	Retained as a monitoring parameter
1,4-Dichlorobenzene	75	Retained as a monitoring parameter

COC	Performance Standard (µg/L)	Current Status
Cadmium	5	Removed from sampling plan in November 2008
Chlorobenzene	100	Retained as a monitoring parameter
Hexachloroethane	10	Not removed from the sampling plan but has not been analyzed for and not been included in permits since 2008
PCE	3	Removed as a monitoring parameter in 2017 permit update; not detected from 2012 to 2015
Vinyl chloride	1	Retained as a monitoring parameter

Table 5-2: Operable Unit 10, Sites 32, 33, and 35 – Current Monitoring Parameters and GWPSs

Analyte	GWPS (µg/L, except as noted)
Arsenic	10
Manganese	50
Sodium	160,000
1,1-Dichloroethene	7
1,3-Dichlorobenzene	210
1,4-Dichlorobenzene	75
1,4-Dioxane	3.2
Benzene	1
Chlorobenzene	100
cis-1,2-Dichloroethene	70
trans-1,2-Dichloroethene	100
TCE	3
Vinyl chloride	1
2,4-Dichlorophenol	0.3
Radium-226	5 pCi/L
Radium-228	5 pCi/L
Chloride	250,000
Fluoride	2,000
Complexed cadmium	200
Nitrite	10,000

The ROD also identified four indicator parameters and associated performance standards for groundwater and required that groundwater treatment continue until the performance standards are met at wells designated during the design as compliance points (see Table 5-3). The indicator parameters were chosen because they encompassed the area of standard exceedances for groundwater.

Table 5-3: Operable Unit 10, Sites 32, 33, and 35 – Groundwater Indicator Parameters and Performance Standards for Groundwater Treatment

Indicator Parameter	Treatment Performance Standard (µg/L)
1,2-Dichlorobenzene	600
1,3-Dichlorobenzene	210
1,4-Dichlorobenzene	75
Chlorobenzene	7100

5.1.3 Status of Implementation

Source Control

In 1997, approximately 200 cubic yards of contaminated soil in Area A were excavated and disposed of off site to address benzo(a)pyrene and dibenz(a,h)anthracene concentrations exceeding risk-based remedial goal options for residential exposure documented in the ROD.

Based on the results of sampling and leachability analysis of soil collected from Areas B, C, and D, concentrations of chlorinated benzenes and naphthalene did not present a future risk to groundwater from leaching, and no further action was required for soil (NAVFAC, 2013b).

Groundwater

A Corrective Action Plan was issued in July 2000 detailing the methods to be used for source reduction, natural attenuation monitoring, and corrective action verification, and included a contingency plan should groundwater treatment and natural attenuation fail to effectively reduce contaminant concentrations to less than groundwater standards.

Groundwater natural attenuation monitoring began in 1997 and continues to date. Groundwater monitoring is managed under the RCRA program and has been optimized in accordance with recommendations made in RCRA post-closure permits. The objective of RCRA compliance monitoring is to evaluate contaminant concentrations to ensure that they do not present an unacceptable threat to human health or the environment under groundwater use restrictions implemented as part of the selected remedy. MNA is conducted to confirm that natural attenuation is sufficiently controlling the mobility of contaminants such that the contaminant plumes remain stable and confined to the intermediate aquifer, with no evidence of off-site contaminant migration. Monitoring is currently conducted in accordance with the 2018 SAP (EnSafe, 2018).

Groundwater remediation began in 2001 with treatment involving injection of oxygen-releasing compound in the chlorobenzene source area as part of a pilot study to enhance aerobic biodegradation of chlorinated benzenes. When it was determined that substrate effectiveness lasted only approximately 9 months, the remedial method was discontinued because annual injections were cost prohibitive. The Navy subsequently operated a biosparging remediation system at the ISDBs from 2005 to 2006 to remediate benzene and chlorobenzene. Biosparging temporarily increased dissolved oxygen concentrations and decreased contaminant concentrations in source areas wells. In 2008, an emulsified vegetable oil and pH buffer injection pilot study and an AquaBupH injection pilot study was conducted in the TCE source area. TCE concentrations initially decreased but eventually rebounded. Byproducts of reductive dechlorination increased because of the injections. Groundwater treatment under the Corrective

Action Plan occurred through 2010, at which time amendments were discontinued, and post-treatment monitoring was initiated. In addition to Navy RCRA post-closure permit compliance monitoring, USGS continues to monitor groundwater conditions to evaluate the effectiveness of 2008 to 2010 treatment activities.

Groundwater remedial performance has been documented through regular reporting to FDEP since 1997. In accordance with the RCRA permit and ROD, groundwater monitoring for RCRA compliance, natural attenuation monitoring, and corrective action verification will continue based on permit requirements.

Land Use Controls

LUCs were implemented at OU 10 in accordance with the LUCIP included as Appendix B to the MOA (Navy, 1999d) to prevent human ingestion and inhalation exposure to contaminated groundwater. Annual physical inspections are conducted to confirm continued implementation of LUCs and compliance with LUC performance objectives described in the LUCIP. Table 5-4 lists OU 10 LUC performance objectives. A LUC RD for OU 10 is in the preliminary planning stages.

Table 5-4: Summary of Implemented LUCs, OU 10, Sites 32, 33, and 35

Media, engineered controls, and areas that do not support UU/UE based on current conditions	LUCs Needed	LUCs Called for in the Decision Documents	Impacted Parcel(s)	LUC Objective	Title of LUC Instrument Implemented and Date
Groundwater	Yes	Yes	Sites 32, 33, 35	Restrict groundwater use of surficial zone of Sand-and-Gravel Aquifer within 300 feet of site boundaries.	*Land Use Control Implementation Plan, Appendix B of 1999 MOA*

5.1.4 Systems Operations/Operation and Maintenance

There are no active remediation systems requiring O&M at OU 10. Monitoring well maintenance is implemented as part of routine LTM. Monitoring well integrity is reviewed during ongoing annual groundwater monitoring. The caps at Sites 32 and 33 require inspection and maintenance, which is conducted under RCRA post-closure.

5.2 PROGRESS SINCE THE LAST REVIEW

This section includes the protectiveness determination and statement from the last five-year review as well as the recommendations from the last Five-Year Review Report and the current status of those recommendations.

Based on the results of the fourth five-year review, the source control and LUC remedial actions implemented for OU 10 were determined to be short-term protective. The protectiveness statement from the Fourth Five-Year Review Report was as follows:

> The remedy at Operable Unit 10 is protective in the short-term because excavation actions removed soil above risk-based health criteria and leachability to groundwater levels, restrictions on groundwater and site uses eliminate exposure to

contaminated groundwater, and long-term monitoring evaluates ongoing degradation trends. To ensure long-term protectiveness, the NAS Pensacola Partnering Team will review the Operable Unit 10 Record of Decision and Resource Conservation and Recovery Act Permit and determine if clarification is required with respect to land use controls and changes in the groundwater monitoring program.

The current status of the OU 10 recommendation from the previous five-year review is provided in Table 5-5.

Table 5-5: Status of OU 10 Recommendations from the 2018 Five-Year Review

Issue	Recommendations	Current Status	Current Implementation Status Description	Completion Date
U.S. EPA has concerns with respect to the interaction of OU 10 ROD and RCRA Permit requirements, specifically related to LUCs and changes in the groundwater monitoring program.	The Naval Air Station Pensacola Partnering Team will review the OU 10 ROD and RCRA Permit to determine if clarification is required with respect to land use controls and changes in long-term monitoring, or if any changes to decision documents are needed.	Ongoing	It was determined that a LUC RD would be prepared for OU 10 and that groundwater monitoring requirements implemented per RCRA permit modifications are also protective under CERCLA. OU 10 groundwater continues to be evaluated as part of CERCLA five-year reviews.	29 August 2025

5.3 FIVE-YEAR REVIEW PROCESS

5.3.1 Community Notification, Involvement, and Site Interviews

A public notice announcing the initiation of this five-year review was published in the *Pensacola News Journal* and on the NAS Pensacola Facebook page on 19 June 2022 (see Appendix D). No public comments were received in response to the public notice. A second public notice will be published announcing the completion of the Fifth Five-Year Review Report and the availability in the Administrative Record of the report and fact sheet summarizing the results of the review. The fact sheet will also be distributed to the RAB and any other interested persons or organizations. The Administrative record can be accessed online at:

https://www.navfac.navy.mil/Business-Lines/Environmental/Products-and-Services/Environmental-Restoration/Southeast/Pensacola-NAS/Administrative-Record/

Interview questionnaires were sent to two members of the NAS Pensacola Restoration Advisory Board, and the completed questionnaire received in response is included in Appendix C.

5.3.2 Data Review

Figure 5-1 shows the locations of OU 10 monitoring wells in the groundwater monitoring program. Analytical results for groundwater monitoring activities were provided in their respective annual reports. The purpose of the groundwater monitoring program at OU 10 is to monitor and report on current concentrations of contaminants, monitor changes in those concentrations, assess whether additional sampling points are necessary, monitor contaminant migration, and provide recommendations, as appropriate, for further monitoring and/or for the completion of monitoring activities. As outlined in the SAP (EnSafe, 2018) and the 2021 approved monitoring program optimization (approved by FDEP on 16 August 2021), groundwater monitoring at SWMU 1 includes an annual and biennial sampling schedule. Groundwater samples are collected annually from 11 intermediate wells and biennially from 17 intermediate wells and one deep well. During this five-year review period, monitoring at OU 10 was conducted annually in November 2017, 2018, 2019, 2020, and 2021.

Table 5-6 summarizes exceedances of performance standards for COCs as listed in the ROD during the current five-year review period, and groundwater monitoring results for the period are summarized below. Detailed results and evaluations are presented in the annual monitoring reports.

Table 5-6: Summary of OU 10 COC Concentrations Exceeding GWPSs

Well	Detections of COCs > GWPSs, 2017 to 2021
PCI-1(1)	None
GM-69(1)	1,4-Dichlorobenzene (2017, 2018, 2019, 2020, 2021)
	Chlorobenzene (2017, 2018, 2019, 2020, 2021)
33G16(1)	Chlorobenzene (2018, 2020)
AE01R(1)	1,4-Dichlorobenzene (2017, 2018)
	Chlorobenzene (2017, 2018, 2019, 2020, 2021)
	Vinyl chloride (2017, 2019, 2020, 2021)
33G12(1)	None
33G20(1)	1,3-Dichlorobenzene (2018)
	1,4-Dichlorobenzene (2018, 2020)
	Chlorobenzene (2018, 2020)
	Vinyl chloride (2018)
USGS-7R(2)	1,3-Dichlorobenzene (2018)
	1,4-Dichlorobenzene (2018, 2020)
	Chlorobenzene (2018, 2020)
	Vinyl chloride (2018)
USGS-9R(2)	1,3-Dichlorobenzene (2018)
	1,4-Dichlorobenzene (2018, 2019, 2020, 2021)
	Chlorobenzene (2018, 2019, 2021)
USGS-12R(2)	1,4-Dichlorobenzene (2019)
AE02(2)	Vinyl chloride (2017, 2019, 2020, 2021)
AE03(2)	Vinyl chloride (2017, 2019, 2021)
AE04(2)	None
AE01RR(2)	Vinyl chloride (2017, 2018, 2019, 2020, 2021)
AE10(2)	Chlorobenzene (2018, 2021)
AE11(2)	1,4-Dichlorobenzene (2021)

Well	Detections of COCs > GWPSs, 2017 to 2021
	Chlorobenzene (2021)
	Vinyl chloride (2017, 2018, 2019, 2020)
32G101[2]	Benzene (2018, 2020)
	Chlorobenzene (2018, 2020)
	Vinyl chloride (2018, 2020)
33G08[2]	None
PCD-1[3]	None

Includes results for analytes with groundwater protection standards as defined in the 1997 ROD that are still analyzed as part of the SWMU 1 RCRA monitoring program.

1 Sampled biennially.
2 Corrective action well; sampled annually.
3 Deep well; sampled biennially.

Evaluation of geochemical data indicate that the anaerobic conditions identified within intermediate zone groundwater are possibly assisting with ongoing reductive dechlorination. Dissolved oxygen concentrations and oxidation-reduction potential are within the optimum range to support anaerobic dechlorination. The pH levels in most intermediate wells also support ongoing anaerobic dechlorination activity. Chloride concentrations are highest in the intermediate wells downgradient of the intermediate monitoring wells with maximum TCE and daughter product concentrations. This may suggest active anaerobic dechlorination. Additionally, high manganese concentrations in the area of the TCE plume suggest a reducing environment and may be indicative of sustained anaerobic dechlorination.

Trend information indicates that the contaminant plumes are generally stable. The plumes do not appear to be migrating off site, and dechlorination is likely helping to maintain plume stability. Concentrations of 1,3-dichlorobenzene and 1,4-dichlorobenzene at AE11, radium at AE01RR, and sodium, chloride, and radium at GM69 showed generally increasing trends, but trends for other contaminants were either stable or declining. Given the results and groundwater flow, the current monitoring network is judged to be adequate for future monitoring. Monitoring will continue in 2022 per the RCRA permit.

Although not identified as an issue affecting protectiveness, evaluation of the emerging contaminant 1,4-dioxane in OU 10 groundwater was recommended in the previous Five-Year Review Report based on historical detections of 1,2-dichloroethane. OU 10 samples were analyzed for 1,4-dioxane for the first time in November 2020, and concentrations at 16 of the 17 intermediate wells sampled exceeded the GCTL of 3.2 µg/L. In November 2021, 1,4-dioxane concentrations at 10 of the 11 intermediate wells sampled exceeded the GCTL. Table 5-7 summarizes concentrations of 1,4-dioxane detected in 2020 and 2021 at OU 10.

Table 5-7: Summary of 1,4-Dioxane Concentrations

Location	Detected Concentration (µg/L)	
	2020	2021
PCI-1[1]	**43**	NS
GM-69[1]	**39**	**46**
33G16[1]	**30**	NS
AE01R[1]	**12**	**12**

Location	Detected Concentration (µg/L)	
	2020	2021
33G12[1]	**18**	**9.6**
33G20[1]	**15**	NS
USGS-7R[2]	**6.1**	NS
USGS-9R[2]	**13**	**10**
USGS-12R[2]	**8.9**	**7**
AE02[2]	**57**	**60 J-**
AE03[2]	**39**	**68**
AE04[2]	2.9 J	2.5 J
AE01RR[2]	**49**	**71 J-**
AE10[2]	**120**	**110**
AE11[2]	**44**	**45**
32G101[2]	**130**	NS
33G08[2]	**9**	NS
PCD-1[3]	1.8 J	NS

1 Sampled biennially.
2 Corrective action well; sampled annually.
3 Deep well; sampled biennially.
NS Not sampled.
J Estimated concentration.
J- Estimated concentration, biased low.
Bolded concentrations exceed the GCTL of 3.2 µg/L.

5.3.3 Site Inspection

The inspection of the site was conducted on 14 April 2022 by Tetra Tech. The purpose of the inspection was to assess the protectiveness of the OU 10 remedy. No issues impacting the current or future protectiveness of the OU 10 remedy were identified during the inspection. Five-year review inspection checklists are included in Appendix E.

5.4 TECHNICAL ASSESSMENT

5.4.1 QUESTION A: Is the remedy functioning as intended by the decision documents?

The results of the five-year review indicate that the OU 10 remedy is functioning as intended by the ROD. Active groundwater treatment was conducted in accordance with the RCRA Corrective Action Plan, and post-treatment monitoring is ongoing. Soil with polynuclear aromatic hydrocarbons (PAH) concentrations associated with unacceptable residential risk was excavated, and the results of the post-ROD leachability investigation documented that no further soil excavation is required to address potential leaching of soil contaminants and subsequent migration to groundwater at concentrations of concern. LUCs implemented in accordance with the OU 10 LUCIP prevent exposure to contaminated groundwater, and the results of groundwater monitoring are used to confirm that site contaminants are not migrating off site. The remedial actions are being implemented as designed and include measures that prevent exposure. The OU 10 remedial actions that have been completed (excavation of contaminated soil, active groundwater treatment, and implementation of LUCs) and that are ongoing (groundwater monitoring) are operating as designed and meet the RAOs. Based on the

completed and ongoing activities, the intent and goals of the OU 10 ROD have been or will be met, and there are no deficiencies or early indicators of potential remedy failure.

5.4.2 QUESTION B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?

There have been no changes in physical conditions, exposure pathways, or land use that would affect the protectiveness of the OU 10 remedy. The exposure assumptions, cleanup levels, toxicity data, and RAOs for the site used at the time of the remedy selection are still valid.

A PFAS PA was completed at NAS Pensacola in September 2021 and recommended OU 10 be evaluated further in a PFAS SI. Preliminary PFAS SI sampling results, as reported in the draft SI Report indicate exceedances of the May 2022 updated U.S. EPA tap water RSLs in groundwater at OU 10, and the SI Report recommends that OU 10 proceed to an RI for PFAS (Tetra Tech, 2022f).

The Navy is currently conducting a base-wide radiological PA/SI to address base-wide radiological issues that are within the CERCLA framework. The Navy submitted the final PA Report to the regulators on 23 September 2021 and is in the process of preparing the planning documents for SI activities. Twenty-seven areas at NAS Pensacola, including OU 10, were identified as having potential radiological releases and will be investigated as part of the SI. SI field activities are tentatively scheduled for early 2023, after the SI planning documents are approved. The SI portion of the investigation is not intended to be a full-scale study of the nature or extent of radiological contamination. Rather, its purpose is to augment the data/information collected during the PA and to determine whether further response action or an RI is necessary, or if no further investigation is appropriate.

5.2.3 QUESTION C: Has any other information come to light that could call into question the protectiveness of the remedy?

No additional information has come to light that could call into question the protectiveness of the remedy. There are no newly identified human health or ecological risks, and there have been no impacts from human activities, weather-related events, or natural disasters.

As a result of the effects of climate change, storm events have been increasing in magnitude with time. The Navy conducts annual LUC inspections that would identify any storm-related impacts that might impact protectiveness. If any such impacts are identified, the Navy will address the impacts as required to ensure continued protectiveness.

5.5 ISSUES/RECOMMENDATIONS

The following table summarizes the issues that affect current or future protectiveness and provides recommendations for future action.

OU 10	**Issue Category: Changed Site Conditions**
	Issue: Groundwater sampling results exceed PFAS risk-based screening levels (U.S. EPA RSLs).

	Recommendation: Complete an RI to refine the CSM and evaluate the magnitude and extent of PFAS. Implement appropriate follow-on actions in accordance with Navy Policy and CERCLA.

Affect Current Protectiveness	Affect Future Protectiveness	Party Responsible	Oversight Party	Milestone Date
No	Yes	Federal Facility Navy	EPA/State	11/20/2026

Other Findings

Although it does not affect remedy protectiveness because LUCs have been implemented via the MOA, it is recommended that LUC documentation be updated. As stated above, preparation of a LUC RD for OU 10 to replace the LUC MOA is in the preliminary planning stages. Also, based on detections of 1,4-dioxane in OU 10 groundwater at concentrations exceeding the GCTL, it is recommended that analysis of OU 10 samples for this emerging contaminant continue and that it be added to the list of monitoring parameters during the next RCRA permit modification. Because LUCs preventing groundwater use have been implemented, this issue does not affect the protectiveness of the OU 10 remedy.

Although there are current exceedances of U.S. EPA Vapor Intrusion Screening Levels (VISLs) at OU 10 wells, no buildings are currently located at the OU and so potential vapor intrusion is not an issue. However, vapor intrusion could be a potential future issue if buildings were to be constructed at OU 10 in the future. Therefore, the planned OU 10 LUC RD should include a requirement that any future building construction evaluate the potential for vapor intrusion at the time of construction and, if necessary, implement vapor intrusion mitigation measures as part of construction.

5.6 PROTECTIVENESS STATEMENT

Protectiveness Statement	
Operable Unit: 10	*Protectiveness Determination:* Short-term Protective
***Protectiveness Statement**: Remedial actions implemented at OU 10 are protective of human health and the environment in the short-term. Soil excavation addressed contaminants in soil at concentrations exceeding residential criteria, and groundwater treatment was completed as required by the ROD. LUCs prevent exposure to remaining contaminants in site groundwater, and monitoring results indicate that the plumes are stable and that contaminated groundwater is not migrating off site. The OU 10 remedial actions that have been completed (excavation of contaminated soil, active groundwater treatment, and LUC implementation) and that are ongoing (groundwater monitoring) are operating as designed and meet the RAOs. Ongoing LUC inspections and groundwater monitoring confirm the effectiveness of the remedy. Based on the completed and ongoing activities, the intent and goals of the OU 10 ROD have been or will be met. However, because OU 10 groundwater PFAS sample results exceed CERCLA risk-based screening levels, an RI is recommended to refine the CSM and nature and extent. Thereafter, appropriate follow-on actions should be implemented in accordance with Navy policy and CERCLA guidance.*	

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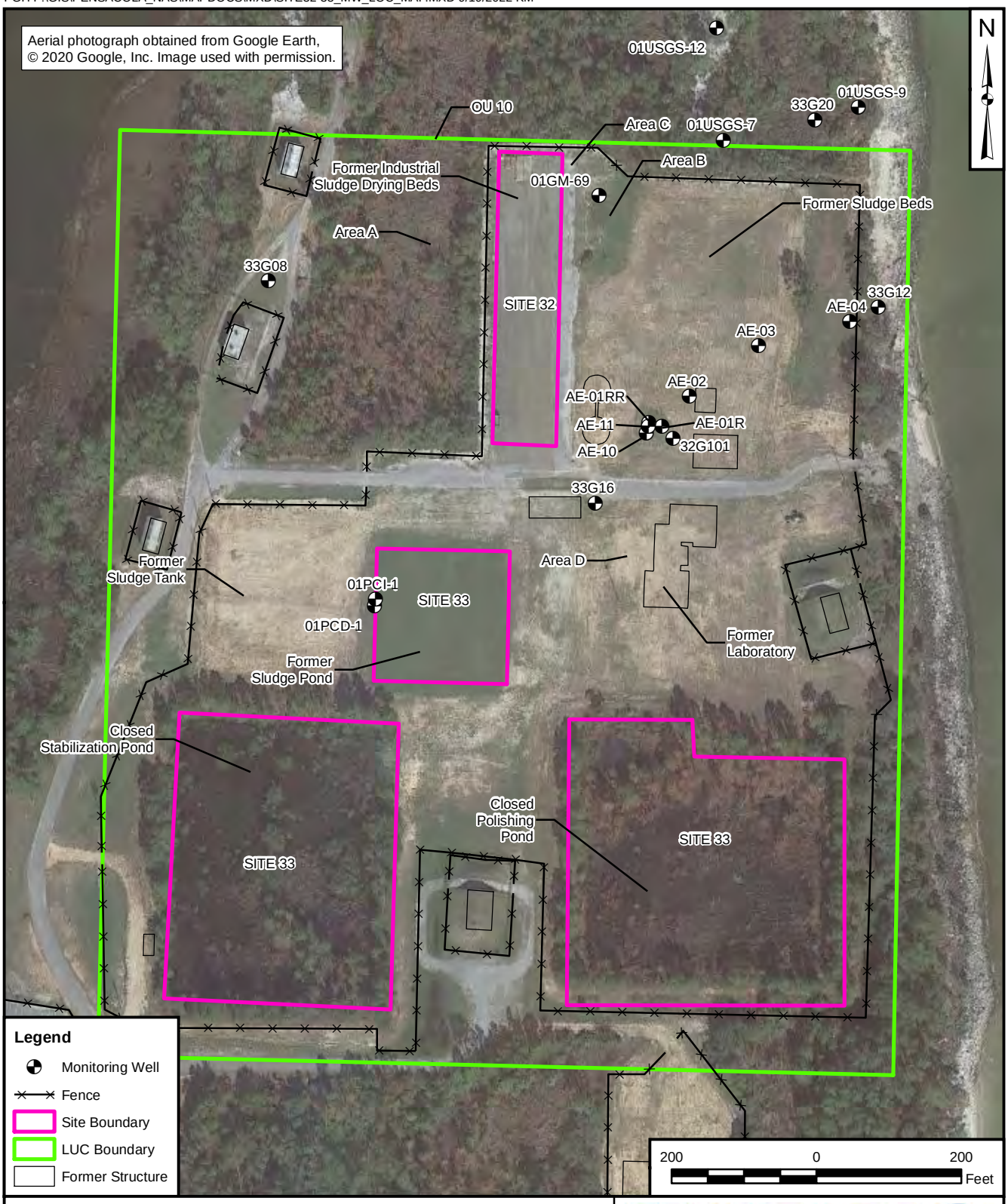

OU 10 SITES 32 AND 33 LAYOUT
NAVAL AIR STATION PENSACOLA
PENSACOLA, FLORIDA

NAVFAC
Naval Facilities Engineering Systems Command

DRAWN BY	DATE	CTO
K. MOORE	09/19/22	N6945021F0538
CHECKED BY	DATE	FIGURE NUMBER
R. MILLER	09/19/22	5-1

6.0 OPERABLE UNIT 11 – SITE 38

OU 11, Site 38 is located north of Pensacola Bay, in the southeastern portion of NAS Pensacola. OU 11 includes Buildings 71 and 604 and the associated IWTP Sewer Line (see Figure 6-1). Soil and groundwater contamination at OU 11, Buildings 71 and 604 was associated with the sewer line areas. Wastes from operations at OU 11 were discharged to the IWTP after its construction in 1973; at that time, wastes entered the IWTP sewer line without any pretreatment or segregation. Prior to 1973, wastes from various Building 71 and 604 operations, including paint stripping, were discharged to Pensacola Bay. The interconnected gravity lines that served Buildings 71 and 604 flowed to the lift station in Building 3435, north of Building 71.

Building 71 was used for aircraft paint stripping and painting operations from 1935 to the late 1970s and hazardous waste storage from 1980 to 1989; the building was demolished in 1993. The Building 71 area includes a gazebo and landscaped area used for ceremonial awards and presentations; surface soil is covered with concrete and grass/landscaped vegetation. Building 604 housed Naval Aviation Depot metal plating operations from 1960 to 1996. Hazardous materials were also stored in this building from the early 1970s to 1996. The Building 604 area is an open, undeveloped, and partially grassy field, with a paved parking lot in the southwestern corner. Building 604 was demolished, but the foundation remains, as discussed in Section 6.1.2.

6.1 RESPONSE ACTION SUMMARY

Sources of contamination at OU 11 are related to previous site activities, including metals, chlorinated solvents, and petroleum-related constituents potentially related to past paint stripping, metal refinishing, parts cleaning, and plating operations; semivolatiles associated with releases from the IWTP line; and pesticides likely the result of residuals from routine spraying.

6.1.1 Basis for Taking Action

An HHRA was performed as part of the OU 11, Site 38 RI (EnSafe, 1998b). Excess risks due to soil contamination (combined ingestion and dermal contact pathways) were 5E-05 for hypothetical future residents and 9E-06 for site workers at Building 604. Soil pathway excess risks (combined ingestion and dermal contact pathways) were 1E-05 for hypothetical future residents and 2E-06 for site workers at Building 71. Non-cancer risk was less than 1 for both scenarios at both buildings. Trespasser risk estimates did not exceed the departure thresholds for risk (1E-06) or HI of 1. The primary contributors to soil risk at both OU 11 locations are arsenic and benzo(a)pyrene equivalents.

Receptors at OU 11 include Pensacola Bay and the main producing zone of the Sand-and-Gravel Aquifer; exposure to groundwater as a drinking water source would be unlikely. Assuming groundwater exposure pathways would be complete, risk estimates for both areas exceeded U.S. EPA's upper bound risk threshold (1E-04) at both buildings and for both residential and site worker scenarios.

Primary ecological risk includes marine/estuarine receptors in Pensacola Bay due to groundwater-to-surface water migration from OU 11. Assuming groundwater exposure pathways would be complete, risk estimates for both areas would exceed U.S. EPA and FDEP risk and hazard thresholds.

6.1.2 Response Actions

The Final OU 11 ROD (NAVFAC, 2006b) was signed by the Navy in September 2006 and by U.S. EPA in October 2006. The following RAOs were established for soil and groundwater at OU 11, Site 38:

- Prevent unacceptable risk from exposure to surface soil.
- Prevent unacceptable risk from ingestion of groundwater with concentrations greater than the FDEP GCTL (Chapter 62-777, Florida Administrative Code [F.A.C.]) and federal MCL.
- Reduce detected concentrations in groundwater to less than the FDEP GCTL (Chapter 62-777, F.A.C.) and federal MCL.
- Reduce detected concentrations in groundwater next to the surface water body to less than surface water Cleanup Target Levels (CTLs) (Chapter 62-777, F.A.C.) and federal water criteria.

Table 6-1 lists COCs and remedial goals for soil, and Table 6-2 lists COCs and remedial goals for groundwater.

Table 6-1: Operable Unit 11, Site 38 – Soil COCs and Remedial Goals for Soil

Chemical of Concern	Remedial Goal[(1)]	Units
Building 604		
Antimony	370	mg/kg
Arsenic	12	mg/kg
Cadmium	1,700	mg/kg
Chromium	470	mg/kg
Copper	89,000	mg/kg
Lead	1,400	mg/kg
beta-BHC	2,400	µg/kg
delta-BHC	490,000	µg/kg
Dieldrin	300	µg/kg
Benzo(a)anthracene	#	µg/kg
Benzo(a)pyrene	700	µg/kg
Benzo(b)fluoranthene	#	µg/kg
Dibenz(a,h)anthracene	#	µg/kg
Methylene Chloride	26,000	µg/kg
PCE	18,000	µg/kg
Building 71		
Arsenic	12	mg/kg
Chromium[(1)]	470	mg/kg
Copper	89,000	mg/kg
Lead[(1)]	1,400	mg/kg
Aroclor-1254	2,600	µg/kg
Benzo(a)pyrene	700	µg/kg
Phenol	220,000,000	µg/kg
1,2-Dichloroethane	700	µg/kg

Chemical of Concern	Remedial Goal[(1)]	Units
2-Methylphenol	31,000,000	µg/kg
4-Methylphenol	3,400,000	µg/kg
PCE	18,000	µg/kg
TCE	9,300	µg/kg

Remedial goals are based on Industrial SCTLs.

1 Copper and lead are not considered COCs under an industrial scenario but are retained as COCs due to unacceptable risk under an unrestricted use scenario.

Concentrations were converted to benzo(a)pyrene equivalents before comparison to the benzo(a)pyrene SCTL.

mg/kg Milligrams per kilogram.

µg/kg Micrograms per kilogram.

Table 6-2: OU 11, Site 38 – Groundwater COCs and Remedial Goals

Contaminant of Concern	Building 604	Building 71	Remedial Goals[(1)] (µg/L)	
			FDEP GCTL (except as noted)	FDEP Marine SWCTL
Acenaphthene	X	-	20	3
Anthracene	X	-	2,100	0.3
Dibenzofuran	X	-	28	67
Fluoranthene	X	-	280	0.3
Fluorene	X	-	280	14
Naphthalene	X	-	14	26
Phenanthrene	X	-	210	0.3
Pyrene	X	-	210	0.3
1,2-Dibromo-3-chloropropane	X	-	0.2	NA
Ethylbenzene	X	-	30	610
PCE	X	X	3	8.85
TCE	X	X	3	80.7
Vinyl chloride	X	X	1	2.4
Barium	X	X	2,000	NA
Cadmium	X	X	5	9.3
Copper	X	X	1,000	2.9
Iron	X	-	1,707.83[(2)]	300
Lead	X	-	15	8.5
Manganese	X	-	50	NA
Mercury	X	-	2	0.025
Zinc	X	X	5,000	86

1 Per the ROD, COC concentrations in wells closest to Pensacola Bay must also meet FDEP marine SWCTLs.

2 Reference Concentration (Background).

NA – Not available.

The selected remedy consists of four major components: removal of selected soil areas, natural attenuation of contaminated groundwater, groundwater monitoring, and LUCs. Removal of selected soil areas included excavation and off-site disposal of exposed surface soil with COC

concentrations exceeding three times Industrial SCTLs or exceeding Leachability SCTLs and covering of the excavated areas with 2 feet of clean fill. Existing asphalt and concrete covering soil with COC concentrations exceeding three-times Industrial SCTLs or exceeding Leachability SCTLs were maintained as a cap to limit the risk of direct exposure and leaching. Natural attenuation relies on naturally occurring processes within the surficial aquifer to reduce contaminant concentrations in groundwater. Dispersion and dilution through aquifer movement, adsorption on soil particles, and biodegradation were expected to be the main attenuation processes at OU 11. Groundwater monitoring included periodic collection of groundwater data to evaluate whether contaminant concentrations are being adequately reduced via natural attenuation and to verify that groundwater COCs are not migrating off site at concentrations of concern. LUCs included prohibiting residential development, preventing use of the surficial aquifer beneath the site, and requiring maintenance of existing covers to prevent exposure to underlying residual contamination.

6.1.3 Status of Implementation

Removal of Selected Soil Areas

As a result of Hurricane Ivan in 2004, cleanup efforts at NAS Pensacola deviated from the selected soil remedy presented in the ROD. Demolition and removal of Building 604, with the exception of the building slab, and asphalt and soil removal in the Building 71 area were completed as part of post-storm cleanup efforts and not as part of an environmental restoration effort, as originally intended.

At Building 604, surface soil in exposed and paved areas was excavated to approximately 2 feet, and subsurface soil with COC concentrations exceeding FDEP Industrial and Leachability SCTLs was left in place. Following building demolition and excavation activities, 2 feet of soil cover was placed into the excavated areas and over the Building 604 foundation, which was not removed, the area was then regraded and seeded as needed. However, surface soil in three limited areas at Building 604 was not removed as planned due to high concentrations of utilities.

At Building 71, pavement and foundation caps were removed, and surface and subsurface soil was excavated from 2 to 4 feet bgs (depending on location). Subsurface soil below 4 feet bgs has COC concentrations greater than FDEP Leachability SCTLs. Following building removal and soil excavation activities at the Building 71 area, 2 feet of soil cover was placed into the excavation area (including the former building foundation area), and the area was then regraded, sodded, and landscaped as a pavilion area.

Because hurricane cleanup efforts did not follow the ROD, subsurface soil (greater than 2 feet bgs) with COC concentrations exceeding industrial SCTLs and/or leachability criteria remains on site. In addition, subsurface soil with leachability exceedances that had previously been capped are no longer capped because of the cleanup effort that removed asphalt parking lots and building foundations. Because the capping material was removed, the subsurface soil is now exposed to storm water infiltration and potential leaching.

The NAS Pensacola Partnering Team agreed to address the potential leaching of subsurface soil and now-exposed surface soil at Building 604 according to provisions in Chapter 62-780.680, F.A.C., which was in effect at the time the ROD was finalized. According to this rule, groundwater monitoring data can be used to demonstrate that the OU 11, Site 38 subsurface soil

COCs will not leach into the groundwater at concentrations that exceed the appropriate groundwater or surface water CTLs. The decision as documented in the Technical Memorandum to the Administrative File – Modification of the Operable Unit 11 (Site 38) Record of Decision, Approach to Address Leachability to Groundwater Potential Concerns (Navy, 2016). The 2018 Final OU 11 Soil RACR documents the results of this evaluation, which determined that no additional remedial actions are required due to leachability concerns for the Building 604 or Building 71 areas (Resolution Consultants, 2018).

Groundwater Monitoring

Groundwater monitoring was initiated at OU 11 in accordance with a Groundwater Monitoring Plan that specified semiannual sampling for 3 years and annual sampling thereafter (Tetra Tech, 2013). Subsequently, U.S. EPA requested that OU 11 groundwater monitoring be combined with monitoring at OUs 20 and 21 because of their proximity, and results for the three Ous are reported together. The OU 11 groundwater monitoring program is conducted to evaluate the progress of MNA and changes in COC concentrations and to verify that migration from the site is not occurring at unacceptable levels. Groundwater monitoring is currently conducted in accordance with a SAP Amendment prepared in 2019 that updated previous SAPs completed in 2014 (Tetra Tech, 2014) and 2015 (Resolution Consultants, 2015) and added Ous 20 and 21 to the plan (Tetra Tech, 2019a). The current monitoring program for OU 11 includes semiannual sampling of five wells in the Building 604 area and eight wells in the Building 71 area for their respective groundwater COCs. However, Building 604 area wells 71MW07 and 38GS13 were destroyed during Hurricane Sally in September 2020. These two wells were designated as source/sentinel and sentinel wells, respectively, and both have had historical exceedances of site COCs. The Navy is currently waiting for seawall repairs to be completed so that wells 71MW07 and 38GS13 can be reinstalled. Natural attenuation parameter data are also collected at four Building 604 wells and three Building 71wells. The groundwater RACR was finalized in 2016 to document that the groundwater portion of the OU 11 remedy was implemented in accordance with the ROD (Resolution Consultants, 2016a).

Land Use Controls

LUCs were implemented in accordance with the 2012 LUC RD (Tetra Tech, 2012) to prohibit residential land use, to prevent use of the surficial aquifer beneath the site, and to maintain the integrity of existing or future monitoring and remedy components, including ensuring that existing covers remain in place unless additional action is taken to protect human health.

Annual physical inspections are conducted to confirm continued implementation of LUCs and compliance with LUC performance objectives described in the LUC RD. Table 6-3 lists the OU 11 LUC performance objectives.

Table 6-3: Summary of Implemented LUCs, OU 11, Site 38

Media, engineered controls, and areas that do not support UU/UE based on current conditions	LUCs Needed	LUCs Called for in the Decision Documents	Impacted Parcel(s)	LUC Objective	Title of LUC Instrument Implemented and Date
Soil	Yes	Yes	Site 38	Prohibit future use or reuse for residential or residential-like purposes including, but not limited to, any form of	*Land Use Control Remedial Design for Soil and Groundwater,*

Media, engineered controls, and areas that do not support UU/UE based on current conditions	LUCs Needed	LUCs Called for in the Decision Documents	Impacted Parcel(s)	LUC Objective	Title of LUC Instrument Implemented and Date
				housing, any kind of school, child-care facilities, playgrounds, and adult convalescent or nursing care facilities.	*Operable Unit 11 – Site 38* December 2012
				Prohibit any excavation or other disturbances of contaminated subsurface soils (exceeding Residential Soil Cleanup Target Levels) unless prior written approval is obtained from U.S. EPA and FDEP.	
				Maintain the integrity of existing or future monitoring and on-site remedy components at the site.	
Groundwater	Yes	Yes	Site 38	Prohibit all uses of groundwater from the surficial aquifer underlying the site including human consumption, dewatering, irrigation, heating/cooling purposes, and industrial processes unless prior written approval is obtained from U.S. EPA and FDEP.	

6.1.4 Systems Operations/Operation and Maintenance

There are no active remediation systems requiring O&M at OU 11. Monitoring well maintenance is implemented as part of routine LTM. Monitoring well integrity is reviewed during ongoing annual groundwater monitoring.

6.2 PROGRESS SINCE THE LAST REVIEW

This section includes the protectiveness determination and statement from the last five-year review as well as the recommendations from the last Five-Year Review Report and the current status of those recommendations.

Based on the results of the fourth five-year review, the remedial actions implemented for OU 11 were determined to be protective. The protectiveness statement from the Fourth Five-Year Review Report was as follows:

> The remedy at Operable Unit 11, Site 38 is protective of human health and the environment. Institutional controls in place have been successful in preventing exposure to contaminants per annual Land Use Control inspections. Groundwater monitoring shows the contaminant plume remains stable and contained to the shallow aquifer onsite. Plume stability suggests that MNA and infiltration limited by surface caps are sufficiently controlling the mobility of contaminants of concern

from soil to groundwater. Ongoing monitoring will continue to determine whether leaching from residual soil is occurring.

No issues affecting current or future protectiveness were identified in the Fourth Five-Year Review Report for OU 11.

6.3 FIVE-YEAR REVIEW PROCESS

6.3.1 Community Notification, Involvement, and Site Interviews

A public notice announcing the initiation of this five-year review was published in the *Pensacola News Journal* and on the NAS Pensacola Facebook page on 19 June 2022 (see Appendix D). No public comments were received in response to the public notice. A second public notice will be published announcing the completion of the Fifth Five-Year Review Report and the availability in the Administrative Record of the report and fact sheet summarizing the results of the review. The fact sheet will also be distributed to the RAB and any other interested persons or organizations. The Administrative record can be accessed online at:

https://www.navfac.navy.mil/Business-Lines/Environmental/Products-and-Services/Environmental-Restoration/Southeast/Pensacola-NAS/Administrative-Record/

Interview questionnaires were sent to two members of the NAS Pensacola Restoration Advisory Board, and the completed questionnaire received in response is included in Appendix C.

6.3.2 Data Review

Figure 6-1 shows the locations of OU 11 monitoring wells in the LTM program. Analytical results for groundwater monitoring activities were provided in their respective annual reports. Monitoring is conduced to evaluate the progress of MNA and changes in COC concentrations and to verify that migration from the site is not occurring at unacceptable levels. During this five-year review period, LTM at OU 11 was conducted in February and July 2019, August 2020, and February and August 2021. The February 2020 LTM event was initially delayed pending FTMR approval and was then canceled due to COVID-19 restrictions at that time.

Table 6-4 summarizes exceedances of remedial goals during the current five-year review period, and groundwater monitoring results for the period are summarized below. Detailed results and evaluations are presented in the annual monitoring reports.

Table 6-4: Summary of OU 11 COC Concentrations Exceeding Remedial Goals

Well	Detections of COCs > Remedial Goals, 2017 to 2021	Analytes[(1)]
Site 38, Building 604		
Upgradient Well		
38GS28	Iron (August 2021)	Select VOCs, select PAHs, and select metals
Source Area Wells		
38GS18	Lead (August 2020 and 2021)	Select VOCs, select PAHs, and select metals
38GS19	PCE (July 2019, August 2020 and August	Select VOCs, select PAHs, and

Well	Detections of COCs > Remedial Goals, 2017 to 2021	Analytes[1]
	2021)	select metals
	TCE (February and July 2019, August 2020, February 2021, August 2021)	
	Vinyl chloride (February and July 2019, August 2020, February 2021, August 2021)	
	Cadmium (August 2021)	
	Lead (August 2021)	
38GI108[2]	None	Select VOCs, select PAHs, and select metals
38GI03[2]	None	Select PAHs
38GS03[2]	None	Select PAHs
Source/Sentinel Well		
38GS13[2]	None	Select PAHs
Downgradient/Sentinel Wells		
38GS32[1]	Vinyl chloride (February and July 2019 [GCTL and SWCTL], August 2020 [GCTL and SWCTL], February 2021, August 2021 [GCTL and SWCTL],)	Select VOCs, select PAHs, and select metals
	Copper (February and July 2019-SWCTL)	
	Lead (February 2019-SWCTL)	
38GS23[2]	None	Select PAHs
Sentinel Wells		
38GI02R	None	Select PAHs
71MW07[2][3]	Fluoranthene (July 2019[SWCTL])	Select PAHs
	Pyrene (July 2019 [SWCTL])	
Site 38, Building 71		
Upgradient Well		
38GS01	Manganese (July 2019, August 2020)	Select VOCs and select metals
Source Area Wells		
38GS03[2]	TCE (February 2019, August 2020, February and August 2021)	Select VOCs and select metals
	Copper (February and July 2019, August 2021 [SWCTL])	
	Zinc (February and July 2019, February and August 2021 [SWCTL])	
38GS12	TCE (July 2019, August 2020, February and August 2021)	Select VOCs and select metals
38GI03[1]	Copper (August 2020 [SWCTL])	Select VOCs and select metals
Source/Sentinel Well		
38GS13[2][3]	TCE (February and July 2019, August 2020-GW)	Select VOCs and select metals
	Copper (February and July 2019, August 2020-SW)	
Downgradient/Sentinel Well		
38GS23[2]	Copper (August 2020, February and August 2021[SWCTL])	Select VOCs and select metals
Sentinel Wells		

Well	Detections of COCs > Remedial Goals, 2017 to 2021	Analytes[1]
38GI02R	None	Select VOCs and select metals
71MW07[2][3]	Copper (July 2019 [SWCTL])	Select VOCs and select metals
	Zinc (July 2019 [SWCTL])	

Exceedances are of the groundwater remedial goal only unless otherwise stated.

1 Building 604 select VOCs include tetrachloroethane, trichloroethane, vinyl chloride, 1,2-dibromo-2-chloropropane, and ethylbenzene. Building 71 select VOCs include tetrachloroethane, trichloroethane, and vinyl chloride. Select PAHs include acenaphthene, anthracene, dibenzofuran, fluoranthene, fluorene, naphthalene, phenanthrene, and pyrene. Select metals for Building 604 include barium, cadmium, copper, iron, lead, manganese, mercury, and zinc. Select metals for Building 71 include barium, cadmium, copper, and zinc.

2 In accordance with the ROD, COC concentrations from these wells results are also compared to FDEP marine SWCTLs.

3 Well was destroyed in September 2020.

Building 604

During this five-year review period, most exceedances of remedial goals in Building 604 wells were detected in source area wells, although there were also exceedances of remedial goals and SWCTLs in downgradient/sentinel well 38GS32, located in an area of altered flow conditions most likely caused by sheet piling installed along the seawall, and at sentinel well 71MW07, which was destroyed by Hurricane Sally after the August 2020 sampling event. No other wells for which results are compared to SWCTLs had exceedances of these criteria.

PCE and TCE concentrations exceeded remedial goals at source area well 38GS19 only, and both COCs have statistically significant decreasing concentrations over time. The PCE and TCE degradation products cis-1,2-DCE (not a COC) and vinyl chloride were also detected at concentrations exceeding remedial goals at 38GS19. Overall, PCE and TCE concentrations have decreased since the RI, and the presence of daughter products cis-1,2-DCE and vinyl chloride indicates that reductive dechlorination is occurring. Ethylbenzene concentrations in samples from Building 604 wells have been less than the remedial goal. Only one exceedance of 1,2-dibromo-3-chloropropane has been detected in these wells, at well 38GI08 in December 2000 (concentrations in eight subsequent samples were less than the remedial goal). Lead and cadmium concentrations also exceeded remedial goals in source area wells during the review period (lead at 38GS18 and 38GS19 and cadmium at 38GS19). Trend data indicate that lead concentrations at 38GS18 are stable and at 38GS19 are increasing over time. Cadmium concentrations at 38GS19 are stable. The iron concentration at upgradient well 38GS28 exceeded the remedial goal in August 2021, which may suggest that background iron concentrations exceed the remedial goal.

At downgradient/sentinel well 38GS32, vinyl chloride concentrations exceeded the groundwater remedial goal and marine SWCTL during all five sampling events. Vinyl chloride concentrations at this well are likely affected by altered groundwater flow associated with the seawall. Mounding in this area is most likely caused by sheet piling installed along the seawall that is preventing groundwater discharge to the basin, resulting in a westward diversion of flow in both the shallow and intermediate zones. Groundwater mounding in this area may influence groundwater geochemistry and account for elevated COC concentrations. Copper and lead concentrations at 38GS32 also exceeded marine SWCTLs during 2019 events. Although 38GS32 is designated as a compliance point, due to the unique nature of groundwater flow

patterns in the area surrounding this well, continued monitoring is appropriate to better understand the effects of mounding groundwater on COC concentrations.

PAHs were either non-detect or were detected at concentrations less than remedial goals at all Building 604 wells during the 2020/2021 reporting period. In 2019, fluoranthene and pyrene concentrations at 71MW07 exceeding marine SWCTLs. This well was destroyed by Hurricane Sally in September 2020, and the 2020/2021 LTM report recommends installation of a replacement well after seawall repairs are completed such that the 71MW07 PAH marine SWCTL exceedances can continue to be monitored for natural attenuation.

Building 71

During this five-year review period, TCE was the only VOC detected in Building 71 area wells at concentrations exceeding the remedial goal. TCE concentrations were greater than the remedial goal at 38GS03 and 38GS12 during four of the five events and at 38GS13 during three events. The VOC plume appears to be stable, and concentrations remain significantly less than SWCTLs.

Copper concentrations exceeded the marine SWCTL at wells 38GS03, 38GI03, 38GS13, and 38GS23 during this review period. Concentrations at 38GS03, 38GI03, and 38GS13 show a decreasing trend over time. Zinc exceedances of the SWCTL were detected at source well 38GS03, and concentrations indicate a stable trend over time. Manganese exceeded the remedial goal in well 38GS01 during the August 2020 event only.

Building 71 area monitoring wells 71MW07 and 38GS13 were destroyed by Hurricane Sally in September 2020, and the 2020/2021 LTM report recommends installation of replacement wells after seawall repairs have been completed.

6.3.3 Site Inspection

The inspection of the site was conducted on 14 April 2022 by Tetra Tech. The purpose of the inspection was to assess the protectiveness of the OU 11 remedy. On 16 September 2020, Hurricane Sally made landfall west of Pensacola, and the storm surge resulted in erosion of the shoreline in some areas. NAS Pensacola experienced a significant amount of erosional damage along its southern shore adjacent to Pensacola Bay, including the shoreline of OU 11, and monitoring wells 38GS13 and 71MW07 (a designated replacement well for 38GS02), were destroyed during the storm. These two wells were designated as source/sentinel and sentinel wells, respectively, and both have had historical exceedances of site COCs. Therefore, these monitoring wells need to be replaced such that the historical exceedances can continue to be monitored for natural attenuation. Shoreline erosion requires assessment and possible corrective action to ensure that damage does not impact the long-term protectiveness of the remedy (see photographs in Appendix E). No other issues impacting the current or future protectiveness of the OU 11 remedy were identified during the inspection. Five-year review inspection checklists are included in Appendix E.

6.4 TECHNICAL ASSESSMENT

6.4.1 QUESTION A: Is the remedy functioning as intended by the decision documents?

The results of the five-year review indicate that the OU 11 remedy is functioning as intended by the ROD. Although implementation of the soil excavation portion of the selected remedy deviated from the ROD (because activities were conducted as part of post-hurricane cleanup efforts and not as part of an environmental restoration effort), subsequent evaluation, as documented in the 2018 soil RACR, determined that no additional soil remedial actions are required to ensure remedy protectiveness. The results of groundwater monitoring will continue to be used to confirm that the remedy is functioning as intended, and soil and groundwater LUCs implemented in accordance with the OU 11 LUC RD prevent exposure to contaminants at concentrations associated with unacceptable human health risk.

The remedial actions are being implemented as designed and include measures that prevent exposure. The OU 11 remedial actions that have been completed (excavation of contaminated soil and implementation of LUCs) and that are ongoing (groundwater monitoring) are operating as designed and meet the RAOs. However, as mentioned in Section 6.3.3, wells 38GS13 and 71MW07 need to be replaced such that historical exceedances can continue to be monitored for natural attenuation. Based on the completed and ongoing activities, the intent and goals of the OU 11 ROD have been or will be met, and there are no deficiencies or early indicators of potential remedy failure.

6.4.2 QUESTION B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?

There have been no changes in, exposure pathways, or land use that would affect the protectiveness of the OU 11 remedy. The exposure assumptions, cleanup levels, toxicity data, and RAOs for the site used at the time of the remedy selection are still valid. As discussed in Section 6.3.3, Hurricane Sally resulted in a significant amount of erosional damage along the southern shore of the facility adjacent to Pensacola Bay, including the shoreline of OU 11. Shoreline erosion requires assessment and possible corrective action to ensure that damage does not impact the long-term protectiveness of the remedy.

A PFAS PA was completed at NAS Pensacola in September 2021 and recommended that Building 604, within OU 11, Site 38, be evaluated further in a PFAS SI. PFAS SI sampling results, as reported in the draft SI Report, indicate exceedances of the May 2022 updated U.S. EPA tap water RSLs in groundwater in the Building 604 area. The SI Report recommends that Building 604 proceed to an RI for further evaluation of PFAS impacts (Tetra Tech, 2022f).

The Navy is currently conducting a base-wide radiological PA/SI to address base-wide radiological issues that are within the CERCLA framework. The Navy submitted the final PA Report to the regulators on 23 September 2021 and is in the process of preparing the planning documents for SI activities. Twenty-seven areas at NAS Pensacola, including OU 11, were identified as having potential radiological releases and will be investigated as part of the SI. SI field activities are tentatively scheduled for early 2023, after the SI planning documents are approved. The SI portion of the investigation is not intended to be a full-scale study of the nature or extent of radiological contamination. Rather, its purpose is to augment the

data/information collected during the PA and to determine whether further response action or an RI is necessary, or if no further investigation is appropriate.

Vapor Intrusion

Although it was not identified as an issue affecting remedy protectiveness, re-evaluation of the potential for vapor intrusion at well 38GS32 was recommended in the previous five-year review because vinyl chloride concentrations at this well, located 50 feet from Building 38, during the previous review period (5.85 to 12.9 µg/L) exceeded the industrial VISL of 2.5 µg/L. Vinyl chloride concentrations during this review period ranged from 1.8 to 15 µg/L, four of the five concentrations were less than 10 µg/L, and the current trend of vinyl chloride concentration at this well is stable. The August 2021 concentration, 1.2 µg/L, was less than the industrial VISL.

Building 38, the Boat Shop, was constructed in 1882 and is a two-story slab-on-grade structure with windows, bay doors, and former bay doors converted to man-doors or windows on all four sides. The building is currently used by PortOps for maintenance. Air conditioners are present on the western side of the building, but bay doors are often open during the course of routine operations, which provides additional natural ventilation.

During the previous five-year review, weight-of-evidence factors were reviewed to further evaluate the potential for vapor intrusion at this location because concentrations only slightly exceeded the groundwater VISL, and because of the conservatism inherent in both the attenuation factor between groundwater and indoor air and toxicology assumptions in the VISL calculator (see Section 6.5.2 of the 2018 Five-Year Review Report). The evaluation of these factors did not change significantly using data from this review period, and the conclusion is the same, which is that the potential for unacceptable industrial vapor intrusion risks in Building 38 is low and that no further evaluation is deemed necessary at this time. It is recommended that this evaluation be conducted again during the next five-year review.

6.2.3 QUESTION C: Has any other information come to light that could call into question the protectiveness of the remedy?

No additional information has come to light that could call into question the protectiveness of the remedy. There are no newly identified human health or ecological risks, and other than shoreline erosion and wells destroyed during Hurricane Sally (38GS13 and 71MW07), there have been no impacts from weather-related events or natural disasters.

As a result of the effects of climate change, storm events have been increasing in magnitude with time. The Navy conducts annual LUC inspections that would identify any storm-related impacts that might impact protectiveness. If any such impacts are identified, the Navy will address the impacts as required to ensure continued protectiveness.

6.5 ISSUES/RECOMMENDATIONS

The following table summarizes the issues that affect current or future protectiveness and provides recommendations for future action.

OU 11	**Issue Category: Changed Site Conditions**			
	Issue: Erosional damage to the southern shoreline needs to be assessed to ensure that the remedy remains protective.			
	Recommendation: Assess areas of shoreline damage relative to areas with residual contamination and implement corrective actions as needed, with any necessary corrective actions designed considering the likelihood of future hurricane damage.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	Federal Facility Navy	EPA/State	8/14/2024
OU 11	**Issue Category: Changed Site Conditions**			
	Issue: Groundwater sampling results exceed PFAS risk-based screening levels (U.S. EPA RSLs).			
	Recommendation: Collect additional SI data and complete an RI to refine the CSM and evaluate the magnitude and extent of PFAS. Implement appropriate follow-on actions in accordance with Navy Policy and CERCLA.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	Federal Facility Navy	EPA/State	11/20/2026

Other Findings

As stated above, wells 71MW07 and 38GS13 were destroyed during Hurricane Sally in September 2020. These two wells were designated as source/sentinel and sentinel wells, respectively, and both have had historical exceedances of site COCs. These wells will be reinstalled after seawall repairs are completed. This issue does not affect the protectiveness of the OU 11 remedy.

6.6 PROTECTIVENESS STATEMENT

Protectiveness Statement	
Operable Unit: 11	*Protectiveness Determination:* Short-term Protective
***Protectiveness Statement**: The selected remedy for OU 11 is protective of human health and the environment in the short term. LUCs prevent residential exposure to residual soil contamination, require maintenance of existing covers preventing exposure to and leaching of underlying contaminated soil, and prevent exposure to groundwater contamination that could result in unacceptable risks. Soil excavation and off-site disposal have been successful in preventing exposure to contaminants in soil. Post-ROD evaluations confirmed that residual leachability concerns were adequately addressed by excavation activities. LTM results show that the contaminant plume remains stable and contained to the shallow aquifer on site. Plume stability suggests that MNA and infiltration limited by surface covers are sufficiently controlling the mobility of COCs from soil to groundwater. The OU 11 remedial actions that have been completed (excavation of contaminated soil, LUC*	

implementation, and monitoring) are operating as designed and meet the RAOs. Ongoing LUC inspections and groundwater monitoring are used to confirm the continued effectiveness of the remedy. Based on the completed and ongoing activities, the intent and goals of the OU 11 ROD have been or will be met. However, to ensure long-term protectiveness, potential impacts to the remedy from hurricane-related shoreline erosion need to be assessed and, if necessary, repaired. In addition, because groundwater PFAS sample results in the Building 604 area exceed CERCLA risk-based screening levels, an RI is recommended to refine the CSM and nature and extent. Thereafter, appropriate follow-on actions should be implemented in accordance with Navy policy and CERCLA guidance.

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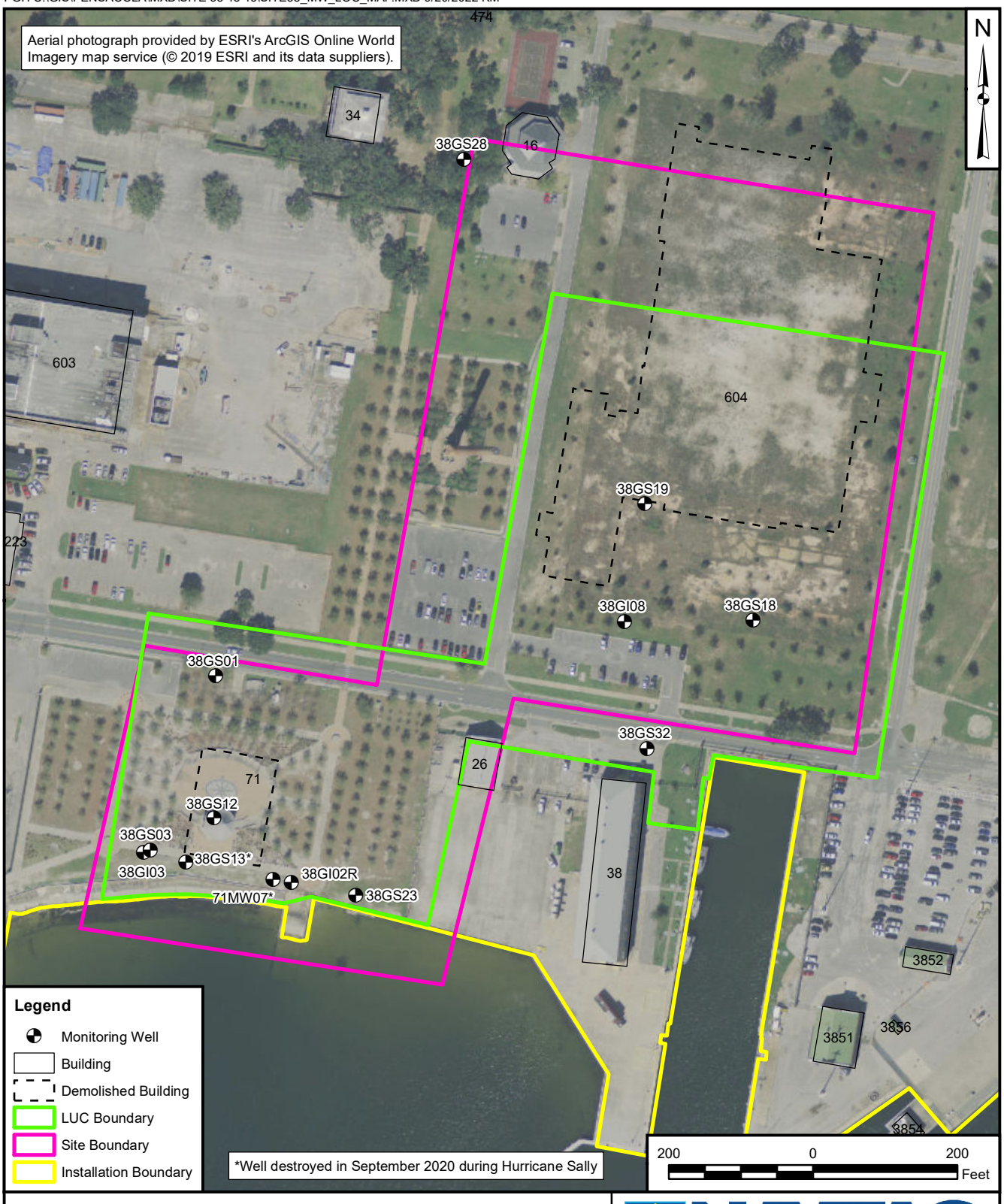

OU 11 SITE 38 LAYOUT
NAVAL AIR STATION PENSACOLA
PENSACOLA, FLORIDA

NAVFAC
Naval Facilities Engineering Systems Command

DRAWN BY	DATE	CTO
K. MOORE	09/06/22	N6945021F0538
CHECKED BY	DATE	FIGURE NUMBER
R. MILLER	09/20/22	6-1

7.0 OPERABLE UNIT 13 – SITES 8 AND 24

OU 13, which includes Sites 8 (Rifle Range Disposal Area) and 24 (DDT Mixing Area), borders the eastern side of John Tower Road and is southeast of the John Tower Road/Taylor Road intersection, in an industrialized portion of NAS Pensacola. (Figure 7-1). Site 8 is an approximately 650-foot by 720-foot area occupied by Building 3561, which is currently used for office, maintenance, and storage activities by the PWD. An asphalt-paved area partially surrounds Building 3561 on the north, east, and west, covering nearly all land surface. Most of Site 8 is secured by a chain-link fence. Site 24 north-adjoins Building 3561 and, from the early 1950s to the early 1960s, was used to mix 4,4'-dichlorodiphenyl-trichloroethane (DDT) with diesel fuel for mosquito control (NAVFAC, 2006a). Up to 20 gallons of diesel fuel/DDT solution was reportedly spilled in the mixing area during transfer from drums to spray tanks. In addition, buried metal, rubber, and plastic aircraft parts were reported during excavation along the eastern boundary of Site 24 (EnSafe, 2000). Most of Site 24 is part of the Barrancas National Cemetery. The central and north portions of Site 24 are primarily unpaved and sparsely covered with native grasses and trees. The area around Building 3678 is fenced and has a gravel/crushed shell surface.

7.1 RESPONSE ACTION SUMMARY

Initial investigations conducted at OU 13 identified combinations of metals, petroleum hydrocarbons, PAHs, PCE, and pesticides in soil and/or groundwater from historical activities at Sites 8 and 24 (NAVFAC, 2006a). Metals contamination in groundwater is attributed to past disposal of metallic-alloy aircraft refuse or other metallic debris at the sites.

7.1.1 Basis for Taking Action

As part of the RI, a baseline risk assessment was conducted to evaluate risks associated with contaminants in soil and groundwater at OU 13 (EnSafe, 1997d). Unacceptable human health risks and leachability risks due to soil at Site 8, as presented in the RI Report, were eliminated as part of the 2004-2005 IRA (discussed in Section 7.1.2); therefore, those risks are not summarized here. The 2006 ROD documented that no further action was required for Site 8 soil after completion of the IRA.

For Site 24 soil, the risk assessment evaluated exposure of site workers, maintenance workers, and hypothetical future child and adult residents to contaminants in soil. Unacceptable carcinogenic risk was estimated for hypothetical future residents due to mainly carcinogenic PAHs (evaluated collectively as benzo(a)pyrene equivalents) in soil. Secondary contributors included arsenic, chlordane, dieldrin, and heptachlor epoxide. Unacceptable risk was also estimated for site workers due to carcinogenic PAHs and arsenic. However, these contaminants were not retained as COCs, as documented in the ROD, because they were determined not to be site related. PAHs were concluded to be attributable to the adjacent road and vehicular traffic, and pesticides and arsenic were attributed to routine pesticide application. Therefore, no COCs were retained for soil at OU 13.

Risks from exposure to groundwater at Sites 8 and 24 were evaluated for the same human receptors as soil, site and maintenance workers and hypothetical future residents. For groundwater at Site 8, unacceptable risks were estimated for hypothetical future residents and site workers, with

cadmium as the main contributor and barium, iron, manganese, and zinc as secondary contributors. For Site 24 groundwater, unacceptable carcinogenic risk was estimated for future residents, with the majority of the risk attributable to arsenic, dieldrin, and vinyl chloride. Non-carcinogenic risks were also unacceptable for future residential exposure to Site 24 groundwater due mainly to arsenic, antimony, iron, and thallium.

The IRA performed at OU 13 removed contaminated surface soil that presented potentially unacceptable ecological risk; therefore, the results of the ecological risk are not discussed here.

7.1.2 Response Actions

In 2004 and 2005, an IRA was conducted to remove soil from Site 8 with contaminant concentrations exceeding Residential and Leachability SCTLs so that LUCs would not be required (NAVFAC, 2006a). Almost 2,000 tons of soil and debris were removed from Site 8 and replaced with clean backfill. Details of the IRA are documented in the Interim RACR (CH2MHILL, 2004). Because soil with Residential and Leachability SCTL exceedances was removed during the IRA, soil LUCs were not required as part of the selected remedy in the ROD.

The Final OU 13 ROD was signed by the Navy in September 2006 and by U.S. EPA in October 2006. The following RAOs were established for groundwater at OU 13:

- Control migration and leaching of contaminants in surface and subsurface soil to groundwater that could result in groundwater contamination in excess of drinking water standards.

- Reduce or eliminate further contamination of site groundwater.

Because shallow groundwater is not used at NAS Pensacola, the exposure pathways evaluated in the risk assessment are incomplete, and there is no exposure to groundwater with contaminant concentrations associated with unacceptable risk, assuming conditions do not change (NAVFAC, 2006). However, because the State of Florida considers all groundwater to be potable, the basis for taking action at OU 13 is the presence of contaminants in groundwater exceeding drinking water standards (NAVFAC, 2006a). As documented in the ROD, COCs for groundwater at OU 13 were determined based on comparison of site concentrations to FDEP drinking water standards (not based on unacceptable risk). Table 8-1 lists the OU 13 groundwater COCs and remedial goals as provided in the ROD.

Table 7-1: Operable Unit 13 Groundwater COCs and Remedial Goals

Chemical of Concern	Remedial Goal (µg/L)	Basis
Antimony	6	FPDWS
Cadmium	5	FPDWS
Dieldrin	0.002	GCTL
Heptachlor epoxide	0.2	FPDWS
Iron	1,707.83	Reference Concentration
Lead	15	FPDWS
Manganese	50	FSDWS

Chemical of Concern	Remedial Goal (µg/L)	Basis
Methylene chloride	5	GCTL
Nickel	100	FPDWS
Thallium	3.8	FPDWS
TCE	3	FPDWS
Vinyl chloride	1	FPDWS

FPDWS FDEP Primary Drinking Water Standard.
FSDWS FDEP Secondary Drinking Water Standard.

The selected remedy consists of LUCs to prevent use of groundwater from the site and groundwater monitoring to evaluate progress toward meeting remedial goals and to confirm that off-site migration is not occurring. No further action is required for soil following completion of the IRA.

7.1.3 Status of Implementation

Groundwater Monitoring

Semiannual sampling of OU 13 wells for the COCs listed in Table 8-1 was conducted from 2007 to 2010 in accordance with the initial Groundwater Monitoring Plan approved in 2008 (Tetra Tech, 2008c). In 2011, the monitoring frequency was reduced from semiannual to annual, and in 2012, based on the results of an optimization evaluation, FDEP and U.S. EPA approved elimination of VOCs (methylene chloride, TCE, and vinyl chloride), pesticides (dieldrin and heptachlor epoxide), and metals (lead, nickel, and thallium) analyses from the program (Solutions-IES 2015b). LTM events have been conducted annually since 2012, with analysis for antimony, cadmium, iron, and manganese, and LTM is currently conducted in accordance with the 2018 SAP (Trinity, 2018). During this review period, annual LTM events included sampling of 14 wells for the remaining four metals COCs. A groundwater RACR was finalized in 2014 to document that the groundwater portion of the OU 13 remedy was implemented in accordance with the ROD (Resolution Consultants, 2014b).

Land Use Controls

LUCs were implemented at OU 13 in accordance with the 2008 LUC RD (NAVFAC, 2008b) to prevent use of the surficial aquifer beneath the site. Annual physical inspections are conducted to confirm continued implementation of LUCs and compliance with LUC performance objectives described in the LUC RD. Table 7-2 lists the OU 13 LUC performance objectives.

Table 7-2: Summary of Implemented LUCs, OU 13, Sites 8 and 24

Media, engineered controls, and areas that do not support UU/UE based on current conditions	LUCs Needed	LUCs Called for in the Decision Documents	Impacted Parcel(s)	LUC Objective	Title of LUC Instrument Implemented and Date
Groundwater	Yes	Yes	OU 13	Prohibit all uses of groundwater from the surficial aquifer underlying the sites (including, but not limited to, human consumption, dewatering, irrigation, heating/cooling purposes, and industrial processes) unless prior	*Remedial Design for Land Use Controls and Groundwater Monitoring at Operable Unit 13,* August 2008

Media, engineered controls, and areas that do not support UU/UE based on current conditions	LUCs Needed	LUCs Called for in the Decision Documents	Impacted Parcel(s)	LUC Objective	Title of LUC Instrument Implemented and Date
				written approval is obtained from the Navy, U.S. EPA, and FDEP.	
				Maintain the integrity of any existing or future monitoring or remediation system(s) unless prior written approval is obtained from the Navy, U.S. EPA, and FDEP.	

7.1.4 Systems Operations/Operation and Maintenance

There are no active remediation systems requiring O&M at OU 13. Monitoring well maintenance is implemented as part of routine LTM. Monitoring well integrity is reviewed during ongoing annual groundwater monitoring.

7.2 PROGRESS SINCE THE LAST REVIEW

This section includes the protectiveness determination and statement from the last five-year review as well as the recommendations from the last Five-Year Review Report and the current status of those recommendations.

Based on the results of the fourth five-year review, the remedial actions implemented for OU 13 were determined to be protective. The protectiveness statement from the Fourth Five-Year Review Report was as follows:

> The remedy at Operable Unit 13, Sites 8 and 24, is protective of human health and the environment. Institutional controls in place have been successful in preventing exposure per annual Land Use Control inspections. Groundwater monitoring shows continued reduction in contaminant concentrations, stable or decreasing trends over the majority of the plume, and containment of contaminants within site boundaries.

No issues affecting current or future protectiveness were identified in the Fourth Five-Year Review Report for OU 13.

7.3 FIVE-YEAR REVIEW PROCESS

7.3.1 Community Notification, Involvement, and Site Interviews

A public notice announcing the initiation of this five-year review was published in the *Pensacola News Journal* and on the NAS Pensacola Facebook page on 19 June 2022 (see Appendix D). No public comments were received in response to the public notice. A second public notice will be published announcing the completion of the Fifth Five-Year Review Report and the availability in the Administrative Record of the report and fact sheet summarizing the results of the review. The fact sheet will also be distributed to the RAB and any other interested persons or organizations. The Administrative record can be accessed online at:

https://www.navfac.navy.mil/Business-Lines/Environmental/Products-and-Services/Environmental-Restoration/Southeast/Pensacola-NAS/Administrative-Record/

Interview questionnaires were sent to two members of the NAS Pensacola Restoration Advisory Board, and the completed questionnaire received in response is included in Appendix C.

7.3.2 Data Review

Figure 7-1 shows the locations of OU 13 monitoring wells in the LTM program. Analytical results for groundwater monitoring activities were provided in their respective annual reports. Monitoring is conducted to evaluate decreases in COC concentrations and to verify that migration from the site is not occurring at unacceptable levels. During this five-year review period, LTM at OU 13 was conducted in December 2017 and November 2018, 2019, 2020, and 2021.

Table 7-3 summarizes exceedances of remedial goals during the current five-year review period, and groundwater monitoring results for the period are summarized below. Detailed results and evaluations are presented in the annual monitoring reports.

Table 7-3. Summary of OU 13 COC Concentrations Exceeding Remedial Goals During this Review Period

Well	Detections of COCs > Remedial Goals, 2017 to 2021	Comments
Background Well (upgradient of Sites 8 and 24)		
08GR06R	Iron (2018, 2021)	
Site 8 Wells		
08GR01R	Antimony (2017, 2019, 2020)	
	Cadmium (2017, 2018, 2019, 2020, 2021)	
	Manganese (2017, 2018, 2019, 2020, 2021)	
08GR02R	Antimony (2021)	
	Cadmium (2017, 2018, 2019, 2020, 2021)	
	Manganese (2019, 2020)	
08GR03R	Antimony (2017, 2019)	
	Cadmium (2017, 2020, 2021)	
08GR05[(1)]	Antimony (2020, 2021)	
	Cadmium (2017, 2020, 2021)	
08GR07[(1)]	None	
24GR15[(1)]	Antimony (2018)	
Upgradient of Site 24		
24GS01/24GS01R	Antimony (2018, 2021)	
Site 24 Wells		
24GS02R/24GS02RR	Iron (2017)	Not sampled in 2018, 2019 or 2020 due to sediment; replaced for 2021
24GS06R	Manganese (2017, 2018, 2020)	
	Iron (2017, 2018, 2020)	
24GS09R	Antimony (2017, 2018, 2019, 2020, 2021)	
24GS10RR[(1)]	None	24GS10R not sampled in 2017 due to sediment; replaced with 24GS10RR for 2018

Well	Detections of COCs > Remedial Goals, 2017 to 2021	Comments
24GS11[(1)]	Manganese (2017)	
	Iron (2017)	
24GS15R[(1)]	None	Not sampled in 2020 due to damage

Per the SAP, samples from 24GR15 are only analyzed for antimony, and samples from 08GR07 are only analyzed for antimony and cadmium. Cadmium analysis was temporarily discontinued at 24GS06R, 24GS10RR, 24GS11, and 24GS15 in 2018 and 2019 only based on a recommendation in the approved 2017 annual report; cadmium was analyzed for at these wells in 2017, 2020, and 2021.

7 Downgradient/perimeter well.

Remedial goal exceedances were detected frequently in Site 8 interior wells 08GR01R, 08GR02R, and 08GR03R and Site 24 interior wells 24GS06R and 24GS09R, but based on LTM results to date, the current downgradient monitoring well network remains suitable for demonstrating that contaminant plumes remain bounded. Remedial goal exceedances in perimeter or downgradient wells during the five-year review period were mainly at 08GR05 (antimony in 2020 and 2021 and cadmium in 2017, 2020, and 2021). Statistical analysis did not indicate a trend at this location. Downgradient well 08GR07 had no remedial goal exceedances during this five-year review period. Other perimeter/downgradient exceedances included antimony at 24GR15 in 2018 (the only exceedance to date at this well) and iron and manganese at 24GS11 in 2017 (subsequent concentrations were less than the remedial goal). Overall, the Sites 8 and 24 antimony and cadmium plumes appear stable. Statistical analysis indicates that the combined Sites 8 and 24 manganese plume appears to be shrinking, and analysis for iron suggests an overall decreasing plume.

7.3.3 Site Inspection

The inspection of the site was conducted on 14 April 2022 by Tetra Tech. The purpose of the inspection was to assess the protectiveness of the OU 13 remedy. No issues impacting the current or future protectiveness of the OU 13 remedy were identified during the inspection. Five-year review inspection checklists are included in Appendix E.

7.4 TECHNICAL ASSESSMENT

7.4.1 QUESTION A: Is the remedy functioning as intended by the decision documents?

The results of the five-year review indicate that the OU 13 remedy is functioning as intended by the ROD. The remedial actions are being implemented as designed and include measures that prevent exposure. The OU 13 remedial actions that have been completed (LUC implementation) and that are ongoing (groundwater monitoring) are operating as designed and meet the RAOs. Ongoing inspections and groundwater monitoring confirm the continued effectiveness of the remedy. Based on the completed and ongoing activities, the intent and goals of the OU 13 ROD have been or will be met, and there are no deficiencies or early indicators of potential remedy failure.

7.4.2 QUESTION B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?

There have been no changes in physical conditions, exposure pathways, or land use that would affect the protectiveness of the OU 13 remedy. The exposure assumptions, cleanup levels,

toxicity data, and RAOs for the site used at the time of the remedy selection are still valid.

A PFAS PA was completed at NAS Pensacola in September 2021 and recommended OU 13 be evaluated further in a PFAS SI. Preliminary PFAS SI sampling results, as reported in the draft SI Report indicate exceedances of the May 2022 updated U.S. EPA tap water RSLs in groundwater at OU 13, and the SI Report recommends that OU 13 proceed to an RI for PFAS (Tetra Tech, 2022f).

The Navy is currently conducting a base-wide radiological PA/SI to address base-wide radiological issues that are within the CERCLA framework. The Navy submitted the final PA Report to the regulators on 23 September 2021 and is in the process of preparing the planning documents for SI activities. Twenty-seven areas at NAS Pensacola, including OU 13, were identified as having potential radiological releases and will be investigated as part of the SI. SI field activities are tentatively scheduled for early 2023, after the SI planning documents are approved. The SI portion of the investigation is not intended to be a full-scale study of the nature or extent of radiological contamination. Rather, its purpose is to augment the data/information collected during the PA and to determine whether further response action or an RI is necessary, or if no further investigation is appropriate.

7.4.3 QUESTION C: Has any other information come to light that could call into question the protectiveness of the remedy?

No additional information has come to light that could call into question the protectiveness of the remedy. There are no newly identified human health or ecological risks, and there have been no impacts from weather-related events or natural disasters.

As a result of the effects of climate change, storm events have been increasing in magnitude with time. The Navy conducts annual LUC inspections that would identify any storm-related impacts that might impact protectiveness. If any such impacts are identified, the Navy will address the impacts as required to ensure continued protectiveness.

7.5 ISSUES/RECOMMENDATIONS

The following table summarizes the issues that affect current or future protectiveness and provides recommendations for future action.

OU 13	**Issue Category: Monitoring**			
	Issue: Groundwater sampling results exceed PFAS risk-based screening levels (U.S. EPA RSLs).			
	Recommendation: Complete an RI to refine the CSM and evaluate the magnitude and extent of PFAS. Implement appropriate follow-on actions in accordance with Navy Policy and CERCLA.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	Federal Facility Navy	EPA/State	11/20/2026

7.6 PROTECTIVENESS STATEMENT

Protectiveness Statement	
Operable Unit: 13	*Protectiveness Determination:* Short-term Protective
***Protectiveness Statement**: The selected remedy at OU 13 is protective of human health and the environment in the short term. LTM results show continued reductions in COC concentrations, stable or decreasing trends over the majority of the plume, and containment of contaminants within site boundaries. LUCs prohibit use of surficial groundwater from the site util remedial goals are achieved. Ongoing LUC inspections and groundwater monitoring confirm the continued effectiveness of the remedy. The OU 13 remedial actions that have been completed (LUC implementation) and that are ongoing (monitoring) are operating as designed and meet the RAOs. Based on the completed and ongoing activities, the intent and goals of the OU 13 ROD have been or will be met. However, because OU 13 groundwater PFAS sample results exceed CERCLA risk-based screening levels, a PFAS RI will be completed to refine the CSM and to evaluate the magnitude and extent of PFAS. Thereafter, appropriate follow-on actions should be implemented in accordance with Navy policy and CERCLA guidance*	

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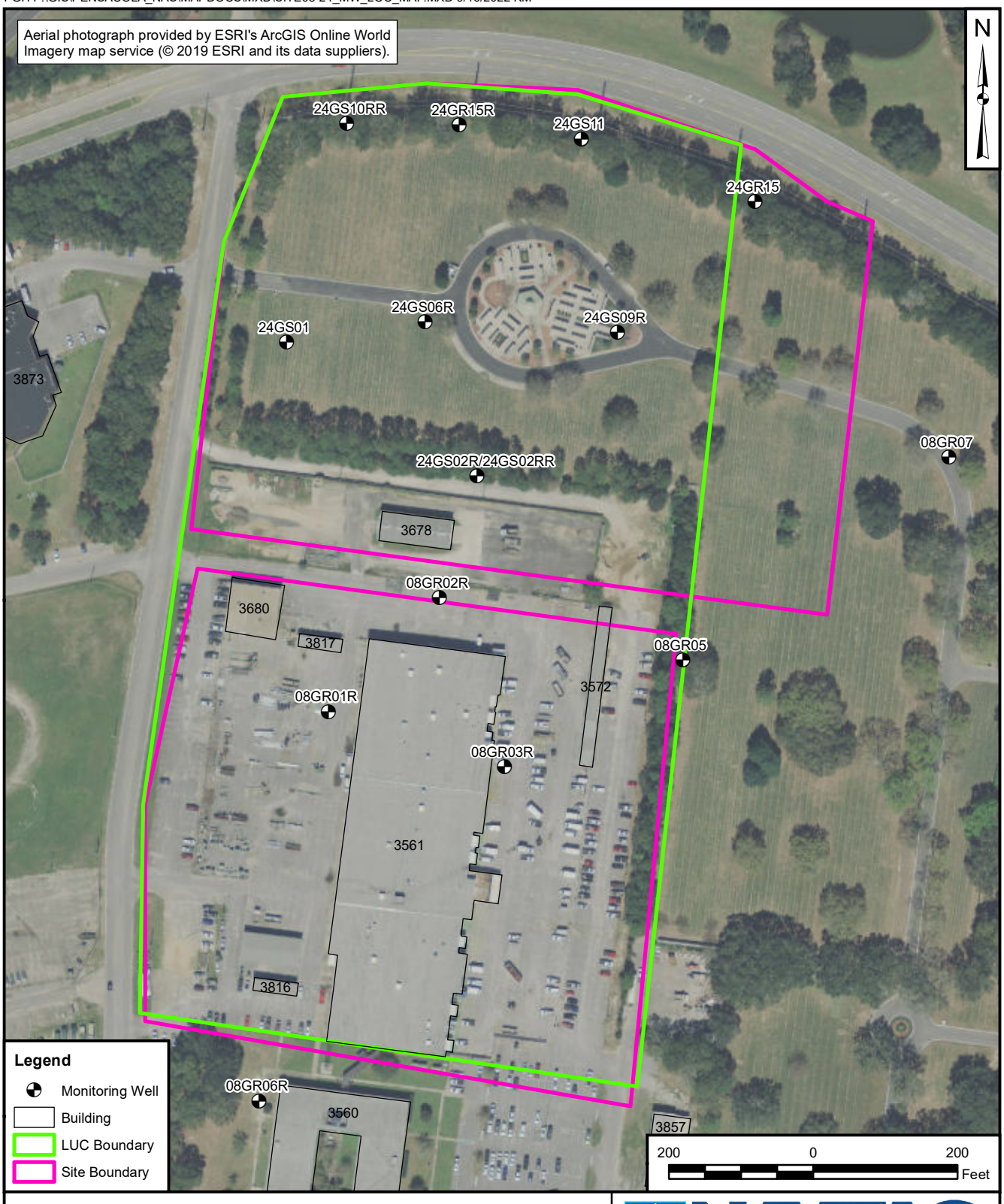

OU 13 SITES 8 AND 24 LAYOUT
NAVAL AIR STATION PENSACOLA
PENSACOLA, FLORIDA

NAVFAC Naval Facilities Engineering Systems Command

DRAWN BY	DATE	CTO
K. MOORE	09/06/22	N6945021F0538
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R. MILLER	09/16/22	7-1

8.0 OPERABLE UNIT 16, SITE 41 - WETLANDS

OU 16, Site 41 wetlands include the following wetlands and wetland complexes: Wetlands 1A, 2, 4A/B/C, 5B, 6 (southern portion), 9 through 14, 16 and 17, 19A/B, 20, 21, 22A/B, 23, 24A/B, 25A/B, 26, 27A/B, 28A/B, 29 through 40, 41A/B, 42 through 51, 52A through 52E, 53 through 55, 56A/B, 57 through 62, 63A/B, 65 through 69, 70A/B, 71, 72, 73A/B, 74 through 79, W1, and W2. OU 16, Site 41 originally included 81 wetlands or wetland complexes, both tidal and non-tidal, within the NAS Pensacola boundary. Ten of those wetlands have since been reassigned to be associated with their terrestrial OUs. Wetlands 1B, 3, 4D, 15, 18A/B were reassigned to OU 1, and Wetlands 5A, 6 (northern end), 7 (southern end), and 64 Complex (comprising Wetland 64, the northern end of Wetland 7, and Wetland 8) were reassigned to OU 2.

Wetland 48, the only OU 16 wetland for which a remedial action is required, is an approximately 12.5-acre thickly vegetated, palustrine forested, freshwater wetland fed by surface runoff and groundwater sources (see Figure 8-1). Several storm water headwalls from the nearby Sherman Field Fuel Farm Area (Fuel Farm) are north of Wetland 48. Fuel Farm Road bisects Wetland 48, and a culvert under the road allows surface water to drain to the east and eventually into Wetland 52 (Resolution Consultants, 2019). Pensacola Bay is the nearest open water surface water body and is approximately 1,000 feet south of Wetland 48.

8.1 RESPONSE ACTION SUMMARY

8.1.1 Basis for Taking Action

Potential human health risks to adult maintenance workers were evaluated as part of the 2007 RI (EnSafe, 2007b). Because Wetland 48 is in a restricted area of the base, the wetland is only accessible to Navy personnel. Wetland 48 is intermittently flooded; therefore, contact with sediment and surface water is possible. The adult maintenance worker scenario for ingestion and dermal contact with surface water and sediment were assessed. Sediment and surface water ingestion and dermal contact risk estimates for maintenance workers were less than the U.S. EPA target risk range of 1E-04 to 1E-06 and FDEP risk threshold of 1E-06, and hazard indices were less than the U.S. EPA and FDEP target hazard index of 1.0. No human health COCs were identified for Wetland 48.

Potential risk to ecological receptors (plants, invertebrates, birds, mammals) was evaluated in the 2007 RI, 2007 RI Addendum (EnSafe, 2007a), and 2019 RI Addendum (Resolution Consultants, 2019). Based on findings of the 2007 RI, the ecological contaminants of potential concern (COPCs) were 4,4'-dichlorodiphenyldichloroethane (DDD), 4,4'- dichlorodiphenyl-dichloroethene (DDE), and 4,4'-DDT in sediment. No ecological COPCs were identified in surface water. The extent of contamination and potential risk from the COPCs in sediment to aquatic invertebrates, fish-eating birds, and fish-eating mammals was evaluated further in the 2007 RI Addendum and 2019 RI Addendum. The 2019 RI Addendum concluded that potential risk to aquatic invertebrates was acceptable but that there was potential unacceptable risk to fish-eating birds. Site-specific risk-based preliminary remediation goals (PRGs) for fish-eating birds, concentrations that can be present site-wide without posing unacceptable risk, were calculated for 4,4'-DDD, 4,4'-DDE, 4,4'-DDT and total DDx. The 95-percent UCLs of the site mean for these ecological COPC exceeded their risk-based PRGs, indicating that potential exposures to fish-eating birds exist at levels that could cause unacceptable risk. PRG exceedances were used

to identify 4,4'-DDD, 4,4'-DDE, 4,4'-DDT and DDx as the ecological COCs for Wetland 48 sediment.

8.1.2 Response Actions

The final OU 16 ROD was submitted in July 2021; FDEP concurrence was received in August 2021, and U.S. EPA signed the ROD in September 2021. The RAOs for OU 16, Site 41 – Wetland 48, as documented in the ROD, are as follows:

- RAO 1 – Reduce unacceptable risk to fish-eating birds associated with exposure to COCs in sediment.
- RAO 2 – Restore the functions and values of the wetland following remedial action.

Cleanup levels for OU 16 sediment are summarized in Table 8-1.

Table 8-1: Operable Unit 16, Site 41 – Wetland 48 Sediment COCs and Cleanup Levels

Contaminant of Concern	Background Concentration[(1)] (µg/kg)	Florida SQAG PEC (µg/kg)	Risk-Based PRG[(2)] (µg/kg)	Cleanup Level (µg/kg)
4,4'-DDD	3.35	28	769	769
4,4'-DDE	4.7	31	154	154
4,4'-DDT	9.46	63	1,250	1,250
DDx	----	--	--	2,173[(3)]

1 Based on NAS Pensacola freshwater wetlands background data (Resolution Consultants, 2019).
2 Calculated as part of the 2019 RI Addendum.
3 There is no toxicity reference value for DDx, so this value could not be calculated using food web modeling; the cleanup level is the sum of cleanup levels for 4,4'-DDD, 4,4'-DDE, and 4,4'-DDT.
SQAG PEC Sediment Quality Assessment Guidelines Probable Effects Concentration.
See the OU 16 ROD for further details and references (NAVFAC, 2021a).

To determine excavation volumes, a virtual removal assessment was conducted in which site-wide exposure point concentrations (i.e., UCLs) were calculated assuming that sediment at and near two hot spots (where total DDx values exceed 1,000 µg/kg) was removed and that background concentrations of COCs remained in place. The calculated post-removal UCLs in the virtual assessment were less than cleanup levels, indicating that Wetland 48 would meet RAO 1. The total area and volume of contaminated sediment at the hot spots were estimated to be 9,621 square feet and 178 cubic yards, respectively.

The selected remedy for sediment at Wetland 48 consists of four major components, removal (excavation) of contaminated sediment, off-site sediment disposal, wetland restoration, and wetland restoration monitoring, as summarized below.

<u>Sediment Removal and Off-Site Disposal</u>
To achieve RAO 1, sediment from within the Fuel Farm Road culvert and at two contamination hot spots will be removed to a depth of 6 inches. A virtual removal assessment scenario demonstrated that removal of the hot spots would result in acceptable ecological risk because the post-excavation, site-wide, 95-percent UCL of DDx concentrations will be less than cleanup

levels. The estimated excavation volume for the two hot spots is approximately 178 cubic yards or 267 tons. Optimal methods for working within the wetland will be determined during the Pre-Design Investigation (PDI).

Sediment in the water obtained from the excavated sediments will be allowed to settle out before sampling and analysis to determine appropriate disposal. If the water does not contain contaminants at concentrations that exceed surface water quality criteria or FDEP Practical Quantitation Limits, the water will be returned to the wetland. Otherwise, the water will be sent off site for treatment and disposal. The excavated sediment and cleared vegetation are expected to be non-hazardous (i.e., able to be disposed of in a RCRA-permitted Subtitle D landfill). Samples of the excavated materials will be collected and analyzed to ensure that the waste materials comply with pertinent RCRA requirements and the waste acceptance criteria of the approved landfill. A stabilization agent may also be added to the removed sediment to assist in material handling and transportation. Before disposal, the sediment will be allowed to dewater until it meets the moisture content required by the landfill.

Wetland Restoration

Removal of 6 inches of sediment from Wetland 48 will be preceded by stripping vegetative cover that cannot be protected and salvaged. Wetland restoration will be necessary and will include grading the site to match pre-excavation topography and planting native species to return the wetland to its pre-excavation condition.

Wetland Restoration Monitoring

Monitoring will be conducted to ensure the establishment of new vegetation and restoration of wetland functions and value following sediment excavation to meet RAO 2. Restoration monitoring may include annual assessment of wetland hydrology, vegetation, and soils to ensure that the hydrology reflects wetland hydrology, that native plants become established and invasive species do not establish in the remedial footprint, and that hydric soils are present. Potential actions that could be taken to ensure that restoration is effective include removal of invasive plants and replanting of desired species should survival fail to meet performance criteria as detailed in the Remedial Design.

No Action was selected for surface water at Wetland 48 and for surface water and sediment at Wetlands 1A, 2, 4A/B/C, 5B, 6 (southern portion), 9 through 14, 16 and 17, 19A/B, 20, 21, 22A/B, 23, 24A/B, 25A/B, 26, 27A/B, 28A/B, 29 through 40, 41A/B, 42 through 47, 49 through 51, 52A through 52E, 53 through 55, 56A/B, 57 and 62, 63A/B, 65 through 69, 70A/B, 71, 72, 73A/B, 74 through 79, W1, and W2.

8.1.3 Status of Implementation

The OU 16, Site 41 – Wetland 48 ROD was signed within this five-year review period, so the selected remedy has not been implemented. Since the ROD was finalized, a draft Wetland 48 PDI SAP was submitted in April 2021, and a preliminary draft Wetland 48 Remedial Design Work Plan was submitted in April 2021. The Wetland 48 PDI SAP was finalized in August 2022. PDI findings will be incorporated into the Remedial Design Work Plan, which is scheduled to be submitted in August 2023.

8.1.4 Systems Operations/Operation and Maintenance

No active remedial systems are included in the OU 16 selected remedy.

8.2 PROGRESS SINCE THE LAST REVIEW

This is the first five-year review for OU 16.

8.3 FIVE-YEAR REVIEW PROCESS

8.3.1 Community Notification, Involvement, and Site Interviews

A public notice announcing the initiation of this five-year review was published in the *Pensacola News Journal* and on the NAS Pensacola Facebook page on 19 June 2022 (see Appendix D). No public comments were received in response to the public notice. A second public notice will be published announcing the completion of the Fifth Five-Year Review Report and the availability in the Administrative Record of the report and fact sheet summarizing the results of the review. The fact sheet will also be distributed to the RAB and any other interested persons or organizations. The Administrative record can be accessed online at

https://www.navfac.navy.mil/Business-Lines/Environmental/Products-and-Services/Environmental-Restoration/Southeast/Pensacola-NAS/Administrative-Record/

Interview questionnaires were sent to two members of the NAS Pensacola Restoration Advisory Board, and the completed questionnaire received in response is included in Appendix C.

8.3.2 Data Review

No post-ROD data have been collected for OU 16.

8.3.3 Site Inspection

The inspection of the site was conducted on 14 April 2022 by Tetra Tech. The OU 16 remedy has not yet been implemented, so no remedy protectiveness issues could be evaluated. Five-year review inspection checklists are included in Appendix E.

8.4 TECHNICAL ASSESSMENT

8.4.1 QUESTION A: Is the remedy functioning as intended by the decision documents?

The remedy has not been implemented but is expected to function as intended upon completion. Expected progress toward meeting RAOs will be assessed during the next five-year review.

8.4.2 QUESTION B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?

There have been no changes in physical conditions, exposure pathways, or land use that would affect the protectiveness of the OU 16 remedy when implemented. The exposure assumptions, cleanup levels, toxicity data, and RAOs for the site used at the time of the remedy selection are still valid.

8.4.3 QUESTION C: Has any other information come to light that could call into question the protectiveness of the remedy?

No additional information has come to light that could call into question the protectiveness of the remedy. There are no newly identified human health or ecological risks, and there have been no impacts from weather-related events or natural disasters.

8.5 ISSUES/RECOMMENDATIONS

No issues affecting future protectiveness of the OU 16 remedy were identified during this five-year review. Because no issues affecting the protectiveness of the remedy were identified, there are no recommendations for OU 16, and no follow-up actions are required.

8.6 PROTECTIVENESS STATEMENT

Protectiveness Statement	
Operable Unit: 16	*Protectiveness Determination:* Will be Protective
***Protectiveness Statement**: The remedy at OU 16 is expected to be protective of human health and the environment upon completion.*	

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Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2019 ESRI and its data suppliers).

N

Wetland W2

Wetland 12

Wetland 48

Legend

- Planned Sediment Excavation Area
- OU 16 Wetlands
- Installation Boundary

2,000 0 2,000 Feet

OU 16 SITE 41 LAYOUT
NAVAL AIR STATION PENSACOLA
PENSACOLA, FLORIDA

NAVFAC Naval Facilities Engineering Systems Command

DRAWN BY	DATE	CTO
K. MOORE	09/06/22	N6945021F0538
CHECKED BY	DATE	FIGURE NUMBER
R. MILLER	09/16/22	8-1

9.0 OPERABLE UNIT 18 – SITE 43

OU 18, Site 43 is the former Demolition Debris Disposal Area. Environmental investigations began in December 1992 when a child using a metal detector discovered a partially exposed drum east of a former tennis court. Subsequent site reconnaissance identified an additional drum and smaller rusted metallic debris in the area. After discovery in 1992, the area surrounding the drums was fenced to prevent general access until further investigation could be conducted (Tetra Tech, 2008b).

OU 18 is located in a developed area in the eastern portion of NAS Pensacola (Figure 9-1), southwest of the Murray Street and Taylor Street intersection and north of BOQ Road. The site encompasses approximately 180,000 square feet (4.1 acres), approximately 40,000 square feet of which is a paved parking lot. The remainder of the site is grassy with scattered trees. The earliest known use of OU 18 was recreational, with a tennis court and building foundation used as a basketball court; both were removed in 2003 (Tetra Tech, 2008b). Based on its location adjoining several military housing areas, recreational users and maintenance workers are expected to use the site for the foreseeable future. The planned future use of the site is open space, with no development or construction activities (NAVFAC, 2010). OU 18 is not fenced, but access to NAS Pensacola is controlled, and the facility perimeter is fenced and patrolled.

9.1 RESPONSE ACTION SUMMARY

Contaminants at OU 18 appear to have resulted from undocumented disposal of solid waste including drums of unknown materials. The sources and nature of materials and the time of disposal are unknown.

9.1.1 Basis for Taking Action

Human health and ecological risk assessments for OU 18 were conducted as part of the RI (Tetra Tech, 2006). Ecological risk was determined to be negligible due to the lack of significant habitat at OU 18. Human health receptors evaluated included occupational, maintenance, and construction workers; recreational users/trespassers; and hypothetical future residents. Unacceptable risks were estimated for carcinogenic PAHs and arsenic in soil and chloroform in groundwater. However, OU 18 arsenic concentrations are within naturally occurring ranges for the United States, so arsenic was not retained as a soil COC. Chloroform was not retained as a COC in groundwater because it was detected infrequently at concentrations significantly less than the MCL and GCTL. Unacceptable risks from lead concentrations in soil at OU 18 were estimated for residential exposure to surface and subsurface soil and groundwater and occupational and construction worker and recreational exposure to surface soil.

Human health risks were also evaluated based on comparisons to FDEP criteria (residential and industrial SCTLs, GCTLs, and site-specific recreational SCTLs developed for OU 18). Based on the results of these comparisons, unacceptable risks for soil were identified for carcinogenic PAHs (residential, industrial, and recreational exposure), lead (residential and industrial exposure), and the metals arsenic, barium, copper, and vanadium (residential exposure). Unacceptable groundwater risks were identified for iron, lead, and manganese, but only lead was retained as a groundwater COC because iron and manganese concentrations were determined not to be site related.

9.1.2 Response Actions

An IRA conducted in 2001 included removal of 657 cubic yards of soil and debris including 20 to 25 rusted metal drums, drum parts, and inert ornamental ordnance and munitions (Tetra Tech, 2008b). Prior to the IRA, remedial goals developed for some COCs were used to determine the extent of contamination requiring removal. Remedial goals were re-evaluated and revised after excavation activities were completed, and it was determined that additional excavation was required. The IRA Report recommended further investigation and evaluation via an RI/FS (NAVFAC, 2010).

The Final OU 18 ROD was signed by the Navy in March 2010 and by U.S. EPA in April 2010. The following RAOs were established to prevent current and future unacceptable exposure to contamination soil and groundwater at the site:

- Prevent unacceptable human health risk associated with exposure to soil containing arsenic, barium, copper, lead, vanadium, and PAHs at concentrations greater than FDEP Industrial SCTLs.

- Prevent unacceptable human health risk associated with exposure to groundwater containing lead concentrations greater than the FDEP GCTL and U.S. EPA Action Level.

Table 9-1 presents COCs and remedial goals identified for soil at OU 18.

Table 9-1: Operable Unit 18, Site 43 – Soil COCs and Remedial Goals

COCs	Remedial Goals	
	Residential	Industrial
Carcinogenic PAHs	100 µg/kg	700 µg/kg
Arsenic	2.1 mg/kg	12 mg/kg
Barium	120 mg/kg	NA
Copper	150 mg/kg	NA
Lead	400 mg.kg	1,400 mg/kg
Vanadium	67 mg/kg	NA

NA Not applicable; concentrations detected at the site did not exceed the industrial SCTL.

The groundwater remedial goal for lead is 15 µg/L, the FDEP GCTL and U.S. EPA Action Level.

The selected remedy includes the following components:

- Limited excavation of surface and subsurface soil with COC concentrations exceeding FDEP Industrial SCTLs and off-site treatment (if required) and disposal.

- Groundwater monitoring for 1 year to evaluate changes in lead concentration and potential migration.

- LUCs to restrict the site to non-residential use, ensure maintenance of existing paved areas, and prohibit uncontrolled soil disturbance/excavation and groundwater use.

9.1.3 Status of Implementation

The OU 18 RACR provides detailed descriptions and documentation of soil and groundwater remedial activities completed at OU 18 to meet the RAOs (AGVIQ-CH2MHILL, 2017). Pre-excavation soil contaminant delineation sampling and analysis, soil excavation and backfilling, monitoring well installation, and baseline groundwater sampling were conducted between May and July 2013. Munitions and explosives of concern anomaly avoidance activities were conducted during pre-excavation sampling, and subsequent anomaly detection and removal were conducted, but no munitions and explosives of concern or material potentially presenting an explosive hazard were identified.

Limited Soil Excavation

Excavation activities were conducted in June and July 2013 to remove soil with COC concentrations exceeding industrial SCTLs from four hot spot areas, A4, A6, A7, and A8. Surface and subsurface soil with Industrial SCTLs exceedances were removed from each hot spot, but post-excavation confirmatory sampling at hot spot A8 indicated that lead exceedances remained in surface soil beyond the excavation boundary. Additional excavation was not possible due to nearby utility lines, so U.S. EPA and FDEP requested additional surface soil sampling to evaluate the risk of exposure to residual lead contamination in soil adjacent to the excavated boundary of hot spot A8. Based on the results of that evaluation and logistical limitations associated with additional soil removal, the NAS Pensacola Partnering Team decided to cover the area with a concrete pad to eliminate the direct contact exposure pathway. To minimize impact to adjacent old-growth trees during remedial activities, concrete pavers were used instead of solid concrete at the base of each tree, leaving space for gravel so rainwater could percolate; additional concrete pavers and a sidewalk were also placed in the vicinity of hot spot A8. The hot spot A8 concrete pad was completed in 2016. A total of 234 tons of contaminated soil were removed from the four hot spot areas and disposed of off site, and approximately 500 pounds of uncontaminated metallic debris was removed and recycled.

Groundwater Monitoring

In May 2013, groundwater samples were collected for lead analysis from three new and two previously installed wells to establish baseline conditions in accordance with a Groundwater Monitoring Plan (Tetra Tech, 2011). The lead concentration at one well exceeded the remedial goal during baseline sampling. One year of quarterly groundwater monitoring was performed between October 2013 and September 2014, in accordance with the requirements of the ROD, to verify that lead concentrations were not increasing and that no unacceptable contaminant migration was occurring. None of the quarterly groundwater samples had lead exceeding the remedial goal during any sampling event. Sporadic detections (less than the remedial goal) did not show an increasing trend over time (AGVIQ-CH2MHILL, 2016d).

Although lead concentrations during quarterly monitoring were less than the remedial goal, the NAS Partnering Team recommended an additional sampling event, which occurred in May 2015, at the well that had a lead exceedance during baseline sampling. Lead was not detected in the May 2015 sample, confirming that seasonal fluctuations did not result in increased lead concentrations. The Navy recommended no further action for groundwater in the annual groundwater monitoring report, which was approved by the U.S. EPA and FDEP in February 2016 (AGVIQ-CH2MHILL, 2016d). The Navy abandoned OU 18 monitoring wells based on the NAS Pensacola Partnering

Team decision to discontinue groundwater monitoring (as documented in March 2016 meeting minutes).

Land Use Controls

LUCs were initially implemented within OU 18 boundaries under a LUC RD to restrict the use of the property to non-residential, control access to the remaining soil exceeding SCTLs, maintain the integrity of the current 40,000-square-foot parking lot on the site, prohibit groundwater use in accordance with the ROD, and maintain the integrity of all existing or future monitoring and on-site remedy components at the site (Tetra Tech, 2011). After groundwater sampling determined that no further action was necessary for groundwater in accordance with the requirements of the ROD, a LUC RD Amendment was issued to provide the basis for removing the groundwater LUC restrictions (NAVFAC, 2017a). The LUC RD Amendment also incorporated additional information to supplement the existing LUC component for ongoing implementation and maintenance of engineering controls for the added concrete pad, concrete pavers, and sidewalk.

OU 18 LUC objectives per the LUC RD Amendment are summarized in Table 8-2. LUC inspections are conducted annually, and annual LUC certification letters for this five-year review period are provided in Appendix C.

The LUC RD Amendment includes an Inspection and Maintenance Plan that details requirements for ensuring that the existing parking lot, concrete pad and pavers, and sidewalk are maintained to prevent exposure to underlying soil. In accordance with this plan, annual LUC inspections include a walkover of the entire 40,000-square-foot asphalt-paved parking lot in the western portion of OU 18 and a walkover of the entire concrete area representing an engineering control to ensure that these controls are operating as intended. The Inspection and Maintenance Plan also includes a procedure for backfilling areas of uprooted trees. If existing trees within the areas of engineering controls are removed, the soils underlying the tree roots will be treated as contaminated with soil COCs. The newly formed gaps left by the removed trees will be cleared of tree roots and other vegetative matter, and the area will be capped in the same manner as the surrounding area.

Table 9-2: Summary of Implemented LUCs, OU 18 – Site 43

Media, engineered controls, and areas that do not support UU/UE based on current conditions	LUCs Needed	LUCs Called for in the Decision Documents	Impacted Parcel(s)	LUC Objective	Title of LUC Instrument Implemented and Date
Soil	Yes	Yes	Site 43	Restrict future use of the site to non-residential land uses unless prior written approval is obtained from the U/S/ EPA and FDEP. Non-residential land use restrictions will prohibit residential or residential-like uses including, but not limited to, any form of housing, any kind of school (including pre-schools, elementary schools, and secondary schools), child-care facilities, playgrounds, and adult convalescent or nursing care facilities.	*Land Use Control Remedial Design Amendment for Operable Unit 18 – Site 43, Former Demolition Disposal Area* July 2017

Media, engineered controls, and areas that do not support UU/UE based on current conditions	LUCs Needed	LUCs Called for in the Decision Documents	Impacted Parcel(s)	LUC Objective	Title of LUC Instrument Implemented and Date
				Prohibit any excavation or other disturbances of existing areas with contaminated surface and subsurface soils (exceeding residential SCTLs) at the site unless prior written approval is obtained from U.S. EPA, FDEP and NAS Pensacola PWD.	
				Maintain the integrity of the current 40,000-square-foot parking lot on the site.	
				Maintain the integrity of all existing or future on-site soil remedy components at the site including the concrete pad and sidewalk placed along BOQ Road in the vicinity of hot spot A8.	

9.1.4 Systems Operations/Operation and Maintenance

There are no active remediation systems requiring O&M at OU 18. The LUC Inspection and Maintenance Plan, as provided in the LUC RD Amendment, is discussed in Section 9.1.3.

9.2 PROGRESS SINCE THE LAST REVIEW

This section includes the protectiveness determination and statement from the last five-year review as well as the recommendations from the last Five-Year Review Report and the current status of those recommendations.

Based on the results of the fourth five-year review, the protectiveness determination for OU 18 was protective. The protectiveness statement from the Fourth Five-Year Review Report was as follows:

> The remedy at Operable Unit 18, Site 43 is protective of human health and the environment. Excavation has removed soil contaminants except for hot spot A8, at which engineering controls (concrete pad and pavers) have been installed to prevent exposure to lead concentrations exceeding the Florida Department of Environmental Protection Industrial Soil Cleanup Target Level. Institutional controls in place have been successful in preventing exposure, according to annual Land Use Control inspections. Groundwater meets remedial goals and has been removed from the land use control portion of the remedy.

No issues affecting current or future protectiveness were identified in the Fourth Five-Year Review Report for OU 18.

9.3 FIVE-YEAR REVIEW PROCESS

9.3.1 Community Notification, Involvement, and Site Interviews

A public notice announcing the initiation of this five-year review was published in the *Pensacola News Journal* and on the NAS Pensacola Facebook page on 19 June 2022 (see Appendix D). No public comments were received in response to the public notice. A second public notice will be published announcing the completion of the Fifth Five-Year Review Report and the availability in the Administrative Record of the report and fact sheet summarizing the results of the review. The fact sheet will also be distributed to the RAB and any other interested persons or organizations. The Administrative record can be accessed online at

https://www.navfac.navy.mil/Business-Lines/Environmental/Products-and-Services/Environmental-Restoration/Southeast/Pensacola-NAS/Administrative-Record/

Interview questionnaires were sent to two members of the NAS Pensacola Restoration Advisory Board, and the completed questionnaire received in response is included in Appendix C.

9.3.2 Data Review

The groundwater monitoring program was completed in 2015, and the recommendation for no further action for groundwater at OU 18 was approved by U.S. EPA and FDEP in 2016 (AGVIQ-CH2MHILL, 2016d).

9.3.3 Site Inspection

The inspection of the site was conducted on 14 April 2022 by Tetra Tech. The purpose of the inspection was to assess the protectiveness of the OU 18 remedy. No issues impacting the current or future protectiveness of the OU 18 remedy were identified during the inspection. Five-year review inspection checklists are included in Appendix E.

9.4 TECHNICAL ASSESSMENT

9.4.1 QUESTION A: Is the remedy functioning as intended by the decision documents?

The results of the five-year review indicate that the OU 18 remedy is functioning as intended by the ROD. The remedial actions are being implemented as designed and include measures that prevent exposure. The OU 18 remedial actions that have been completed (soil excavation, installation of engineering controls, LUC implementation, and groundwater monitoring) are operating or operated as designed and meet the RAOs. Ongoing inspections confirm the continued effectiveness of the remedy. The results of groundwater monitoring confirmed that lead concentrations had decreased to less than the remedial goal and that no further action, including no LUCs, are required for groundwater at OU 18. Based on the completed and ongoing activities, the intent and goals of the OU 18 ROD have been or will be met, and there are no deficiencies or early indicators of potential remedy failure.

9.4.2 QUESTION B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?

There have been no changes in physical conditions, exposure pathways, or land use that would affect the protectiveness of the OU 18 remedy. The exposure assumptions, cleanup levels, toxicity data, and RAOs for the site used at the time of the remedy selection are still valid.

The Navy is currently conducting a base-wide radiological PA/SI to address base-wide radiological issues that are within the CERCLA framework. The Navy submitted the final PA Report to the regulators on 23 September 2021 and is in the process of preparing the planning documents for SI activities. Twenty-seven areas at NAS Pensacola, including OU 18, were identified as having potential radiological releases and will be investigated as part of the SI. SI field activities are tentatively scheduled for early 2023, after the SI planning documents are approved. The SI portion of the investigation is not intended to be a full-scale study of the nature or extent of radiological contamination. Rather, its purpose is to augment the data/information collected during the PA and to determine whether further response action or an RI is necessary, or if no further investigation is appropriate.

9.4.3 QUESTION C: Has any other information come to light that could call into question the protectiveness of the remedy?

No additional information has come to light that could call into question the protectiveness of the remedy. There are no newly identified human health or ecological risks, and there have been no impacts from weather-related events or natural disasters.

As a result of the effects of climate change, storm events have been increasing in magnitude with time. The Navy conducts annual LUC inspections that would identify any storm-related impacts that might impact protectiveness. If any such impacts are identified, the Navy will address the impacts as required to ensure continued protectiveness.

9.5 ISSUES/RECOMMENDATIONS

No issues affecting the current or future protectiveness of the OU 18 remedy were identified during this five-year review. Because no issues affecting the protectiveness of the remedy were identified, there are no recommendations for OU 18, and no follow-up actions are required.

9.6 PROTECTIVENESS STATEMENT

Protectiveness Statement	
Operable Unit: 18	*Protectiveness Determination:* Protective
***Protectiveness Statement**: The selected remedy for OU 18 is protective of human health and the environment. Soil excavation and off-site disposal to meet industrial remedial goals and installation and maintenance of engineering controls at hot spot A8 have been successful in preventing exposure to contaminants in soil. LUCs prevent residential exposure to residual soil contamination and confirm that engineering controls continue to prevent exposure to soil associated with potentially unacceptable risks. Groundwater monitoring results confirmed that lead concentrations had decreased to less than the remedial goal. The OU 18 remedial actions that have been completed (soil excavation, installation of engineering controls, LUC implementation, and groundwater monitoring) are operating or operated as designed and meet the RAOs. Ongoing LUC inspections confirm the continued effectiveness of the remedy. Based on the completed and ongoing activities, the intent and goals of the OU 18 ROD have been or will be met.*	

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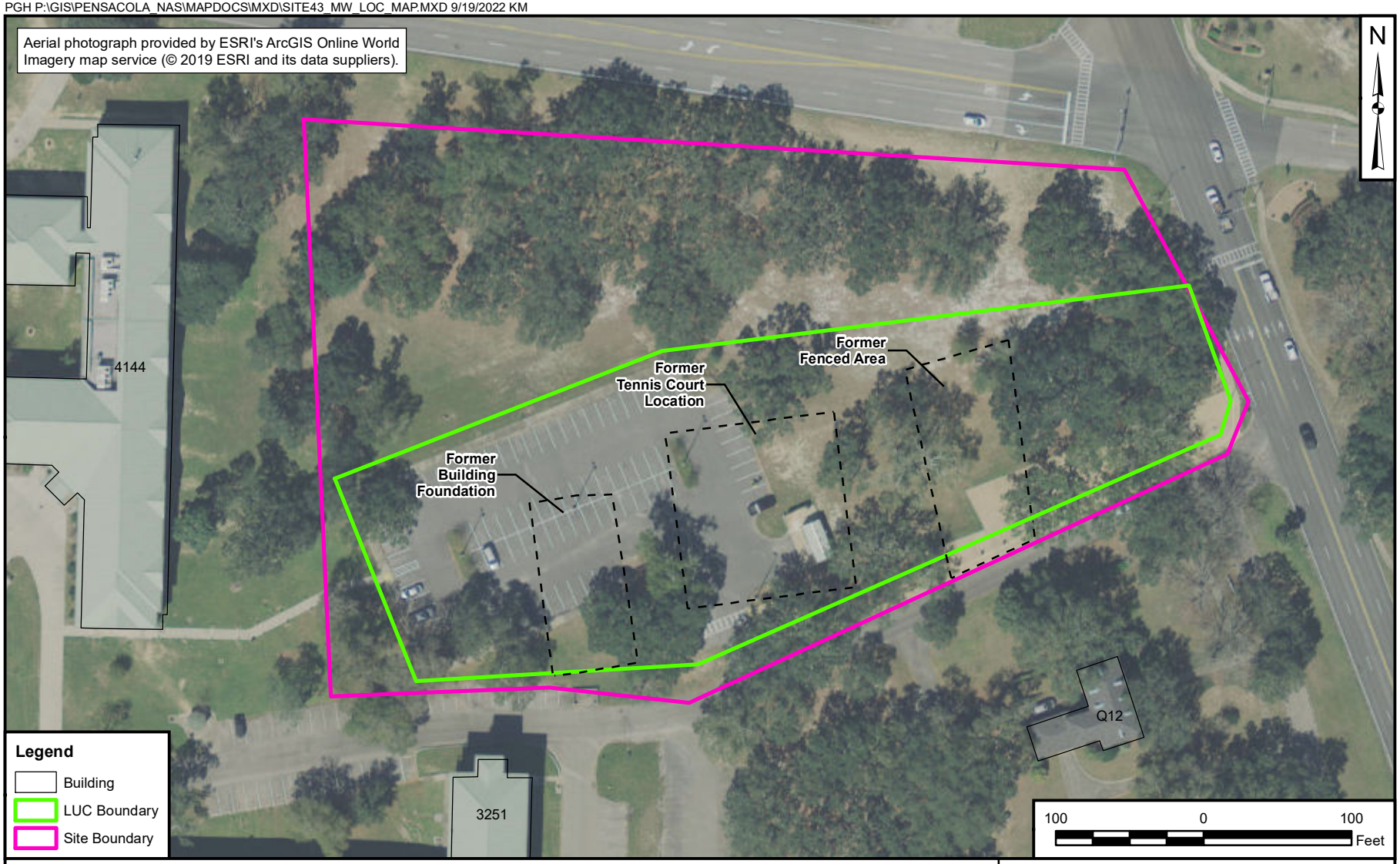

OU 18 SITE 43 LAYOUT
NAVAL AIR STATION PENSACOLA
PENSACOLA, FLORIDA

NAVFAC
Naval Facilities Engineering Systems Command

DRAWN BY	DATE	CTO
K. MOORE	09/06/22	N6945021F0538
CHECKED BY	DATE	FIGURE NUMBER
R. MILLER	09/19/22	9-1

10.0 OPERABLE UNIT 19 – SITE 44

OU 19, Site 44 is located at the southwestern end of Building 3221, a large hangar adjacent to Forrest Sherman Field and currently used to refurbish aircraft used for display at the nearby National Museum of Naval Aviation and includes the TCE plume that originates from the southwestern end of Building 3221 (see Figure 10-1). The hangar and adjacent paved areas were part of the Naval Air Rework Facility and were likely used for aircraft maintenance before the current National Museum of Naval Aviation opened in 1975. The paved area adjacent to the southwestern corner of Building 3221 is currently used as a wash rack for cleaning aircraft and aircraft parts. Surface drainage in this area flows to a small concrete-lined ditch located on the southeastern edge of the pavement. When aircraft parts washing activities are being conducted, a diverter system is used to direct the runoff to the sanitary sewer system for treatment. OU 19 was first investigated as UST Site 3221 SW in 1992, following the removal of a 1,000-gallon UST near Building 3221. PCE was detected at concentrations exceeding the federal and FDEP MCLs downgradient of the UST, and because of the detection of chlorinated solvents, the site was transferred to the IRP for further assessment.

Currently, the surface of OU 19 is a mixture of concrete, asphalt, and grass. The north-central portion of the site is covered with concrete, the northwestern portion is an asphalt-covered storage area for various aircraft parts and is bounded to the west by a wooded area, the northeastern portion abutting Building 3221 is an asphalt parking area, and the southern portion is grass covered, bisected by an unpaved access road trending southwest to northeast. OU 19 also includes the TCE plume that originates from the southwestern end of Building 3221 and extends approximately 1,300 feet to the northeast.

10.1 RESPONSE ACTION SUMMARY

The release of contaminants at OU 19 appears to have resulted from routine aircraft maintenance and wash activities or undocumented spills; the source and nature of materials and time of release are unknown (NAVFAC, 2017).

10.1.1 Basis for Taking Action

Human health and ecological risk assessments were conducted as part of the OU 19 RI (Tetra Tech, 2007). Receptors evaluated included occupational, maintenance, and construction workers; trespassers/recreational users; and hypothetical future residents. Cancer risks estimated for exposure of occupational workers, recreational users, and hypothetical future residents to soil at Site 44 were less than U.S. EPA's target risk range (1 x 10-4 to 1 x 10-6) but greater than FDEP's target risk of 1 x 10-6. The primary risk drivers were carcinogenic PAHs and arsenic. The cancer risk for hypothetical future residents exposed to groundwater at OU 19 exceeded U.S. EPA's target risk range, due mainly to TCE.

Human health risks were also evaluated based on comparisons to FDEP criteria (risk-based residential and industrial SCTLs, leachability SCTLs, and GCTLs and state MCLs). Based on the results of these comparisons, carcinogenic PAHs concentrations in surface and subsurface soil at the site were associated with unacceptable residential and industrial risk, and arsenic

concentrations in surface soil were associated with unacceptable residential risk. Residential risk associated with exposure to TCE in OU 19 groundwater was also unacceptable.

The screening-level ecological risk assessment concluded that, although several contaminants were detected in surface soil at concentration exceeding conservative screening levels, the overall level of risk, after re-evaluation of the conservative assumptions, was considered to be minimal. No remedial action was required to address ecological receptors at the site (NAVFAC, 2017).

10.1.2 Response Actions

The Final OU 19 ROD (NAVFAC, 2017) was signed by the Navy in July 2017 and by U.S. EPA in September 2017. OU 19 RAOs are as follows:

- Prevent unacceptable human health risk associated with exposure to surface and subsurface soil with arsenic and carcinogenic PAH concentrations exceeding FDEP Residential and Industrial Direct Exposure SCTLs.
- Prevent unacceptable human health risk associated with exposure to groundwater with TCE (and daughter products from breakdown) concentrations exceeding the FPDWS (the most conservative of the FDEP GCTLs/MCLs or federal MCLs).
- Restore groundwater beneath this site (which is classified by Florida as potential drinking water) to meet the TCE and daughter products FPDWSs (the most conservative of the FDEP MCLs/GCTLs or federal MCLs), within the estimated 30-year timeframe, given site-specific conditions.

Table 10-1 lists OU 19, Site 44 soil COCs and remedial goals, which were threshold values used to estimate excavation volumes based on industrial use and implementation of LUCs.

Table 10-1: Operable Unit 19, Site 44 – COCs and Remedial Goals in Soil

Contaminant of Concern	Remedial Goal	
	Residential	Industrial
Carcinogenic PAHs	0.1 mg/kg	0.7 mg/kg
Arsenic	2.1 mg/kg	NA

Remedial goals are FDEP SCTLs.
NA Not applicable; arsenic was not detected at the site in excess of Industrial SCTLs.

Table 10-2 lists OU 19, Site 44 groundwater remedial goals for TCE and its daughter products.

Table 10-2: Operable Unit 19, Site 44 – Groundwater Remedial Goals for TCE and Daughter Products

Parameter	FDEP MCL/GCTL	U.S.EPA MCL	Remedial Goal
TCE	3 µg/L	5 µg/L	3 µg/L
cis-1,2-DCE	70 µg/L	70 µg/L	70 µg/L
trans-1,2-DCE	100 µg/L	100 µg/L	100 µg/L
1,1-DCE	7 µg/L	7 µg/L	7 µg/L
Vinyl chloride	1 µg/L	2 µg/L	1 µg/L

Remedial goals are the lesser of FDEP MCLs/GCTLs and U.S. EPA MCLs.

The selected remedy includes the following components, discussed below.

- Limited excavation of soil with Industrial SCTL exceedances.
- Disposal of excavated soil at an off-site permitted landfill after off-site treatment, if required.
- MNA relative to TCE (and daughter products from breakdown) concentrations and monitoring plume stability.
- Soil and groundwater LUCs to restrict the site to non-residential use, to prohibit uncontrolled soil disturbance/excavation, and to prohibit groundwater use.

10.1.3 Status of Implementation

Limited Soil Excavation and Off-Site Disposal

Soil excavation at OU 19 was conducted in accordance with the RAWP (Tetra Tech, 2019b), as documented in the Soil RACR (Tetra Tech, 2020). Pre-excavation sampling to refine the limits of excavation presented in the ROD, soil removal, backfilling, and site restoration were completed in August 2019. Soil with carcinogenic PAH concentrations greater than Industrial SCTLs was excavated from an approximately 150-square-foot-area to a depth of 2 feet bgs, and approximately 11 cubic yards of PAH-contaminated soil were transported off site for disposal at an approved landfill. Treatment of soil prior to disposal was not required.

Monitored Natural Attenuation

During this five-year review period, nine LTM events were conducted at OU 19 in accordance with the 2019 approved SAP (Tetra Tech, 2019c) and approved April 2021 FTMR (Tetra Tech, 2021a). The monitoring well network currently includes 41 wells screened in four groundwater monitoring zones (shallow, intermediate zone I, intermediate zone II, and deep). Groundwater samples from these wells are analyzed for TCE and daughter products cis- and trans-1,2-DCE, 1,1-DCE, and vinyl chloride. Samples from select wells are also analyzed for MNA parameters.

The first year of monitoring was conducted on a quarterly basis, in accordance with the ROD, in November 2018 and February, May, and August 2019. The recommendation in the 2019 Annual Groundwater Monitoring Report to decrease the sampling frequency to semiannual was not approved until late 2020; therefore, 2020 sampling included two events on a quarterly frequency (January and April 2020) and a subsequent semiannual event (October 2020). Semiannual events were then conducted in May and November 2021. A groundwater RACR was finalized in February 2022 to document that the groundwater portion of the OU 19 remedy was implemented in accordance with the ROD (Tetra Tech, 2022b).

Land Use Controls

LUCs were implemented in accordance with the 2018 LUC RD (Tetra Tech, 2018) to prohibit residential land use and excavation or removal of soil from the site (to prevent exposure to remaining soil with exceedances of Residential SCTLs) and to prevent use of the surficial aquifer beneath the site. Annual physical inspections are conducted to confirm continued implementation of LUCs and compliance with LUC performance objectives described in the LUC RD. Table 10-3 lists the OU 19 LUC performance objectives.

Table 10-3: Summary of Implemented LUCs, OU 19, Site 44

Media, engineered controls, and areas that do not support UU/UE based on current conditions	LUCs Needed	LUCs Called for in the Decision Documents	Impacted Parcel(s)	LUC Objective	Title of LUC Instrument Implemented and Date
Soil	Yes	Yes	Site 44	Restrict exposure to receptors by prohibiting the site's future use to non-residential land uses unless prior written approval is obtained from the Navy, U.S. EPA, and FDEP. Non-residential land use restrictions will prohibit residential or residential-like uses including, but not limited to, any form of housing, childcare facilities, pre-schools, elementary schools, secondary schools, playgrounds, and convalescent or nursing care facilities.	*Final Land Use Control Remedial Design, Operable Unit 11, Site 44 – Former UST Site 23221 SW* September 2018
				Prohibit any unauthorized excavation or removal of contaminated surface and subsurface soils at the site unless prior written approval is obtained from the Navy, USEPA, and FDEP.	
Groundwater	Yes	Yes	Site 44	Prohibit uses of groundwater from the surficial aquifer underlying the site (including, but not limited to, human consumption, dewatering, irrigation, heating/cooling purposes, and other industrial processes) unless prior written approval is obtained from the Navy, USEPA, and FDEP.	
				Maintain the integrity of all existing or future on-site remedy components including groundwater monitoring wells and signage unless prior written approval is obtained from the Navy, USEPA, and FDEP.	

10.1.4 Systems Operations/Operation and Maintenance

There are no active remediation systems requiring O&M at OU 19. Monitoring well maintenance is implemented as part of routine LTM. Monitoring well integrity is reviewed during ongoing semiannual groundwater monitoring.

10.2 PROGRESS SINCE THE LAST REVIEW

This section includes the protectiveness determination and statement from the last five-year review as well as the recommendations from the last Five-Year Review Report and the current status of those recommendations.

Based on the results of the fourth five-year review, the protectiveness determination for OU was "will be protective." The protectiveness statement from the Fourth Five-Year Review Report was as follows:

> The remedy at Operable Unit 19 is expected to be protective of human health and the environment upon completion. In the interim, exposure pathways that could result in unacceptable risks are being controlled because groundwater is not used, site use remains non-residential, access is limited, and the in-place Naval Air Station Pensacola dig permit process prevents unauthorized intrusive activities.

No issues affecting current or future protectiveness were identified in the Fourth Five-Year Review Report for OU 19.

10.3 FIVE-YEAR REVIEW PROCESS

10.3.1 Community Notification, Involvement, and Site Interviews

A public notice announcing the initiation of this five-year review was published in the *Pensacola News Journal* and on the NAS Pensacola Facebook page on 19 June 2022 (see Appendix D). No public comments were received in response to the public notice. A second public notice will be published announcing the completion of the Fifth Five-Year Review Report and the availability in the Administrative Record of the report and fact sheet summarizing the results of the review. The fact sheet will also be distributed to the RAB and any other interested persons or organizations. The Administrative record can be accessed online at

https://www.navfac.navy.mil/Business-Lines/Environmental/Products-and-Services/Environmental-Restoration/Southeast/Pensacola-NAS/Administrative-Record/

Interview questionnaires were sent to two members of the NAS Pensacola Restoration Advisory Board, and the completed questionnaire received in response is included in Appendix C.

10.3.2 Data Review

Figure 10-1 shows the locations of monitoring wells in the OU 19 LTM program. Analytical results for groundwater monitoring activities were provided in their respective annual reports. Monitoring is conduced to evaluate the progress of MNA and to monitor plume stability. All sampling events were conducted during this Five-Year Review period. Monitoring was conducted quarterly from November 2018 to April 2020 and then semiannually from October 2020 to November 2021. The currently sampling program includes groundwater sample collection and water level measurements from a total of 41 wells, 13 in the shallow zone, 16 and 10 wells in intermediate zones I and II, respectively, and two in the deep zone. The two deep zone wells are only sampled annually during the first semiannual event. Sampling events in 2018 through 2020 included 39 wells, but two upgradient wells were added for the 2021 events

(PEN-44-27S in the shallow zone and PEN-44-27I in intermediate zone I). Groundwater samples from all wells are analyzed for TCE and daughter products cis- and trans-1,2-DCE, 1,1-DCE, and vinyl chloride. Samples from select wells are also analyzed for MNA parameters.

Table 10-4 summarizes exceedances of remedial goals during the current five-year review period, and groundwater monitoring results for the period are summarized below. Detailed results and evaluations are presented in the annual monitoring reports.

Table 10-4. Summary of TCE and Daughter Products Exceeding Remedial Goal During this Review Period

Well	Detections of COCs > Remedial Goals, 2017 to 2021	Purpose
Shallow Wells		
PEN-44-27S	None (not sampled in 2018/2019 or 2020)	Upgradient
PEN-3221-09	TCE (November 2018, February, May, and August 2019, January and April 2020, May and November 2021)	In-plume well/Former UST Site
PEN-44-11	TCE (November, February, May, and August 2019, January, April, and October 2020, May and November 2021)	In-plume well
PEN-44-15	TCE (October 2020)	In-plume well
PEN-44-21	TCE (November 2021)	In-plume well
PEN-44-36S	None	In-plume well
PEN-3221-10	TCE (April and October 2020)	Plume edge well
PEN-44-10	TCE (November 2021)	Plume edge well
PEN-44-22	TCE (October 2020)	Plume edge well
PEN-44-37S	None	Plume edge well
PEN-44-13	None	Sidegradient well
PEN-44-42S	None	Sidegradient well
PEN-44-44S	None	Sidegradient well
Intermediate Zone I Wells		
PEN-44-27I	None (not sampled in 2018/2019 or 2020)	Upgradient
PEN-44-12I	TCE (November, May, and August 2019)	In-plume well
PEN-44-28I	TCE (November, February, May, and August 2019, January, April, and October 2020, May and November 2021)	In-plume well
PEN-44-29I	TCE (February 2019 and October 2020, May and November 2021)	In-plume well
PEN-44-31I	TCE (November, February, May, and August 2019, January, April, and October 2020, May and November 2021)	In-plume well
PEN-44-32I	TCE (November 2018, February, May, and August 2019, January, April, and October 2020, May and November 2021)	In-plume well
PEN-44-35I	None	In-plume well
PEN-44-36I	None	In-plume well
PEN-44-37I	TCE (November 2018, February, and August 2019,	In-plume well

Well	Detections of COCs > Remedial Goals, 2017 to 2021	Purpose
	October 2020, May 2021)	
PEN-44-39I	TCE (November 2018, February, May, and August 2019, January, April, and October 2020, May and November 2021)	In-plume well
PEN-44-30I	TCE (February 2019 and October 2020, May and November 2021)	Plume edge well
PEN-44-33I	TCE (November 2021)	Plume edge well
PEN-44-42I	None	Sidegradient well
PEN-44-44I	None	Sidegradient well
PEN-44-45I	None	Downgradient well
PEN-44-46I	None	Downgradient well
Intermediate Zone II Wells		
PEN-44-28II	None	In-plume well
PEN-44-35II	TCE (November 2021)	In-plume well
PEN-44-36II	TCE (November 2018, February, and May 2019)	In-plume well
PEN-44-37II	TCE (November 2018, February, May, and August 2019, January, April, and October 2020, May 2021)	In-plume well
PEN-44-39II	TCE (November 2018, February, May, and August 2019, January, April, and October 2020, May and November 2021)	In-plume well
PEN-44-33II	None	Sidegradient well
PEN-44-42II	None	Sidegradient well
PEN-44-44II	None	Sidegradient well
PEN-44-45II	None	Sidegradient well
PEN-44-46II	None	Downgradient well
Deep Wells		
PEN-44-28D	None	In-plume well
PEN-44-46D	None	Downgradient well

During this five-year review period, the majority of TCE exceedances were detected at wells within the baseline plume boundary as defined in the ROD (i.e., in-plume wells), with limited exceedances in plume edge wells, and no exceedances in sidegradient, downgradient, or deep wells.

Based on monitoring results through 2021, 12 of the 39 on-site wells sampled (not including the two upgradient wells) had statistically significant decreasing trends, 16 wells had concentrations less than detection limits, and 11 wells had stable trends. The TCE daughter product cis-1,2-DCE was detected at low concentrations at 15 monitoring wells. The presence of cis-1,2-DCE indicates that dechlorination processes are active. The later stage daughter product vinyl chloride was not detected in any samples. Given the overall low concentrations of TCE and cis-DCE, vinyl chloride could be generated at concentrations less than detection or could be degrading in more aerobic pockets of the aquifer as it is generated. An assessment of natural attenuation parameter data indicated that the intermediate I, intermediate II, and deep aquifer zones are favorable for reductive dechlorination. The stratified geochemical conditions are conducive to degradation of TCE being transported in groundwater by a downward hydraulic

gradient.

Based on groundwater monitoring results to date, the TCE plume remains within the spatial bounds of the original site boundary as defined in the 2017 ROD, and concentrations have been stable or decreasing. Natural attenuation parameter results and the presence of the TCE daughter product cis-1,2-DCE indicate that aquifer conditions are favorable for natural attenuation and that natural attenuation of TCE is active.

10.3.3 Site Inspection

The inspection of the site was conducted on 14 April 2022 by Tetra Tech. The purpose of the inspection was to assess the protectiveness of the OU 19 remedy. No issues impacting the current or future protectiveness of the OU 19 remedy were identified during the inspection. Five-Year Review inspection checklists are included in Appendix E.

10.4 TECHNICAL ASSESSMENT

10.4.2 QUESTION A: Is the remedy functioning as intended by the decision documents?

The results of the Five-Year Review indicate that the OU 19 remedy is functioning as intended by the ROD. The remedial actions are being implemented as designed and include measures that prevent exposure. The OU 19 remedial actions that have been completed (soil excavation and LUC implementation) and that are ongoing (groundwater monitoring) are operating as designed and meet the RAOs. Ongoing LUC inspections and groundwater monitoring confirm the continued effectiveness of the remedy. Based on the completed and ongoing activities, the intent and goals of the OU 19 ROD have been or will be met, and there are no deficiencies or early indicators of potential remedy failure.

10.4.3 QUESTION B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?

There have been no changes in physical conditions, exposure pathways, or land use that would affect the protectiveness of the OU 19 remedy. The exposure assumptions, cleanup levels, toxicity data, and RAOs for the site used at the time of the remedy selection are still valid.

A PFAS PA was completed at NAS Pensacola in September 2021 and recommended that OU 19, Site 15 be evaluated further in a PFAS SI. Preliminary PFAS SI sampling results, as reported in the draft SI Report indicate exceedances of the May 2022 updated U.S. EPA tap water RSLs in groundwater at OU 19, and the SI Report recommends that OU 19, in combination with Former Fire Training Area 2, proceed to an RI for PFAS (Tetra Tech, 2022f).

<u>Vapor Intrusion</u>
PEN 44-11 has consistently had TCE groundwater concentrations greater than its default VISL for a commercial/industrial scenario. However, the building at OU 19 is an airplane maintenance hangar, which under typical physical and operating conditions has a significantly higher air exchange rate than what is used to derive the VISL. Typical operations in this building include open doors to facilitate air flow, the increasing the attenuation of any contaminants that would infiltrate the building from the subsurface. Hence, based on these factors, concentrations in

groundwater are not expected to be at levels that would result in unacceptable indoor air concentrations of TCE.

10.4.4 QUESTION C: Has any other information come to light that could call into question the protectiveness of the remedy?

No additional information has come to light that could call into question the protectiveness of the remedy. There are no newly identified human health or ecological risks, and there have been no impacts from weather-related events or natural disasters.

As a result of the effects of climate change, storm events have been increasing in magnitude with time. The Navy conducts annual LUC inspections that would identify any storm-related impacts that might impact protectiveness. If any such impacts are identified, the Navy will address the impacts as required to ensure continued protectiveness.

10.5 ISSUES/RECOMMENDATIONS

The following table summarizes the issues that affect current or future protectiveness and provides recommendations for future action.

OU 4	**Issue Category: Changed Site Conditions**			
	Issue: Groundwater sampling results exceed PFAS risk-based screening levels (U.S. EPA RSLs).			
	Recommendation: Complete an RI to refine the CSM and evaluate the magnitude and extent of PFAS. Implement appropriate follow-on actions in accordance with Navy Policy and CERCLA.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	Federal Facility Navy	EPA/State	11/20/2026

10.6 PROTECTIVENESS STATEMENT

Protectiveness Statement	
Operable Unit: 19	*Protectiveness Determination:* Short-term Protective
***Protectiveness Statement**: The selected remedy for OU 19 is protective of human health and the environment in the short term. Soil excavation and off-site disposal have been successful in preventing exposure to contaminants exceeding Industrial SCTLs in soil. LUCs prevent residential exposure to residual soil contamination and prevent exposure to groundwater contamination that could result in unacceptable risks until remedial goals are achieved. Groundwater monitoring results show that the TCE plume is stable and that natural attenuation process are active. The OU 19 remedial actions that have been completed (excavation and off-site disposal of contaminated soil and LUC implementation) and that are ongoing (groundwater monitoring) are operating as designed and meet the RAOs. Ongoing LUC inspections and groundwater monitoring confirm the continued effectiveness of the remedy. Based on the completed and ongoing activities, the intent and goals of the OU 19 ROD have been or will be*	

met. However, because OU 19 groundwater PFAS sample results exceed CERCLA risk-based screening levels, an RI is recommended to refine the CSM and nature and extent. Thereafter, appropriate follow-on actions should be implemented in accordance with Navy policy and CERCLA guidance.

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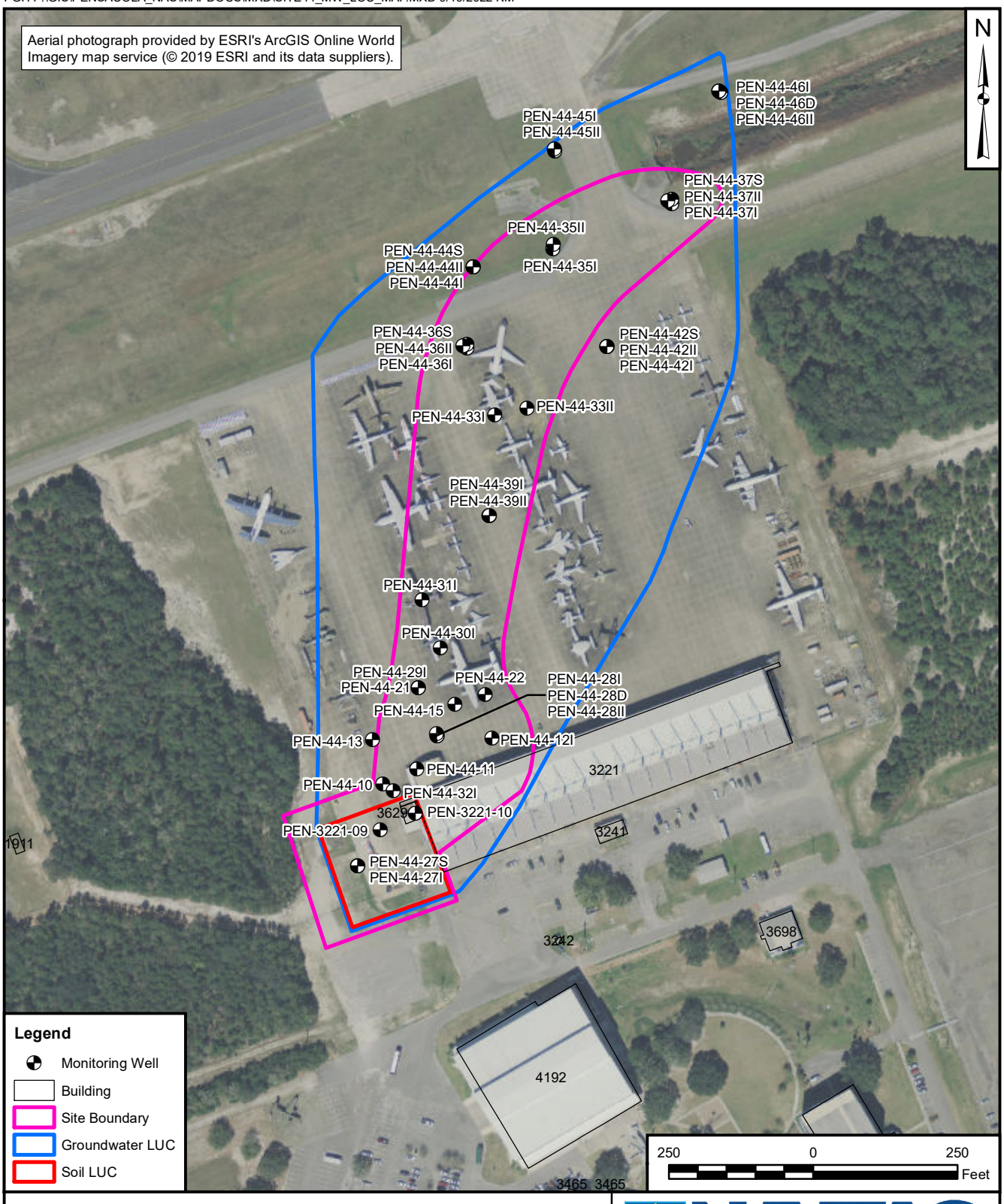

OU 19 SITE 44 LAYOUT
NAVAL AIR STATION PENSACOLA
PENSACOLA, FLORIDA

NAVFAC
Naval Facilities Engineering Systems Command

DRAWN BY	DATE	CTO
K. MOORE	09/06/22	N6945021F0538
CHECKED BY	DATE	FIGURE NUMBER
R. MILLER	09/16/22	10-1

11.0 NEXT REVIEW

The next five-year review, which will be conducted pursuant to CERCLA using U.S. EPA and Navy five-year review guidance, will be due within 5 years of the signature date on the cover of this Five-Year Review Report. The Navy will be responsible for completing the next five-year review, planning and development of which should begin at least 18 months prior to the due date to that ensure statutory deadlines are met.

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NAVFAC, 2008b. Remedial Design for Land Use Controls and Groundwater Monitoring at Operable Unit 13, Site 8 – Rifle Range Disposal Area and Site 24 – DDT Mixing Area, NAS Pensacola, Pensacola, Florida. 21 August.

NAVFAC, 2008c. Record of Decision, Operable Unit 2, Naval Air Station Pensacola, Pensacola, Florida. 19 September.

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APPENDIX B–LAND USE CONTROL DOCUMENTATION

DEPARTMENT OF THE NAVY
NAVAL AIR STATION PENSACOLA
150 HASE ROAD SUITE-A
PENSACOLA, FL 32508-1051

5090
Ser N4/0006
January 5, 2018

Florida Department of Environmental Protection
Mr. David Grabka, Waste Cleanup Program
Bob Martinez Center
2600 Blair Stone Road MS 4535
Tallahassee, FL 32399-2400

Dear Mr. Grabka:

SUBJECT: 2017 ANNUAL LAND USE CONTROL REPORT – NAVAL AIR STATION, PENSACOLA, FLORIDA

Naval Air Station Pensacola (NASP) hereby certifies that the institutional and land use controls (LUCs) for Operable Units 1, 2, 4, 11, 13, and 18 (NASP), and Underground Storage Tank Site 1120 (Bronson Field) as outlined in the LUC Memorandum of Agreement of September 1999 are still in effect and should remain in place. The 2017 Annual LUC Compliance Certificates are enclosed for your records.

If any further information is needed, please contact me at (850) 452-3131 ext. 3003, or via email at mark.w.gibson@navy.mil.

Sincerely,

Mark W. Gibson

MARK W. GIBSON
Environmental Director
By direction of the
Commanding Officer

Enclosures: 2017 Annual LUC Compliance Certificates

Copy to: NASP Admin

Site 1 (OU 1) Annual LUC Compliance Certificate

Naval Air Station Pensacola
FL9170024567

Property Owner: NAVAL AIR STATION PENSACOLA

Property Address: NAS PENSACOLA - PENSACOLA, FLORIDA

Is evaluation for all or a portion of the OU 1 property? ALL
If evaluating only a portion of the site, attach a figure identifying the portion being evaluated.

This evaluation covers the period from **1 January** 2017 **through 31 December** 2017
Form shall be submitted by **1 March** of the year following the reporting period.

Certification Checklist

	In Compliance	Non-Compliance	See Comment
1) Limit intrusive activities within the landfill boundary without prior approval from NAS Pensacola Environmental Office	☑	☐	☐
2) Restrict use of groundwater use of the surficial zone of the Sand-and-Gravel Aquifer within 300 feet of the site	☑	☐	☐

I, the undersigned, herby certify that I am an authorized representative of the above named property owner and that the above described Land Use Controls have been complied with for the period noted. Alternately, any known deficiencies and owner's completed or planned actions to address such deficiencies are described in the attached Explanation of Deficiency(ies).

Mark W. Gibson — 12 DEC 2017

Signature – ~~Greg Campbell~~ (Navy) GIBSON, Mark — Date

Signature – Patty Whittemore (Navy) — Date

Signature — Date

Signature — Date

Sites 11, 12, 25, 26 27. & 30 (OU 2) Annual LUC Compliance Certificate

Naval Air Station Pensacola
FL9170024567

Property Owner: NAVAL AIR STATION PENSACOLA

Property Address: NAS PENSACOLA - PENSACOLA, FLORIDA

Is evaluation for all or a portion of the OU 2 property? ALL
If evaluating only a portion of the site, attach a figure identifying the portion being evaluated.

This evaluation covers the period from **1 January** 2017 **through 31 December** 2017
Form shall be submitted by **1 March** of the year following the reporting period.

Certification Checklist

	In Compliance	Non-Compliance	See Comment
1) Prohibit reuse of the site for residential uses including, but not limited to, any form of housing, child-care facilities, any kind of school including preschools, elementary schools, and secondary schools, playgrounds, and adult convalescent or nursing care facilities.	☑	☐	☐
2) Prohibit the excavation, disturbance, and removal of soil unless prior written approval is obtained from the facility's environmental coordinator.	☑	☐	☐
3) Prohibit potable uses of groundwater from the surficial aquifer underlying the site, including, but not limited to, drinking, washing, cooking, cleaning, and turf irrigation, without prior written approval from the Navy, USEPA, and FDEP.	☑	☐	☐
4) Prevent unacceptable occupational exposure to contaminated groundwater in the surficial aquifer by requiring the use of personal protective equipment (PPE) and monitoring equipment for excavations that may encounter groundwater.	☑	☐	☐
5) Maintain the integrity of any existing or future monitoring or remediation system(s	☑	☐	☐

I, the undersigned, herby certify that I am an authorized representative of the above named property owner and that the above described Land Use Controls have been complied with for the period noted. Alternately, any known deficiencies and owner's completed or planned actions to address such deficiencies are described in the attached Explanation of Deficiency(ies).

Mark W. Gibson — Signature – (Navy)

12 DEC 2017 — Date

_____ — Signature – (Navy)

_____ — Date

_____ — Signature

_____ — Date

_____ — Signature

_____ — Date

Mail completed form(s) to:

U.S. Environmental Protection Agency
Region 4
Waste Management Division, Federal Facilities Branch.
61 Forsyth Street
Atlanta, GA 30303

Florida Dept of Environmental Protection
Division of Waste Management
Twin Towers Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Commanding Officer
Naval Facilities Engineering Command, Southeast
Attn: Director, Environmental Restoration Division
PO Box 190010
North Charleston, SC 29419-9010

Site 15 (OU 4) Annual LUC Compliance Certificate

Naval Air Station Pensacola
FL9170024567

Property Owner: NAVAL AIR STATION PENSACOLA

Property Address: NAS PENSACOLA - PENSACOLA, FLORIDA

Is evaluation for all or a portion of the OU 4 property? ALL
If evaluating only a portion of the site, attach a figure identifying the portion being evaluated.

This evaluation covers the period from **1 January** 2017 **through 31 December** 2017
Form shall be submitted by **1 March** of the year following the reporting period.

Certification Checklist

	In Compliance	Non-Compliance	See Comment
1) Restrict use of groundwater from the surficial zone of the Sand-and-Gravel Aquifer within 300 feet of the site.	☑	☐	☐
2) Restrict site use to industrial.	☑	☐	☐

I, the undersigned, herby certify that I am an authorized representative of the above named property owner and that the above described Land Use Controls have been complied with for the period noted. Alternately, any known deficiencies and owner's completed or planned actions to address such deficiencies are described in the attached Explanation of Deficiency(ies).

Mark W. Gibson — Signature – (Navy)

12 Dec 2017 — Date

_____ — Signature – (Navy)

_____ — Date

_____ — Signature

_____ — Date

_____ — Signature

_____ — Date

Site 38 (OU 11) Annual LUC Compliance Certificate

Naval Air Station Pensacola
FL9170024567

Property Owner: NAVAL AIR STATION PENSACOLA

Property Address: NAS PENSACOLA - PENSACOLA, FLORIDA

Is evaluation for all or a portion of the OU 11 property? ALL
If evaluating only a portion of the site, attach a figure identifying the portion being evaluated.

This evaluation covers the period from **1 January** 2017 **through 31 December** 2017
Form shall be submitted by **1 March** of the year following the reporting period.

Certification Checklist

	In Compliance	Non-Compliance	See Comment
1) Prevent residential use at Site 38	☑	☐	☐
2) Restrict future uses of the surficial aquifer until the levels of contamination in the groundwater meet the State of Florida's Groundwater Cleanup Target Levels (GCTLs) in 62-777.	☑	☐	☐

I, the undersigned, herby certify that I am an authorized representative of the above named property owner and that the above described Land Use Controls have been complied with for the period noted. Alternately, any known deficiencies and owner's completed or planned actions to address such deficiencies are described in the attached Explanation of Deficiency(ies).

Mark W. Gibson — 12 Dec 2017
Signature – (Navy) — Date

Signature - (Navy) — Date

Signature — Date

Signature — Date

Sites 8 and 24 (OU 13) Annual LUC Compliance Certificate

Naval Air Station Pensacola
FL9170024567

Property Owner: NAVAL AIR STATION PENSACOLA

Property Address: NAS PENSACOLA - PENSACOLA, FLORIDA

Is evaluation for all or a portion of the OU 13 property? ALL
If evaluating only a portion of the site, attach a figure identifying the portion being evaluated.

This evaluation covers the period from **1 January** 2017 **through 31 December** 2017.
Form shall be submitted by **1 March** of the year following the reporting period.

Certification Checklist

	In Compliance	Non-Compliance	See Comment
1) No groundwater being used for any purpose (unless previously approved by USEPA, FDEP, and the Navy).	☑	☐	☐
2) No tampering or damage to groundwater monitoring wells or remediation system(s).	☑	☐	☐
3) Any violations of these LUCs were reported within 10 days of discovery and an explanation provided of those actions taken or to be taken was provided within 10 days of notification.	☑	☐	☐

I, the undersigned, herby certify that I am an authorized representative of the above named property owner and that the above described Land Use Controls have been complied with for the period noted. Alternately, any known deficiencies and owner's completed or planned actions to address such deficiencies are described in the attached Explanation of Deficiency(ies).

Mark W. Gibson — Signature – (Navy)

12 DEC 2017 — Date

_____ Signature – (Navy)

_____ Date

_____ Signature

_____ Date

_____ Signature

_____ Date

Site 43 (OU 18) Annual LUC Compliance Certificate

Naval Air Station Pensacola
FL9170024567

Property Owner: NAVAL AIR STATION PENSACOLA

Property Address: NAS PENSACOLA - PENSACOLA, FLORIDA

Is evaluation for all or a portion of the OU 18 property? ALL
If evaluating only a portion of the site, attach a figure identifying the portion being evaluated.

This evaluation covers the period from **1 January** 2017 **through 31 December** 2017

Certification Checklist

	In Compliance	Non-Compliance	See Comment
1) Restrict future use of the Site to non-residential land uses unless prior written approval is obtained from the USEPA and FDEP. Non-residential land use restrictions will prohibit residential or residential-like uses including, but not limited to, any form of housing, any kind of school (including pre-schools, elementary schools, and secondary schools), child care facilities, playgrounds, and adult convalescent or nursing care facilities.	☑	☐	☐
2) Prohibit any excavation or other disturbances of existing areas with contaminated surface and subsurface soils (exceeding residential Soil Cleanup Target Levels (SCTLs) at the site unless written approval is obtained from USEPA and FDEP.	☑	☐	☐
3) Maintain the integrity of the 40,000-square-foot parking lot on the site.	☑	☐	☐
4) Prohibit all uses of groundwater from the surficial aquifer underlying the Site including, but not limited to , human consumption, dewatering, irrigation, heating /cooling purposes, and industrial processes at the Site unless prior written approval is obtained from the USEPA and FDEP.	☑	☐	☐
5) Maintain the integrity of all existing or future monitoring and on-site remedy components at the site.	☑	☐	☐
6) warning signs posted and maintained approximately every 500 feet along the Site boundary	☑	☐	☐

I, the undersigned, herby certify that I am an authorized representative of the above named property owner and that the above described Land Use Controls have been complied with for the period noted. Alternately, any known deficiencies and owner's completed or planned actions to address such deficiencies are described in the attached Explanation of Deficiency(ies).

Mark W. Gibson — 12 DEC 2017

Signature – (Navy) — Date

Signature – (Navy) — Date

Signature — Date

Signature — Date

Site 1 (OU 1) Annual LUC Compliance Certificate

Naval Air Station Pensacola
FL9170024567

Property Owner: NAVAL AIR STATION PENSACOLA

Property Address: NAS PENSACOLA - PENSACOLA, FLORIDA

Is evaluation for all or a portion of the OU 1 property? ALL
If evaluating only a portion of the site, attach a figure identifying the portion being evaluated.

This evaluation covers the period from **1 January 2018 through 31 December 2018.**
Form shall be submitted by **1 March** of the year following the reporting period.

Certification Checklist

	In Compliance	Non-Compliance	See Comment
1) Limit intrusive activities within the landfill boundary without prior approval from NAS Pensacola Environmental Office	☒	☐	☐
2) Restrict use of groundwater use of the surficial zone of the Sand-and-Gravel Aquifer within 300 feet of the site	☒	☐	☐

I, the undersigned, herby certify that I am an authorized representative of the above named property owner and that the above described Land Use Controls have been complied with for the period noted. Alternately, any known deficiencies and owner's completed or planned actions to address such deficiencies are described in the attached Explanation of Deficiency(ies).

Mark W. Gibson — 14 November 2018

Signature – Mark Gibson (Navy) — Date

_____ _____

Signature – Patty Whittemore (Navy) — Date

_____ _____

Signature — Date

_____ _____

Signature — Date

Sites 11, 12, 25, 26 27. & 30 (OU 2) Annual LUC Compliance Certificate

Naval Air Station Pensacola
FL9170024567

Property Owner: NAVAL AIR STATION PENSACOLA

Property Address: NAS PENSACOLA - PENSACOLA, FLORIDA

Is evaluation for all or a portion of the OU 2 property? ALL
If evaluating only a portion of the site, attach a figure identifying the portion being evaluated.

This evaluation covers the period from **1 January 2018 through 31 December 2018**.
Form shall be submitted by **1 March** of the year following the reporting period.

Certification Checklist

	In Compliance	Non-Compliance	See Comment
1) Prohibit reuse of the site for residential uses including, but not limited to, any form of housing, child-care facilities, any kind of school including preschools, elementary schools, and secondary schools, playgrounds, and adult convalescent or nursing care facilities.	☒	☐	☐
2) Prohibit the excavation, disturbance, and removal of soil unless prior written approval is obtained from the facility's environmental coordinator.	☒	☐	☐
3) Prohibit potable uses of groundwater from the surficial aquifer underlying the site, including, but not limited to, drinking, washing, cooking, cleaning, and turf irrigation, without prior written approval from the Navy, USEPA, and FDEP.	☒	☐	☐
4) Prevent unacceptable occupational exposure to contaminated groundwater in the surficial aquifer by requiring the use of personal protective equipment (PPE) and monitoring equipment for excavations that may encounter groundwater.	☒	☐	☐
5) Maintain the integrity of any existing or future monitoring or remediation system(s	☒	☐	☐

I, the undersigned, herby certify that I am an authorized representative of the above named property owner and that the above described Land Use Controls have been complied with for the period noted. Alternately, any known deficiencies and owner's completed or planned actions to address such deficiencies are described in the attached Explanation of Deficiency(ies).

Mark W. Gibson	14 November 2018
Signature – Mark Gibson (Navy)	Date
Signature – Patty Whittemore (Navy)	Date
Signature	Date
Signature	Date

Mail completed form(s) to:

U.S. Environmental Protection Agency
Region 4
Waste Management Division, Federal Facilities Branch.
61 Forsyth Street
Atlanta, GA 30303

Florida Dept of Environmental Protection
Division of Waste Management
Twin Towers Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Commanding Officer
Naval Facilities Engineering Command, Southeast
Attn: Director, Environmental Restoration Division
PO Box 190010
North Charleston, SC 29419-9010

Site 15 (OU 4) Annual LUC Compliance Certificate

Naval Air Station Pensacola
FL9170024567

Property Owner: NAVAL AIR STATION PENSACOLA

Property Address: NAS PENSACOLA - PENSACOLA, FLORIDA

Is evaluation for all or a portion of the OU 4 property? ALL
If evaluating only a portion of the site, attach a figure identifying the portion being evaluated.

This evaluation covers the period from **1 January 2018 through 31 December 2018**.
Form shall be submitted by **1 March** of the year following the reporting period.

Certification Checklist

	In Compliance	Non-Compliance	See Comment
1) Restrict use of groundwater from the surficial zone of the Sand-and-Gravel Aquifer within 300 feet of the site.	☒	☐	☐
2) Restrict site use to industrial.	☒	☐	☐

I, the undersigned, herby certify that I am an authorized representative of the above named property owner and that the above described Land Use Controls have been complied with for the period noted. Alternately, any known deficiencies and owner's completed or planned actions to address such deficiencies are described in the attached Explanation of Deficiency(ies).

Mark W. Gibson — 14 November 2018

Signature – Mark Gibson (Navy) — Date

Signature – Patty Whittemore (Navy) — Date

Signature — Date

Signature — Date

Site 38 (OU 11) Annual LUC Compliance Certificate

Naval Air Station Pensacola
FL9170024567

Property Owner: NAVAL AIR STATION PENSACOLA

Property Address: NAS PENSACOLA - PENSACOLA, FLORIDA

Is evaluation for all or a portion of the OU 11 property? ALL
If evaluating only a portion of the site, attach a figure identifying the portion being evaluated.

This evaluation covers the period from **1 January 2018 through 31 December 2018**.
Form shall be submitted by **1 March** of the year following the reporting period.

Certification Checklist

	In Compliance	Non-Compliance	See Comment
1) Prevent residential use at Site 38	☒	☐	☐
2) Restrict future uses of the surficial aquifer until the levels of contamination in the groundwater meet the State of Florida's Groundwater Cleanup Target Levels (GCTLs) in 62-777.	☒	☐	☐

I, the undersigned, herby certify that I am an authorized representative of the above named property owner and that the above described Land Use Controls have been complied with for the period noted. Alternately, any known deficiencies and owner's completed or planned actions to address such deficiencies are described in the attached Explanation of Deficiency(ies).

Mark W. Gibson — 14 November 2018

Signature – Mark Gibson (Navy) — Date

_____ — _____

Signature – Patty Whittemore (Navy) — Date

_____ — _____

Signature — Date

_____ — _____

Signature — Date

Sites 8 and 24 (OU 13) Annual LUC Compliance Certificate

Naval Air Station Pensacola
FL9170024567

Property Owner: NAVAL AIR STATION PENSACOLA

Property Address: NAS PENSACOLA - PENSACOLA, FLORIDA

Is evaluation for all or a portion of the OU 13 property? ALL
If evaluating only a portion of the site, attach a figure identifying the portion being evaluated.

This evaluation covers the period from **1 January 2018 through 31 December 2018**.
Form shall be submitted by **1 March** of the year following the reporting period.

Certification Checklist

	In Compliance	Non-Compliance	See Comment
1) No groundwater being used for any purpose (unless previously approved by USEPA, FDEP, and the Navy).	☒	☐	☐
2) No tampering or damage to groundwater monitoring wells or remediation system(s).	☒	☐	☐
3) Any violations of these LUCs were reported within 10 days of discovery and an explanation provided of those actions taken or to be taken was provided within 10 days of notification.	☒	☐	☐

I, the undersigned, herby certify that I am an authorized representative of the above named property owner and that the above described Land Use Controls have been complied with for the period noted. Alternately, any known deficiencies and owner's completed or planned actions to address such deficiencies are described in the attached Explanation of Deficiency(ies).

Mark W. Gibson — 14 November 2018

Signature – Mark Gibson (Navy) — Date

Signature – Patty Whittemore (Navy) — Date

Signature — Date

Signature — Date

Sites 43 (OU 18) Annual LUC Compliance Certificate

Naval Air Station Pensacola
FL9170024567

Property Owner: NAVAL AIR STATION PENSACOLA

Property Address: NAS PENSACOLA - PENSACOLA, FLORIDA

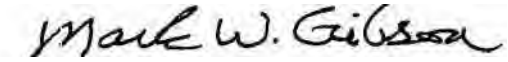
Is evaluation for all or a portion of the OU 18 property? _____
If evaluating only a portion of the site, attach a figure identifying the portion being evaluated.

This evaluation covers the period from **1 January 2018 through 31 December 2018**.

Certification Checklist

	In Compliance	Non-Compliance	See Comment
1) Restrict future use of the Site to non-residential land uses unless prior written approval is obtained from the USEPA and FDEP. Non-residential land use restrictions will prohibit residential or residential-like uses including, but not limited to, any form of housing, any kind of school (including pre-schools, elementary schools, and secondary schools), child care facilities, playgrounds, and adult convalescent or nursing care facilities.	☒	☐	☐
2) Prohibit any excavation or other disturbances of existing areas with contaminated surface and subsurface soils (exceeding residential Soil Cleanup Target Levels (SCTLs) at the site unless written approval is obtained from USEPA and FDEP.	☒	☐	☐
3) Maintain the integrity of the 40,000-square-foot parking lot on the site.	☒	☐	☐
4) Prohibit all uses of groundwater from the surficial aquifer underlying the Site including, but not limited to , human consumption, dewatering, irrigation, heating /cooling purposes, and industrial processes at the Site unless prior written approval is obtained from the USEPA and FDEP.	☒	☐	☐
5) Maintain the integrity of all existing or future monitoring and on-site remedy components at the site.	☒	☐	☐
6) warning signs posted and maintained approximately every 500 feet along the Site boundary	☐	☐	☒ Additional signs will be installed

I, the undersigned, herby certify that I am an authorized representative of the above named property owner and that the above described Land Use Controls have been complied with for the period noted. Alternately, any known deficiencies and owner's completed or planned actions to address such deficiencies are described in the attached Explanation of Deficiency(ies).



14 November 2018

Signature – Mark Gibson (Navy) Date

Signature – Patty Whittemore (Navy) Date

Signature Date

Signature Date

Site 44 Annual LUC Compliance Certificate

Naval Air Station Pensacola
FL9170024567

Property Owner: NAVAL AIR STATION PENSACOLA

Property Address: NAS PENSACOLA, PENSACOLA FLORIDA

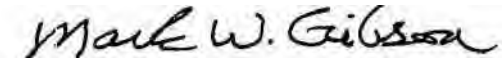
Is evaluation for all or a portion of the Site 44 property? ALL
If evaluating only a portion of the site, attach a figure identifying the portion being evaluated.

This evaluation covers the period from **1 January 2018 through 31 December 2018.**
Form shall be submitted by **1 March** of the year following the reporting period.

Certification Checklist

	In Compliance	Non-Compliance	See Comment
1) No residential use of site, including but not limited to any form of housing, child-care facilities, preschools, elementary schools, secondary schools, playgrounds, convalescent or nursing care facilities (unless previously approved by USEPA and FDEP).	[X]	☐	☐
2) No unauthorized excavation, and/or removal of soil with contaminant concentrations exceeding FDEP residential SCTLs. (unless previously approved by USEPA and FDEP).	[X]	☐	☐
3) No use of groundwater from the surficial aquifer underlying Site 44, including, but not limited to, human consumption, dewatering, irrigation, heating/cooling purposes, and industrial processes (unless prior written approved is obtained from the Navy, USEPA and FDEP).	[X]	☐	☐
4) Maintain the integrity of any existing or future monitoring or remediation systems (unless prior written approved is obtained from the Navy, USEPA and FDEP).	[X]	☐	☐

I, the undersigned, hereby certify that I am an authorized representative of the above named property owner and that the above described Land Use Controls have been complied with for the period noted. Alternately, any known deficiencies and owner's completed or planned actions to address such deficiencies are described in the attached Explanation of Deficiency(ies).



Signature - Mark Gibson (Navy)

14 November 2018

Date

Signature - Patty Whittemore (Navy)

Date

Signature

Date

Mail completed form(s) to:
United States
Environmental Protection
Agency
Region 4
Attn: NAS Pensacola
RPM Waste Management
Division 61 Forsyth Street,
Southwest Atlanta, GA
30303-8909

Florida Dept of Environmental
Protection
Division of Waste Management
Bureau of Waste Cleanup
Federal Programs Section
Attn: NAS Pensacola RPM, MS 4535
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Commanding Officer
Naval Facilities
Engineering
Command, Southeast
Attn: Director,
Environmental
Restoration Division
NAS Jacksonville
Building 903
Jacksonville, FL 32212-
0030

DEPARTMENT OF THE NAVY
NAVAL AIR STATION PENSACOLA
150 HASE ROAD SUITE-A
PENSACOLA, FL 32508-1051

5090
Ser N00/0003
29 Jan 20

David Grabka
Florida Dept. of Environmental Protection
Bob Martinez Center
2600 Blair Stone Road
Tallahassee, FL 32399-2400

REC'D FEB 4 2020

Dear Mr. Grabka:

SUBJECT: 2019 ANNUAL LAND USE CONTROL REPORT – NAVAL AIR STATION, PENSACOLA, FLORIDA

Naval Air Station Pensacola (NASP) hereby certifies that the Land Use Controls (LUCs) for Operable Units 1, 4, and 10 as outlined in the LUC Memorandum of Agreement of September 1999 and for Operable Units 2, 11, 13, 18, and 19, as outlined in the individual Land Use Control Remedial Designs (LUC RDs), are still in effect and should remain in place. The 2019 Annual LUC Compliance Certificates are enclosed for your records.

In addition, NASP hereby certifies that the LUCs for TACAN Building 1917, UST Site 1120, and UST Site 108, Building 3644 as outlined in the individual Land Use Control Implementation Plans and the Florida Department of Environmental Protection's Site Rehabilitation Completion Orders are still in effect and should remain in place. The 2019 Annual LUC Compliance Certificates are enclosed for your records.

If you have any questions, please contact Anna Evans, NASP Installation Restoration Program Manager. She can be reached at (850) 452-2010, or via e-mail: anna.evans.ctr@navy.mil.

Sincerely,

T. F. KINSELLA, JR
Captain, U.S. Navy
Commanding Officer

Enclosure: 2019 Annual LUC Compliance Certificates

Copy to: NASP Admin

Site 1 (OU 1) Annual LUC Compliance Certificate

Naval Air Station Pensacola
FL9170024567

Property Owner: NAVAL AIR STATION PENSACOLA

Property Address: NAS PENSACOLA - PENSACOLA, FLORIDA

Is evaluation for all or a portion of the OU 1 property? ALL
If evaluating only a portion of the site, attach a figure identifying the portion being evaluated.

This evaluation covers the period from **1 January 2019 through 31 December 2019.**
Form shall be submitted by **1 March** of the year following the reporting period.

Certification Checklist

	In Compliance	Non-Compliance	See Comment
1) Limit intrusive activities within the landfill boundary without prior approval from NAS Pensacola Environmental Office	☒	☐	☐
2) Restrict use of groundwater use of the surficial zone of the Sand-and-Gravel Aquifer within 300 feet of the site	☒	☐	☐

I, the undersigned, herby certify that I am an authorized representative of the above named property owner and that the above described Land Use Controls have been complied with for the period noted. Alternately, any known deficiencies and owner's completed or planned actions to address such deficiencies are described in the attached Explanation of Deficiency(ies).

Signature – Michael Hardy (Navy) — Date: 11/14/19

Signature FDEP — Date: 11/13/19

Signature — Date

Signature — Date

Sites 11, 12, 25, 26 27. & 30 (OU 2) Annual LUC Compliance Certificate

Naval Air Station Pensacola
FL9170024567

Property Owner: NAVAL AIR STATION PENSACOLA

Property Address: NAS PENSACOLA - PENSACOLA, FLORIDA

Is evaluation for all or a portion of the OU 2 property? ALL
If evaluating only a portion of the site, attach a figure identifying the portion being evaluated.

This evaluation covers the period from **1 January 2019 through 31 December 2019**.
Form shall be submitted by **1 March** of the year following the reporting period.

Certification Checklist

	In Compliance	Non-Compliance	See Comment
1) Prohibit reuse of the site for residential uses including, but not limited to, any form of housing, child-care facilities, any kind of school including preschools, elementary schools, and secondary schools, playgrounds, and adult convalescent or nursing care facilities.	☒	☐	☐
2) Prohibit the excavation, disturbance, and removal of soil unless prior written approval is obtained from the facility's environmental coordinator.	☒	☐	☐
3) Prohibit potable uses of groundwater from the surficial aquifer underlying the site, including, but not limited to, drinking, washing, cooking, cleaning, and turf irrigation, without prior written approval from the Navy, USEPA, and FDEP.	☒	☐	☐
4) Prevent unacceptable occupational exposure to contaminated groundwater in the surficial aquifer by requiring the use of personal protective equipment (PPE) and monitoring equipment for excavations that may encounter groundwater.	☒	☐	☐
5) Maintain the integrity of any existing or future monitoring or remediation system(s	☒	☐	☐

I, the undersigned, herby certify that I am an authorized representative of the above named property owner and that the above described Land Use Controls have been complied with for the period noted. Alternately, any known deficiencies and owner's completed or planned actions to address such deficiencies are described in the attached Explanation of Deficiency(ies).

Signature – Michael Hardy (Navy) — Date 11/14/19

Signature FDEP — Date 11/13/19

Signature — Date

Signature — Date

Mail completed form(s) to:

U.S. Environmental Protection Agency
Region 4
Waste Management Division, Federal Facilities Branch.
61 Forsyth Street
Atlanta, GA 30303

Florida Dept of Environmental Protection
Division of Waste Management
Twin Towers Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Commanding Officer
Naval Facilities Engineering Command, Southeast
Attn: Director, Environmental Restoration Division
PO Box 190010
North Charleston, SC 29419-9010

Site 15 (OU 4) Annual LUC Compliance Certificate

Naval Air Station Pensacola
FL9170024567

Property Owner: NAVAL AIR STATION PENSACOLA

Property Address: NAS PENSACOLA - PENSACOLA, FLORIDA

Is evaluation for all or a portion of the OU 4 property? ALL
If evaluating only a portion of the site, attach a figure identifying the portion being evaluated.

This evaluation covers the period from **1 January 2019 through 31 December 2019.**
Form shall be submitted by **1 March** of the year following the reporting period.

Certification Checklist

	In Compliance	Non-Compliance	See Comment
1) Restrict use of groundwater from the surficial zone of the Sand-and-Gravel Aquifer within 300 feet of the site.	☒	☐	☐
2) Restrict site use to industrial.	☒	☐	☐

I, the undersigned, herby certify that I am an authorized representative of the above named property owner and that the above described Land Use Controls have been complied with for the period noted. Alternately, any known deficiencies and owner's completed or planned actions to address such deficiencies are described in the attached Explanation of Deficiency(ies).

Signature – Michael Hardy (Navy) — Date: 11/14/19

Signature FDEP — Date: 11/13/19

Signature — Date

Signature — Date

Site 38 (OU 11) Annual LUC Compliance Certificate

Naval Air Station Pensacola
FL9170024567

Property Owner: NAVAL AIR STATION PENSACOLA

Property Address: NAS PENSACOLA - PENSACOLA, FLORIDA

Is evaluation for all or a portion of the OU 11 property? ALL
If evaluating only a portion of the site, attach a figure identifying the portion being evaluated.

This evaluation covers the period from **1 January 2019 through 31 December 2019**.
Form shall be submitted by **1 March** of the year following the reporting period.

Certification Checklist

	In Compliance	Non-Compliance	See Comment
1) Prevent residential use at Site 38	☒	☐	☐
2) Restrict future uses of the surficial aquifer until the levels of contamination in the groundwater meet the State of Florida's Groundwater Cleanup Target Levels (GCTLs) in 62-777.	☒	☐	☐

I, the undersigned, herby certify that I am an authorized representative of the above named property owner and that the above described Land Use Controls have been complied with for the period noted. Alternately, any known deficiencies and owner's completed or planned actions to address such deficiencies are described in the attached Explanation of Deficiency(ies).

Michael A Hardy — Signature – Michael Hardy (Navy)

11/14/19 — Date

Signature — Date

Signature — Date

Signature — Date

Sites 8 and 24 (OU 13) Annual LUC Compliance Certificate

Naval Air Station Pensacola
FL9170024567

Property Owner: NAVAL AIR STATION PENSACOLA

Property Address: NAS PENSACOLA - PENSACOLA, FLORIDA

Is evaluation for all or a portion of the OU 13 property? ALL
If evaluating only a portion of the site, attach a figure identifying the portion being evaluated.

This evaluation covers the period from **1 January 2019 through 31 December 2019**.
Form shall be submitted by **1 March** of the year following the reporting period.

Certification Checklist

	In Compliance	Non-Compliance	See Comment
1) No groundwater being used for any purpose (unless previously approved by USEPA, FDEP, and the Navy).	☒	☐	☐
2) No tampering or damage to groundwater monitoring wells or remediation system(s).	☒	☐	☐
3) Any violations of these LUCs were reported within 10 days of discovery and an explanation provided of those actions taken or to be taken was provided within 10 days of notification.	☒	☐	☐

I, the undersigned, herby certify that I am an authorized representative of the above named property owner and that the above described Land Use Controls have been complied with for the period noted. Alternately, any known deficiencies and owner's completed or planned actions to address such deficiencies are described in the attached Explanation of Deficiency(ies).

Michael Hardy — Signature – Michael Hardy (Navy) — Date: 11/14/19

David P. Grabka FDEP — Signature — Date: 11/13/19

Signature — Date

Signature — Date

Sites 43 (OU 18) Annual LUC Compliance Certificate

Naval Air Station Pensacola
FL9170024567

Property Owner: NAVAL AIR STATION PENSACOLA

Property Address: NAS PENSACOLA - PENSACOLA, FLORIDA

Is evaluation for all or a portion of the OU 18 property? ALL
If evaluating only a portion of the site, attach a figure identifying the portion being evaluated.

This evaluation covers the period from **1 January 2019 through 31 December 2019**.

Certification Checklist

	In Compliance	Non-Compliance	See Comment
1) Restrict future use of the Site to non-residential land uses unless prior written approval is obtained from the USEPA and FDEP. Non-residential land use restrictions will prohibit residential or residential-like uses including, but not limited to, any form of housing, any kind of school (including pre-schools, elementary schools, and secondary schools), child care facilities, playgrounds, and adult convalescent or nursing care facilities.	☒	☐	☐
2) Prohibit any excavation or other disturbances of existing areas with contaminated surface and subsurface soils (exceeding residential Soil Cleanup Target Levels (SCTLs) at the site unless written approval is obtained from USEPA and FDEP.	☒	☐	☐
3) Maintain the integrity of the 40,000-square-foot parking lot on the site.	☒	☐	☐
4) Prohibit all uses of groundwater from the surficial aquifer underlying the Site including, but not limited to , human consumption, dewatering, irrigation, heating /cooling purposes, and industrial processes at the Site unless prior written approval is obtained from the USEPA and FDEP.	☒	☐	☐
5) Maintain the integrity of all existing or future monitoring and on-site remedy components at the site.	☒	☐	☐
6) warning signs posted and maintained approximately every 500 feet along the Site boundary	☒	☐	☐

I, the undersigned, herby certify that I am an authorized representative of the above named property owner and that the above described Land Use Controls have been complied with for the period noted. Alternately, any known deficiencies and owner's completed or planned actions to address such deficiencies are described in the attached Explanation of Deficiency(ies).

Michael Hardy — Signature – Michael Hardy (Navy) — 11/14/19 — Date

David P. Graham FDEP — Signature — 11/13/19 — Date

Signature — Date

Signature — Date

Site 44 Annual LUC Compliance Certificate

Naval Air Station Pensacola
FL9170024567

Property Owner: NAVAL AIR STATION PENSACOLA

Property Address: NAS PENSACOLA, PENSACOLA FLORIDA

Is evaluation for all or a portion of the Site 44 property? ALL
If evaluating only a portion of the site, attach a figure identifying the portion being evaluated.

This evaluation covers the period from **1 January 2019 through 31 December 2019.**
Form shall be submitted by **1 March** of the year following the reporting period.

Certification Checklist

	In Compliance	Non-Compliance	See Comment
1) No residential use of site, including but not limited to any form of housing, child-care facilities, preschools, elementary schools, secondary schools, playgrounds, convalescent or nursing care facilities (unless previously approved by USEPA and FDEP).	[X]	☐	☐
2) No unauthorized excavation, and/or removal of soil with contaminant concentrations exceeding FDEP residential SCTLs. (unless previously approved by USEPA and FDEP).	[X]	☐	☐
3) No use of groundwater from the surficial aquifer underlying Site 44, including, but not limited to, human consumption, dewatering, irrigation, heating/cooling purposes, and industrial processes (unless prior written approved is obtained from the Navy, USEPA and FDEP).	[X]	☐	☐
4) Maintain the integrity of any existing or future monitoring or remediation systems (unless prior written approved is obtained from the Navy, USEPA and FDEP).	[X]	☐	☐

I, the undersigned, hereby certify that I am an authorized representative of the above named property owner and that the above described Land Use Controls have been complied with for the period noted. Alternately, any known deficiencies and owner's completed or planned actions to address such deficiencies are described in the attached Explanation of Deficiency(ies).

Michael Hardy — Signature - Michael Hardy (Navy) — Date: 11/14/19

David P. Grabka FDEP — Signature — Date: 11/13/19

Signature — Date

Mail completed form(s) to:

United States Environmental Protection Agency
Region 4
Attn: NAS Pensacola RPM Waste Management Division 61 Forsyth Street, Southwest Atlanta, GA 30303-8909

Florida Dept of Environmental Protection
Division of Waste Management
Bureau of Waste Cleanup
Federal Programs Section
Attn: NAS Pensacola RPM, MS 4535
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Commanding Officer
Naval Facilities Engineering Command, Southeast
Attn: Director, Environmental Restoration Division
NAS Jacksonville
Building 903
Jacksonville, FL 32212-0030

Sites 32, 33 and 35 (OU 10) Annual LUC Compliance Certificate

Naval Air Station Pensacola
FL9170024567

Property Owner: NAVAL AIR STATION PENSACOLA

Property Address: NAS PENSACOLA - PENSACOLA, FLORIDA

Is evaluation for all or a portion of the OU 1 property? ALL
If evaluating only a portion of the site, attach a figure identifying the portion being evaluated.

This evaluation covers the period from **1 January 2019 through 31 December 2019**.
Form shall be submitted by **1 March** of the year following the reporting period.

Certification Checklist

	In Compliance	Non-Compliance	See Comment
1) Restrict use of groundwater use of the surficial zone of the Sand-and-Gravel Aquifer within 300 feet of the site	☒	☐	☐

I, the undersigned, herby certify that I am an authorized representative of the above named property owner and that the above described Land Use Controls have been complied with for the period noted. Alternately, any known deficiencies and owner's completed or planned actions to address such deficiencies are described in the attached Explanation of Deficiency(ies).

Signature – Michael Hardy (Navy) — Date 11/14/19

Signature FDEP — Date 11/14/19

Signature — Date

Signature — Date

DEPARTMENT OF THE NAVY
NAVAL AIR STATION PENSACOLA
150 HASE ROAD SUITE A
PENSACOLA, FLORIDA 32508-1051

5090
Ser N4/0074
February 25, 2021

Mr. Tim Woolheater
Senior Remedial Project Manager
U.S. EPA Region 4
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, GA 30303-8960

Dear Mr. Woolheater:

SUBJECT: 2020 ANNUAL LAND USE CONTROL REPORT – NAVAL AIR STATION PENSACOLA

Naval Air Station Pensacola (NASP) hereby certifies that the land use controls (LUCs) for Operable Units 1, 4, and 10 as outlined in the LUC Memorandum of Agreement of September 1999 and for Operable Units 2, 11, 13, 18, and 19 as outlined in the individual Land Use Control Remedial Designs, are still in effect and should remain in place. The 2020 Annual LUC Compliance Certificates are enclosed for your records.

If you have any questions, please contact Thomas Archie, NASP Installation Restoration Program Manager, (850) 452-2010, or via email at thomas.archie.ctr@navy.mil.

Sincerely,

T. F. KINSELLA, JR
Captain, U.S. Navy
Commanding Officer

Enclosure: 2020 Annual LUC Compliance Certificates

Copy to: NAVFAC SE DET PEN IEPD

Site 1 (OU 1) Annual LUC Compliance Certificate

Naval Air Station Pensacola
FL9170024567

Property Owner: NAVAL AIR STATION PENSACOLA

Property Address: NAS PENSACOLA - PENSACOLA, FLORIDA

Is evaluation for all or a portion of the OU 1 property? ALL
If evaluating only a portion of the site, attach a figure identifying the portion being evaluated.

This evaluation covers the period from **1 January 2020 through 31 December 2020.**
Form shall be submitted by **1 March** of the year following the reporting period.

Certification Checklist

	In Compliance	Non-Compliance	See Comment
1) Limit intrusive activities within the landfill boundary without prior approval from NAS Pensacola Environmental Office	☑	☐	☐
2) Restrict use of groundwater use of the surficial zone of the Sand-and-Gravel Aquifer within 300 feet of the site	☑	☐	☐

I, the undersigned, herby certify that I am an authorized representative of the above named property owner and that the above described Land Use Controls have been complied with for the period noted. Alternately, any known deficiencies and owner's completed or planned actions to address such deficiencies are described in the attached Explanation of Deficiency(ies).

ARCHIE.THOMAS.LEE.1048331552 Digitally signed by ARCHIE.THOMAS.LEE.1048331552 Date: 2021.01.29 13:52:55 -06'00' 1/29/2021

Signature Date

KEETHLER.MICHAEL.NEWTON.1077401977 Digitally signed by KEETHLER.MICHAEL.NEWTON.1077401977 Date: 2021.02.12 14:26:52 -06'00'

Signature Date

Signature Date

Signature Date

Mail completed form(s) to:

U.S. Environmental Protection Agency
Region 4
Waste Management Division,
Federal Facilities
Branch. Attn: Tim Woolheater
61 Forsyth Street
Atlanta, GA 30303

Florida Dept of Environmental Protection
Division of Waste Management
Bureau of Waste Cleanup
Federal Programs Section
Attn: NAS Pensacola RPM; Mr. David Grabka 2600 Blair Stone Road
Tallahassee, FL 32399-2400

Commanding Officer
Naval Facilities Engineering Command, Southeast
Attn: Environmental Restoration Division RPM; Mr. Chad Tripp
Building 903 Jacksonville, FL 32212-0030

Sites 11, 12, 25, 26 27. & 30 (OU 2) Annual LUC Compliance Certificate

Naval Air Station Pensacola
FL9170024567

Property Owner: NAVAL AIR STATION PENSACOLA

Property Address: NAS PENSACOLA - PENSACOLA, FLORIDA

Is evaluation for all or a portion of the OU 2 property? ALL
If evaluating only a portion of the site, attach a figure identifying the portion being evaluated.

This evaluation covers the period from **1 January 2020 through 31 December 2020**.
Form shall be submitted by **1 March** of the year following the reporting period.

Certification Checklist

	In Compliance	Non-Compliance	See Comment
1) Prohibit reuse of the site for residential uses including, but not limited to, any form of housing, child-care facilities, any kind of school including preschools, elementary schools, and secondary schools, playgrounds, and adult convalescent or nursing care facilities.	☑	☐	☐
2) Prohibit the excavation, disturbance, and removal of soil unless prior written approval is obtained from the facility's environmental coordinator.	☑	☐	☐
3) Prohibit potable uses of groundwater from the surficial aquifer underlying the site, including, but not limited to, drinking, washing, cooking, cleaning, and turf irrigation, without prior written approval from the Navy, USEPA, and FDEP.	☑	☐	☐
4) Prevent unacceptable occupational exposure to contaminated groundwater in the surficial aquifer by requiring the use of personal protective equipment (PPE) and monitoring equipment for excavations that may encounter groundwater.	☑	☐	☐
5) Maintain the integrity of any existing or future monitoring or remediation system(s	☑	☐	☐

I, the undersigned, herby certify that I am an authorized representative of the above named property owner and that the above described Land Use Controls have been complied with for the period noted.

Alternately, any known deficiencies and owner's completed or planned actions to address such deficiencies are described in the attached Explanation of Deficiency(ies).

ARCHIE.THOMAS.LEE.1048331552 Digitally signed by ARCHIE.THOMAS.LEE.1048331552 Date: 2021.01.29 13:54:24 -06'00' 1/29/21

Signature Date

KEETHLER.MICHAEL.NEWTON.1077401977 Digitally signed by KEETHLER.MICHAEL.NEWTON.1077401977 Date: 2021.02.12 14:29:27 -06'00'

Signature Date

Signature Date

Signature Date

Mail completed form(s) to:

U.S. Environmental Protection Agency
Region 4
Waste Management Division,
Federal Facilities
Branch. Attn: Tim Woolheater
61 Forsyth Street
Atlanta, GA 30303

Florida Dept of Environmental Protection
Division of Waste Management
Bureau of Waste Cleanup
Federal Programs Section
Attn: NAS Pensacola RPM; Mr. David Grabka 2600 Blair Stone Road
Tallahassee, FL 32399-2400

Commanding Officer
Naval Facilities Engineering Command, Southeast
Attn: Environmental Restoration Division RPM; Mr. Chad Tripp
Building 903 Jacksonville, FL 32212-0030

Site 15 (OU 4) Annual LUC Compliance Certificate

Naval Air Station Pensacola
FL9170024567

Property Owner: NAVAL AIR STATION PENSACOLA

Property Address: NAS PENSACOLA - PENSACOLA, FLORIDA

Is evaluation for all or a portion of the OU 4 property? ALL
If evaluating only a portion of the site, attach a figure identifying the portion being evaluated.

This evaluation covers the period from **1 January 2020 through 31 December 2020**.
Form shall be submitted by **1 March** of the year following the reporting period.

Certification Checklist

	In Compliance	Non-Compliance	See Comment
1) Restrict use of groundwater from the surficial zone of the Sand-and-Gravel Aquifer within 300 feet of the site.	☑	☐	☐
2) Restrict site use to industrial.	☑	☐	☐

I, the undersigned, herby certify that I am an authorized representative of the above named property owner and that the above described Land Use Controls have been complied with for the period noted. Alternately, any known deficiencies and owner's completed or planned actions to address such deficiencies are described in the attached Explanation of Deficiency(ies).

ARCHIE.THOMAS.LEE.1048331552 Digitally signed by ARCHIE.THOMAS.LEE.1048331552 Date: 2021.01.29 13:56:15 -06'00' 1/29/21

Signature Date

KEETHLER.MICHAEL.NEWTON.1077401977 Digitally signed by KEETHLER.MICHAEL.NEWTON.1077401977 Date: 2021.02.12 14:31:00 -06'00'

Signature Date

Signature Date

Signature Date

Mail completed form(s) to:

U.S. Environmental Protection Agency
Region 4
Waste Management Division,
Federal Facilities
Branch. Attn: Tim Woolheater
61 Forsyth Street
Atlanta, GA 30303

Florida Dept of Environmental Protection
Division of Waste Management
Bureau of Waste Cleanup
Federal Programs Section
Attn: NAS Pensacola RPM; Mr. David Grabka 2600 Blair Stone Road
Tallahassee, FL 32399-2400

Commanding Officer
Naval Facilities Engineering Command, Southeast
Attn: Environmental Restoration Division RPM; Mr. Chad Tripp
Building 903 Jacksonville, FL 32212-0030

Sites 32, 33 and 35 (OU 10) Annual LUC Compliance Certificate

Naval Air Station Pensacola
FL9170024567

Property Owner: NAVAL AIR STATION PENSACOLA

Property Address: NAS PENSACOLA - PENSACOLA, FLORIDA

Is evaluation for all or a portion of the OU 1 property? ALL
If evaluating only a portion of the site, attach a figure identifying the portion being evaluated.

This evaluation covers the period from **1 January 2020 through 31 December 2020.**
Form shall be submitted by **1 March** of the year following the reporting period.

Certification Checklist

	In Compliance	Non-Compliance	See Comment
1) Restrict use of groundwater use of the surficial zone of the Sand-and-Gravel Aquifer within 300 feet of the site	☑	☐	☐

I, the undersigned, herby certify that I am an authorized representative of the above named property owner and that the above described Land Use Controls have been complied with for the period noted. Alternately, any known deficiencies and owner's completed or planned actions to address such deficiencies are described in the attached Explanation of Deficiency(ies).

ARCHIE.THOMAS.LEE.1048331552 Digitally signed by ARCHIE.THOMAS.LEE.1048331552 Date: 2021.01.29 13:58:09 -06'00' 1/29/21

Signature Date

KEETHLER.MICHAEL.NEWTON.1077401977 Digitally signed by KEETHLER.MICHAEL.NEWTON.1077401977 Date: 2021.02.12 14:32:41 -06'00'

Signature Date

Signature Date

Signature Date

Mail completed form(s) to:

U.S. Environmental Protection Agency
Region 4
Waste Management Division,
Federal Facilities
Branch. Attn: Tim Woolheater
61 Forsyth Street
Atlanta, GA 30303

Florida Dept of Environmental Protection
Division of Waste Management
Bureau of Waste Cleanup
Federal Programs Section
Attn: NAS Pensacola RPM; Mr. David Grabka 2600 Blair Stone Road
Tallahassee, FL 32399-2400

Commanding Officer
Naval Facilities Engineering Command, Southeast
Attn: Environmental Restoration Division RPM; Mr. Chad Tripp
Building 903 Jacksonville, FL 32212-0030

Site 38 (OU 11) Annual LUC Compliance Certificate

Naval Air Station Pensacola
FL9170024567

Property Owner: NAVAL AIR STATION PENSACOLA

Property Address: NAS PENSACOLA - PENSACOLA, FLORIDA

Is evaluation for all or a portion of the OU 11 property? ALL
If evaluating only a portion of the site, attach a figure identifying the portion being evaluated.

This evaluation covers the period from **1 January 2020 through 31 December 2020**.
Form shall be submitted by **1 March** of the year following the reporting period.

Certification Checklist

	In Compliance	Non-Compliance	See Comment
1) Prevent residential use at Site 38	☑	☐	☐
1) Restrict future uses of the surficial aquifer until the levels of contamination in the groundwater meet the State of Florida's Groundwater Cleanup Target Levels (GCTLs) in 62-777.	☑	☐	☐

I, the undersigned, herby certify that I am an authorized representative of the above named property owner and that the above described Land Use Controls have been complied with for the period noted. Alternately, any known deficiencies and owner's completed or planned actions to address such deficiencies are described in the attached Explanation of Deficiency(ies).

ARCHIE.THOMAS.LEE.1048331552 Digitally signed by ARCHIE.THOMAS.LEE.1048331552 Date: 2021.01.29 14:00:24 -06'00' 1/29/21

Signature Date

KEETHLER.MICHAEL.NEWTON.1077401977 Digitally signed by KEETHLER.MICHAEL.NEWTON.1077401977 Date: 2021.02.12 14:34:11 -06'00'

Signature Date

Signature Date

Signature Date

Mail completed form(s) to:

U.S. Environmental Protection Agency
Region 4
Waste Management Division,
Federal Facilities
Branch. Attn: Tim Woolheater
61 Forsyth Street
Atlanta, GA 30303

Florida Dept of Environmental Protection
Division of Waste Management
Bureau of Waste Cleanup
Federal Programs Section
Attn: NAS Pensacola RPM; Mr. David Grabka 2600 Blair Stone Road
Tallahassee, FL 32399-2400

Commanding Officer
Naval Facilities Engineering Command, Southeast
Attn: Environmental Restoration Division RPM; Mr. Chad Tripp
Building 903 Jacksonville, FL 32212-0030

Sites 8 and 24 (OU 13) Annual LUC Compliance Certificate

Naval Air Station Pensacola
FL9170024567

Property Owner: NAVAL AIR STATION PENSACOLA

Property Address: NAS PENSACOLA - PENSACOLA, FLORIDA

Is evaluation for all or a portion of the OU 13 property? ALL
If evaluating only a portion of the site, attach a figure identifying the portion being evaluated.

This evaluation covers the period from **1 January 2020 through 31 December 2020**.
Form shall be submitted by **1 March** of the year following the reporting period.

Certification Checklist

	In Compliance	Non-Compliance	See Comment
1) No groundwater being used for any purpose (unless previously approved by USEPA, FDEP, and the Navy).	☑	☐	☐
2) No tampering or damage to groundwater monitoring wells or remediation system(s).	☐	☑	☑
3) Any violations of these LUCs were reported within 10 days of discovery and an explanation provided of those actions taken or to be taken was provided within 10 days of notification.	☑	☐	☐

Comments: note #2, two wells encountered damage from Hurricane Sally (9/16/20). Damage was assessed, documented and submitted for repair estimates and planning.

I, the undersigned, herby certify that I am an authorized representative of the above named property owner and that the above described Land Use Controls have been complied with for the period noted. Alternately, any known deficiencies and owner's completed or planned actions to address such deficiencies are described in the attached Explanation of Deficiency(ies).

ARCHIE.THOMAS.LEE.1048331552 Digitally signed by ARCHIE.THOMAS.LEE.1048331552 Date: 2021.01.29 14:05:15 -06'00' — 1/29/21

Signature — Date

KEETHLER.MICHAEL.NEWTON.1077401977 Digitally signed by KEETHLER.MICHAEL.NEWTON.1077401977 Date: 2021.02.12 14:37:46 -06'00'

Signature — Date

Signature — Date

Signature — Date

Mail completed form(s) to:

U.S. Environmental Protection Agency
Region 4
Waste Management Division,
Federal Facilities
Branch. Attn: Tim Woolheater
61 Forsyth Street
Atlanta, GA 30303

Florida Dept of Environmental Protection
Division of Waste Management
Bureau of Waste Cleanup
Federal Programs Section
Attn: NAS Pensacola RPM; Mr. David
Grabka 2600 Blair Stone Road
Tallahassee, FL 32399-2400

Commanding Officer
Naval Facilities Engineering
Command, Southeast
Attn: Environmental Restoration
Division RPM; Mr. Chad Tripp
Building 903 Jacksonville, FL
32212-0030

Sites 43 (OU 18) Annual LUC Compliance Certificate

Naval Air Station Pensacola
FL9170024567

Property Owner: NAVAL AIR STATION PENSACOLA

Property Address: NAS PENSACOLA - PENSACOLA, FLORIDA

Is evaluation for all or a portion of the OU 18 property? ALL
If evaluating only a portion of the site, attach a figure identifying the portion being evaluated.

This evaluation covers the period from **1 January 2020 through 31 December 2020**.

Certification Checklist

	In Compliance	Non-Compliance	See Comment
1) Restrict future use of the Site to non-residential land uses unless prior written approval is obtained from the USEPA and FDEP. Non-residential land use restrictions will prohibit residential or residential-like uses including, but not limited to, any form of housing, any kind of school (including pre-schools, elementary schools, and secondary schools), child care facilities, playgrounds, and adult convalescent or nursing care facilities.	☑	☐	☐
2) Prohibit any excavation or other disturbances of existing areas with contaminated surface and subsurface soils (exceeding residential Soil Cleanup Target Levels (SCTLs) at the site unless written approval is obtained from USEPA and FDEP.	☑	☐	☐
3) Maintain the integrity of the 40,000-square-foot parking lot on the site.	☑	☐	☐
4) Prohibit all uses of groundwater from the surficial aquifer underlying the Site including, but not limited to , human consumption, dewatering, irrigation, heating /cooling purposes, and industrial processes at the Site unless prior written approval is obtained from the USEPA and FDEP.	☑	☐	☐
5) Maintain the integrity of all existing or future monitoring and on-site remedy components at the site.	☑	☐	☐
6) warning signs posted and maintained approximately every 500 feet along the Site boundary	☑	☐	☐

I, the undersigned, herby certify that I am an authorized representative of the above named property owner and that the above described Land Use Controls have been complied with for the period noted. Alternately, any known deficiencies and owner's completed or planned actions to address such deficiencies are described in the attached Explanation of Deficiency(ies).

ARCHIE.THOMAS.LEE.1048331552 Digitally signed by ARCHIE.THOMAS.LEE.1048331552 Date: 2021.01.29 14:02:03 -06'00' 1/29/21

Signature Date

KEETHLER.MICHAEL.NEWTON.1077401977 Digitally signed by KEETHLER.MICHAEL.NEWTON.1077401977 Date: 2021.02.12 14:39:24 -06'00'

Signature Date

Signature Date

Signature Date

Mail completed form(s) to:

U.S. Environmental Protection Agency
Region 4
Waste Management Division,
Federal Facilities
Branch. Attn: Tim Woolheater
61 Forsyth Street
Atlanta, GA 30303

Florida Dept of Environmental Protection
Division of Waste Management
Bureau of Waste Cleanup
Federal Programs Section
Attn: NAS Pensacola RPM; Mr. David Grabka 2600 Blair Stone Road
Tallahassee, FL 32399-2400

Commanding Officer
Naval Facilities Engineering Command, Southeast
Attn: Environmental Restoration Division RPM; Mr. Chad Tripp
Building 903 Jacksonville, FL 32212-0030

Site 44 Annual LUC Compliance Certificate

Naval Air Station Pensacola
FL9170024567

Property Owner: NAVAL AIR STATION PENSACOLA

Property Address: NAS PENSACOLA, PENSACOLA FLORIDA

Is evaluation for all or a portion of the Site 44 property? ALL
If evaluating only a portion of the site, attach a figure identifying the portion being evaluated.

This evaluation covers the period from **1 January 2020 through 31 December 2020.**
Form shall be submitted by **1 March** of the year following the reporting period.

Certification Checklist

	In Compliance	Non-Compliance	See Comment
1) No residential use of site, including but not limited to any form of housing, child-care facilities, preschools, elementary schools, secondary schools, playgrounds, convalescent or nursing care facilities (unless previously approved by USEPA and FDEP).	☑	☐	☐
2) No unauthorized excavation, and/or removal of soil with contaminant concentrations exceeding FDEP residential SCTLs. (unless previously approved by USEPA and FDEP).	☑	☐	☐
3) No use of groundwater from the surficial aquifer underlying Site 44, including, but not limited to, human consumption, dewatering, irrigation, heating/cooling purposes, and industrial processes (unless prior written approved is obtained from the Navy, USEPA and FDEP).	☑	☐	☐
4) Maintain the integrity of any existing or future monitoring or remediation systems (unless prior written approved is obtained from the Navy, USEPA and FDEP).	☑	☐	☐

I, the undersigned, hereby certify that I am an authorized representative of the above named property owner and that the above described Land Use Controls have been complied with for the period noted. Alternately, any known deficiencies and owner's completed or planned actions to address such deficiencies are described in the attached Explanation of Deficiency(ies).

ARCHIE.THOMAS.LEE.1048331552 Digitally signed by ARCHIE.THOMAS.LEE.1048331552 Date: 2021.01.29 14:03:40 -06'00' 1/29/21

Signature Date

KEETHLER.MICHAEL.NEWTON.1077401977 Digitally signed by KEETHLER.MICHAEL.NEWTON.1077401977 Date: 2021.02.12 14:41:17 -06'00'

Signature Date

Signature Date

Signature Date

Mail completed form(s) to:

U.S. Environmental Protection Agency
Region 4
Waste Management Division,
Federal Facilities
Branch. Attn: Tim Woolheater
61 Forsyth Street
Atlanta, GA 30303

Florida Dept of Environmental Protection
Division of Waste Management
Bureau of Waste Cleanup
Federal Programs Section
Attn: NAS Pensacola RPM; Mr. David Grabka 2600 Blair Stone Road
Tallahassee, FL 32399-2400

Commanding Officer
Naval Facilities Engineering Command, Southeast
Attn: Environmental Restoration Division RPM; Mr. Chad Tripp
Building 903 Jacksonville, FL 32212-0030

DEPARTMENT OF THE NAVY
NAVAL AIR STATION PENSACOLA
150 HASE ROAD SUITE-A
PENSACOLA, FLORIDA 32508-1051

5090
Ser N4/0186
7 Apr 22

Mr. Tim Woolheater
Senior Remedial Project Manager
U.S. EPA Region 4
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, GA 30303-8960

Dear Mr. Woolheater:

SUBJECT: 2021 ANNUAL LAND USE CONTROL REPORT – NAVAL AIR STATION PENSACOLA, PENSACOLA, FLORIDA

Naval Air Station Pensacola (NASP) hereby certifies that the land use controls (LUCs) for Operable Units 1, 4, and 10 as outlined in the LUC Memorandum of Agreement of September 1999 and for Operable Units 2, 11, 13, 18, and 19 as outlined in the individual Land Use Control Remedial Designs (LUC RDs), are still in effect and should remain in place. The 2021 Annual LUC Compliance Certificates are enclosed for your records.

If you have any questions, please contact Thomas Archie, NASP Installation Restoration Program Manager, at commercial (850) 452-2010, or via email at thomas.archie.ctr@navy.mil.

Sincerely,

T. M. SHASHATY
Captain, United Stated Navy
Commanding Officer

Enclosure: 2021 Annual LUC Compliance Certificates

Copy to: NAVFAC SE DET PEN IEPD

DEPARTMENT OF THE NAVY
NAVAL AIR STATION PENSACOLA
150 HASE ROAD SUITE-A
PENSACOLA, FLORIDA 32508-1051

5090
Ser N4/0187
7 Apr 22

Mr. David Grabka
Florida Department of Environmental Protection
Bob Martinez Center
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Dear Mr. Grabka:

SUBJECT: 2021 ANNUAL LAND USE CONTROL REPORT – NAVAL AIR STATION PENSACOLA, PENSACOLA, FLORIDA

Naval Air Station Pensacola (NASP) hereby certifies that the land use controls (LUCs) for Operable Units 1, 4, and 10 as outlined in the LUC Memorandum of Agreement of September 1999 and for Operable Units 2, 11, 13, 18, and 19 as outlined in the individual Land Use Control Remedial Designs (LUC RDs), are still in effect and should remain in place. The 2021 Annual LUC Compliance Certificates are enclosed for your records.

If you have any questions, please contact Thomas Archie, NASP Installation Restoration Program Manager, at commercial (850) 452-2010, or via email at thomas.archie.ctr@navy.mil.

Sincerely,

T. M. SHASHATY
Captain, United Stated Navy
Commanding Officer

Enclosure: 2021 Annual LUC Compliance Certificates

Copy to: NAVFAC SE DET PEN IEPD

Site 44 Annual LUC Compliance Certificate

Naval Air Station
Pensacola FL9170024567

Property Owner: NAVAL AIR STATION PENSACOLA

Property Address: NAS PENSACOLA, PENSACOLA FLORIDA

Is evaluation for all or a portion of the Site 44 property? ALL
If evaluating only a portion of the site, attach a figure identifying the portion being evaluated.

This evaluation covers the period from **1 January 2021 through 31 December 2021.**
Form shall be submitted by **1 March** of the year following the reporting period.

Certification Checklist

	In Compliance	Non-Compliance	See Comment
1) No residential use of site, including but not limited to any form of housing, child-care facilities, preschools, elementary schools, secondary schools, playgrounds, convalescent or nursing care facilities (unless previously approved by USEPA and FDEP).	☑	☐	
2) No unauthorized excavation, and/or removal of soil with contaminant concentrations exceeding FDEP residential SCTLs. (unless previously approved by USEPA and FDEP).	☑	☐	
3) No use of groundwater from the surficial aquifer underlying Site 44, including, but not limited to, human consumption, dewatering, irrigation, heating/cooling purposes, and industrial processes (unless prior written approved is obtained from the Navy, USEPA and FDEP).	☑	☐	
4) Maintain the integrity of any existing or future monitoring or remediation systems (unless prior written approved is obtained from the Navy, USEPA and FDEP).	☑	☐	

I, the undersigned, hereby certify that I am an authorized representative of the above named property owner and that the above described Land Use Controls have been complied with for the period noted. Alternately, any known deficiencies and owners completed or planned actions to address such deficiencies are described in the attached Explanation of Deficiency (ies).

	1/6/2022
Signature	Date
Signature	Date
Signature	Date
Signature	Date

Mail completed form(s) to:

U.S. Environmental Protection Agency
Region 4
Waste Management Division,
Federal Facilities
Branch. Attn: Tim Woolheater
61 Forsyth Street
Atlanta, GA 30303

Florida Dept. of Environmental Protection
Division of Waste Management
Bureau of Waste Cleanup
Federal Programs Section
Attn: NAS Pensacola RPM; Mr. David Grabka 2600 Blair Stone Road
Tallahassee, FL 32399-2400

Commanding Officer
Naval Facilities Engineering Command, Southeast
Attn: Environmental Restoration Division RPM; Mr. Chad Tripp
Building 903 Jacksonville, FL 32212-0030

Site 1 (OU 1) Annual LUC Compliance Certificate

Naval Air Station Pensacola
FL9170024567

Property Owner: NAVAL AIR STATION PENSACOLA

Property Address: NAS PENSACOLA - PENSACOLA, FLORIDA

Is evaluation for all or a portion of the OU 1 property? ALL
If evaluating only a portion of the site, attach a figure identifying the portion being evaluated.

This evaluation covers the period from **1 January 2021 through 31 December 2021.**
Form shall be submitted by **1 March** of the year following the reporting period.

Certification Checklist

	In Compliance	Non-Compliance	See Comment
1) Limit intrusive activities within the landfill boundary without prior approval from NAS Pensacola Environmental Office	☑	☐	
2) Restrict use of groundwater use of the surficial zone of the Sand-and-Gravel Aquifer within 300 feet of the site	☑	☐	

I, the undersigned, herby certify that I am an authorized representative of the above named property owner and that the above described Land Use Controls have been complied with for the period noted. Alternately, any known deficiencies and owner's completed or planned actions to address such deficiencies are described in the attached Explanation of Deficiency (ies).

1/5/22

Signature Date

Signature Date

Signature Date

Signature Date

Mail completed form(s) to:

U.S. Environmental Protection Agency
Region 4
Waste Management Division,
Federal Facilities
Branch. Attn: Tim Woolheater
61 Forsyth Street
Atlanta, GA 30303

Florida Dept. of Environmental Protection
Division of Waste Management
Bureau of Waste Cleanup
Federal Programs Section
Attn: NAS Pensacola RPM; Mr. David Grabka 2600 Blair Stone Road
Tallahassee, FL 32399-2400

Commanding Officer
Naval Facilities Engineering Command, Southeast
Attn: Environmental Restoration Division RPM; Mr. Chad Tripp
Building 903 Jacksonville, FL 32212-0030

Sites 11, 12, 25, 26 27. & 30 (OU 2) Annual LUC Compliance Certificate

Naval Air Station Pensacola
FL9170024567

Property Owner: NAVAL AIR STATION PENSACOLA

Property Address: NAS PENSACOLA - PENSACOLA, FLORIDA

Is evaluation for all or a portion of the OU 2 property? ALL
If evaluating only a portion of the site, attach a figure identifying the portion being evaluated.

This evaluation covers the period from **1 January 2021 through 31 December 2021**.
Form shall be submitted by **1 March** of the year following the reporting period.

Certification Checklist

	In Compliance	Non-Compliance	See Comment
1) Prohibit reuse of the site for residential uses including, but not limited to, any form of housing, child-care facilities, any kind of school including preschools, elementary schools, and secondary schools, playgrounds, and adult convalescent or nursing care facilities.	☑	☐	
2) Prohibit the excavation, disturbance, and removal of soil unless prior written approval is obtained from the facility's environmental coordinator.	☑	☐	
3) Prohibit potable uses of groundwater from the surficial aquifer underlying the site, including, but not limited to, drinking, washing, cooking, cleaning, and turf irrigation, without prior written approval from the Navy, USEPA, and FDEP.	☑	☐	
4) Prevent unacceptable occupational exposure to contaminated groundwater in the surficial aquifer by requiring the use of personal protective equipment (PPE) and monitoring equipment for excavations that may encounter groundwater.	☑	☐	
5) Maintain the integrity of any existing or future monitoring or remediation system(s).	☑	☐	

I, the undersigned, herby certify that I am an authorized representative of the above named property owner and that the above described Land Use Controls have been complied with for the period noted Alternately, any known deficiencies and owner's completed or planned actions to address such deficiencies are described in the attached Explanation of Deficiency(ies).

Sites 11, 12, 25, 26 27. & 30 (OU 2) Annual LUC Compliance Certificate

Naval Air Station Pensacola
FL9170024567

	1/5/22
Signature	Date
Signature	Date
Signature	Date
Signature	Date

Mail completed form(s) to:

U.S. Environmental Protection Agency
Region 4
Waste Management Division,
Federal Facilities
Branch. Attn: Tim Woolheater
61 Forsyth Street
Atlanta, GA 30303

Florida Dept. of Environmental Protection
Division of Waste Management
Bureau of Waste Cleanup
Federal Programs Section
Attn: NAS Pensacola RPM; Mr. David Grabka 2600 Blair Stone Road
Tallahassee, FL 32399-2400

Commanding Officer
Naval Facilities Engineering Command, Southeast
Attn: Environmental Restoration Division RPM; Mr. Chad Tripp
Building 903 Jacksonville, FL 32212-0030

Site 15 (OU 4) Annual LUC Compliance Certificate

Naval Air Station Pensacola
FL9170024567

Property Owner: NAVAL AIR STATION PENSACOLA

Property Address: NAS PENSACOLA - PENSACOLA, FLORIDA

Is evaluation for all or a portion of the OU 4 property? ALL
If evaluating only a portion of the site, attach a figure identifying the portion being evaluated.

This evaluation covers the period from **1 January 2021 through 31 December 2021.**
Form shall be submitted by **1 March** of the year following the reporting period.

Certification Checklist

	In Compliance	Non-Compliance	See Comment
1) Restrict use of groundwater from the surficial zone of the Sand-and-Gravel Aquifer within 300 feet of the site.	☑	☐	
2) Restrict site use to industrial.	☑	☐	

I, the undersigned, herby certify that I am an authorized representative of the above named property owner and that the above described Land Use Controls have been complied with for the period noted. Alternately, any known deficiencies and owner's completed or planned actions to address such deficiencies are described in the attached Explanation of Deficiency (ies).

	1/6/22
Signature	Date
Signature	Date
Signature	Date
Signature	Date

Mail completed form(s) to:

U.S. Environmental Protection Agency
Region 4
Waste Management Division,
Federal Facilities
Branch. Attn: Tim Woolheater
61 Forsyth Street
Atlanta, GA 30303

Florida Dept. of Environmental Protection
Division of Waste Management
Bureau of Waste Cleanup
Federal Programs Section
Attn: NAS Pensacola RPM; Mr. David Grabka 2600 Blair Stone Road
Tallahassee, FL 32399-2400

Commanding Officer
Naval Facilities Engineering Command, Southeast
Attn: Environmental Restoration Division RPM; Mr. Chad Tripp
Building 903 Jacksonville, FL 32212-0030

Sites 32, 33 and 35 (OU 10) Annual LUC Compliance Certificate

Naval Air Station Pensacola
FL9170024567

Property Owner: NAVAL AIR STATION PENSACOLA

Property Address: NAS PENSACOLA - PENSACOLA, FLORIDA

Is evaluation for all or a portion of the OU 10 property? ALL
If evaluating only a portion of the site, attach a figure identifying the portion being evaluated. This evaluation covers the period from **1 January 2021 through 31 December 2021.** Form shall be submitted by **1 March** of the year following the reporting period.

Certification Checklist

	In Compliance	Non-Compliance	See Comment
1) Restrict use of groundwater use of the surficial zone of the Sand-and-Gravel Aquifer within 300 feet of the site	☑	☐	

I, the undersigned, herby certify that I am an authorized representative of the above named property owner and that the above described Land Use Controls have been complied with for the period noted. Alternately, any known deficiencies and owner's completed or planned actions to address such deficiencies are described in the attached Explanation of Deficiency (ies).

1/6/2022
Signature Date

Signature Date

Signature Date

Signature Date

Mail completed form(s) to:

U.S. Environmental Protection Agency
Region 4
Waste Management Division,
Federal Facilities
Branch. Attn: Tim Woolheater
61 Forsyth Street
Atlanta, GA 30303

Florida Dept. of Environmental Protection
Division of Waste Management
Bureau of Waste Cleanup
Federal Programs Section
Attn: NAS Pensacola RPM; Mr. David Grabka 2600 Blair Stone Road
Tallahassee, FL 32399-2400

Commanding Officer
Naval Facilities Engineering Command, Southeast
Attn: Environmental Restoration Division RPM; Mr. Chad Tripp
Building 903 Jacksonville, FL 32212-0030

Site 38 (OU 11) Annual LUC Compliance Certificate

Naval Air Station Pensacola
FL9170024567

Property Owner: NAVAL AIR STATION PENSACOLA

Property Address: NAS PENSACOLA - PENSACOLA, FLORIDA

Is evaluation for all or a portion of the OU 11 property? ALL
If evaluating only a portion of the site, attach a figure identifying the portion being evaluated.

This evaluation covers the period from **1 January 2021 through 31 December 2021**.
Form shall be submitted by **1 March** of the year following the reporting period.

Certification Checklist

	In Compliance	Non-Compliance	See Comment
1) Prevent residential use at Site 38	☑	☐	
1) Restrict future uses of the surficial Aquifer until the levels of contamination in the groundwater meet the State of Florida's Groundwater Cleanup Target Levels (GCTLs) in 62-777.	☑	☐	

I, the undersigned, herby certify that I am an authorized representative of the above named property owner and that the above described Land Use Controls have been complied with for the period noted. Alternately, any known deficiencies and owner's completed or planned actions to address such deficiencies are described in the attached Explanation of Deficiency (ies).

1/6/2022
Signature Date

Signature Date

Signature Date

Mail completed form(s) to:

U.S. Environmental Protection Agency
Region 4
Waste Management Division,
Federal Facilities
Branch. Attn: Tim Woolheater
61 Forsyth Street
Atlanta, GA 30303

Florida Dept. of Environmental Protection
Division of Waste Management
Bureau of Waste Cleanup
Federal Programs Section
Attn: NAS Pensacola RPM; Mr. David Grabka 2600 Blair Stone Road
Tallahassee, FL 32399-2400

Commanding Officer
Naval Facilities Engineering Command, Southeast
Attn: Environmental Restoration Division RPM; Mr. Chad Tripp
Building 903 Jacksonville, FL 32212-0030

Sites 8 and 24 (OU 13) Annual LUC Compliance Certificate

Naval Air Station Pensacola
FL9170024567

Property Owner: NAVAL AIR STATION PENSACOLA

Property Address: NAS PENSACOLA - PENSACOLA, FLORIDA

Is evaluation for all or a portion of the OU 13 property? ALL
If evaluating only a portion of the site, attach a figure identifying the portion being evaluated.

This evaluation covers the period from **1 January 2021 through 31 December 2021**.
Form shall be submitted by **1 March** of the year following the reporting period.

Certification Checklist

	In Compliance	Non-Compliance	See Comment
1) No groundwater being used for any purpose (unless previously approved by USEPA, FDEP, and the Navy).	☑	☐	
2) No tampering or damage to groundwater monitoring wells or remediation system(s).	☑	☐	
3) Any violations of these LUCs were reported within 10 days of discovery and an explanation provided of those actions taken or to be taken was provided within 10 days of notification.	☑	☐	

I, the undersigned, herby certify that I am an authorized representative of the above named property owner and that the above described Land Use Controls have been complied with for the period noted. Alternately, any known deficiencies and owner's completed or planned actions to address such deficiencies are described in the attached Explanation of Deficiency (ies).

1/6/2022
Signature Date

Signature Date

Signature Date

Mail completed form(s) to:

U.S. Environmental Protection Agency
Region 4
Waste Management Division,
Federal Facilities
Branch. Attn: Tim Woolheater
61 Forsyth Street
Atlanta, GA 30303

Florida Dept. of Environmental Protection
Division of Waste Management
Bureau of Waste Cleanup
Federal Programs Section
Attn: NAS Pensacola RPM; Mr. David Grabka 2600 Blair Stone Road
Tallahassee, FL 32399-2400

Commanding Officer
Naval Facilities Engineering Command, Southeast
Attn: Environmental Restoration Division RPM; Mr. Chad Tripp
Building 903 Jacksonville, FL 32212-0030

Sites 43 (OU 18) Annual LUC Compliance Certificate

Naval Air Station Pensacola
FL9170024567

Property Owner: NAVAL AIR STATION PENSACOLA

Property Address: NAS PENSACOLA - PENSACOLA, FLORIDA

Is evaluation for all or a portion of the OU 18 property? ALL
If evaluating only a portion of the site, attach a figure identifying the portion being evaluated.

This evaluation covers the period from **1 January 2021 through 31 December 2021**.

Certification Checklist

	In Compliance	Non-Compliance	See Comment
1) Restrict future use of the Site to non-residential land uses unless prior written approval is obtained from the USEPA and FDEP. Non- residential land use restrictions will prohibit residential or residential-like uses including, but not limited to, any form of housing, any kind of school (including pre-schools, elementary schools, and secondary schools), child care facilities, playgrounds, and adult convalescent or nursing care facilities.	☑	☐	
2) Prohibit any excavation or other disturbances of existing areas with contaminated surface and subsurface soils (exceeding residential Soil Cleanup Target Levels (SCTLs) at the site unless written approval is obtained from USEPA and FDEP.	☑	☐	
3) Maintain the integrity of the 40,000-square-foot parking lot on the site.	☑	☐	
4) Prohibit all uses of groundwater from the surficial aquifer underlying the Site including, but not limited to , human consumption, dewatering, irrigation, heating /cooling purposes, and industrial processes at the Site unless prior written approval is obtained from the USEPA and FDEP.	☑	☐	
5) Maintain the integrity of all existing or future monitoring and on-site remedy components at the site.	☑	☐	
6) warning signs posted and maintained approximately every 500 feet along the Site boundary	☑	☐	

I, the undersigned, herby certify that I am an authorized representative of the above named property owner and that the above described Land Use Controls have been complied with for the period noted. Alternately, any known deficiencies and owner's completed or planned actions to address such deficiencies are described in the attached Explanation of Deficiency (ies).

	1/6/2022
Signature	Date
Signature	Date
Signature	Date

Mail completed form(s) to:

U.S. Environmental Protection Agency
Region 4
Waste Management Division,
Federal Facilities
Branch. Attn: Tim Woolheater
61 Forsyth Street
Atlanta, GA 30303

Florida Dept. of Environmental Protection
Division of Waste Management
Bureau of Waste Cleanup
Federal Programs Section
Attn: NAS Pensacola RPM; Mr. David
Grabka 2600 Blair Stone Road
Tallahassee, FL 32399-2400

Commanding Officer
Naval Facilities Engineering
Command, Southeast
Attn: Environmental Restoration
Division RPM; Mr. Chad Tripp
Building 903 Jacksonville, FL
32212-0030

APPENDIX C–PUBLIC NOTICE

Classifieds

To advertise, visit:
classifieds.pnj.com

- Classifieds Phone: **850.435.8585**
- Classifieds Email: **pnjclass@gannett.com**
- Public Notices/Legals Email: **pnjlegals@gannett.com**

All classified ads are subject to the applicable rate card, copies of which are available from our Advertising Dept. All ads are subject to approval before publication. The Pensacola News Journal reserves the right to edit, refuse, reject, classify or cancel any ad at any time. Errors must be reported in the first day of publication. The Pensacola News Journal shall not be liable for any loss or expense that results from an error in or omission of an advertisement. No refunds for early cancellation of order.

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$800.00 Boston Terrier, m&f, 6 weeks ckc reg call for pics (251)228-1063 GSFARMS@CENTURYLINK.NET

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In with new, out with the old!

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Find great homes!

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-Blowing -Haul Off
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Landscaping

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Public Notices

public notices/legals email: **pnjlegals@gannett.com** or call: **850.435.8585**

Public Notice
Department of the Navy's Fifth Five-Year Review
Naval Air Station Pensacola
Pensacola, Florida

The Department of the Navy, in coordination with the United States Environmental Protection Agency (U.S. EPA) Region IV and Florida Department of Environmental Protection, has begun the Fifth Five-Year Review of the remedies for the following Naval Air Station (NAS) Pensacola Operable Units (OUs):

- OU 1 – Site 1 (Former Sanitary Landfill)
- OU 2 – Site 11 (North Chevalier Field Disposal Area), Site 12 (Scrap Bins), Site 25 (Radium Spill Area), Site 26 (Supply Department Outside Storage Area), Site 27 (Radium Dial Shop Sewer), and Site 30 (Complex of Industrial Buildings 649 and 755 and Industrial Wastewater Treatment Plant Sewer Line)
- OU 4 – Site 15 (Pesticide Rinsate Disposal Area)
- OU 10 – Site 32 (Former Industrial Sludge Drying Beds), Site 33 (Former Wastewater Treatment Plant Ponds), and Site 35 (Miscellaneous Industrial Wastewater Treatment Plant Solid Waste Management Units)
- OU 11 – Site 38 (Facility Hazardous Waste Storage [Buildings 71 and 604] and Associated Wastewater Treatment Plant Sewer Line)
- OU 13 – Site 8 (Rifle Range Disposal Area) and Site 24 (DDT Mixing Area)
- OU 16 – Site 41 (Wetlands)
- OU 18 – Site 43 (Demolition Debris Disposal Area)
- OU 19 – Site 44 (Building 3221 Former Underground Storage Tank/Solvent Site)

The Navy will prepare the Five-Year Review Report as part of the Navy Installation Restoration Program, following U.S. EPA guidelines under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and Superfund Amendments and Reauthorization Act of 1988. The purpose of the Five-Year Review process is to determine whether the remedy selected at each OU is effectively protecting human health and the environment.

The Five-Year Review process is mandated under CERCLA for sites where the selected remedial action results in contamination remaining in excess of levels that allow for unlimited use and unrestricted exposure. This Fifth Five-Year Review Report will be completed by 11 August 2023. The Navy will conduct interviews, review reports, and assess site conditions to evaluate if the remedies remain protective of human health and the environment. Public participation is encouraged and welcomed.

A subsequent public notice will announce the completion of the Five-Year Review Report and its availability to the public at the NAS Pensacola website: https://www.navfac.navy.mil/Business-Lines/Environmental/Products-and-Services/Environmental-Restoration/Southeast/Pensacola-NAS/.

Documents in the Administrative Record for these OUs can also be viewed by the public through the NAS Pensacola website.

Any person wishing to participate in the interview process or provide comments regarding this notice may respond in writing by letter or email within 30 days of this publication to:

Mr. Jason Bortz
Public Affairs Officer
Naval Air Station Pensacola
150 Hase Road, Suite A
Pensacola, Florida 32508-5217
E-mail: jason.j.bortz.civ@us.navy.mil

For information about the Five-Year Review or any environmental cleanup activities at NAS Pensacola, please contact Mr. Bortz at jason.j.bortz.civ@us.navy.mil.

Legal No. 5302161 June 19, 2022

IN THE CIRCUIT COURT OF THE FIRST JUDICIAL CIRCUIT
IN AND FOR ESCAMBIA COUNTY, FLORIDA
PROBATE DIVISION

IN RE: ESTATE OF
SAMUEL BARROWS, III CASE NO: 2022 CP 000260
Deceased.
_____/

NOTICE TO CREDITORS

TO ALL PERSONS HAVING CLAIMS OR DEMANDS AGAINST THE ABOVE ESTATE:

The administration of the estate of Samuel Barrows, III, deceased, File Number 2022 CP 000260, is pending in the Circuit Court of Escambia County, Florida, the address of which is P.O. Box 333, Pensacola, FL 32591-0333, (850) 595-4300. The names and addresses of the personal representative and the personal representative=s attorney are set forth below.

ALL INTERESTED PERSONS ARE NOTIFIED THAT:

All creditors of the decedent and other persons having claims or demands against the decedent=s estate on whom a copy of this notice is served within three months after the date of the first publication of this notice must file their claims with this Court WITHIN THE LATER OF THREE MONTHS AFTER THE DATE OF THE FIRST PUBLICATION OF THIS NOTICE OR THIRTY DAYS AFTER THE DATE OF SERVICE OF A COPY OF THIS NOTICE ON THEM.

All other creditors of the decedent and persons having claims against the estate of the decedent must file their claims with this Court WITHIN THREE MONTHS AFTER THE DATE OF THE FIRST PUBLICATION OF THIS NOTICE.

ALL CLAIMS AND DEMANDS NOT SO FILED WILL BE FOREVER BARRED.

The date of the first publication of this notice is 6/12/22.

Attorney for Personal Representative Personal Representative

/s/ Ryan Mynard /s/ Amber Brannon
RYAN MYNARD Amber Brannon
RYAN M. MYNARD, ATTORNEY AT LAW, P.A. 344 Campbell Road
POST OFFICE BOX 249 DeFuniak Springs, FL 32435
CRESTVIEW, FLORIDA 32536
Telephone: (850) 683-3940
Facsimile: (850) 689-8630
Primary Email: eservice.ryanmynard@yahoo.com
Secondary Email: assistant.ryanmynard@yahoo.com
Florida Bar No.: 0150185
Legal No.5295005 June 12, 19, 2022

APPENDIX D–COMPLETED INTERVIEW QUESTIONNAIRE

INTERVIEW QUESTIONS

FIFTH FIVE-YEAR REVIEW
NAVAL AIR STATION PENSACOLA

Please use other side for any additional comments .

1. What is your overall impression of the remedial actions conducted or planned at the active environmental sites at the base?

Generally, I believe the actions taken have been sufficient to protect persons living and working at NAS Pensacola. However, my overriding impression is that in many situations the costs are excessive, relative to the benefits received. The administrative costs and duplication of efforts by multiple agencies contribute to the excessive costs.

2. Have the Navy's environmental cleanup activities had any effects on the surrounding communities?

I am not aware of any adverse effects. The extensive study of the water bodies adjacent to NAS, and therefore in direct contact with surrounding communities assured me that any environmental impacts are restricted to the NAS property.

3. Are you aware of any community concerns regarding cleanup activities at the active sites at the base? If so, please provide details.

I am not.

4. Are you aware of any complaints, incidents, unusual activities (vandalism, trespassing), or emergency responses by local authorities at any of the active environmental sites?

I am not.

5. Do you feel well informed about the environmental cleanup activities and progress?

Yes, and more specifically in the earlier stages of the remediation effort. As a member of the Restoration Advisory Board, I have acquired less knowledge in the last 5 years or so because of the less frequent meetings of the Board; however, I do not mean to imply that more frequent meetings are necessary.

6. Do you have any comments, suggestions, or recommendations regarding the management of the active environmental sites?

No.

Name: Jesse W. Rigby

Title: Attorney; resident of Escambia County

Organization/Community: Millview community in Escambia County; member of the RAS

Please return to:
John King, PG, Remedial Project Manager
NAVFAC Southeast
904-601-5450
john.c.king238.civ@us.navy.mil

APPENDIX E–SITE INSPECTION CHECKLISTS

Five-Year Review Site Inspection Checklist

I. SITE INFORMATION RLS 4/14/22

Site name: NAS Pensacola, OU 1, Site 1	**Date of inspection:** 4/14/22 4/14/22
Location and Region: Pensacola, FL/Region 4	**EPA ID:** FL9170024567
Agency, office, or company leading the five-year review: Tetra Tech/NAVFAC Southeast	**Weather/temperature:** Partly Cloudy / 74°F

Remedy Includes: (Check all that apply)

- X Landfill cover/containment
- □ Access controls
- X Institutional controls
- □ Groundwater pump and treatment
- □ Surface water collection and treatment
- X Other Former Interceptor Trench System was decommissioned/abandoned
- X Monitored natural attenuation
- □ Groundwater containment
- □ Vertical barrier walls

Attachments: □ Inspection team roster attached □ Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** _____ _____ _____
   Name Title Date
   Interviewed □ at site □ at office □ by phone Phone no. _____ X N/A
   Problems, suggestions; □ Report attached

2. **O&M staff** _____ _____ _____
   Name Title Date
   Interviewed □ at site □ at office □ by phone Phone no. _____ X N/A
   Problems, suggestions; □ Report attached

3. **Other interviews** (optional) □ Report attached.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**

□ O&M manual	□ Readily available	□ Up to date	□ N/A
□ As-built drawings	□ Readily available	□ Up to date	X N/A
□ Maintenance logs	□ Readily available	□ Up to date	X N/A

Remarks _____

2. **Site-Specific Health and Safety Plan** □ Readily available □ Up to date X N/A
   □ Contingency plan/emergency response plan □ Readily available □ Up to date X N/A

3. **O&M and OSHA Training Records** □ Readily available □ Up to date X N/A

4. **Permits and Service Agreements**

□ Air discharge permit	□ Readily available	□ Up to date	X N/A
□ Effluent discharge	□ Readily available	□ Up to date	X N/A
□ Waste disposal, POTW	□ Readily available	□ Up to date	X N/A
□ Other permits _____	□ Readily available	□ Up to date	X N/A

5. **Gas Generation Records** □ Readily available □ Up to date X N/A

6. **Settlement Monument Records** □ Readily available □ Up to date X N/A

7. **Groundwater Monitoring Records** X Readily available X Up to date □ N/A

8. **Leachate Extraction Records** □ Readily available □ Up to date X N/A

9.	**Discharge Compliance Records**			
	☐ Air	☐ Readily available	☐ Up to date	X N/A
	☐ Water (effluent)	☐ Readily available	☐ Up to date	X N/A
10.	**Daily Access/Security Logs**	☐ Readily available	☐ Up to date	X N/A

IV. O&M COSTS

3. **Unanticipated or Unusually High O&M Costs During Review Period** X N/A

Describe costs and reasons: _____

V. ACCESS AND INSTITUTIONAL CONTROLS **X** Applicable ☐ N/A

A. Fencing

1. **Fencing damaged** ☐ Location shown on site map ☐ Gates secured X N/A

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map X N/A

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented	☐ Yes	x No	☐ N/A
Site conditions imply ICs not being fully enforced	☐ Yes	x No	☐ N/A

Type of monitoring (*e.g.*, self-reporting, drive by): Visual land use control inspections
Frequency: Annual
Responsible party/agency: NAVFAC
Contact: Chad Tripp, NAVFAC Remedial Project Manager

Reporting is up to date	x Yes	☐ No	☐ N/A
Reports are verified by the lead agency	x Yes	☐ No	☐ N/A
Specific requirements in deed or decision documents have been met	x Yes	☐ No	☐ N/A
Violations have been reported	☐ Yes	☐ No	x N/A

2. **Adequacy** x ICs are adequate ☐ ICs are inadequate ☐ N/A

Remarks _____

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map ☒ No vandalism evident

Remarks _____

2. **Land use changes on site** ☐ N/A

Remarks None

3. **Land use changes off site** ☐ N/A

Remarks None

VI. GENERAL SITE CONDITIONS

A. Roads ☒ Applicable ☐ N/A

1. **Roads damaged** ☐ Location shown on site map ☒ Roads adequate ☐ N/A
Remarks Dirt roads are maintained by the Navy and were adequate.

B. Other Site Conditions

Remarks None

VII. LANDFILL COVERS X Applicable ☐ N/A

A. Landfill Surface ***(cover consists of at least 2 feet of soil)***

1. **Settlement** (Low spots) ☐ Location shown on site map ☒ Settlement not evident
Areal extent _____ Depth _____
Remarks _____

2. **Cracks** ☐ Location shown on site map ☒ Cracking not evident
Lengths _____ Widths _____ Depths _____
Remarks _____

3. **Erosion** ☐ Location shown on site map ☒ Erosion not evident
Areal extent _____ Depth _____
Remarks _____

4. **Holes** ☐ Location shown on site map ☒ Holes not evident
Areal extent _____ Depth _____
Remarks _____

5. **Vegetative Cover** ☒ Grass ☒ Cover properly established ☒ No signs of stress
☒ Trees/Shrubs
Remarks _____

6. **Alternative Cover (armored rock, concrete, etc.)** ☒ N/A
Remarks _____

7. **Bulges** ☐ Location shown on site map ☒ Bulges not evident
Areal extent _____ Height _____
Remarks _____

8. **Wet Areas/Water Damage** ☒ Wet areas/water damage not evident
☐ Wet areas ☐ Location shown on site map Areal extent _____
☐ Ponding ☐ Location shown on site map Areal extent _____
☐ Seeps ☐ Location shown on site map Areal extent _____
☐ Soft subgrade ☐ Location shown on site map Areal extent _____
Remarks _____

9. **Slope Instability** ☐ Slides ☐ Location shown on site map ☒ No evidence of slope instability
Areal extent _____
Remarks _____

B. Benches ☐ Applicable x N/A

C. Letdown Channels ☐ Applicable x N/A

D. Cover Penetrations ☐ Applicable X N/A

1. **Gas Vents** X N/A

2. **Gas Monitoring Probes** X N/A

3. **Monitoring Wells**
☐ Properly secured/locked ☒ Functioning ☒ Routinely sampled ☒ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks Wells are being assessed as part of Basewid Well Inventory

E. Gas Collection and Treatment ☐ Applicable x N/A

F. Cover Drainage Layer ☐ Applicable x N/A

H. Retaining Walls ☐ Applicable x N/A

I. Perimeter Ditches/Off-Site Discharge ☐ Applicable x N/A

VIII. VERTICAL BARRIER WALLS ☐ Applicable X N/A

IX. GROUNDWATER/SURFACE WATER REMEDIES X Applicable ☐ N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines ☐ Applicable X N/A

B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable X N/A

C. Treatment System ☐ Applicable X N/A

D. Monitoring Data

1. **Monitoring data:**
X Are routinely submitted on time X Are of acceptable quality

2. **Monitoring data suggest**:
☒ Groundwater plume is effectively contained ☐ Contaminant concentrations are declining

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)
☐ Properly secured/locked ☒ Functioning ☒ Routinely sampled ☒ Good condition
☐ All required wells located ☐ Needs Maintenance ☐ N/A
Remarks See D-3

X. OTHER REMEDIES ☐ Applicable X N/A

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).
The purpose of the remedy is to protect groundwater from leachable compounds, restore groundwater to beneficial use, and prevent further surfacewater contamination in Wetland 3. Based on this inspection, the remedy is functioning as designed although additional investigations for iron in surface water are ongoing.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

NA

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

None

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

this is addressed in the LTM program.

Five-Year Review Site Inspection Checklist

I. SITE INFORMATION

Site name: NAS Pensacola, OU 2, Sites 11, 12, 25, 16, 27, 30,	**Date of inspection:** 4/14/21
Location and Region: Pensacola, FL/Region 4	**EPA ID:** FL9170024567
Agency, office, or company leading the five-year review: Tetra Tech/NAVFAC Southeast	**Weather/temperature:** Cloudy 69° F

Remedy Includes: (Check all that apply)

- X Landfill cover/containment
- ☐ Access controls
- X Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- X Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls
- X Other Soil excavation: Sites 12, 25, 27, and 30; asphalt or concrete cap/cover: Sites 12, 25, and 27; soil cover: Sites 11 and 26

Attachments: ☐ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** NA (Name) _____ (Title) _____ (Date)
   Interviewed ☐ at site ☐ at office ☐ by phone Phone no. _____ X N/A
   Problems, suggestions; ☐ Report attached

2. **O&M staff** NA (Name) _____ (Title) _____ (Date)
   Interviewed ☐ at site ☐ at office ☐ by phone Phone no. _____ X N/A
   Problems, suggestions; ☐ Report attached

3. **Other interviews** (optional) ☐ Report attached. NA

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1.	**O&M Documents**			
	☐ O&M manual	☐ Readily available	☐ Up to date	X N/A
	☐ As-built drawings	☐ Readily available	☐ Up to date	X N/A
	☐ Maintenance logs	☐ Readily available	☐ Up to date	X N/A
2.	**Site-Specific Health and Safety Plan**	☐ Readily available	☐ Up to date	X N/A
	☐ Contingency plan/emergency response plan	☐ Readily available	☐ Up to date	X N/A
3.	**O&M and OSHA Training Records**	☐ Readily available	☐ Up to date	X N/A
4.	**Permits and Service Agreements**			
	☐ Air discharge permit	☐ Readily available	☐ Up to date	X N/A
	☐ Effluent discharge	☐ Readily available	☐ Up to date	X N/A
	☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	X N/A
	☐ Other permits _____	☐ Readily available	☐ Up to date	X N/A
5.	**Gas Generation Records**	☐ Readily available	☐ Up to date	X N/A
6.	**Settlement Monument Records**	☐ Readily available	☐ Up to date	X N/A
7.	**Groundwater Monitoring Records**	X Readily available	X Up to date	☐ N/A
8.	**Leachate Extraction Records**	☐ Readily available	☐ Up to date	X N/A

9.	**Discharge Compliance Records**			
	☐ Air	☐ Readily available	☐ Up to date	X N/A
	☐ Water (effluent)	☐ Readily available	☐ Up to date	X N/A
10.	**Daily Access/Security Logs**	☐ Readily available	☐ Up to date	X N/A

IV. O&M COSTS

3. **Unanticipated or Unusually High O&M Costs During Review Period** ☒ N/A
Describe costs and reasons: _____

V. ACCESS AND INSTITUTIONAL CONTROLS X Applicable ☐ N/A

A. Fencing

1. **Fencing damaged** ☐ Location shown on site map ☐ Gates secured X N/A

B. Other Access Restrictions

1. **Signs and other security measures *(Site 11 only)*** ☐ Location shown on site map ☐ N/A
Remarks Signage is adequate

V. ACCESS AND INSTITUTIONAL CONTROLS (CONT'D) ☐ Applicable ☐ N/A

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented	☐ Yes	X No	☐ N/A
Site conditions imply ICs not being fully enforced	☐ Yes	X No	☐ N/A

Type of monitoring (*e.g.*, self-reporting, drive by): Visual land use control inspections
Frequency: Annual
Responsible party/agency: NAVFAC
Contact: Chad Tripp, NAVFAC Remedial Project Manager

Reporting is up to date	X Yes	☐ No	☐ N/A
Reports are verified by the lead agency	X Yes	☐ No	☐ N/A
Specific requirements in deed or decision documents have been met	X Yes	☐ No	☐ N/A
Violations have been reported	☐ Yes	☐ No	X N/A

2. **Adequacy** X ICs are adequate ☐ ICs are inadequate ☐ N/A
Remarks _____

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map ☒ No vandalism evident
Remarks _____

2. **Land use changes on site** ☐ N/A
Remarks Land use has not changed

3. **Land use changes off site** ☐ N/A
Remarks None

VI. GENERAL SITE CONDITIONS

A. Roads ☑ Applicable ☐ N/A

1. **Roads damaged** ☐ Location shown on site map ☒ Roads adequate ☐ N/A
Remarks

B. Other Site Conditions

Remarks None

VII. LANDFILL COVERS X Applicable ☐ N/A

A. Landfill Surface ***(Site 11 native soil cover)***

1. **Settlement** (Low spots) ☐ Location shown on site map ☒ Settlement not evident
Areal extent _____ Depth _____
Remarks

2. **Cracks** ☐ Location shown on site map ☒ Cracking not evident
Lengths _____ Widths _____ Depths _____
Remarks

3. **Erosion** ☐ Location shown on site map ☒ Erosion not evident
Areal extent _____ Depth _____
Remarks

4. **Holes** ☐ Location shown on site map ☒ Holes not evident
Areal extent _____ Depth _____
Remarks

5. **Vegetative Cover** ☒ Grass ☐ Cover properly established ☒ No signs of stress
☐ Trees/Shrubs (indicate size and locations on a diagram)
Remarks

6. **Alternative Cover (armored rock, concrete, etc.)** ☒ N/A
Remarks

7. **Bulges** ☐ Location shown on site map ☒ Bulges not evident
Areal extent _____ Height _____
Remarks

8. **Wet Areas/Water Damage** ☒ Wet areas/water damage not evident
☐ Wet areas ☐ Location shown on site map Areal extent _____
☐ Ponding ☐ Location shown on site map Areal extent _____
☐ Seeps ☐ Location shown on site map Areal extent _____
☐ Soft subgrade ☐ Location shown on site map Areal extent _____
Remarks

9.	**Slope Instability** ☐ Slides ☐ Location shown on site map ☒ No evidence of slope instability Areal extent _____ Remarks _____
B. Benches	☐ Applicable x N/A
C. Letdown Channels	☐ Applicable x N/A
D. Cover Penetrations	☐ Applicable X N/A
1.	**Gas Vents** X N/A
2.	**Gas Monitoring Probes** X N/A
3.	**Monitoring Wells** ☐ Properly secured/locked ☒ Functioning ☒ Routinely sampled ☒ Good condition ☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A Remarks Monitoring wells will be assessed seperately as part of Bassamide Inventory
E. Gas Collection and Treatment	☐ Applicable x N/A
F. Cover Drainage Layer	☐ Applicable x N/A
H. Retaining Walls	☐ Applicable x N/A
I. Perimeter Ditches/Off-Site Discharge	☐ Applicable x N/A
VIII. VERTICAL BARRIER WALLS	☐ Applicable X N/A
IX. GROUNDWATER/SURFACE WATER REMEDIES	X Applicable ☐ N/A
A. Groundwater Extraction Wells, Pumps, and Pipelines	☐ Applicable X N/A
B. Surface Water Collection Structures, Pumps, and Pipelines	☐ Applicable X N/A
C. Treatment System	☐ Applicable XN/A
D. Monitoring Data	
1.	**Monitoring data:** X Are routinely submitted on time X Are of acceptable quality
2.	**Monitoring data suggest**: ☑ Groundwater plume is effectively contained ☑ Contaminant concentrations are declining
D. Monitored Natural Attenuation	
1.	**Monitoring Wells** (natural attenuation remedy) ☐ Properly secured/locked ☑ Functioning ☑ Routinely sampled ☐ Good condition ☑ All required wells located ☐ Needs Maintenance ☐ N/A Remarks See D.3 above 3065174 covered by AC unit
X. OTHER REMEDIES	☐ Applicable X N/A

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

See Response Actions for remedy components & RAOs.
Based on this inspection, the remedy is functioning as designed.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

Not Applicable

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

Not Applicable

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

The LTM Program has added non-ROD COCs with no documentation. Most of these analytes can be removed from the LTM Program, but some require further evaluation. There are also some ROD COCs that can be removed from the analyte list at certain locations.

Five-Year Review Site Inspection Checklist

I. SITE INFORMATION

Site name: NAS Pensacola, OU 4, Site 15	**Date of inspection:** 4/14/22
Location and Region: Pensacola, FL/Region 4	**EPA ID:** FL9170024567
Agency, office, or company leading the five-year review: Tetra Tech/NAVFAC Southeast	**Weather/temperature:** Partly cloudy/73°F

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☐ Access controls
- X Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- X Other Soil excavation
- X Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ☐ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** _____ _____ _____
   Name Title Date
   Interviewed ☐ at site ☐ at office ☐ by phone Phone no. _____ X N/A
   Problems, suggestions: ☐ Report attached

2. **O&M staff** _____ _____ _____
   Name Title Date
   Interviewed ☐ at site ☐ at office ☐ by phone Phone no. _____ X N/A
   Problems, suggestions: ☐ Report attached

3. **Other interviews** (optional) ☐ Report attached.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1.	**O&M Documents**			
	☐ O&M manual	☐ Readily available	☐ Up to date	X N/A
	☐ As-built drawings	☐ Readily available	☐ Up to date	X N/A
	☐ Maintenance logs	☐ Readily available	☐ Up to date	X N/A
2.	**Site-Specific Health and Safety Plan**	☐ Readily available	☐ Up to date	X N/A
	☐ Contingency plan/emergency response plan	☐ Readily available	☐ Up to date	X N/A
3.	**O&M and OSHA Training Records**	☐ Readily available	☐ Up to date	X N/A
4.	**Permits and Service Agreements**			
	☐ Air discharge permit	☐ Readily available	☐ Up to date	X N/A
	☐ Effluent discharge	☐ Readily available	☐ Up to date	X N/A
	☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	X N/A
	☐ Other permits	☐ Readily available	☐ Up to date	X N/A
5.	**Gas Generation Records**	☐ Readily available	☐ Up to date	X N/A
6.	**Settlement Monument Records**	☐ Readily available	☐ Up to date	X N/A
7.	**Groundwater Monitoring Records**	X Readily available	X Up to date	☐ N/A
8.	**Leachate Extraction Records**	☐ Readily available	☐ Up to date	X N/A

9.	**Discharge Compliance Records**			
	☐ Air	☐ Readily available	☐ Up to date	X N/A
	☐ Water (effluent)	☐ Readily available	☐ Up to date	X N/A
10.	**Daily Access/Security Logs**	☐ Readily available	☐ Up to date	X N/A

IV. O&M COSTS

3. **Unanticipated or Unusually High O&M Costs During Review Period** ☑ N/A
Describe costs and reasons: _____

V. ACCESS AND INSTITUTIONAL CONTROLS **X** Applicable ☐ N/A

A. Fencing

1. **Fencing damaged** ☐ Location shown on site map ☐ Gates secured X N/A

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map X N/A

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented	☐ Yes	x No	☐ N/A
Site conditions imply ICs not being fully enforced	☐ Yes	x No	☐ N/A

Type of monitoring (*e.g.*, self-reporting, drive by): Visual land use control inspections
Frequency: Annual
Responsible party/agency: NAVFAC
Contact: Chad Tripp, NAVFAC Remedial Project Manager

Reporting is up to date	x Yes	☐ No	☐ N/A
Reports are verified by the lead agency	x Yes	☐ No	☐ N/A
Specific requirements in deed or decision documents have been met	x Yes	☐ No	☐ N/A
Violations have been reported	☐ Yes	☐ No	x N/A

2. **Adequacy** x ICs are adequate ☐ ICs are inadequate ☐ N/A
Remarks _____

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map ☑ No vandalism evident
Remarks _____

2. **Land use changes on site** ☐ N/A
Remarks None

3. **Land use changes off site** ☐ N/A
Remarks None

VI. GENERAL SITE CONDITIONS

A. Roads ☑ Applicable ☐ N/A

1.	**Roads damaged** ☐ Location shown on site map ☑ Roads adequate ☐ N/A Remarks
B. Other Site Conditions	
	Remarks Site in good condition
VII. LANDFILL COVERS ☐ Applicable x N/A	
VIII. VERTICAL BARRIER WALLS ☐ Applicable X N/A	
IX. GROUNDWATER/SURFACE WATER REMEDIES X Applicable ☐ N/A	
A. Groundwater Extraction Wells, Pumps, and Pipelines ☐ Applicable X N/A	
B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable X N/A	
C. Treatment System ☐ Applicable X N/A	
D. Monitoring Data	
1.	**Monitoring data:** X Are routinely submitted on time X Are of acceptable quality
2.	**Monitoring data suggest**: ☑ Groundwater plume is effectively contained ☑ Contaminant concentrations are declining
D. Monitored Natural Attenuation	
1.	**Monitoring Wells** (natural attenuation remedy) ☐ Properly secured/locked ☑ Functioning ☑ Routinely sampled ☑ Good condition ☐ All required wells located RJS 4/14/22 ☐ Needs Maintenance ☐ N/A Remarks ~~3065174 covered by AC unit.~~ Wells are being assessed as part of Basewide Well Inventory.
X. OTHER REMEDIES ☐ Applicable X N/A	
XI. OVERALL OBSERVATIONS	
A.	**Implementation of the Remedy**
	Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.). The MNA remedy is functioning as intended. Arsenic concentrations are declining. The goal is to get GW COCs below the RG.
B.	**Adequacy of O&M**

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

NA

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

NA

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

Optimization is discussed in the LTM Reports

Five-Year Review Site Inspection Checklist

I. SITE INFORMATION	
Site name: NAS Pensacola, OU 10, Sites 32, 33, 35	**Date of inspection:** 4/14/22
Location and Region: Pensacola, FL/Region 4	**EPA ID:** FL9170024567
Agency, office, or company leading the five-year review: Tetra Tech/NAVFAC Southeast	**Weather/temperature:** Partly Cloudy/68°F

Remedy Includes: (Check all that apply)

- □ Landfill cover/containment
- □ Access controls
- X Institutional controls
- □ Groundwater pump and treatment
- □ Surface water collection and treatment
- X Other Soil excavation
- X Monitored natural attenuation ***(under RCRA)***
- □ Groundwater containment
- □ Vertical barrier walls

Attachments: □ Inspection team roster attached □ Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** _____ _____ _____
   Name Title Date
   Interviewed □ at site □ at office □ by phone Phone no. _____ X N/A
   Problems, suggestions; □ Report attached

2. **O&M staff** _____ _____ _____
   Name Title Date
   Interviewed □ at site □ at office □ by phone Phone no. _____ X N/A
   Problems, suggestions; □ Report attached

3. **Other interviews** (optional) □ Report attached.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1.	**O&M Documents**			
	□ O&M manual	□ Readily available	□ Up to date	X N/A
	□ As-built drawings	□ Readily available	□ Up to date	X N/A
	□ Maintenance logs	□ Readily available	□ Up to date	X N/A
	Remarks _____			
2.	**Site-Specific Health and Safety Plan**	□ Readily available	□ Up to date	X N/A
	□ Contingency plan/emergency response plan	□ Readily available	□ Up to date	X N/A
3.	**O&M and OSHA Training Records**	□ Readily available	□ Up to date	X N/A
4.	**Permits and Service Agreements**			
	□ Air discharge permit	□ Readily available	□ Up to date	X N/A
	□ Effluent discharge	□ Readily available	□ Up to date	X N/A
	□ Waste disposal, POTW	□ Readily available	□ Up to date	X N/A
	□ Other permits _____	□ Readily available	□ Up to date	X N/A
5.	**Gas Generation Records**	□ Readily available	□ Up to date	X N/A
6.	**Settlement Monument Records**	□ Readily available	□ Up to date	X N/A
7.	**Groundwater Monitoring Records**	X Readily available	X Up to date	□ N/A
8.	**Leachate Extraction Records**	□ Readily available	□ Up to date	X N/A

9.	**Discharge Compliance Records**			
	☐ Air	☐ Readily available	☐ Up to date	X N/A
	☐ Water (effluent)	☐ Readily available	☐ Up to date	X N/A
10.	**Daily Access/Security Logs**	☐ Readily available	☐ Up to date	X N/A

IV. O&M COSTS

3. **Unanticipated or Unusually High O&M Costs During Review Period** ☐ N/A

Describe costs and reasons: None

V. ACCESS AND INSTITUTIONAL CONTROLS X Applicable ☐ N/A

A. Fencing

1. **Fencing damaged** ☐ Location shown on site map ☐ Gates secured X N/A

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map X N/A

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented	☐ Yes	x No	☐ N/A
Site conditions imply ICs not being fully enforced	☐ Yes	x No	☐ N/A

Type of monitoring (*e.g.*, self-reporting, drive by): Visual land use control inspections
Frequency: Annual
Responsible party/agency: NAVFAC
Contact: Chad Tripp, NAVFAC Remedial Project Manager

Reporting is up to date	x Yes	☐ No	☐ N/A
Reports are verified by the lead agency	x Yes	☐ No	☐ N/A
Specific requirements in deed or decision documents have been met	x Yes	☐ No	☐ N/A
Violations have been reported	☐ Yes	☐ No	x N/A

2. **Adequacy** x ICs are adequate ☐ ICs are inadequate ☐ N/A

Remarks

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map ☒ No vandalism evident

Remarks

2. **Land use changes on site** ☐ N/A

Remarks None

3. **Land use changes off site** ☐ N/A

Remarks None

VI. GENERAL SITE CONDITIONS

A. Roads ☒ Applicable ☐ N/A

1. **Roads damaged** ☐ Location shown on site map ☒ Roads adequate ☐ N/A
Remarks _____

B. Other Site Conditions

Remarks None

VII. LANDFILL COVERS ☐ Applicable x N/A

VIII. VERTICAL BARRIER WALLS ☐ Applicable X N/A

IX. GROUNDWATER/SURFACE WATER REMEDIES X Applicable ☐ N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines ☐ Applicable X N/A

B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable X N/A

C. Treatment System ☐ Applicable X N/A

D. Monitoring Data

1. **Monitoring data:**

X Are routinely submitted on time X Are of acceptable quality

2. **Monitoring data suggest**:

☒ Groundwater plume is effectively contained ☐ Contaminant concentrations are declining

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)

☐ Properly secured/locked ☒ Functioning ☒ Routinely sampled ☒ Good condition
☐ All required wells located ☐ Needs Maintenance ☐ N/A
Remarks Monitoring Wells are being assessed under ~~Baseline~~ Basewide Well Inventory
RLS 4/14/22

X. OTHER REMEDIES ☐ Applicable X N/A

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

See Response Actions for remedy components + RAOs
Based on this inspection, the remedy appears to be functioning as intended.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

NA

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

NA

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

Optimization is done through the RCRA groundwater monitoring program.

Five-Year Review Site Inspection Checklist

I. SITE INFORMATION	
Site name: NAS Pensacola, OU 11, Site 38	**Date of inspection:** 4/14/22
Location and Region: Pensacola, FL/Region 4	**EPA ID:** FL9170024567
Agency, office, or company leading the five-year review: Tetra Tech/NAVFAC Southeast	**Weather/temperature:** Partly Cloudy / 72°F

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☐ Access controls
- X Institutional controls
- ☐ Groundwater pump and treatment
- X Other Soil excavation
- X Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls
- ☐ Surface water collection and treatment

Attachments: ☐ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** _____ _____ _____
   Name Title Date
   Interviewed ☐ at site ☐ at office ☐ by phone Phone no. _____ X N/A
   Problems, suggestions: ☐ Report attached

2. **O&M staff** _____ _____ _____
   Name Title Date
   Interviewed ☐ at site ☐ at office ☐ by phone Phone no. _____ X N/A
   Problems, suggestions: ☐ Report attached

3. **Other interviews** (optional) ☐ Report attached.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1.	**O&M Documents**			
	☐ O&M manual	☐ Readily available	☐ Up to date	X N/A
	☐ As-built drawings	☐ Readily available	☐ Up to date	X N/A
	☐ Maintenance logs	☐ Readily available	☐ Up to date	X N/A
2.	**Site-Specific Health and Safety Plan**	☐ Readily available	☐ Up to date	X N/A
	☐ Contingency plan/emergency response plan	☐ Readily available	☐ Up to date	X N/A
3.	**O&M and OSHA Training Records**	☐ Readily available	☐ Up to date	X N/A
4.	**Permits and Service Agreements**			
	☐ Air discharge permit	☐ Readily available	☐ Up to date	X N/A
	☐ Effluent discharge	☐ Readily available	☐ Up to date	X N/A
	☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	X N/A
	☐ Other permits _____	☐ Readily available	☐ Up to date	X N/A
5.	**Gas Generation Records**	☐ Readily available	☐ Up to date	X N/A
6.	**Settlement Monument Records**	☐ Readily available	☐ Up to date	X N/A
7.	**Groundwater Monitoring Records**	X Readily available	X Up to date	☐ N/A
8.	**Leachate Extraction Records**	☐ Readily available	☐ Up to date	X N/A
9.	**Discharge Compliance Records**			
	☐ Air	☐ Readily available	☐ Up to date	X N/A
	☐ Water (effluent)	☐ Readily available	☐ Up to date	X N/A

10.	**Daily Access/Security Logs**	☐ Readily available	☐ Up to date	X N/A

IV. O&M COSTS

3. **Unanticipated or Unusually High O&M Costs During Review Period** ☒ N/A
Describe costs and reasons: _____

V. ACCESS AND INSTITUTIONAL CONTROLS x Applicable ☐ N/A

A. Fencing

1.	**Fencing damaged**	☐ Location shown on site map	☐ Gates secured	X N/A

B. Other Access Restrictions

1.	**Signs and other security measures**	☐ Location shown on site map	X N/A

V. ACCESS AND INSTITUTIONAL CONTROLS (CONT'D) ☐ Applicable ☐ N/A

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented	☐ Yes	x No	☐ N/A
Site conditions imply ICs not being fully enforced	☐ Yes	x No	☐ N/A

Type of monitoring (*e.g.*, self-reporting, drive by): Visual land use control inspections
Frequency: Annual
Responsible party/agency: NAVFAC
Contact: Chad Tripp, NAVFAC Remedial Project Manager

Reporting is up to date	x Yes	☐ No	☐ N/A
Reports are verified by the lead agency	x Yes	☐ No	☐ N/A
Specific requirements in deed or decision documents have been met	x Yes	☐ No	☐ N/A
Violations have been reported	☐ Yes	☐ No	x N/A

2. **Adequacy** x ICs are adequate ☐ ICs are inadequate ☐ N/A
Remarks _____

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map ☒ No vandalism evident
Remarks _____

2. **Land use changes on site** ☐ N/A
Remarks None

3. **Land use changes off site** ☐ N/A
Remarks None

VI. GENERAL SITE CONDITIONS

A. Roads ☒ Applicable ☐ N/A

1. **Roads damaged** ☐ Location shown on site map ☒ Roads adequate ☐ N/A
Remarks _____

B. Other Site Conditions

Remarks The shoreline at the former Building 71 area of OU 11 has been severely eroded from Hurricane Sally. See attached Photolog.

VII. LANDFILL COVERS ☐ Applicable x N/A

VIII. VERTICAL BARRIER WALLS ☐ Applicable X N/A

IX. GROUNDWATER/SURFACE WATER REMEDIES X Applicable ☐ N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines ☐ Applicable X N/A

B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable X N/A

C. Treatment System ☐ Applicable X N/A

D. Monitoring Data

1. **Monitoring data:**

X Are routinely submitted on time X Are of acceptable quality

2. **Monitoring data suggest**:

☒ Groundwater plume is effectively contained ☒ Contaminant concentrations are declining

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)

☐ Properly secured/locked ☐ Functioning ☒ Routinely sampled ☐ Good condition
☐ All required wells located ☒ Needs Maintenance ☐ N/A
Remarks Several wells have been damaged or destroyed by Hurricane Sally.

X. OTHER REMEDIES ☐ Applicable X N/A

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission. etc.).

See Response Actions for remedy Components & RAOs.
The shoreline at the former Building 71 area of OU 11 has been severely eroded by Hurricane Sally and there may be areas that no longer have 2 feet of cover. See attached Photolog.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

NA

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

NA.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

Optimization is done through the LTM program.

OU 11 Site 38 Former Building 71 southwest corner shoreline

OU 11 Site 38 Former Building 71 shoreline looking north at well 38GS13

OU 11 Site 38 Former Building 71 shoreline south of gazebo

OU 11 Site 38 Former Building 71 shoreline east of gazebo

OU 11 Site 38 Former Building 71 southeast corner shoreline

Five-Year Review Site Inspection Checklist

I. SITE INFORMATION

Site name: NAS Pensacola, OU 13, Sites 8 and 24	**Date of inspection:** 4/14/22
Location and Region: Pensacola, FL/Region 4	**EPA ID:** FL9170024567
Agency, office, or company leading the five-year review: Tetra Tech/NAVFAC Southeast	**Weather/temperature:** Partly Sunny / 77°F

Remedy Includes: (Check all that apply)

- □ Landfill cover/containment
- □ Access controls
- X Institutional controls
- □ Groundwater pump and treatment
- □ Other _____
- X Monitored natural attenuation
- □ Groundwater containment
- □ Vertical barrier walls
- □ Surface water collection and treatment

Attachments: □ Inspection team roster attached □ Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** _____ (Name) _____ (Title) _____ (Date)
   Interviewed □ at site □ at office □ by phone Phone no. _____ X N/A
   Problems, suggestions; □ Report attached

2. **O&M staff** _____ (Name) _____ (Title) _____ (Date)
   Interviewed □ at site □ at office □ by phone Phone no. _____ X N/A
   Problems, suggestions; □ Report attached

3. **Other interviews** (optional) □ Report attached.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1.	**O&M Documents**			
	□ O&M manual	□ Readily available	□ Up to date	X N/A
	□ As-built drawings	□ Readily available	□ Up to date	X N/A
	□ Maintenance logs	□ Readily available	□ Up to date	X N/A
2.	**Site-Specific Health and Safety Plan**	□ Readily available	□ Up to date	X N/A
	□ Contingency plan/emergency response plan	□ Readily available	□ Up to date	X N/A
3.	**O&M and OSHA Training Records**	□ Readily available	□ Up to date	X N/A
4.	**Permits and Service Agreements**			
	□ Air discharge permit	□ Readily available	□ Up to date	X N/A
	□ Effluent discharge	□ Readily available	□ Up to date	X N/A
	□ Waste disposal, POTW	□ Readily available	□ Up to date	X N/A
	□ Other permits _____	□ Readily available	□ Up to date	X N/A
5.	**Gas Generation Records**	□ Readily available	□ Up to date	X N/A
6.	**Settlement Monument Records**	□ Readily available	□ Up to date	X N/A
7.	**Groundwater Monitoring Records**	X Readily available	X Up to date	□ N/A
8.	**Leachate Extraction Records**	□ Readily available	□ Up to date	X N/A

9.	**Discharge Compliance Records**			
	☐ Air	☐ Readily available	☐ Up to date	X N/A
	☐ Water (effluent)	☐ Readily available	☐ Up to date	X N/A
10.	**Daily Access/Security Logs**	☐ Readily available	☐ Up to date	X N/A

IV. O&M COSTS

3. **Unanticipated or Unusually High O&M Costs During Review Period** ☒ N/A

Describe costs and reasons: _____

V. ACCESS AND INSTITUTIONAL CONTROLS X Applicable ☐ N/A

A. Fencing

1. **Fencing damaged** ☐ Location shown on site map ☐ Gates secured X N/A

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map X N/A

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented	☐ Yes	x No	☐ N/A
Site conditions imply ICs not being fully enforced	☐ Yes	x No	☐ N/A

Type of monitoring (*e.g.*, self-reporting, drive by): Visual land use control inspections
Frequency: Annual
Responsible party/agency: NAVFAC
Contact: Chad Tripp, NAVFAC Remedial Project Manager

Reporting is up to date	x Yes	☐ No	☐ N/A
Reports are verified by the lead agency	x Yes	☐ No	☐ N/A
Specific requirements in deed or decision documents have been met	x Yes	☐ No	☐ N/A
Violations have been reported	☐ Yes	☐ No	x N/A

2. **Adequacy** x ICs are adequate ☐ ICs are inadequate ☐ N/A

Remarks _____

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map ☒ No vandalism evident

Remarks _____

2. **Land use changes on site** ☐ N/A

Remarks None

3. **Land use changes off site** ☐ N/A

Remarks None

VI. GENERAL SITE CONDITIONS

A. Roads ☒ Applicable ☐ N/A

1. **Roads damaged** ☐ Location shown on site map ☑ Roads adequate ☐ N/A
Remarks _____

B. Other Site Conditions

Remarks None

VII. LANDFILL COVERS ☐ Applicable x N/A

VIII. VERTICAL BARRIER WALLS ☐ Applicable X N/A

IX. GROUNDWATER/SURFACE WATER REMEDIES X Applicable ☐ N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines ☐ Applicable X N/A

B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable X N/A

C. Treatment System ☐ Applicable X N/A

D. Monitoring Data

1. **Monitoring data:**

X Are routinely submitted on time X Are of acceptable quality

2. **Monitoring data suggest**:

☒ Groundwater plume is effectively contained ☒ Contaminant concentrations are declining

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)
☐ Properly secured/locked ☒ Functioning ☒ Routinely sampled ☒ Good condition
☐ All required wells located ☐ Needs Maintenance ☐ N/A
Remarks Monitoring wells are being assessed through baseside well inventory.

X. OTHER REMEDIES ☐ Applicable X N/A

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).
See Response Actions for remedy components & RAOs.
Based on this inspection the remedy appears to be functioning as intended.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

NA

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

NA

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

Optimization is done through the LTM program.

Five-Year Review Site Inspection Checklist

I. SITE INFORMATION

Site name: NAS Pensacola, OU 18, Site 43	**Date of inspection:** 4/14/22
Location and Region: Pensacola, FL/Region 4	**EPA ID:** FL9170024567
Agency, office, or company leading the five-year review: Tetra Tech/NAVFAC Southeast	**Weather/temperature:** Partly Cloudy

Remedy Includes: (Check all that apply)

- □ Landfill cover/containment
- □ Access controls
- X Institutional controls
- □ Groundwater pump and treatment
- □ Monitored natural attenuation ***(monitoring discontinued)***
- □ Groundwater containment
- □ Vertical barrier walls
- □ Surface water collection and treatment
- X Other Pavement (concrete) over contaminated soil that was impractical to remove.

Attachments: □ Inspection team roster attached □ Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** _____ _____ _____
   Name Title Date
   Interviewed □ at site □ at office □ by phone Phone no. _____ X N/A
   Problems, suggestions; □ Report attached

2. **O&M staff** _____ _____ _____
   Name Title Date
   Interviewed □ at site □ at office □ by phone Phone no. _____ X N/A
   Problems, suggestions; □ Report attached

3. **Other interviews** (optional) □ Report attached.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1.	**O&M Documents**			
	□ O&M manual	□ Readily available	□ Up to date	X N/A
	□ As-built drawings	□ Readily available	□ Up to date	X N/A
	□ Maintenance logs	□ Readily available	□ Up to date	X N/A
2.	**Site-Specific Health and Safety Plan**	□ Readily available	□ Up to date	X N/A
	□ Contingency plan/emergency response plan	□ Readily available	□ Up to date	X N/A
3.	**O&M and OSHA Training Records**	□ Readily available	□ Up to date	X N/A
4.	**Permits and Service Agreements**			
	□ Air discharge permit	□ Readily available	□ Up to date	X N/A
	□ Effluent discharge	□ Readily available	□ Up to date	X N/A
	□ Waste disposal, POTW	□ Readily available	□ Up to date	X N/A
	□ Other permits _____	□ Readily available	□ Up to date	X N/A
5.	**Gas Generation Records**	□ Readily available	□ Up to date	X N/A
6.	**Settlement Monument Records**	□ Readily available	□ Up to date	X N/A
7.	**Groundwater Monitoring Records**	□ Readily available	□ Up to date	X N/A
8.	**Leachate Extraction Records**	□ Readily available	□ Up to date	X N/A
9.	**Discharge Compliance Records**			
	□ Air	□ Readily available	□ Up to date	X N/A
	□ Water (effluent)	□ Readily available	□ Up to date	X N/A

10.	**Daily Access/Security Logs**	☐ Readily available	☐ Up to date	X N/A

IV. O&M COSTS

3. **Unanticipated or Unusually High O&M Costs During Review Period** ☒ N/A
Describe costs and reasons: _____

V. ACCESS AND INSTITUTIONAL CONTROLS X Applicable ☐ N/A

A. Fencing

1. **Fencing damaged** ☐ Location shown on site map ☐ Gates secured X N/A

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ☒ N/A
Remarks _____

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented	☐ Yes	x No	☐ N/A
Site conditions imply ICs not being fully enforced	☐ Yes	x No	☐ N/A

Type of monitoring (*e.g.*, self-reporting, drive by): Visual land use control inspections
Frequency: Annual
Responsible party/agency: NAVFAC
Contact: Chad Tripp, NAVFAC Remedial Project Manager

Reporting is up to date	x Yes	☐ No	☐ N/A
Reports are verified by the lead agency	x Yes	☐ No	☐ N/A
Specific requirements in deed or decision documents have been met	x Yes	☐ No	☐ N/A
Violations have been reported	☐ Yes	☐ No	x N/A

2. **Adequacy** x ICs are adequate ☐ ICs are inadequate ☐ N/A
Remarks _____

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map ☒ No vandalism evident
Remarks _____

2. **Land use changes on site** ☐ N/A
Remarks None

3. **Land use changes off site** ☐ N/A
Remarks None

VI. GENERAL SITE CONDITIONS

A. Roads ☒ Applicable ☐ N/A

1. **Roads damaged** ☐ Location shown on site map ☒ Roads adequate ☐ N/A
Remarks _____

B. Other Site Conditions

Remarks None

VII. LANDFILL COVERS ☐ Applicable x N/A

VIII. VERTICAL BARRIER WALLS ☐ Applicable X N/A

IX. GROUNDWATER/SURFACE WATER REMEDIES ☐ Applicable X N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines ☐ Applicable X N/A

B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable X N/A

C. Treatment System ☐ Applicable X N/A

D. Monitoring Data ***(Groundwater monitoring discontinued, as approved by EPA and FDEP)***

1. **Monitoring data:**
☐ Are routinely submitted on time ☐ Are of acceptable quality Not Applicable

2. **Monitoring data suggest**: Not Applicable
☐ Groundwater plume is effectively contained ☐ Contaminant concentrations are declining

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ All required wells located ☐ Needs Maintenance X N/A

X. OTHER REMEDIES ☐ Applicable X N/A

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).
See Response Actions for remedy components and RAOs.
Based on this inspection, the remedy appears to be functioning as intended.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.
NA

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

NA

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

NA - Groundwater Monitoring completed in 2015

Five-Year Review Site Inspection Checklist

I. SITE INFORMATION	
Site name: NAS Pensacola, OU 19, Site 44	**Date of inspection:** 4/14/22
Location and Region: Pensacola, FL/Region 4	**EPA ID:** FL9170024567
Agency, office, or company leading the five-year review: Tetra Tech/NAVFAC Southeast	**Weather/temperature:** Partly Sunny / 74°F

Remedy Includes: (Check all that apply)

- □ Landfill cover/containment
- □ Access controls
- X Institutional controls
- □ Groundwater pump and treatment
- X Other Soil excavation
- X Monitored natural attenuation
- □ Groundwater containment
- □ Vertical barrier walls
- □ Surface water collection and treatment

Attachments: □ Inspection team roster attached □ Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** _____ _____ _____
   Name Title Date
   Interviewed □ at site □ at office □ by phone Phone no. _____ X N/A
   Problems, suggestions; □ Report attached

2. **O&M staff** _____ _____ _____
   Name Title Date
   Interviewed □ at site □ at office □ by phone Phone no. _____ X N/A
   Problems, suggestions; □ Report attached

3. **Other interviews** (optional) □ Report attached.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1.	**O&M Documents**			
	□ O&M manual	□ Readily available	□ Up to date	X N/A
	□ As-built drawings	□ Readily available	□ Up to date	X N/A
	□ Maintenance logs	□ Readily available	□ Up to date	X N/A
2.	**Site-Specific Health and Safety Plan**	□ Readily available	□ Up to date	X N/A
	□ Contingency plan/emergency response plan	□ Readily available	□ Up to date	X N/A
3.	**O&M and OSHA Training Records**	□ Readily available	□ Up to date	X N/A
4.	**Permits and Service Agreements**			
	□ Air discharge permit	□ Readily available	□ Up to date	X N/A
	□ Effluent discharge	□ Readily available	□ Up to date	X N/A
	□ Waste disposal, POTW	□ Readily available	□ Up to date	X N/A
	□ Other permits _____	□ Readily available	□ Up to date	X N/A
5.	**Gas Generation Records**	□ Readily available	□ Up to date	X N/A
6.	**Settlement Monument Records**	□ Readily available	□ Up to date	X N/A
7.	**Groundwater Monitoring Records**	X Readily available	X Up to date	□ N/A
8.	**Leachate Extraction Records**	□ Readily available	□ Up to date	X N/A
9.	**Discharge Compliance Records**			
	□ Air	□ Readily available	□ Up to date	X N/A
	□ Water (effluent)	□ Readily available	□ Up to date	X N/A

10.	**Daily Access/Security Logs**	☐ Readily available	☐ Up to date	X N/A

IV. O&M COSTS

3. **Unanticipated or Unusually High O&M Costs During Review Period** ~~X~~ N/A
Describe costs and reasons: _____

V. ACCESS AND INSTITUTIONAL CONTROLS X Applicable ☐ N/A

A. Fencing

1. **Fencing damaged** ☐ Location shown on site map X Gates secured ~~X N/A~~ RLS 4/14/22

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ☐ N/A
Remarks Signage is adequate. Access is restricted by fencing and gate.

V. ACCESS AND INSTITUTIONAL CONTROLS (CONT'D) ~~X~~ Applicable ☐ N/A

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented	☐ Yes	x No	☐ N/A
Site conditions imply ICs not being fully enforced	☐ Yes	x No	☐ N/A

Type of monitoring (*e.g.*, self-reporting, drive by): Visual land use control inspections
Frequency: Annual
Responsible party/agency: NAVFAC
Contact: Chad Tripp, NAVFAC Remedial Project Manager

Reporting is up to date	x Yes	☐ No	☐ N/A
Reports are verified by the lead agency	x Yes	☐ No	☐ N/A
Specific requirements in deed or decision documents have been met	x Yes	☐ No	☐ N/A
Violations have been reported	☐ Yes	☐ No	x N/A

2. **Adequacy** x ICs are adequate ☐ ICs are inadequate ☐ N/A
Remarks _____

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map ~~X~~ No vandalism evident
Remarks _____

2. **Land use changes on site** ☐ N/A
Remarks None

3. **Land use changes off site** ☐ N/A
Remarks None

VI. GENERAL SITE CONDITIONS

A. Roads ☒ Applicable ☐ N/A

1. **Roads damaged** ☐ Location shown on site map ☒ Roads adequate ☐ N/A
   Remarks

B. Other Site Conditions

Remarks None

VII. LANDFILL COVERS ☐ Applicable x N/A

VIII. VERTICAL BARRIER WALLS ☐ Applicable X N/A

IX. GROUNDWATER/SURFACE WATER REMEDIES X Applicable ☐ N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines ☐ Applicable X N/A

B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable X N/A

C. Treatment System ☐ Applicable X N/A

D. Monitoring Data

1. **Monitoring data:**

   X Are routinely submitted on time X Are of acceptable quality

2. **Monitoring data suggest**:

   ☒ Groundwater plume is effectively contained ☒ Contaminant concentrations are declining

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)

   ☐ Properly secured/locked ☒ Functioning ☒ Routinely sampled ☒ Good condition
   ☐ All required wells located ☐ Needs Maintenance ☐ N/A
   Remarks Monitoring wells are being assessed through Basewide Well Inventory

X. OTHER REMEDIES ☐ Applicable X N/A

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

See Response Actions for remedy components and RAOs.
Based on this inspection, the remedy appears to be functioning as intended

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

NA

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

NA

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

Optimization is done through the LTM program.