Department of Energy
Portsmouth/Paducah Project Office
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October 27, 2022

Mr. Brian Begley
PPPO-02-10022846-23
Federal Facility Agreement Manager
Division of Waste Management
Kentucky Department for Environmental Protection
300 Sower Boulevard, 2nd Floor
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Ms. April Webb
Hazardous Waste Branch Manager
Division of Waste Management
Kentucky Department for Environmental Protection
300 Sower Boulevard, 2nd Floor
Frankfort, Kentucky 40601
Mr. Victor Weeks
Federal Facility Agreement Manager
U.S. Environmental Protection Agency, Region 4

61 Forsyth Street
Atlanta, Georgia 30303
Dear Mr. Begley, Ms. Webb, and Mr. Weeks:

## U.S. DEPARTMENT OF ENERGY PADUCAH GASEOUS DIFFUSION PLANT FEDERAL FACILITY AGREEMENT SEMIANNUAL PROGRESS REPORT FOR THE SECOND HALF OF FISCAL YEAR 2022 PADUCAH, KENTUCKY, DOE/LX/07-2478/V2

Enclosed is the U.S. Department of Energy Paducah Gaseous Diffusion Plant Federal Facility Agreement Semiannual Progress Report for the Second Half of Fiscal Year 2022 Paducah, Kentucky, DOE/LX/07-2478/V2, and the associated certification page. This report is required by Sections XXIII and XXXII.F of the Federal Facility Agreement (FFA) and Part IV (Corrective Action) of the Hazardous Waste Management Facility Permit.

In accordance with Section XX of the Paducah Federal Facility Agreement, the U.S. Environmental Protection Agency and the Kentucky Department for Environmental Protection have a 90 -day review period. If the FFA Parties have no substantive comments, the U.S. Department of Energy requests a letter of concurrence.

If you have any questions or require additional information, please contact me at (270) 441-6862.
Sincerely,

| Tracey L. Duncan | Digitally signed by Tracey Date: 2022.10.27 10:30:14 -05'00' |
| :---: | :---: |
| Tracey Duncan |  |
| Federal Facility Agreement Manager |  |
| Portsmouth/Paducah Project Office |  |

## Enclosures:

1. Certification Page
2. FFA Semiannual Progress Report for the Second Half of Fiscal Year 2022

## General Reference Compendium

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## CERTIFICATION

## Document Identification:

U.S. Department of Energy Paducah Gaseous Diffusion Plant Federal Facility Agreement Semiannual Progress Report for the Second Half of Fiscal Year 2022 Paducah, Kentucky, DOE/LX/07-2478/V2, October 2022

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Four Rivers Nuclear Partnership, LLC


Myrna狏. Redfield, Plogram Manager
Four Rivers Nuclear Partnership, LLC


Date Stigned

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.
U.S. Department of Energy


April Ladd, Acting Paducah Site Lead Portsmouth/Paducah Project Office
U.S. Department of Energy

$$
10-27-22
$$

Date Signed

DOE/LX/07-2478/V2
Secondary Document

# U.S. Department of Energy <br> Paducah Gaseous Diffusion Plant <br> Federal Facility Agreement Semiannual Progress Report for the Second Half of Fiscal Year 2022 <br> Paducah, Kentucky 



## CLEARED FOR PUBLIC RELEASE

# U.S. Department of Energy <br> Paducah Gaseous Diffusion Plant Federal Facility Agreement <br> Semiannual Progress Report for the Second Half of Fiscal Year 2022 Paducah, Kentucky 

Date Issued-October 2022
U.S. DEPARTMENT OF ENERGY

Office of Environmental Management

Prepared by
FOUR RIVERS NUCLEAR PARTNERSHIP, LLC, managing the
Deactivation and Remediation Project at the
Paducah Gaseous Diffusion Plant under Contract DE-EM0004895

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## ACRONYMS

| AR | Administrative Record |
| :---: | :---: |
| BGOU | Burial Grounds Operable Unit |
| CAB | Citizens Advisory Board |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act |
| CRP | community relations plan |
| D\&D | decontamination and decommissioning |
| DOE | U.S. Department of Energy |
| EIC | Environmental Information Center |
| EPA | U.S. Environmental Protection Agency |
| EW | extraction well |
| FFA | Federal Facility Agreement |
| FRNP | Four Rivers Nuclear Partnership, LLC |
| gpm | gallons per minute |
| GRC | general reference compendium |
| GWOU | Groundwater Operable Unit |
| IRA | interim remedial action |
| KDEP | Kentucky Department for Environmental Protection |
| LUCIP | land use control implementation plan |
| MCL | maximum contaminant level |
| MW | monitoring well |
| NEPCS | Northeast Plume Containment System |
| NTCRA | non-time-critical removal action |
| NTU | nephelometric turbidity unit |
| NWPGS | Northwest Plume Groundwater System |
| O\&M | operations and maintenance |
| OU | operable unit |
| PD | post-decision |
| PEGASIS | PPPO Environmental Geographic Analytical Spatial Information System |
| PPPO | Portsmouth/Paducah Project Office |
| PVA | property valuation administrator |
| RMD | risk methods document |
| ROD | Record of Decision |
| SMP | site management plan |
| SST | Swift \& Staley Team |
| SWMU | solid waste management unit |
| SWOU | Surface Water Operable Unit |
| TVA | Tennessee Valley Authority |
| VOC | volatile organic compound |
| WAG | waste area grouping |

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# FEDERAL FACILITY AGREEMENT SEMIANNUAL PROGRESS REPORT SECOND HALF OF FISCAL YEAR 2022 

Facility: Paducah Gaseous Diffusion Plant<br>Plant EPA I.D. No.: KY8-890-008-982<br>Reporting Period: 4/1/2022-9/30/2022<br>INTRODUCTION

The Paducah Gaseous Diffusion Plant was placed on the National Priorities List on May 31, 1994. In accordance with Section 120 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the U.S. Department of Energy (DOE) entered into a Federal Facility Agreement (FFA) with the U.S. Environmental Protection Agency (EPA) and Kentucky Department for Environmental Protection (KDEP) on February 13, 1998. The FFA established one set of consistent requirements for achieving comprehensive site remediation in accordance with the Resource Conservation and Recovery Act and CERCLA, including stakeholder involvement.

Site cleanup activities are integrated into the following operable units (OUs).

- C-400 Complex OU
- Groundwater OU (GWOU)
- Surface Water OU (SWOU)
- Soils OU
- Burial Grounds OU (BGOU)
- Facility Decontamination and Decommissioning (D\&D) OU
- Lagoons OU
- Depleted Uranium Hexafluoride ( $\mathrm{DUF}_{6}$ ) Footprint Underlying Soils OU
- Soils and Slabs OU
- CERCLA Waste Disposal Alternatives OU
- Comprehensive Site OU

Section XXIII of the FFA requires that DOE prepare a regulatory semiannual progress report that describes the actions that DOE has taken during the previous six months to implement FFA requirements, as well as the schedules ${ }^{1}$ of activities to be taken during the upcoming six months. Activities that have taken place after the reporting period end date are not included in this report, but will be included in the reporting period in which they occur. Projects and activities reported in this update are grouped by the OUs listed in Table 1.

[^0]Table 1. Operable Units and Corresponding Report Topics

| Operable Unit | Project/Activities |
| :---: | :---: |
| C-400 Complex Operable Unit | - C-400 D\&D <br> - C-400 Final Remedial Action |
| Groundwater Operable Unit | - C-400 Interim Remedial Action (IRA) <br> - Southwest Plume Sources Remedial Action <br> - Dissolved-Phase Plumes Remedial Action <br> - Northeast Plume IRA <br> - Northwest Plume IRA |
| Burial Grounds Operable Unit | - C-749 Uranium Burial Ground Solid Waste Management Unit (SWMU) 2 |
| Surface Water Operable Unit | - Remedial Action |
| Water Policy | - Removal Action |
| Additional Reporting | - Waste Area Groupings (WAGs) 1 and 7 <br> - Community Relations Plan (CRP) <br> - SMP <br> - CERCLA Five-Year Review <br> - Plant Industrial Area Vapor Intrusion Assessment |

Each section of this update has been divided into nine sections as follows.
I. Work performed during the reporting period (including summaries of findings and any deviations from the work plan)
II. Schedules of activities to be performed during the next reporting period (including projected work/crucial phases of construction)
III. Identity and assigned tasks of DOE contractors for work to be performed for this project
IV. Statement of the manner and extent to which the requirements and time schedules are being met
V. Primary/Secondary Document Tracking System
A) Documents under review and/or preparation for this reporting period
B) Due dates for completion of review/modification tasks
VI. Anticipated problems/delays (provide summary of problems, schedule, reason for delay, and actions taken to prevent or mitigate delay)
VII. Summary of all contacts with local community, public interest groups, or state government
VIII. Changes in relevant personnel
IX. Actual cost for operations and maintenance $(\mathrm{O} \& M)$, if appropriate

Each section satisfies a reporting requirement for the FFA Semiannual Progress Report or the Hazardous Waste Management Facility Permit and has been formatted in accordance with the template found in Appendix D of the FFA.

This report includes five appendices as follows.

- Appendix A contains Northeast and Northwest Plumes Water Withdrawal Reports for the January 1, 2022, through June 30, 2022, reporting period.
- Appendix B contains Figures B. 1 through B.30, as referenced in the Northeast and Northwest Plumes updates. All groundwater data are available in the Portsmouth/Paducah Project Office (PPPO) Environmental Geographic Analytical Spatial Information System (PEGASIS) and, therefore, have not been summarized in this semiannual report.
- Appendix C contains a map depicting monitoring well (MW) locations for the C-746-K Landfill and graphical presentations of trichloroethene (TCE) concentrations in these wells over time. These data are currently collected semiannually. All groundwater data are available in PEGASIS and, therefore, have not been summarized in this semiannual report.
- Appendix D contains updates to the Administrative Record (AR) index since the last progress report. This is required by the Paducah FFA (Section XXXII.F). In October 2018, DOE began a comprehensive review of the Paducah Environmental Information Center (EIC) to ensure that the project document files were complete. As part of this effort, DOE reorganized the Paducah EIC to include the original three categories: 1) AR File, 2) Post-Decision (PD) File, and 3) General Reference Compendium (GRC); and added 4) AR Reference File and 5) AR Archive File. The AR Reference File contains programmatic documents that support the AR [e.g., SMP, Risk Methods Document (RMD)]. As a result of this reorganization of the EIC, Appendix D has been expanded to include updates to the AR index that include the AR File, PD File, and AR Reference File.

The AR Archive File contains documents for projects that originally were expected to have a decision document [i.e., Record of Decision (ROD) or Action Memorandum], but had been resequenced prior to a final decision. These documents have been archived within the AR Archive File to establish future AR files for projects and, as a result, are not included in Appendix D. The AR Archive File can be viewed on the EIC website.

The GRC, which supplements the Paducah AR, contains technical documents associated with the Paducah Site that do not meet the CERCLA criteria of an AR File or a PD File (e.g., CRP, CERCLA Five-Year Review, Annual Site Environmental Report); but are deemed important in understanding the Paducah Site environmental remedial efforts. Because the GRC is not part of the AR, it is not included as part of the update to Appendix D. The GRC can be viewed on the EIC website.

- Appendix E contains figures depicting the C-749 Uranium Burial Ground (SWMU 2) groundwater MW network and a summary of the SWMU 2 trends for TCE and technetium- 99 (Tc-99) for a period of five years. All groundwater data are available in PEGASIS and, therefore, have not been summarized in this semiannual report.

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# FEDERAL FACILITY AGREEMENT <br> SEMIANNUAL PROGRESS REPORT <br> SECOND HALF OF FISCAL YEAR 2022 

Facility: Paducah Gaseous Diffusion Plant<br>Plant EPA I.D. No.: KY8-890-008-982<br>Reporting Period: 4/1/2022-9/30/2022

## C-400 COMPLEX OPERABLE UNIT

The C-400 Complex OU was established in a Memorandum of Agreement on the C-400 Complex under the Federal Facility Agreement for the Paducah Gaseous Diffusion Plant, Paducah, Kentucky (C-400 Complex OU MOA), signed August 8, 2017; the agreement then was incorporated into the SMP. The following two projects are included in the C-400 Complex OU.

- C-400 D\&D
- C-400 Final Remedial Action

On September 16, 2022, the FFA parties executed an FFA milestone modification, which incorporated the C-400 D\&D into the C-400 Final Remedial Action. Because the demolition of the C-400 Cleaning Building will be incorporated into the C-400 Final Remedial Action, milestones associated with the C-400 D\&D, which was intended to be a non-time-critical removal action (NTCRA), will not be necessary. Per the Memorandum, Suspension of D1 and D2 Comprehensive Environmental Response, Compensation, and Liability Act Documents Associated with the C-400 Cleaning Building Non-Time-Critical Removal Action at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky (C-400 Building D\&D MOA), dated October 2, 2019, the original NTCRA documents were not approved, and the NTCRA was suspended. With the FFA parties' execution of the FFA milestone modification, the C-400 Building D\&D MOA is superseded, and the planning documents associated with the NTCRA and their associated milestones are no longer required because the C-400 Cleaning Building will be demolished as part of the remedial action. Additionally, under the FFA parties' FFA milestone modification, the milestone dates in the C-400 Complex OU MOA, which provided for enforceable milestones and planning dates and was later extended due to the force majeure related to COVID-19, are also superseded.

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# FEDERAL FACILITY AGREEMENT <br> SEMIANNUAL PROGRESS REPORT <br> SECOND HALF OF FISCAL YEAR 2022 

Facility: Paducah Gaseous Diffusion Plant Plant EPA I.D. No.: KY8-890-008-982<br>Reporting Period: 4/1/2022-9/30/2022

## C-400 COMPLEX OPERABLE UNIT: C-400 Final Remedial Action

The C-400 Final Remedial Action will investigate the C-400 Complex OU and associated SWMUs, evaluate potential remedial alternatives, develop decision documents selecting an alternative(s), and design and implement the remedial alternative(s).
I. Work performed during the reporting period (including summaries of findings and any deviations from the work plan):

- Continued scoping of the Remedial Investigation/Feasibility Study Report for the C-400 Complex Operable Unit at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2474\&D1, with EPA and KDEP.
- Continued development of the Remedial Investigation/Feasibility Study Report for the C-400 Complex Operable Unit at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2474\&D1.
II. Schedules of activities to be performed during the next reporting period (including projected work/crucial phases of construction):
- Complete scoping of the Remedial Investigation/Feasibility Study Report for the C-400 Complex Operable Unit at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2474\&D1, with EPA and KDEP.
- Finalize and submit the Remedial Investigation/Feasibility Study Report for the C-400 Complex Operable Unit at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2474\&D1, to EPA and KDEP no later than January 5, 2023.
- Initiate development of the D1 proposed plan for the C-400 Complex OU.
III. Identity and assigned tasks of DOE contractors for work to be performed for this project:
- Reporting responsibility for the work to be performed in support of the C-400 Complex OU belongs to Four Rivers Nuclear Partnership, LLC (FRNP). FRNP also provides programmatic and technical support, analytical services, and business management services. Swift \& Staley Team (SST) manages the AR and the EIC for DOE.
IV. Statement of the manner and extent to which the requirements and time schedules are being met:

Requirements for the C-400 Complex Remedial Action are being met consistent with the following documents:

- Memorandum of Agreement on the C-400 Complex under the Federal Facility Agreement for the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, signed August 8, 2017;
- Memorandum of Agreement for Resolution of Formal Dispute Regarding the Non-Concurrence by EPA and KDEP on the DOE Milestone Modification Request for Submittal of the Revised Proposed Plan for the Volatile Organic Compound Contamination at the C-400 Cleaning Building at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky (DOE/LX/07-2407\&D1), signed September 28, 2017;
- Memorandum of Agreement for Resolution of Formal Disputes on EPA Conditional Concurrence on the Removal Notification for Demolition of the C-400 Cleaning Building in the C-400 Complex Operable Unit at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/O7-2420\&D2 and the Engineering Evaluation/Cost Analysis for Demolition of the C-400 Cleaning Building in the C-400 Complex Operable Unit at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2425\&D2, signed August 1, 2019; and
- Site Management Plan, Paducah Gaseous Diffusion Plant, Paducah, Kentucky, Annual Revision-FY 2022, DOE/LX/07-2473\&D2.


## V. Primary/Secondary Document Tracking System:

A) Documents under review and/or preparation for this reporting period:

- Remedial Investigation/Feasibility Study Report for the C-400 Complex Operable Unit at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2474\&D1, was under development during this reporting period.
B) Due dates for completion of review/modification tasks:
- Remedial Investigation/Feasibility Study Report for the C-400 Complex Operable Unit at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2474\&D1, is due to EPA and KY no later than January 5, 2023.
- Comments from EPA and KDEP on the Remedial Investigation/Feasibility Study Report for the C-400 Complex Operable Unit at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2474\&D1, are due within 90 days of document issuance.
VI. Anticipated problems/delays (provide summary of problems, schedule, reason for delay, and actions taken to prevent or mitigate delay):
- None.
VII. Summary of all contacts with local community, public interest groups, or state government:
- DOE provided routine updates on the subproject to the Paducah Site Citizens Advisory Board (CAB), FFA project managers, FFA senior managers, local elected officials, and/or Congressional staff.
VIII. Changes in relevant personnel:
- None.
IX. Actual cost for $\mathbf{O \&} \mathbf{M}$, if appropriate:
- None.

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# FEDERAL FACILITY AGREEMENT <br> SEMIANNUAL PROGRESS REPORT <br> SECOND HALF OF FISCAL YEAR 2022 

Facility: Paducah Gaseous Diffusion Plant Plant EPA I.D. No.: KY8-890-008-982<br>Reporting Period: 4/1/2022-9/30/2022

## GROUNDWATER OPERABLE UNIT

The scope of the GWOU includes performing investigations, conducting baseline risk assessments, evaluating removal/remedial alternatives, and selecting and implementing actions necessary to achieve protection of human health and the environment from exposure to groundwater contamination that could result in an unacceptable risk.

Within the GWOU are these projects: C-400 IRA, Southwest Plume Sources Remediation, Dissolved-Phase Plumes, Northeast Plume IRA, and Northwest Plume IRA.

The overall objective of the GWOU is to remove/mitigate ongoing sources and to remediate the groundwater to target contaminant concentrations. The predominant contaminant of concern in the groundwater plumes is TCE. Table 2 provides an overall picture of the TCE mass removed [TCE values may contain other volatile organic compounds (VOCs)] by various actions.

Table 2. Cumulative TCE* Removed at Paducah

| Source Area | Cumulative TCE <br> Removed (gal)* |
| :--- | :---: |
| Northwest Plume Pump-and-Treat | $3,960^{* *}$ |
| Northeast Plume Pump-and-Treat | $365^{* *}$ |
| C-400 Six-Phase Treatability Study | 1,900 |
| C-400 Phase I | 535 |
| C-400 Phase IIa | 1,137 |
| Southwest Plume (SWMU 1) | $24^{* * *}$ |
| Other sources (i.e., SWMU 91-LASAGNA ${ }^{\text {Tw }}$ ) | 246 |
| Total | 8,167 |

*TCE values may contain other VOCs.
**Cumulative through June 30, 2022.
***Removed during deep soil mixing operations.

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# FEDERAL FACILITY AGREEMENT <br> SEMIANNUAL PROGRESS REPORT <br> SECOND HALF OF FISCAL YEAR 2022 

Facility: Paducah Gaseous Diffusion Plant Plant EPA I.D. No.: KY8-890-008-982<br>Reporting Period: 4/1/2022-9/30/2022

## GROUNDWATER OPERABLE UNIT PROJECT: C-400 IRA

I. Work performed during the reporting period (including summaries of findings and any deviations from the work plan):

- Continued long-term monitoring of the C-400 IRA groundwater monitoring network as required by the Record of Decision for Interim Remedial Action for the Groundwater Operable Unit for the Volatile Organic Compound Contamination at the C-400 Cleaning Building at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/OR/07-2150\&D2/R2.
- Conducted annual inspections in accordance with the Land Use Control Implementation Plan: Interim Remedial Action for the Groundwater Operable Unit for the Volatile Organic Compound Contamination at the C-400 Cleaning Building at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/OR/07-2151\&D2/R2.
II. Schedules of activities to be performed during the next reporting period (including projected work/crucial phases of construction):
- Continue long-term monitoring for the C-400 IRA. Data from long-term monitoring for the C-400 IRA are available in PEGASIS.
III. Identity and assigned tasks of DOE contractors for work to be performed for this project:
- Reporting responsibility for the work to be performed in support of the C-400 IRA belongs to FRNP. FRNP also provides programmatic and technical support, analytical services, and business management services. SST manages the AR and the EIC for DOE.
IV. Statement of the manner and extent to which the requirements and time schedules are being met:

The requirements for the C-400 IRA are being met consistent with the following documents:

- Memorandum of Agreement on the C-400 Complex under the Federal Facility Agreement for the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, signed August 8, 2017;
- Memorandum of Agreement for Resolution of Formal Dispute Regarding the Non-Concurrence by EPA and KDEP on the DOE Milestone Modification Request for Submittal of the Revised Proposed Plan for the Volatile Organic Compound Contamination at the C-400 Cleaning Building at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky (DOE/LX/07-2407\&D1), signed September 28, 2017;
- Record of Decision for Interim Remedial Action for the Groundwater Operable Unit for the Volatile Organic Compound Contamination at the C-400 Cleaning Building at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/OR/07-2150\&D2/R2; and
- Land Use Control Implementation Plan: Interim Remedial Action for the Groundwater Operable Unit for the Volatile Organic Compound Contamination at the C-400 Cleaning Building at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/OR/07-2151\&D2/R2.
V. Primary/Secondary Document Tracking System:
A) Documents under review and/or preparation for this reporting period:
- None.
B) Due dates for completion of review/modification tasks:
- None.
VI. Anticipated problems/delays (provide summary of problems, schedule, reason for delay, and actions taken to prevent or mitigate delay):
- None.
VII. Summary of all contacts with local community, public interest groups, or state government:
- None.
VIII. Changes in relevant personnel:
- None.
IX. Actual cost for O\&M, if appropriate:
- Sampling of the C-400 IRA wells has been incorporated into the Environmental Monitoring Program. O\&M cost for sampling for the C-400 IRA Project is not tracked separately.


# FEDERAL FACILITY AGREEMENT SEMIANNUAL PROGRESS REPORT SECOND HALF OF FISCAL YEAR 2022 

Facility: Paducah Gaseous Diffusion Plant Plant EPA I.D. No.: KY8-890-008-982<br>Reporting Period: 4/1/2022-9/30/2022

## GROUNDWATER OPERABLE UNIT PROJECT: Southwest Plume Sources

I. Work performed during the reporting period (including summaries of findings and any deviations from the work plan):

## SWMU 1

- Continued long-term monitoring of the SWMU 1 MW network as required by the Remedial Action Work Plan for In Situ Source Treatment by Deep Soil Mixing of the Southwest Groundwater Plume Volatile Organic Source at the C-747-C Oil Landfarm (Solid Waste Management Unit 1) at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-1287\&D2/A1/R1.
- Conducted inspections of land use control implementation plan (LUCIP) warning signs at SWMU 1 and verified the Excavation/Penetration Permit program for the Southwest Plume area as required by the Record of Decision for Solid Waste Management Units 1, 211-A, 211-B, and Part of 102 Volatile Organic Compound Sources for the Southwest Groundwater Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-0365\&D2/R1.


## SWMUs 211-A and 211-B

- Continued field activity implementation of the SWMU 211-A Enhanced In Situ Bioremediation Project as contained in the Certified for Construction Remedial Design Report for SWMU 211-A for Volatile Organic Compound Sources to the Southwest Groundwater Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2435\&D2, and the Remedial Action Work Plan for SWMU 211-A Enhanced In Situ Bioremediation for Volatile Organic Compound Sources to the Southwest Groundwater Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2443\&D2.
- Finalized and issued the Explanation of Significant Differences to the Record of Decision for Solid Waste Management Units 1, 211-A, 211-B, and Part of 102 Volatile Organic Compound Sources for the Southwest Groundwater Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2480\&D1, to EPA and KDEP on July 15, 2022.
- Received EPA and KDEP comments on the Explanation of Significant Differences to the Record of Decision for Solid Waste Management Units 1, 211-A, 211-B, and Part of 102 Volatile Organic Compound Sources for the Southwest Groundwater Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2480\&D1, on August 18, 2022, and September 23, 2022, respectively.
- Initiated development of the Remedial Action Completion Report with Postconstruction Report Elements for SWMU 211-A Enhanced In Situ Bioremediation for Volatile Organic Compound

Sources to the Southwest Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2483\&D1.

- Conducted inspections of LUCIP warning signs at SWMU 211-A and SWMU 211-B and verified the Excavation/Penetration Permit Program for the Southwest Plume areas as required by the Record of Decision for Solid Waste Management Units 1, 211-A, 211-B, and Part of 102 Volatile Organic Compound Sources for the Southwest Groundwater Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-0365\&D2/R1.
II. Schedules of activities to be performed during the next reporting period (including projected work/crucial phases of construction):


## SWMU 1

- Continue long-term monitoring of the SWMU 1 MW network as required by the Remedial Action Work Plan for In Situ Source Treatment by Deep Soil Mixing of the Southwest Groundwater Plume Volatile Organic Source at the C-747-C Oil Landfarm (Solid Waste Management Unit 1) at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-1287\&D2/A1/R1.
- Conduct inspections of LUCIP warning signs at SWMU 1 and verify the Excavation/Penetration Permit Program for the Southwest Plume area as required by the Record of Decision for Solid Waste Management Units 1, 211-A, 211-B, and Part of 102 Volatile Organic Compound Sources for the Southwest Groundwater Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-0365\&D2/R1.


## SWMUs 211-A and 211-B

- Develop and issue the Explanation of Significant Differences to the Record of Decision for Solid Waste Management Units 1, 211-A, 211-B, and Part of 102 Volatile Organic Compound Sources for the Southwest Groundwater Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2480\&D2, to EPA and KDEP for approval.
- Complete field activities for the SWMU 211-A Enhanced In Situ Bioremediation remedial action and initiate long-term monitoring of the remedy as required in the Certified for Construction Remedial Design Report for SWMU 211-A for Volatile Organic Compound Sources to the Southwest Groundwater Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2435\&D2, and the Remedial Action Work Plan for SWMU 211-A Enhanced In Situ Bioremediation for Volatile Organic Compound Sources to the Southwest Groundwater Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2443\&D2/R2.
- Continue development and issue the Remedial Action Completion Report with Postconstruction Report Elements for SWMU 211-A Enhanced In Situ Bioremediation for Volatile Organic Compound Sources to the Southwest Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2483\&D1, to EPA and KDEP for approval.
- Conduct inspections of LUCIP warning signs at SWMU 211-A and SWMU 211-B and verify the Excavation/Penetration Permit Program for the Southwest Plume areas as required by the Record of Decision for Solid Waste Management Units 1, 211-A, 211-B, and Part of

102 Volatile Organic Compound Sources for the Southwest Groundwater Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-0365\&D2/R1.
III. Identity and assigned tasks of DOE contractors for work to be performed for this project:

- Reporting responsibility for the work to be performed in support of the Southwest Plume Sources belongs to FRNP. FRNP also provides programmatic and technical support, analytical services, and business management services. SST manages the AR and the EIC for DOE.
IV. Statement of the manner and extent to which the requirements and time schedules are being met:
- The requirements for the SWMU 1 portion of the Southwest Plume sources remedial action subproject are being met consistent with the SMP, the FFA, and as agreed to by the FFA parties.
- The requirements for the SWMU 211-A portion of the Southwest Plume subproject are being met consistent with the SMP, the FFA, and as agreed to by the FFA parties.


## V. Primary/Secondary Document Tracking System:

A) Documents under review and/or preparation for this reporting period:

- Explanation of Significant Differences to the Record of Decision for Solid Waste Management Units 1, 211-A, 211-B, and Part of 102 Volatile Organic Compound Sources for the Southwest Groundwater Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2480\&D1, was under development and the document was under review by EPA and KDEP during this reporting period.
- Explanation of Significant Differences to the Record of Decision for Solid Waste Management Units 1, 211-A, 211-B, and Part of 102 Volatile Organic Compound Sources for the Southwest Groundwater Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2480\&D2, was under development during this reporting period.
- Remedial Action Completion Report With Postconstruction Report Elements for SWMU 211-A Enhanced In Situ Bioremediation for Volatile Organic Compound Sources to the Southwest Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2483\&D1, was under development during this reporting period.
B) Due dates for completion of review/modification tasks:
- Explanation of Significant Differences to the Record of Decision for Solid Waste Management Units 1, 211-A, 211-B, and Part of 102 Volatile Organic Compound Sources for the Southwest Groundwater Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2480\&D2, is expected to be submitted to EPA and KDEP on November 22, 2022.
- Approval of the Explanation of Significant Differences to the Record of Decision for Solid Waste Management Units 1, 211-A, 211-B, and Part of 102 Volatile Organic Compound Sources for the Southwest Groundwater Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2480\&D2, is due within 30 days of document issuance.
VI. Anticipated problems/delays (provide summary of problems, schedule, reason for delay, and actions taken to prevent or mitigate delay):
- None.
VII. Summary of all contacts with local community, public interest groups, or state government:
- DOE provided routine updates on the subproject to the Paducah Site CAB, FFA project managers, FFA senior managers, local elected officials, and/or Congressional staff, as applicable.
VIII. Changes in relevant personnel:
- None.


## IX. Actual cost for O\&M, if appropriate:

- None.


# FEDERAL FACILITY AGREEMENT <br> SEMIANNUAL PROGRESS REPORT <br> SECOND HALF OF FISCAL YEAR 2022 

Facility: Paducah Gaseous Diffusion Plant Plant EPA I.D. No.: KY8-890-008-982<br>Reporting Period: 4/1/2022-9/30/2022

## GROUNDWATER OPERABLE UNIT PROJECT: Dissolved-Phase Plumes

I. Work performed during the reporting period (including summaries of findings and any deviations from the work plan):

- Met quarterly with the Modeling Working Group during this reporting period on April 6, 2022, and July 13, 2022.
- Finalized and issued the Evaluation of Anthropogenic Recharge Associated with the Process Buildings in Support of the Sitewide Groundwater Flow Model, Paducah Gaseous Diffusion Plant, Paducah, Kentucky, FRNP-RPT-0224, on July 19, 2022. Received EPA and KDEP acknowledgment on July 22, 2022.
- Developed and issued the revised 2016 Update of the Paducah Gaseous Diffusion Plant Sitewide Groundwater Flow Model, DOE/LX/07-2415\&D2/A1, which incorporated the final Evaluation of the 2016 Groundwater Model with Updated Reference Point Elevations for the Groundwater Monitoring Network at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, FRNP-RPT-0234, on July 27, 2022. Received EPA and KDEP acknowledgment on July 8, 2022.
- Initiated development of the Detailed Correlations between Lithologic Units in the McNairy Formation across the Paducah Gaseous Diffusion Plant, FRNP-RPT-0249.
- Initiated development of the Comparison of Regional Groundwater Flow Pre- and PostConstruction and Operation of Olmsted Locks and Dam, FRNP-RPT-0260.
- Initiated updates to the sitewide groundwater model.
II. Schedule of activities to be performed during the next reporting period (including projected work/crucial phases of construction):
- Conduct quarterly meetings with the Modeling Working Group which are currently planned for October 5, 2022, and January 11, 2023.
- Finalize development of the Detailed Correlations between Lithologic Units in the McNairy Formation across the Paducah Gaseous Diffusion Plant, FRNP-RPT-0249.
- Finalize development of the Comparison of Regional Groundwater Flow Pre- and PostConstruction and Operation of Olmsted Locks and Dam, FRNP-RPT-0260.
- Continue implementing the updates to the sitewide groundwater model.
III. Identity and assigned tasks of DOE contractors for work to be performed for this project:
- Reporting responsibility for the work to be performed in support of the Dissolved-Phase Plume belongs to FRNP. FRNP also provides programmatic and technical support, analytical services, and business management services. SST manages the AR and the EIC for DOE.
IV. Statement of the manner and extent to which the requirements and time schedules are being met:
- No activities are scheduled for this project during the upcoming reporting period. The Modeling Working Group will continue to support Paducah Site projects.
V. Primary/Secondary Document Tracking System:
A) Documents under review and/or preparation for this reporting period:
- None.
B) Due dates for completion of review/modification tasks:
- None.
VI. Anticipated problems/delays (provide summary of problems, schedule, reason for delay, and actions taken to prevent or mitigate delay):
- None.
VII. Summary of all contacts with local community, public interest groups, or state government:
- DOE provided routine updates on the subproject to the Paducah Site CAB, FFA project managers, FFA senior managers, local elected officials, and/or Congressional staff, as applicable.
VIII. Changes in relevant personnel:
- None.
IX. Actual cost for O\&M, if appropriate:
- None.


# FEDERAL FACILITY AGREEMENT <br> SEMIANNUAL PROGRESS REPORT <br> SECOND HALF OF FISCAL YEAR 2022 

Facility: Paducah Gaseous Diffusion Plant Plant EPA I.D. No.: KY8-890-008-982<br>Reporting Period: 4/1/2022-9/30/2022

## GROUNDWATER OPERABLE UNIT PROJECT: Northeast Plume IRA

I. Work performed during the reporting period (including summaries of findings and any deviations from the work plan):

- Treated $33,055,605 \mathrm{gal}$ of contaminated groundwater, with an average system treatment rate of 127 gallons per minute (gpm) during this reporting period. The system is designed so that continuous operation of the Northeast Plume Containment System (NEPCS) is possible when only one of the two extraction wells (EWs) is functional. The NEPCS achieved an average operational efficiency, as a whole, of $76.0 \%$. Operational online efficiencies for the reporting period for C-765 were as follows: January 2022, 0\%; February 2022, 0\%; March 2022, 11.7\%; April 2022, $99.8 \%$; May 2022, $99.7 \%$; and June 2022, > $99.9 \%$. The C-765-A operational online efficiencies for the reporting period for C-765-A were as follows: January 2022, 100\%; February 2022, $100 \%$; March 2022, $99.9 \%$; April 2022, $99.9 \%$; May 2022, $98.9 \%$; and June 2022, 99.9\%.


## A) Process Operations:

The NEPCS consists of two EWs (EW234 and EW235), transfer piping, two treatment units for air stripping and suspended solids removal, and MW network. The old EWs, EW331 and EW332, equalization tank, and old transfer piping have been placed in standby mode.
B) Process Testing:

Operation of the NEPCS began February 28, 1997. As of June 30, 2022, the NEPCS has processed a total of approximately $2,129,281,643$ gal of water. The monthly withdrawal volumes for this reporting period are presented in Appendix A, Table A.1, of this report. This table includes a summary of the withdrawn water volumes and average daily rates.
C) NEPCS Influent, Effluent, and Extraction Well Testing:

Due to sample analysis time and the data assessment process, there is a three month lag in the analytical data and operational data. Graphs in this report present analytical data through June 2022. Data are available in PEGASIS.

Influent TCE analytical data from 2017 through the end of June 2022 are presented in Appendix B. Environmental samples were collected monthly from the treatment system influent and weekly from the treatment system effluent for the period of January 1, 2022, through June 30, 2022. High, low, and average influent and effluent TCE concentrations for these months are presented in Table 3.

Table 3. TCE Concentrations for Northeast Plume

|  | TCE $(\boldsymbol{\mu g} / \mathrm{L})$ |  |  |
| :--- | :---: | :---: | :---: |
|  | High | Low | Average |
| Influent C-765 (EW234) | 493 | 257 | 330 |
| Influent C-765-A (EW235) | 158 | 106 | 129 |
| Effluent from C-765 | 2.09 | $<1^{*}$ | 1.16 |
| Effluent from C-765-A | 2.20 | $<1^{*}$ | 1.09 |
| Effluent (CERCLA Outfall C001) | 2.03 | $<1^{*}$ | 1.01 |
| *Values denoted are below the detection limit. |  |  |  |

*Values denoted are below the detection limit.

As presented in Table 3, the NEPCS continued to remove TCE effectively. The systems operated with an average removal efficiency of $99.6 \%$ for EW234 and $99.2 \%$ for EW235 for TCE.

The EWs were sampled monthly during this reporting period. For the period of January 1, 2022, through June 30, 2022, EW234 had an average TCE concentration of $330 \mu \mathrm{~g} / \mathrm{L}$, while EW235 had an average concentration of $129 \mu \mathrm{~g} / \mathrm{L}$.

Treated groundwater for the Northeast Plume is discharged to a CERCLA outfall, and data associated with the CERCLA outfall are included as part of Appendix B of this report.

## D) Maintenance Activities:

## Routine Maintenance Activities:

Daily, monthly, quarterly, and annual routine maintenance activities were conducted in accordance with the Northwest/Northeast Plume Daily Operational Data Collection and Maintenance, CP4-ER-0017.

- C-765 system was shut down for 0.25 hours for planned maintenance during this reporting period.
- C-765-A system was shut down for 0.75 hours for planned maintenance during this reporting period.


## Non-routine Maintenance Activities:

- C-765 system was unexpectedly shut down for 2,076.50 hours during this reporting period. Of that time, 2,073 hours of downtime were attributable to a EW234 pump motor failures and 3.5 hours of downtime were attributable to a site plant power outages and an unscheduled repair. During the EW234 pump motor failure, the C-765-A system was offline only for 1 hour, which limited impact to the downgradient plume.
- C-765-A system was unexpectedly shut down for 10.5 hours due to power outages, and unplanned maintenance and repair during this reporting period.
E) Effectiveness Monitoring-Monitoring Well Results:

Figure B.1, included in Appendix B, shows locations of the MWs and EWs. Figure B. 2 shows system influent TCE concentrations, and Figure B. 3 includes a summary of the Tc-99 activities in the Northeast Plume EWs. Figure B. 4 shows the estimated cumulative amount of TCE removed since the NEPCS began operations in 1997. Figures B. 5 through B.14, presented in Appendix B, show TCE concentrations and Tc-99 activities in upgradient transect wells, MWs near the EWs, downgradient wells, distal downgradient wells, and wells near the C-400 Complex. The EWs are working well to increase TCE mass removal and to enhance control of the plume. This is shown in Figure B. 4 in Appendix B with an increase in mass removal beginning in October 2017, with initiation of pumping from the optimized EWs.

During this reporting period, the FFA parties reviewed and assessed the Northeast Plume TCE and Tc-99 transect well results on a quarterly basis. The analytical results can be found in Appendix B, along with analytical results for other NEPCS MWs. This information is used by the FFA parties when considering if additional adjustments are needed to minimize undesirable expansion of high concentrations of Tc-99 and TCE within the Northeast Plume. As agreed to by the FFA parties, 100 gpm and 75 gpm are the target flowrates for EW234 and EW235, respectively. The NEPCS continues to operate under Condition \#3 of the Memorandum of Agreement for Resolution of Formal Dispute of the Explanation of Significant Differences to the Record of Decision for the Interim Remedial Action of the Northeast Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky (DOE/LX/07-1291 \&D2), and Remedial Action Work Plan for Optimization of the Northeast Plume Interim Remedial Action at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky (DOE/LX/07-1280\&D2).
F) Modification of the NEPCS Operations or Configuration:

- None.


## G) See Section V for work related to document preparation and review.

II. Schedule of activities to be performed during the next reporting period (including projected work/crucial phases of construction):

- Continue to conduct and document the necessary tasks required for equipment maintenance, calibration, and operation as specified in the Operation and Maintenance Plan for the Northeast Plume Containment System Interim Remedial Action at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2470\&D1.
- Provide TCE and Tc-99 transect MW sampling results in conjunction with other Northeast Plume MWs results to EPA and KDEP on a quarterly basis.
III. Identity and assigned tasks of DOE contractors for work to be performed for this project:
- Reporting responsibility for the work to be performed in support of the Northeast Plume IRA belongs to FRNP. FRNP also provides programmatic and technical support, analytical services, and business management services. SST manages the AR and the EIC for DOE.
IV. Statement of the manner and extent to which the requirements and time schedules are being met:
- The effluent concentration goal of $30 \mu \mathrm{~g} / \mathrm{L}$ for TCE was met during the reporting period. The NEPCS remained operational $76.0 \%$ of the time during this reporting period.
V. Primary/Secondary Document Tracking System:
A) Documents under review and/or preparation for this reporting period:
- None.
B) Due dates for completion of review/modification tasks:
- None.
VI. Anticipated problems/delays (provide summary of problems, schedule, reason for delay, and actions taken to prevent or mitigate delay):
- None.
VII. Summary of all contacts with local community, public interest groups, or state government:
- DOE provided routine updates on the subproject to the Paducah Site CAB, FFA project managers, FFA senior managers, local elected officials, and/or Congressional staff.
VIII. Changes in relevant personnel:
- None.
IX. Actual cost for O\&M, if appropriate:
- Actual costs for O\&M of the Northwest and Northeast Plume facilities are tracked jointly. The total operating cost for the reporting period was approximately $\$ 779,000$.


# FEDERAL FACILITY AGREEMENT <br> SEMIANNUAL PROGRESS REPORT <br> SECOND HALF OF FISCAL YEAR 2022 

Facility: Paducah Gaseous Diffusion Plant Plant EPA I.D. No.: KY8-890-008-982<br>Reporting Period: 4/1/2022-9/30/2022

## GROUNDWATER OPERABLE UNIT PROJECT: Northwest Plume IRA

I. Work performed during the reporting period (including summaries of findings and any deviations from the work plan):

- Treated $49,057,676 \mathrm{gal}$ of contaminated groundwater, with an average monthly operational efficiency of $94.8 \%$ during this reporting period. The average system treatment rate for the reporting period was approximately 188 gpm . Operational efficiencies for the reporting period were as follows: January 2022, 99.5\%; February 2022, 74.4\%; March 2022, 97.2\%; April 2022, $99.0 \%$; May 2022, $97.5 \%$; and June 2022, $99.8 \%$.


## A) Process Operations:

The Northwest Plume Groundwater System (NWPGS) consists of two EWs (EW232 and EW233), located just north of the Paducah Site, and underground transfer pipeline for moving contaminated groundwater. The treatment facility has an operational capacity of $220 \mathrm{gal} / \mathrm{min}$ and utilizes air stripping for removal of TCE in groundwater, ion exchange for removal of Tc-99 in groundwater, and vapor phase carbon for capturing TCE from the exhaust of the air stripper. Treated groundwater is released to a tributary that flows to Kentucky Pollutant Discharge Elimination System Outfall 001. A MW network is used to evaluate performance and effectiveness of the optimized EWs.

## B) Process Testing:

Operation of the NWPGS began on August 28, 1995. As of June 30, 2022, the NWPGS has processed a total of approximately $2,685,175,660 \mathrm{gal}$ of water. The monthly withdrawal volumes for the reporting period are presented in Appendix A, Table A.2, of this report. This table includes a summary of the withdrawn water volumes and average daily rates.
C) NWPGS Influent, Effluent, and Extraction Well Testing:

Due to sample analysis time and the data assessment process, there is a three month lag in the analytical data and operational data. Graphs in this report present data through June 2022. Data are available in PEGASIS.

Figure B.15, included in Appendix B, shows locations of the Northwest Plume MWs. Influent TCE and Tc-99 analytical data are presented in Appendix B on Figures B. 16 and B.17. Figures B. 18 and B. 19 include a summary of the TCE and Tc-99 concentrations of the effluent versus time at the NWPGS. Figure B. 20 shows the cumulative estimated amount of TCE removed since the NWPGS began operations in 1995. The influent sample results, compared to the NWPGS effluent results, indicated that the NWPGS continues to remove TCE and Tc-99 effectively.

For radionuclides, all reported values, including negative values, are used to derive averages. Negative Tc-99 results may be reported due to a statistical determination of the counts seen by a detector, minus a background count. High, low, and average influent and effluent TCE and Tc-99 concentrations from January 1, 2022, through June 30, 2022, are presented in Table 4.

Table 4. TCE and Tc-99 Concentrations for Northwest Plume (January 1, 2022, through June 30, 2022)

| TCE $(\mu \mathrm{g} / \mathrm{L})$ |  |  |  | Tc-99 (pCi/L) |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: |
|  | High | Low | Average | High | Low | Average |
| Influent | 943 | 681 | 828 | 250 | 193 | 208 |
| Effluent | 1.43 | $<1^{*}$ | 1.07 | 69.9 | 25.3 | 42.1 |

*The values denoted are below the detection limit.
The treatment system influent was sampled monthly. The effluent was sampled weekly. These sampling frequencies were conducted in accordance with the Operation and Maintenance Plan for the Northwest Plume Groundwater System Interim Remedial Action at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2469\&D2. As presented in Table 4, the NWPGS continued to remove TCE and Tc-99 effectively. The system operated with an average removal efficiency of $99.9 \%$ for TCE and $79.8 \%$ for Tc-99.

The average TCE effluent concentration for this reporting period was $1.07 \mu \mathrm{~g} / \mathrm{L}$, which is less than the treatment goal of $5 \mu \mathrm{~g} / \mathrm{L}$. The average Tc-99 effluent value was $42.1 \mathrm{pCi} / \mathrm{L}$, which is less than the operational goal of $900 \mathrm{pCi} / \mathrm{L}$, during the reporting period.

High, low, and average sample results for this reporting period at the EWs are shown in Table 5. EW232 and EW233 were sampled quarterly in accordance with the Operation and Maintenance Plan for the Northwest Plume Groundwater System Interim Remedial Action at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2469\&D2.

Table 5. TCE and Tc-99 Concentrations for Northwest Plume Extraction Wells (January 1, 2022, through June 30, 2022)

| TCE ( $\mu \mathrm{g} / \mathrm{L})$ |  |  |  | Tc-99 (pCi/L) |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: |
|  | High | Low | Average | High | Low | Average |
| EW232 | 629 | 370 | 500 | 195 | 109 | 152 |
| EW233 | 837 | 811 | 824 | 342 | 235 | 279 |

## D) Treatment Media:

## Ion Exchange Resins:

The NWPGS is equipped with four ion exchange columns used for Tc-99 removal. Purolite ${ }^{\circledR}$ A520E resin is used in the columns, which are arranged in a lead/lag configuration in a trailer.

## Activated Carbon Media:

The NWPGS is equipped with two carbon columns that contain granular activated carbon for absorption of VOCs from the vapor-phase effluent of the air stripper unit. The Operation and Maintenance Plan for the Northwest Plume Groundwater System Interim Remedial Action at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2469\&D2, requires that spent carbon be replaced every 6 months. The last carbon changeout was completed on September 27, 2022. The next carbon changeout is projected for March 2023.
E) Maintenance Activities:

## Routine Maintenance Activities:

Daily, monthly, quarterly, and annual routine maintenance activities were conducted in accordance with the Northwest/Northeast Plume Daily Operational Data Collection and Maintenance, CP4-ER-0017, and Monthly, Quarterly, and Annual Maintenance at the C-612 Northwest Plume Groundwater System, CP4-ER-0016.

- The NWPGS was shut down for a total of 9 hours for planned maintenance, including carbon changeout activities.


## Non-routine Maintenance Activities:

- The NWPGS was unexpectedly shut down for a total of 214.75 hours with the majority of the downtime due to the failure of the air stripper blower.
F) Effectiveness Monitoring-Monitoring Well Results:

Figures B. 21 through B. 30 presented in Appendix B, show TCE and Tc-99 concentrations in EWs and nearby MWs from 2017 through June 2022.
G) Modification of the NWPGS Operations or Configuration:

- None.
H) See Section V for work related to document preparation and review.
II. Schedules of activities to be performed during the next reporting period (including projected work/crucial phases of construction):
- Continue to conduct and document the necessary tasks required for equipment maintenance, calibration, and operation, as specified in the Operation and Maintenance Plan for the Northwest Plume Groundwater System Interim Remedial Action at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2469\&D2.
III. Identity and assigned tasks of DOE contractors for work to be performed for this project:
- Reporting responsibility for the work to be performed in support of the Northwest Plume IRA belongs to FRNP. FRNP also provides programmatic and technical support, analytical services, and business management services. SST manages the AR and the EIC for DOE.
IV. Statement of the manner and extent to which the requirements and time schedules are being met:
- The average NWPGS water effluent concentrations met the operational goals of $5 \mu \mathrm{~g} / \mathrm{L}$ for TCE and $900 \mathrm{pCi} / \mathrm{L}$ for Tc-99 during the reporting period. The NWPGS has maintained an average monthly operational efficiency of $94.8 \%$ during this reporting period.
V. Primary/Secondary Document Tracking System:
A) Documents under review and/or preparation for this reporting period:
- None.
B) Due dates for completion of review/modification tasks:
- None.
VI. Anticipated problems/delays (provide summary of problems, schedule, and reason for delay, and actions taken to prevent or mitigate delay):
- A failure of the EW232 pump that occurred after the current reporting period will impact the withdraw information in the next report.
VII. Summary of all contacts with local community, public interest groups, or state government:
- DOE provided routine updates on the subproject to the Paducah Site CAB, FFA project managers, FFA senior managers, local elected officials, and/or Congressional staff.
VIII. Changes in relevant personnel:
- None.
IX. Actual cost for $\mathbf{O \&} \mathbf{M}$, if appropriate:
- Actual costs for O\&M of the Northwest and Northeast Plume facilities are tracked jointly. The total operating cost for the reporting period was approximately $\$ 779,000$.


# FEDERAL FACILITY AGREEMENT <br> SEMIANNUAL PROGRESS REPORT <br> SECOND HALF OF FISCAL YEAR 2022 

Facility: Paducah Gaseous Diffusion Plant<br>Plant EPA I.D. No.: KY8-890-008-982<br>Reporting Period: 4/1/2022-9/30/2022

## BURIAL GROUNDS OPERABLE UNIT

The scope of the BGOU includes an RI, baseline human health risk assessment, evaluation of remedial alternatives, remedy selection, and implementation of actions, as necessary, for protection of human health and the environment for the following burial grounds: C-749 (SWMU 2); C-404 (SWMU 3); C-747/C-748-B (SWMU 4); C-746-F (SWMU 5); C-747-B (SWMU 6); C-747-A (SWMUs 7 and 30), which includes the area beneath C-747-A (SWMU 12); the residential/inert borrow area (SWMU 145); and the C-746-S\&T Landfills (SWMUs 9 and 10, respectively).

This section also includes information on the sampling activities being conducted at the C-749 Uranium Burial Ground, as required in the Record of Decision for Interim Remedial Action at Solid Waste Management Units 2 and 3 of Waste Area Group 22 at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/OR/06-1351\&D1, signed in 1995.

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# FEDERAL FACILITY AGREEMENT <br> SEMIANNUAL PROGRESS REPORT <br> SECOND HALF OF FISCAL YEAR 2022 

Facility: Paducah Gaseous Diffusion Plant Plant EPA I.D. No.: KY8-890-008-982<br>Reporting Period: 4/1/2022-9/30/2022

## BURIAL GROUNDS OPERABLE UNIT PROJECT: C-749 Uranium Burial Ground (SWMU 2)

I. Work performed during the reporting period (including summaries of findings and any deviations from the work plan):

- Continued groundwater monitoring at the C-749 Uranium Burial Ground, as required by the Record of Decision for Interim Remedial Action at Solid Waste Management Unit 2 and 3 of Waste Area Group 22 at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/OR/06-1351\&D1. Appendix E contains figures depicting the C-749 Uranium Burial Ground (SWMU 2) groundwater MW locations and a summary of the SWMU 2 trends for TCE and Tc - 99 for a period of five years. All groundwater data are available in PEGASIS and, therefore, have not been summarized in this report.
II. Schedules of activities to be performed during the next reporting period (including projected work/crucial phases of construction):
- Continue groundwater monitoring at the C-749 Uranium Burial Ground, as required by the Record of Decision for Interim Remedial Action at Solid Waste Management Unit 2 and 3 of Waste Area Group 22 at the Paducah Gaseous Diffusion Plant Paducah, Kentucky, DOE/OR/06-1351\&D1.
III. Identity and assigned tasks of DOE contractors for work to be performed for this project:
- Reporting responsibility for the work to be performed in support of the C-749 Uranium Burial Ground belongs to FRNP. FRNP also provides programmatic and technical support, analytical services, and business management services. SST manages the AR and the EIC for DOE and maintains existing burial ground cover.
IV. Statement of the manner and extent to which the requirements and time schedules are being met:
- The requirements and time schedules are being met.
V. Primary/Secondary Document Tracking System:
A) Documents under review and/or preparation during this reporting period:
- None.
B) Due dates for completion of review/modification tasks:
- None.
VI. Anticipated problems/delays (provide summary of problems, schedule, reason for delay, and actions taken to prevent or mitigate delay):
- None.
VII. Summary of all contacts with local community, public interest groups, or state government:
- None.
VIII. Changes in relevant personnel:
- None.


## IX. Actual cost for O\&M, if appropriate:

- Sampling of the C-749 Uranium Burial Ground has been incorporated into the Environmental Monitoring Program. O\&M cost for this project is not tracked separately.


# FEDERAL FACILITY AGREEMENT <br> SEMIANNUAL PROGRESS REPORT <br> SECOND HALF OF FISCAL YEAR 2022 

Facility: Paducah Gaseous Diffusion Plant<br>Plant EPA I.D. No.: KY8-890-008-982<br>Reporting Period: 4/1/2022-9/30/2022

## SURFACE WATER OPERABLE UNIT

The SWOU includes the Surface Water Removal Action and Surface Water Remedial Action projects. O\&M is performed on North-South Diversion Ditch Sections 1 and 2 and institutional controls, as required by the Operation and Maintenance Plan for Sections 1 and 2 of the North-South Diversion Ditch at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/OR/07-2057\&D2, and Operation and Maintenance Plan for the Surface Water Operable Unit at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/OR/07-1904\&D1/R2; and O\&M activities for the C-613 Sedimentation Basin are maintained in accordance with the Operation and Maintenance Plan for the Northwest Storm Water Control Facility at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/OR/07-2044\&D1/R4, respectively.

Per the Operation and Maintenance Plan for the Northwest Storm Water Control Facility at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/OR/07-2044\&D1/R4, the relationship of turbidity to total suspended solids is compared on a quarterly basis. An update to the existing linear regression model was performed in September 2022, and the current maximum discharge limit for turbidity is 95 nephelometric turbidity units (NTUs), with a 30-day average not to exceed 45 NTUs.

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# FEDERAL FACILITY AGREEMENT <br> SEMIANNUAL PROGRESS REPORT <br> SECOND HALF OF FISCAL YEAR 2022 

Facility: Paducah Gaseous Diffusion Plant Plant EPA I.D. No.: KY8-890-008-982<br>Reporting Period: 4/1/2022-9/30/2022

## SURFACE WATER OPERABLE UNIT PROJECT: Remedial Action

I. Work performed during the reporting period (including summaries of findings and any deviations from the work plan):

- Conducted inspections in accordance with the Land Use Control Implementation Plan for the North-South Diversion Ditch at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/OR/07-1949\&D2/R2.
- Conducted inspections for Environmental Indicator signs in April 2022 and Institutional Control measures in June 2022 in accordance with the Operation and Maintenance Plan for the Surface Water Operable Unit at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/OR/07-1904\&D1/R2.
II. Schedules of activities to be performed during the next reporting period (including projected work/crucial phases of construction):
- Conduct inspections in accordance with the Land Use Control Implementation Plan for the North-South Diversion Ditch at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/OR/07-1949\&D2/R2.
- Conduct inspections for Environmental Indicator signs and Institutional Control measures in in accordance with the Operation and Maintenance Plan for the Surface Water Operable Unit at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/OR/07-1904\&D1/R2.
III. Identity and assigned tasks of DOE contractors for work to be performed for this project:
- Reporting responsibility for the work to be performed in support of the SWOU Remedial Action belongs to FRNP. FRNP also provides programmatic and technical support, analytical services, and business management services. SST manages the AR and the EIC for DOE.
IV. Statement of the manner and extent to which the requirements and time schedules are being met:
- The requirements and time schedules are being met for the SWOU consistent with the SMP and as agreed to by the FFA parties.
V. Primary/Secondary Document Tracking System:
A) Documents under review and/or preparation for this reporting period:
- None.
B) Due dates for completion of review/modification tasks:
- None.
VI. Anticipated problems/delays (provide summary of problems, schedule, reason for delay, and actions taken to prevent or mitigate delay):
- None.
VII. Summary of all contacts with local community, public interest groups, or state government:
- DOE provided routine updates on the subproject to the Paducah Site CAB, FFA project managers, FFA senior managers, local elected officials, and/or Congressional staff.
VIII. Changes in relevant personnel:
- None.


## IX. Actual cost for O\&M, if appropriate:

- O\&M activities have been incorporated into the Environmental Monitoring Program. O\&M cost for this project is not tracked separately.


# FEDERAL FACILITY AGREEMENT SEMIANNUAL PROGRESS REPORT SECOND HALF OF FISCAL YEAR 2022 

Facility: Paducah Gaseous Diffusion Plant Plant EPA I.D. No.: KY8-890-008-982<br>Reporting Period: 4/1/2022-9/30/2022<br>WATER POLICY

Pursuant to the June 1994 Action Memorandum for the Water Policy at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/OR/06-1201\&D2, that was approved by EPA in August 1994, municipal water service was offered at no cost to all existing private residences and businesses within the Water Policy affected area. The affected area is defined as follows:


#### Abstract

The affected area is generally bounded by the Ohio River to the north, DOE property boundary to the south, Metropolis Lake Road to the east, and Bethel Church Road to the west. Specifically, on the west side, the boundary follows the DOE property boundary northwest to the intersection with Big Bayou Creek. At that point, it moves west to the intersection of Bethel Church Road and the centerline of a powerline easement just south of Bobo Lane. Property fronting the north end of Bethel Church Road is included in the affected area north of the intersection with the powerline easement to the Ohio River. Specifically, on the east side, the boundary follows the DOE property boundary northwest to the southern point of private property that fronts Ogden Landing Road (identified in McCracken County Property Valuation Office records as \#20-27-1A). At that point, it moves east along the southern edge of properties that front the south side of Ogden Landing Road to the intersection of Ogden Landing Road with Metropolis Lake Road. Property fronting on both sides of Metropolis Lake Road is included in the affected area north of this intersection of the roads to the Ohio River.


There are 680.5 acres within the Water Policy affected area (i.e., excluding DOE property) that lie over the 2020 TCE groundwater plume above the $5 \mu \mathrm{~g} / \mathrm{L}$ maximum contaminant level (MCL); 522.5 acres are owned by either West Kentucky Wildlife Management Area or the Tennessee Valley Authority (TVA), and 158 acres are owned by private residents or businesses. DOE has implemented various water policy activities that ensure proper management of the Water Policy and assist in DOE's long-term protectiveness of residents and businesses located within the Water Policy affected area. These activities include the following: (1) update water policy area information by maintaining an annual subscription to the online McCracken County Property Valuation Administrator (PVA) office and verifying land ownership with the PVA office; (2) review the monthly billing register, ensuring water bill payments and assessing trends; (3) manage license agreements; (4) provide sampling results; (5) provide an annual water policy educational fact sheet to all residents and businesses within the affected area; (6) perform annual cap and lock inspections; and (7) demonstrate, on an annual basis, that residents and businesses located over the groundwater plume are not utilizing the groundwater.

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# FEDERAL FACILITY AGREEMENT <br> SEMIANNUAL PROGRESS REPORT <br> SECOND HALF OF FISCAL YEAR 2022 

Facility: Paducah Gaseous Diffusion Plant Plant EPA I.D. No.: KY8-890-008-982<br>Reporting Period: 4/1/2022-9/30/2022<br>PROJECT: Water Policy

## I. Work performed during this reporting period (including summaries of findings and any deviations from the work plan):

## License Agreements:

- Offered three license agreements during this reporting period. The three license agreements are pending landowner signature. One license agreement that was sent during the previous reporting period was signed by the landowner during this reporting period. The supplement to the January 4, 2011, permit between TVA and DOE was signed during this reporting period. As of September 30, 2022, 102 of 124 parcels within the Water Policy affected area are covered by a license agreement. The number of license agreements counted also includes parcels on the west side of Bethel Church Road.


## Water Bills:

- Reviewed all water bills for properties that DOE pays and noted no significant trends during this reporting period.

Demonstration that Residents Located over the Contaminated Groundwater Plume Are Protected:

- Continued to review the water bills for the 10 parcels that lay over the $5 \mu \mathrm{~g} / \mathrm{L}$ or greater portion of the TCE groundwater plumes to ensure no downward trends in usage which could indicate that property owners are using groundwater instead of municipal water. No issues were identified during this review.
- Verified land ownership by reviewing the PVA website. No issues were identified during this assessment.


## Monitoring:

- Routine monitoring was conducted in accordance with the following documents:
- Operation and Maintenance Plan for the Northeast Plume Containment System Interim Remedial Action at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2470\&D1; and
- Operation and Maintenance Plan for the Northwest Plume Groundwater System Interim Remedial Action at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2469\&D2.
- Data collected in support of water policy monitoring will be made available in PEGASIS once data have been reported to the landowners.

Northeast:

- Nine MWs and seven residential wells are monitored routinely in accordance with the Operation and Maintenance Plan for the Northeast Plume Containment System Interim Remedial Action at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2470\&D1.
- Sampled three MWs during this reporting period. Two MWs were sampled in May 2022 and one MW was sampled in September 2022. None of the MWs sampled in May 2022 exhibited detections greater than the MCL for TCE $(5 \mu \mathrm{~g} / \mathrm{L})$. Analytical data are pending for the sample collected in September 2022.

Northwest:

- Thirteen MWs and five residential wells are monitored routinely in accordance with the Operation and Maintenance Plan for the Northwest Plume Groundwater System Interim Remedial Action at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2469\&D2. (Note: Tc-99 was added as a result of the Memorandum of Agreement for Resolution of Informal Dispute Concerning U.S. Environmental Protection Agency and Kentucky Department for Environmental Protection Requirements for Additional Actions or Modifications Regarding the CY 2018 Five-Year Review for Remedial Actions at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2426\&D2, dated June 22, 2020.)
- Sampled MWs and residential wells in May 2022 and August 2022, respectively, during this reporting period, in accordance with the Water Policy Boundary Monitoring Program per the Environmental Monitoring Plan. Analytical data for MWs and residential wells sampled in February 2022 were not available for reporting in the previous reporting period; the analytical data have been included in this report. One of the residential wells sampled in February 2022 exhibited a detection of greater than the MCL for TCE ( $5 \mu \mathrm{~g} / \mathrm{L}$ ). All other MWs or residential wells sampled in February 2022 and May 2022 were below the MCL for TCE. None of the MWs or residential wells sampled exhibited detections of Tc-99. Analytical data are pending for samples collected in August 2022.
- Sampled residential well R40 in April 2022, July 2022, and August 2022. Samples taken in April 2022 and July 2022 were collected from the well using the standard purge volume and an extended purge volume. One of the samples collected in April 2022 using the standard purge volume had a result greater than the MCL for vinyl chloride ( $2 \mu \mathrm{~g} / \mathrm{L}$ ). Vinyl chloride has not previous been detected in R40. All other analytes were less than the MCL for the April 2022 sampling event. The samples collected using the extended purge volume had results less than the MCL for vinyl chloride and TCE. A downhole video inspection was performed in July 2022 and the video inspection did not reveal any well failure. There was some biofouling in the well, but not excessive. The residential well pump and tubing were replaced with a new pump and tubing in July 2022; and the well was sampled using the standard purge volume and the extended purge volume. TCE and vinyl chloride results from the July 2022 sampling event were below the MCL for both analytes at both purge volumes. The August 2022 sample was collected using the standard purge volume. Analytical data are pending for the sample collected in August 2022.
II. Schedules of activities to be performed during the next reporting period (including projected work/crucial phases of construction):
- Continue routine monitoring and reporting in accordance with the Operation and Maintenance Plan for the Northeast Plume Containment System Interim Remedial Action at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2470\&D1; and the Operation and Maintenance Plan for the Northwest Plume Groundwater System Interim Remedial Action at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2469\&D2.
III. Identity and assigned tasks of DOE contractors for work to be performed for this project:
- Reporting responsibility for the work to be performed in support of the Water Policy belongs to FRNP. FRNP also provides programmatic and technical support, analytical services, and business management services. SST manages the AR and the EIC for DOE.
IV. Statement of the manner and extent to which the requirements and time schedules are being met:
- The requirements and time schedules are being met.
V. Primary/Secondary Document Tracking System:
A) Documents under review and/or preparation for this reporting period:
- None.
B) Due dates for completion of review/modification tasks:
- None.
VI. Anticipated problems/delays (provide summary of problems, schedule, reason for delay, and actions taken to prevent or mitigate delay):
- None.
VII. Summary of all contacts with local community, public interest groups, or state government:
- DOE provided routine updates on the subproject to the Paducah Site CAB, FFA project managers, FFA senior managers, local elected officials, and/or Congressional staff.
VIII. Changes in relevant personnel:
- None.
IX. Actual cost for O\&M, if appropriate:
- Water bill payments are included in DOE's annual operating budget for the Paducah Site.

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## FEDERAL FACILITY AGREEMENT

 SEMIANNUAL PROGRESS REPORT SECOND HALF OF FISCAL YEAR 2022Facility: Paducah Gaseous Diffusion Plant
Plant EPA I.D. No.: KY8-890-008-982
Reporting Period: 4/1/2022-9/30/2022
ADDITIONAL REPORTING

Presented in this Additional Reporting section are updates for the following:

- WAGs 1 and 7 (C-746-K Landfill, TCE Spill Sites, Underground Storage Tanks, and Kentucky Ordnance Works sites);
- CRP;
- SMP;
- CERCLA Five-Year Review; and
- Plant Industrial Area Vapor Intrusion Assessment.

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# FEDERAL FACILITY AGREEMENT <br> SEMIANNUAL PROGRESS REPORT <br> SECOND HALF OF FISCAL YEAR 2022 

Facility: Paducah Gaseous Diffusion Plant Plant EPA I.D. No.: KY8-890-008-982<br>Reporting Period: 4/1/2022-9/30/2022

PROJECT: WAGs 1 and 7 (C-746-K Landfill, TCE Spill Sites, Underground Storage Tanks, and Kentucky Ordnance Works Sites)
I. Work performed during this reporting period (including summaries of findings and any deviations from the work plan):

- Continued monitoring around the C-746-K Landfill, as required by the Record of Decision for Waste Area Groups 1 and 7 at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/OR/06-1470\&D3. WAGs 1 and 7 ROD requires these data to be submitted semiannually. The results of the groundwater monitoring data for the previous five years are presented graphically in Appendix C.
II. Schedules of activities to be performed during the next reporting period (including projected work/crucial phases of construction):
- Monitoring will continue around C-746-K Landfill, as required by the ROD. This monitoring is conducted and reported in accordance with other site programs, such as the Environmental Monitoring Program.
III. Identity and assigned tasks of DOE contractors for work to be performed for this project:
- Reporting responsibility for the work to be performed in support of WAGs 1 and 7 belongs to FRNP. FRNP also provides programmatic and technical support, analytical services, and business management services. SST manages the AR and the EIC for DOE.
IV. Statement of the manner and extent to which the requirements and time schedules are being met:
- The requirements and time schedules are being met.
V. Primary/Secondary Document Tracking System:
A) Documents under review and/or preparation for this reporting period:
- None
B) Due dates for completion of review/modification tasks:
- None.
VI. Anticipated problems/delays (provide summary of problems, schedule, reason for delay, and actions taken to prevent or mitigate delay):
- None.
VII. Summary of all contacts with local community, public interest groups, or state government:
- None.
VIII. Changes in relevant personnel:
- None.


## IX. Actual cost for O\&M, if appropriate:

- Sampling activities for the C-746-K Landfill have been incorporated into the Environmental Monitoring Program. O\&M cost for this project is not tracked separately.


# FEDERAL FACILITY AGREEMENT <br> SEMIANNUAL PROGRESS REPORT <br> SECOND HALF OF FISCAL YEAR 2022 

Facility: Paducah Gaseous Diffusion Plant Plant EPA I.D. No.: KY8-890-008-982<br>Reporting Period: 4/1/2022-9/30/2022

PROJECT: Community Relations Plan
I. Work performed during this reporting period (including summaries of findings and any deviations from the work plan):

- $\quad$ Submitted the Community Relations Plan under the Federal Facility Agreement at the U.S. Department of Energy Paducah Gaseous Diffusion Plant, DOE/LX/07-2481\&D1, to EPA and KDEP on June 14, 2022.
- Received EPA concurrence on the Community Relations Plan under the Federal Facility Agreement at the U.S. Department of Energy Paducah Gaseous Diffusion Plant, DOE/LX/07-2481\&D1, on July 5, 2022, and KDEP acknowledgment without comment on July 6, 2022.
II. Schedules of activities to be performed during the next reporting period (including projected work/crucial phases of construction):
- None.
III. Identity and assigned tasks of DOE contractors for work to be performed for this project:
- Reporting responsibility for the work to be performed in support of the CRP belongs to FRNP. FRNP also provides programmatic and technical support, analytical services, and business management services. SST manages the AR and the EIC for DOE.
IV. Statement of the manner and extent to which the requirements and time schedules are being met:
- The requirements and time schedules are being met.
V. Primary/Secondary Document Tracking System:
A) Documents under review and/or preparation for this reporting period:
- Community Relations Plan under the Federal Facility Agreement at the U.S. Department of Energy Paducah Gaseous Diffusion Plant, DOE/LX/07-2481\&D1, was under development and the document was under review and approved by EPA and KDEP during this reporting period.
B) Due dates for completion of review/modification tasks:
- None.
VI. Anticipated problems/delays (provide summary of problems, schedule, reason for delay, and actions taken to prevent or mitigate delay):
- None.
VII. Summary of all contacts with local community, public interest groups, or state government:
- DOE provided routine updates on the subproject to the Paducah Site CAB, FFA project managers, local elected officials, and/or Congressional staff.
VIII. Changes in relevant personnel:
- None.


## IX. Actual cost for O\&M, if appropriate:

- None.


# FEDERAL FACILITY AGREEMENT <br> SEMIANNUAL PROGRESS REPORT <br> SECOND HALF OF FISCAL YEAR 2022 

## Facility: Paducah Gaseous Diffusion Plant Plant EPA I.D. No.: KY8-890-008-982 <br> Reporting Period: 4/1/2022-9/30/2022 <br> PROJECT: Site Management Plan

I. Work performed during this reporting period (including summaries of findings and any deviations from the work plan):

- Consulted with EPA and KDEP regarding the C-635 Pumphouse and Cooling Tower on August 29, 2022.
- Held scoping meetings for the Site Management Plan, Paducah Gaseous Diffusion Plant, Paducah, Kentucky, Annual Revision-FY 2023, DOE/LX/07-2482\&D1, with EPA and KDEP in August 2022 and September 2022.
II. Schedules of activities to be performed during the next reporting period (including projected work/crucial phases of construction):
- Consult with EPA and KDEP regarding the remaining cooling tower facilities.
- Finalize and submit the Site Management Plan, Paducah Gaseous Diffusion Plant, Paducah, Kentucky, Annual Revision-FY 2023, DOE/LX/07-2482\&D1, to EPA and KDEP by November 15, 2022.
III. Identity and assigned tasks of DOE contractors for work to be performed for this project:
- Reporting responsibility for the work to be performed in support of the SMP belongs to FRNP. FRNP also provides programmatic and technical support, analytical services, and business management services. SST manages the AR and the EIC for DOE.
IV. Statement of the manner and extent to which the requirements and time schedules are being met:
- The requirements and time schedules are being met.
V. Primary/Secondary Document Tracking System:
A) Documents under review and/or preparation for this reporting period:
- Site Management Plan, Paducah Gaseous Diffusion Plant, Paducah, Kentucky, Annual Revision-FY 2023, DOE/LX/07-2482\&D1, was under development during this reporting period.
B) Due dates for completion of review/modification tasks:
- The Site Management Plan, Paducah Gaseous Diffusion Plant, Paducah, Kentucky, Annual Revision-FY 2023, DOE/LX/07-2482\&D1, is due to EPA and KDEP no later than November 15, 2022.
- Comments on the Site Management Plan, Paducah Gaseous Diffusion Plant, Paducah, Kentucky, Annual Revision-FY 2023, DOE/LX/07-2482\&D1, are due within 30 days of document issuance or December 15, 2022.
VI. Anticipated problems/delays (provide summary of problems, schedule, reason for delay, and actions taken to prevent or mitigate delay):
- The requirements and time schedules are being met.
VII. Summary of all contacts with local community, public interest groups, or state government:
- DOE provided routine updates on the subproject to the Paducah Site CAB, FFA project managers, FFA senior managers, local elected officials, and/or Congressional staff.
VIII. Changes in relevant personnel:
- None.
IX. Actual cost for O\&M, if appropriate:
- None.


# FEDERAL FACILITY AGREEMENT 

SEMIANNUAL PROGRESS REPORT
SECOND HALF OF FISCAL YEAR 2022
Facility: Paducah Gaseous Diffusion Plant
Plant EPA I.D. No.: KY8-890-008-982
Reporting Period: 4/1/2022-9/30/2022

## PROJECT: CERCLA Five-Year Review

I. Work performed during this reporting period (including summaries of findings and any deviations from the work plan):

- Initiated scoping of the 2023 CERCLA Five-Year Review with EPA and KDEP.
II. Schedules of activities to be performed during the next reporting period (including projected work/crucial phases of construction):
- Continue scoping of the 2023 CERCLA Five-Year Review with EPA and KDEP.
- Develop and publish public announcement of the commencement of the 2023 CERCLA FiveYear Review.
- Initiate development of the 2023 CERCLA Five-Year Review.
III. Identity and assigned tasks of DOE contractors for work to be performed for this project:
- Reporting responsibility for the work to be performed in support of the Five-Year Review belongs to FRNP. FRNP also provides programmatic and technical support, analytical services, and business management services. SST manages the AR and the EIC for DOE.
IV. Statement of the manner and extent to which the requirements and time schedules are being met:
- The requirements and time schedules are being met.
V. Primary/Secondary Document Tracking System:
A) Documents under review and/or preparation for this reporting period:
- None.
B) Due dates for completion of review/modification tasks:
- None.
VI. Anticipated problems/delays (provide summary of problems, schedule, reason for delay, and actions taken to prevent or mitigate delay):
- None.
VII. Summary of all contacts with local community, public interest groups, or state government:
- DOE provided routine updates on the subproject to the Paducah Site CAB, FFA project managers, FFA senior managers, local elected officials, and/or Congressional staff.
VIII. Changes in relevant personnel:
- None.


## IX. Actual cost for O\&M, if appropriate:

- None.


# FEDERAL FACILITY AGREEMENT <br> SEMIANNUAL PROGRESS REPORT <br> SECOND HALF OF FISCAL YEAR 2022 

Facility: Paducah Gaseous Diffusion Plant Plant EPA I.D. No.: KY8-890-008-982<br>Reporting Period: 4/1/2022-9/30/2022

## PROJECT: Plant Industrial Area Vapor Intrusion Assessment

I. Work performed during this reporting period (including summaries of findings and any deviations from the work plan):

- None.
II. Schedules of activities to be performed during the next reporting period (including projected work/crucial phases of construction):
- Plant Industrial Area Vapor Intrusion Preliminary Risk Assessment Report, Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2471\&D2, recommends additional vapor intrusion sampling at select locations in C-310, C-409, and C-720; this sampling is planned to be performed during the second quarter of FY 2023.
- Evaluate the vapor intrusion pathway to a building or proposed building if or when the use of an occupiable building at the Paducah Site changes, a new building is constructed, or a parcel of land is transferred for a different use, consistent with the requirements in the RMD.
III. Identity and assigned tasks of DOE contractors for work to be performed for this project:
- Reporting responsibility for the work to be performed in support of the Plant Industrial Area Vapor Intrusion Assessment subproject belongs to FRNP. FRNP also provides programmatic and technical support, analytical services, and business management services. SST manages the AR and the EIC for DOE.
IV. Statement of the manner and extent to which the requirements and time schedules are being met:
- The requirements and time schedules related to the Plant Industrial Area Vapor Intrusion subproject are being met.
V. Primary/Secondary Document Tracking System:
A) Documents under review and/or preparation for this reporting period:
- None.
B) Due dates for completion of review/modification tasks:
- None.
VI. Anticipated problems/delays (provide summary of problems, schedule, reason for delay, and actions taken to prevent or mitigate delay):
- None.
VII. Summary of all contacts with local community, public interest groups, or state government:
- DOE provided routine updates on the subproject to the Paducah Site CAB, FFA project managers, FFA senior managers, local elected officials, and/or Congressional staff.
VIII. Changes in relevant personnel:
- None.


## IX. Actual cost for O\&M, if appropriate:

- None.


## APPENDIX A

## NORTHEAST AND NORTHWEST PLUME WATER WITHDRAWAL REPORTS

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Table A.1. Northeast Plume Containment System Water Withdrawal Reporting Form (Gallons of Water Pumped)

| Day | January 2022 | February 2022 | March 2022 | April 2022 | May 2022 | June 2022 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | 108,289 | 107,244 | 102,863 | 256,338 | 253,420 | 245,320 |
| 2 | 108,289 | 108,135 | 109,606 | 256,338 | 253,417 | 249,352 |
| 3 | 108,289 | 107,910 | 106,098 | 256,338 | 229,918 | 252,528 |
| 4 | 113,552 | 107,910 | 109,294 | 256,336 | 253,704 | 252,528 |
| 5 | 99,563 | 107,910 | 109,294 | 256,753 | 249,298 | 252,528 |
| 6 | 111,015 | 107,910 | 109,294 | 263,858 | 252,220 | 252,528 |
| 7 | 108,079 | 107,910 | 109,295 | 246,297 | 252,220 | 249,750 |
| 8 | 108,079 | 107,910 | 104,755 | 255,511 | 252,220 | 250,393 |
| 9 | 108,079 | 110,687 | 117,715 | 255,511 | 252,222 | 251,392 |
| 10 | 108,079 | 107,077 | 95,083 | 255,511 | 244,072 | 253,212 |
| 11 | 103,621 | 108,038 | 107,063 | 255,509 | 248,177 | 253,212 |
| 12 | 107,460 | 108,038 | 107,063 | 265,751 | 248,311 | 253,212 |
| 13 | 109,925 | 108,038 | 107,063 | 266,560 | 249,331 | 253,210 |
| 14 | 108,361 | 108,036 | 107,061 | 246,038 | 249,331 | 253,409 |
| 15 | 108,361 | 103,228 | 107,748 | 246,038 | 249,331 | 247,206 |
| 16 | 108,361 | 105,592 | 108,356 | 246,038 | 249,328 | 253,822 |
| 17 | 108,361 | 120,788 | 107,600 | 246,038 | 250,886 | 252,473 |
| 18 | 108,359 | 106,291 | 108,067 | 246,035 | 246,124 | 252,473 |
| 19 | 105,282 | 106,291 | 108,067 | 255,222 | 253,931 | 252,473 |
| 20 | 110,963 | 106,291 | 108,067 | 254,935 | 251,645 | 252,473 |
| 21 | 108,065 | 106,292 | 108,066 | 250,642 | 251,645 | 252,477 |
| 22 | 108,065 | 106,911 | 105,001 | 251,232 | 251,645 | 248,329 |
| 23 | 108,065 | 109,053 | 114,988 | 251,232 | 251,643 | 251,769 |
| 24 | 108,065 | 108,618 | 103,650 | 251,232 | 249,894 | 252,651 |
| 25 | 103,632 | 108,618 | 107,897 | 251,232 | 255,096 | 252,651 |
| 26 | 108,186 | 108,618 | 109,523 | 257,483 | 252,028 | 252,651 |
| 27 | 109,646 | 108,618 | 107,897 | 247,179 | 253,120 | 252,650 |
| 28 | 107,687 | 108,620 | 107,895 | 252,576 | 253,120 | 250,050 |
| 29 | 107,687 |  | 238,732 | 253,420 | 253,120 | 253,658 |
| 30 | 107,687 |  | 254,016 | 253,420 | 253,120 | 250,826 |
| 31 | 107,686 |  | 252,599 |  | 253,123 |  |
| Monthly Total | 3,344,838 | 3,026,582 | 3,759,716 | 7,606,603 | 7,766,660 | 7,551,206 |
| Daily Average | 107,898 | 108,092 | 121,281 | 253,553 | 250,537 | 251,707 |


| Total (January 2022-June 2022) $=$ | $33,055,605 \mathrm{gal}$ |
| ---: | ---: | ---: |
| Average (January 2022-June 2022) $=$ | 182,628 gallons |
|  | per day $(\mathrm{gpd})$ |

Table A.2. Northwest Plume Groundwater System Water Withdrawal Reporting Form (Gallons of Water Pumped)

| Day | January 2022 | February 2022 | March 2022 | April 2022 | May 2022 | June 2022 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | 283,162 | 298,720 | 257,390 | 283,211 | 290,311 | 278,030 |
| 2 | 283,162 | 272,390 | 290,820 | 283,211 | 290,307 | 305,260 |
| 3 | 283,162 | 286,638 | 280,070 | 283,211 | 287,070 | 284,933 |
| 4 | 293,530 | 286,638 | 288,428 | 283,207 | 296,680 | 284,933 |
| 5 | 261,150 | 286,638 | 288,428 | 287,990 | 281,930 | 284,933 |
| 6 | 282,090 | 286,638 | 288,428 | 298,860 | 296,968 | 284,931 |
| 7 | 282,363 | 286,638 | 288,426 | 275,980 | 296,968 | 285,780 |
| 8 | 282,363 | 273,030 | 214,390 | 288,156 | 296,968 | 291,140 |
| 9 | 282,363 | 291,960 | 308,050 | 288,156 | 296,966 | 287,740 |
| 10 | 282,361 | 278,300 | 253,030 | 288,156 | 256,110 | 268,750 |
| 11 | 278,600 | 285,791 | 284,405 | 288,152 | 293,470 | 268,750 |
| 12 | 275,390 | 285,791 | 284,405 | 291,600 | 141,320 | 268,750 |
| 13 | 291,670 | 285,791 | 284,405 | 302,430 | 275,503 | 268,750 |
| 14 | 284,696 | 285,787 | 284,405 | 285,326 | 275,503 | 198,220 |
| 15 | 284,696 | 283,970 | 285,710 | 285,326 | 275,503 | 288,610 |
| 16 | 284,696 | 0 | 289,230 | 285,326 | 275,501 | 287,500 |
| 17 | 284,696 | 0 | 285,060 | 285,326 | 289,830 | 288,698 |
| 18 | 284,696 | 0 | 287,556 | 285,326 | 286,980 | 288,698 |
| 19 | 278,800 | 0 | 287,556 | 234,350 | 292,760 | 288,698 |
| 20 | 293,550 | 0 | 287,556 | 245,630 | 287,823 | 288,698 |
| 21 | 273,843 | 0 | 287,552 | 294,730 | 287,823 | 288,698 |
| 22 | 273,843 | 0 | 162,150 | 293,365 | 287,823 | 279,050 |
| 23 | 273,843 | 249,360 | 275,920 | 293,365 | 287,821 | 267,240 |
| 24 | 273,841 | 286,152 | 292,040 | 293,365 | 291,150 | 288,155 |
| 25 | 274,760 | 286,152 | 287,845 | 293,365 | 260,510 | 288,155 |
| 26 | 284,630 | 286,152 | 287,845 | 271,850 | 288,520 | 288,155 |
| 27 | 282,780 | 286,152 | 287,845 | 280,170 | 291,144 | 288,155 |
| 28 | 284,115 | 286,152 | 287,845 | 289,450 | 291,144 | 286,129 |
| 29 | 284,115 |  | 286,190 | 290,311 | 291,144 | 290,361 |
| 30 | 284,115 |  | 286,410 | 290,311 | 291,144 | 285,620 |
| 31 | 284,115 |  | 287,680 |  | 291,144 |  |
| Monthly Total | 8,731,196 | 5,954,840 | 8,647,070 | 8,539,212 | 8,743,838 | 8,441,520 |
| Daily Average | 281,651 | 212,673 | 278,938 | 284,640 | 282,059 | 281,384 |


| Total (January 2022-June 2022) $=$ | $49,057,676 \mathrm{gal}$ |
| ---: | ---: | ---: |
| Average (January 2022-June 2022) $=$ | $271,037 \mathrm{gpd}$ |

## APPENDIX B

NORTHEAST PLUME AND NORTHWEST PLUME GRAPHS, DATA, AND MAPS (FIGURES B. 1 THROUGH B.30)

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Figure B.1. Northeast Plume Groundwater Wells and Extraction Wells


NOTE: Data rejected by validation or assessment have not been graphed.
Figure B.2. Northeast Plume Containment System Influent TCE Concentrations


NOTE: Data rejected by validation or assessment have not been graphed.
Figure B.3. Northeast Plume-Tc-99 Activities in Extraction Wells


NOTE: Data rejected by validation or assessment are not included on the graph.
Figure B.4. Northeast Plume Containment System TCE Removed


Figure B.5. Northeast Plume-Upgradient Transect Wells - TCE Trends





NOTE: Data rejected by validation or assessment have not been graphed.
Figure B.9. Northeast Plume-TCE Concentrations in Downgradient Wells


NOTE: Data rejected by validation or assessment have not been graphed.
Figure B.10. Northeast Plume-Tc-99 Activities in Downgradient Wells


NOTE: Data rejected by validation or assessment have not been graphed.
Figure B.11. Northeast Plume-TCE Concentrations in Distal Downgradient Wells
B-14


NOTE: Data rejected by validation or assessment have not been graphed.
Figure B.12. Northeast Plume-Tc-99 Activities in Distal Downgradient Wells


NOTE: Data rejected by validation or assessment have not been graphed.
Figure B.13. Northeast Plume-TCE Activities in Wells near C-400 Complex


NOTE: Data rejected by validation or assessment have not been graphed.
Figure B.14. Northeast Plume-Tc-99 Activities in Wells near C-400 Complex


Figure B.15. Northwest Plume Groundwater Wells


NOTE: Data rejected by validation or assessment have not been graphed.
Figure B.16. Northwest Plume Groundwater System Influent TCE Concentrations


NOTE: Data rejected by validation or assessment have not been graphed.
Figure B.17. Northwest Plume Groundwater System Influent Tc-99 Activities


NOTE: Data rejected by validation or assessment have not been graphed.
Figure B.18. Northwest Plume Groundwater System Effluent TCE Concentrations


Figure B.19. Northwest Plume Groundwater System Effluent Tc-99 Activities


NOTE: Data rejected by validation or assessment are not included on the graph.

Figure B.20. Northwest Plume Groundwater System TCE Removed


Figure B.21. Northwest Plume-Downgradient of New Well Field-TCE Trends


Figure B.22. Northwest Plume-Downgradient of New Well Field-Tc-99 Trends


Figure B.23. Northwest Plume-South Well Field TCE Trends


Figure B.24. Northwest Plume-South Well Field-Tc-99 Trends


Figure B.25. Northwest Plume-New Well Field-TCE Trends



Figure B.27. Northwest Plume-Upgradient of Extraction Wells-TCE Trends


Figure B.28. Northwest Plume-Upgradient of Extraction Wells-Tc-99 Trends


NOTE: Data rejected by validation or assessment have not been graphed.
Figure B.29. Northwest Plume-TCE Concentrations in Extraction Wells


NOTE: Data rejected by validation or assessment have not been graphed.
Figure B.30. Northwest Plume-Tc-99 Activities in Extraction Wells

## APPENDIX C

## C-746-K LANDFILL (SWMU 8) DATA

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## APPENDIX D

ADMINISTRATIVE RECORD, POST-DECISION RECORD, AND ADMINISTRATIVE RECORD REFERENCE INDICES

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Paducah Documents Added to the Post-Decision Files-Second Quarter CY2022

| Document Status | Document Date | Document ID | Title | Author Affiliation | To Affiliation | Name | Date Added |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| NSDD-PD | 3/31/2022 | CP4-ES-0041-F03 | WALKTHROUGH CHECKLIST - NORTH-SOUTH DIVERSION DITCH (WEEKLY) - MARCH 2022 | FRNP | N/A | INF-RECMGMT-CP4-ES-0041-F03- <br> WALKTHROUGH <br> CHECK NSDD MAR- <br> 2022-03-31 | 4/19/2022 |
| NSDD-PD | 3/7/2022 | CP4-ES-0041-F07 | WALKTHROUGH CHECKLIST - NORTH-SOUTH DIVERSION DITCH (STORM EVENT) - MARCH 2022 | FRNP | N/A | INF-RECMGMT-CP4-ES-0041-F07- <br> WALKTHROUGH NSDD STORM-2022-03-07 | 4/19/2022 |
| NSDD-PD | 3/30/2022 | CP4-ES-0041-F20 | WINTERIZATION CHECKLIST- NORTH-SOUTH DIVERSION DITCH (WEEKLY) - MARCH 2022 | FRNP | N/A | $\begin{aligned} & \text { INF-RECMGMT-CP4- } \\ & \text { ES-0041-F20- } \\ & \text { WINTER CHECK } \\ & \text { NSDD MAR-2022-03- } \\ & 30 \end{aligned}$ | 4/19/2022 |
| NSDD-PD | 04/28/22 | CP4-ES-0041-F03 | WALKTHROUGH CHECKLIST - NORTH-SOUTH DIVERSION DITCH (WEEKLY) APRIL 2022 | FRNP | N/A | $\begin{aligned} & \text { INF-RECMGMT-CP4- } \\ & \text { ES-0041-F03-N-S } \\ & \text { DIV DITCH } \\ & \text { CHECKLIST-2022-04- } \\ & 28 \end{aligned}$ | 5/17/2022 |
| NSDD-PD | 04/25/02 | CP4-ES-0041-F07 | WALKTHROUGH CHECKLIST - NORTH-SOUTH DIVERSION DITCH (STORM EVENT) APRIL 2022 | FRNP | N/A | INF-RECMGMT-CP4-ES-0041-F07-N-S STORM EVENT- 2022-04-25 | 5/17/2022 |
| NSDD-PD | 5/24/2022 | CP4-ES-0041-F03 | WALKTHROUGH CHECKLIST - NORTH-SOUTH DIVERSION DITCH (WEEKLY) - MAY 2022 | FRNP | N/A | INF-RECMGMT-CP4-ES-0041-F03-N-S WEEKLY <br> CHECKLIST-2022-0524 | 6/16/2022 |
| NSDD-PD | 5/24/2022 | CP4-ES-0041-F04 | WALKTHROUGH CHECKLIST - NORTH-SOUTH DIVERSION DITCH (QUARTERLY) - MAY 2022 | FRNP | N/A | INF-RECMGMT-CP4-ES-0041-F04-N-S QUARTERLY MAY-2022-05-24 | 6/16/2022 |
| NSDD-PD | 5/23/2022 | CP4-ES-0041-F07 | WALKTHROUGH CHECKLIST - NORTH-SOUTH DIVERSION DITCH (STORM EVENT) - MAY 2022 | FRNP | N/A | INF-RECMGMT-CP4-ES-0041-F07-N-S STORM EVENT MAY. 2022-05-23 | 6/16/2022 |
| SWP-PD | 3/31/2022 | CP4-ES-0041-F17 | QUARTERLY SOUTHWEST PLUME SOLID WASTE MANAGEMENT UNIT (SWMU) INSPECTIONS - MARCH 2022 | FRNP | N/A | INF-RECMGMT-CP4- ES-0041-F17- QUART SW SWMU INSPECT MAR-2022- $03-31$ | 4/19/2022 |

## Paducah Documents Added to the Post-Decision Files-Second Quarter CY2022

| Document Status | Document Date | Document ID | Title | Author Affiliation | To Affiliation | Name | Date Added |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SWP-PD | 3/16/2022 | $\begin{aligned} & \text { PPPO-02-10020691- } \\ & 22 \end{aligned}$ | NOTIFICATION OF REMEDIAL ACTION FIELD START FOR SOLID WASTE MANAGEMENT UNIT 211-A ENHANCED IN SITU BIOREMEDIATION FOR VOLATILE ORGANIC COMPOUND SOURCES TO THE SOUTHWEST GROUNDWATER PLUME AT THE PADUCAH GASEOUS DIFFUSION PLANT, PADUCAH, KENTUCKY | DOE | KDEP, USEPA-4 | INF-RECMGMT- <br> PPPO-02-10020691- <br> 22-SWMU 211A SW <br> PLUME-2022-03-16 | 4/19/2022 |
| SWP-PD | 5/16/2022 | $\begin{aligned} & \text { PPPO-02-10020989- } \\ & 22 \end{aligned}$ | SOUTHWEST PLUME VOLATILE ORGANIC COMPOUND SOURCES APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS | DOE | EIC | INF-RECMGMT-PPPO-02-10020989-22-SW PLUME VOC-2022-05-06 | 6/16/2022 |

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| $\begin{array}{\|l} \hline \text { Document } \\ \text { Status } \end{array}$ | Document Date | Document ID | Title | Author Affiliation | To Affiliation | Name | Date Added |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| ARF ARR | 12/18/1992 | 4WD-FFB | SOLID WASTE MANAGEMENT UNIT (SWMU) ASSESSMENT REPORTS (SAR) FOR SOLID WASTE MANAGEMENT UNITS (SWMUS) 170-175 AT THE PADUCAH GASEOUS DIFFUSION PLANT (PGDP) PADUCAH, KENTUCKY EPA ID NUMBER KY8 890008982 | USEPA-4 | DOE | INF-RECMGMT-4WD-FFB-SWMU ASSESS SWMU 170-175-1992-12- 18 | 4/19/2022 |
| ARF ARR | 8/11/1992 | 4WD-ORCRA\&FF | RESOURCE CONSERVATION AND RECOVERY ACT (RCRA) FACILITY INVESTIGATION (RFI) DETERMINATIONS FOR NEWLY DISCOVERED SOLID WASTE MANAGEMENT UNITS (SWMUS)/AREAS OF CONCERN (AOCS) U.S. DEPARTMENT OF ENERGY PADUCAH GASEOUS DIFFUSION PLANT ENVIRONMENTAL PROTECTION AGENCY (EPA) ID NUMBER KY8 890008 982 | USEPA-4 | $\begin{aligned} & \text { DOE, MMES, } \\ & \text { ORO } \end{aligned}$ | INF-RECMGMT-4WD-ORCRA-FFRFI DETER NEW SWMU AOC-1992-08-11 | 4/19/2022 |
| ARF ARR | 4/6/2022 | $\begin{aligned} & \text { PPPO-02- } \\ & 10020162-22 \end{aligned}$ | PADUCAH FEDERAL FACILITY AGREEMENT FISCAL YEAR 2023 PRESIDENT'S BUDGET | DOE | KDEP, USEPA-4 | INF-RECMGMT-PPPO-02-10020162-22-FFA FY 2023 PRES BUDGET-2022-04-06 | 4/19/2022 |
| ARF ARR | 3/23/2022 | $\begin{aligned} & \text { PPPO-02- } \\ & 10020613-22 \end{aligned}$ | PADUCAH FEDERAL FACILITY AGREEMENT MODIFICATION-FISCAL YEAR 2022 SITE MANAGEMENT PLAN, ENFORCEABLE COMMITMENTS, AND LIST OF SOLID WASTE MANAGEMENT UNITS/AREAS OF CONCERN | DOE | KDEP, USEPA-4 | INF-RECMGMT-PPPO-02-10020613-22-FFA MOD SITE MGMT PLAN-2022-03-23 | 4/19/2022 |
| ARF ARR | 4/8/2022 | $\begin{aligned} & \text { PPPO-02- } \\ & 10020887-22 \end{aligned}$ | PADUCAH FEDERAL FACILITY AGREEMENT SIGNED MODIFICATIONFISCAL YEAR 2022 SITE MANAGEMENT PLAN, ENFORCEABLE COMMITMENTS, AND LIST OF SOLID WASTE MANAGEMENT UNITS/AREAS OF CONCERN | DOE | KDEP, USEPA-4 | INF-RECMGMT-PPPO-02-10020887-22-FFA MOD SITE MGMT PLAN-2022-04-08 | 4/19/2022 |
| ARF ARR | 3/31/2022 | $\begin{aligned} & \text { DOE/OR/07-1707, } \\ & \text { PRS-035 } \end{aligned}$ | FEDERAL FACILITY AGREEMENT FOR THE PADUCAH GASEOUS DIFFUSION PLANT | USEPA-4, KDEP, DOE | $\begin{aligned} & \text { USEPA-4, KDEP, } \\ & \text { DOE } \end{aligned}$ | INF-RECMGMT-DOE-OR-07-1707 PRS-035-FFA AGREE PGDP-2022- 03-31 | 4/19/2022 |
| ARF ARR | 4/22/2022 | $\begin{aligned} & \text { FR-22-0693, } \\ & \text { DOE/LX/07- } \\ & \text { 0024\&D1/R1 } \end{aligned}$ | APPROVAL OF THE REVISED SOLID WASTE MANAGEMENT UNIT (SWMU) ASSESSMENT REPORT (SAR) FOR SWMU 419 (0024\&D1/R1) AND REVISED NO FURTHER ACTION AREA PADUCAH SITE PADUCAH, MCCRACKEN COUNTY, KENTUCKY KY8-890-008-982 | KDEP | DOE | INF-RECMGMT-FR-22-0693KDWM APPROVE SAR SWMU 219 2022-04-22 | 5/17/2022 |
| ARF ARR | 4/18/2022 | $\begin{aligned} & \text { PPPO-02- } \\ & 10020712-22 \end{aligned}$ | FEDERAL FACILITY AGREEMENT BUDGET REPORTING-PRELIMINARY ASSESSMENT OF FISCAL YEAR 2024 BUDGET FORMULATION GUIDANCE AND UPDATE OF THE FISCAL YEAR 2024 BUDGET TARGETS ON SITE PRIORITIES (INTEGRATED PRIORITY LIST) | DOE | KDEP, USEPA-4 | INF-RECMGMT-PPPO-02- 10020712-22-FFA BUDGET FY24 IPL-2022-04-18 | 5/17/2022 |
| ARF ARR | 4/14/2022 | PPPO-02- 10020971-22, DOE/LX/07- 0024\&D1/R1 | C-752-C DECONTAMINATION FACILITY SOLID WASTE MANAGEMENT UNIT ASSESSMENT REPORT-SWMU 419, HAZARDOUS WASTE MANAGEMENT FACILITY PERMIT NUMBER KY8-890-008-982, AGENCY INTEREST NUMBER 3059 | DOE | KDEP, USEPA-4 | INF-RECMGMT-PPPO-02- 10020971-22-C-752-C SAR 419- $2022-04-14$ | 5/17/2022 |
| ARF ARR | 9/15/2008 | $\begin{aligned} & \text { DOE/LX/07- } \\ & \text { O060\&D1 } \end{aligned}$ | EPA SIGNED MODIFICATION TO THE PADUCAH FEDERAL FACILITY AGREEMENT FISCAL-YEAR 2008 SITE MANAGEMENT PLAN, ENFORCEABLE COMMENTS, AND LIST OF SOLID WASTE MANAGEMENT UNITS/AREAS OF CONCERNS AT THE PADUCAH GASEOUS DIFFUSION PLANT, PADUCAH, KENTUCKY (DOE/LX/07-0060\&D1) | DOE | USEPA-4 | INF-RECMGMT-SIGN EPA SMP MOD-2008-09-15 | 5/17/2022 |

## Paducah Documents Added to the Administrative Record Files-Third Quarter CY2022

| Document Status | Document Date | Document ID | Title | Author Affiliation | To Affiliation | Name | Date Added |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| ARF SOU | 08/22/22 | PPPO-02-10022027-22 | DOCUMENTATION THAT THE C-403 NEUTRALIZATION TANK (SOLID WASTE MANAGEMENT UNIT 40) IS INCLUDED IN THE C400 COMPLEX OPERABLE UNIT | DOE | EIC | INF-RECMGMT- PPPO-02- 10022027-22- SWMU 40 INCLUDED IN C400-2022-08-22 | 9/20/2022 |
| ARF SOU | 06/21/22 | PPPO-02-10021282-22 | SOLID WASTE MANAGEMENT UNIT 216 | DOE | EIC | INF-RECMGMT- PPPO-02- $10021282-22-$ SWMU 216-2022- $06-21$ | 7/20/2022 |

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| Date |  |  |  | Author Affiliation | To Affiliation | Name | Date Added |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SWP-PD | 9/12/2022 | FR-22-0740, DOE/LX/07-2480\&D1 | KENTUCKY DEPARTMENT OF WASTE MANAGEMENT EXTENSION REQUEST FOR SUBMITTAL OF COMMENTS TO THE EXPLANATION OF SIGNIFICANT DIFFERENCES TO THE RECORD OF DECISION FOR SOLID WASTE MANAGEMENT UNITS 1, 211-A,211-B, AND PART OF 102 VOLATILE ORGANIC COMPOUND SOURCES FOR THE SOUTHWEST PLUME (DOE/LX/07-2480\&D1) PADUCAH SITE PADUCAH, MCCRACKEN COUNTY, KENTUCKY KY8-890-008-982 | KDEP | DOE | $\begin{aligned} & \text { INF-RECMGMT-FR- } \\ & 22-0740-K Y \text { EXT } \\ & \text { REQ ESD-2022-09- } \\ & 12 \end{aligned}$ | 9/20/2022 |
| SWP-PD | 8/18/2022 | $\begin{array}{\|l\|} \hline \text { FR-22-0729, } \\ \text { DOE/LX/07-2480\&D1 } \end{array}$ | U.S. ENVIRONMENTAL PROTECTION AGENCY ACKNOWLEDGEMENT OF RECEIPT AND REVIEW FOR THE EXPLANATION OF SIGNIFICANT DIFFERENCES TO THE RECORD OF DECISION FOR THE SOLID WASTE MANAGEMENT UNITS 1, 211-A, 211-B, AND PART OF 102 VOLATILE ORGANIC COMPOUND SOURCES FOR THE SOUTHWEST GROUNDWATER PLUME AT THE PADUCAH GASEOUS DIFFUSION PLANT, PADUCAH KENTUCKY, DOE/LX/07-2480\&D1, TRANSMITTAL DATE OF JULY 15, 2022 | USEPA-4 | DOE | $\begin{aligned} & \text { INF-RECMGMT-FR- } \\ & 22-0729-E P A ~ A C K \\ & \text { ESD-2022-08-18 } \end{aligned}$ | 9/20/2022 |
| C400SOURCE-PD | 8/18/2022 | CP4-ES-0041-F16 | C-400 LAND USE CONTROL IMPLEMENTATION PLAN (LUCIP) INSPECTION | FRNP | FRNP | INF-RECMGMT-CP4- ES-0041-F16-C400 LUCIP INSPECTION- 2022-08-18 | 9/20/2022 |
| NSDD-PD | 08/02/22 | CP4-ES-0041-F07 | WALKTHROUGH CHECKLIST - NORTH-SOUTH DIVERSION DITCH (STORM EVENT) | FRNP | N/A | INF-RECMGMT-CP4- ES-0041-F07-N-S STORM EVENT CHECKLIST-2022-08- 02 | 9/20/2022 |
| NSDD-PD | 08/18/22 | CP4-ES-0041-F05 | WALKTHROUGH CHECKLIST - NORTH-SOUTH DIVERSION DITCH SURGE BASIN/CONCRETE DITCH (SEMI-ANNUAL) | FRNP | N/A | INF-RECMGMT-CP4- ES-0041-F05-N-S SEMIANNUAL CHECKLIST-2022-08- 18 | 9/20/2022 |
| NSDD-PD | 8/16/2022 | CP4-ES-0041-F04 | WALKTHROUGH CHECKLIST - NORTH-SOUTH DIVERSION DITCH (QUARTERLY) | FRNP | N/A | INF-RECMGMT-CP4- ES-0041-F04-N-S QUARTERLY CHECKLIST-2022-08- 16 | 9/20/2022 |
| NSDD-PD | 8/31/2022 | CP4-ES-0041-F03 | WALKTHROUGH CHECKLIST - NORTH-SOUTH DIVERSION DITCH (WEEKLY) | FRNP | N/A | INF-RECMGMT-CP4- ES-0041-F03-N-S WEEKLY CHECKLIST-2022-08- 31 | 9/20/2022 |

## Paducah Documents Added to the Post-Decision Files-Third Quarter CY2022

|  | Document Status D | Document Date | Document ID | Title | Author Affiliation | To Affiliation | Name | Date Added |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | SWP-PD | 7/15/2022 | PPPO-02-1002088222C, DOE/LX/072480\&D1 | TRANSMITTAL OF THE EXPLANATION OF SIGNIFICANT DIFFERENCES TO THE RECORD OF DECISION FOR SOLID WASTE MANAGEMENT UNITS 1, 211-A, 211-B, AND PART OF 102 VOLATILE ORGANIC COMPOUND SOURCES FOR THE SOUTHWEST GROUNDWATER PLUME AT THE PADUCAH GASEOUS DIFFUSION PLANT, PADUCAH, KENTUCKY, DOE/LX/07-2480\&D1 | DOE | \|KDEP, USEPA-4 | $\left\|\begin{array}{l}\text { INF-RECMGMT- } \\ \text { PPPO-02-10020882- } \\ \text { 22C-ESD SWMU } 1 \\ \text { 211-A 211-B-2022-07 } \\ 15\end{array}\right\|$ | 8/16/2022 |
|  | SWP-PD | 6/13/2022 | CP4-ES-0041-F17 | QUARTERLY SOUTHWEST PLUME SOLID WASTE MANAGEMENT UNIT INSPECTIONS | FRNP | N/A | $\begin{array}{\|l\|} \hline \text { INF-RECMGMT-CP4- } \\ \text { ES-0041-F17-QTR } \\ \text { SW PLUME SWMU } \\ \text { INSP-2022-06-13 } \end{array}$ | 8/16/2022 |
|  | NSDD-PD | 6/27/2022 | CP4-ES-0041-F07 | WALKTHROUGH CHECKLIST - NORTH-SOUTH DIVERSION DITCH (STORM EVENT) | FRNP | N/A | $\begin{array}{\|l\|} \hline \text { INF-RECMGMT-CP4- } \\ \text { ES-0041-F07-N-S } \\ \text { CHECKLIST STORM- } \\ 2022-06-27 \end{array}$ | 8/16/2022 |
|  | NSDD-PD | 7/28/2022 | CP4-ES-0041-F03 | WALKTHROUGH CHECKLIST - NORTH-SOUTH DIVERSION DITCH (WEEKLY) | FRNP | N/A | INF-RECMGMT-CP4-ES-0041-F03-N-S CHECKLIST WEEKLY-2022-07-28 | 8/16/2022 |
|  | NSDD-PD | 6/30/2022 | CP4-ES-0041-F03 | WALKTHROUGH CHECKLIST - NORTH-SOUTH DIVERSION DITCH (WEEKLY) | FRNP | N/A | $\begin{array}{\|l\|} \hline \text { INF-RECMGMT-CP4- } \\ \text { ES-0041-F03-N-S } \\ \text { CHECKLIST } \\ \text { WEEKLY-2022-06-30 } \end{array}$ | 8/16/2022 |
|  | NSDD-PD | 7/28/2022 | CP4-ES-0041-F07 | WALKTHROUGH CHECKLIST- NORTH-SOUTH DIVERSION DITCH (STORM EVENT) | FRNP | N/A | $\begin{aligned} & \text { INF-RECMGMT-CP4- } \\ & \text { ES-0041-F07-N-S } \\ & \text { CHECKLIST STORM- } \\ & 2022-07-28 \end{aligned}$ | 8/16/2022 |
|  | SWP-PD | 11/16/2021 | CP4-ES-0041-F17 | QUARTERLY SOUTHWEST (SW) PLUME SOLID WASTE MANAGEMENT UNIT (SWMU) INSPECTIONS | FRNP | N/A | INF-RECMGMT-CP4-ES-0041-F17-QTR SW SWMU INSPECT-2021-1116 | 7/20/2022 |

Paducah Documents Added to the Administrative Record Reference Files-Third Quarter CY2022

| $\begin{array}{\|l} \hline \text { Document } \\ \text { Status } \end{array}$ | Document Date | Document ID | Title | Author Affiliation | To Affiliation | Name | Date Added |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| ARF ARR | 8/19/2022 | $\begin{aligned} & \text { FR-22-0730, } \\ & \text { DOE/LX/07- } \\ & \text { 0300\&D1/R1 } \end{aligned}$ | APPROVAL OF THE REVISED SOLID WASTE MANAGEMENT UNIT ASSESSMENT REPORT (SAR) FOR SWMU 220 (0300\&D1/R1) PADUCAH SITE PADUCAH, MCCRACKEN COUNTY, KENTUCKY KY8-890-008-982 | KDEP | DOE | INF-RECMGMT-FR-22-0730-KY APPROVE SAR FOR SWMU 220-2022-08-19 | 9/20/2022 |
| ARF ARR | 7/29/2022 | $\begin{array}{\|l\|} \hline \text { PPPO-02-10021915 } \\ 22 \end{array}$ | PADUCAH FEDERAL FACILITY AGREEMENT FISCAL YEAR 2022 FUNDING ALLOCATION EVALUATION | DOE | KDEP, USEPA-4 | $\begin{aligned} & \text { INF-RECMGMT-PPPO-02- } \\ & \text { 10021915-22-FFA FY22 FUNDING- } \\ & 2022-07-29 \end{aligned}$ | 8/16/2022 |
| ARF ARR | 7/29/2022 | PPPO-02-10021862 22, DOE/LX/07- 0300\&D1/R1 | U.S. DEPARTMENT OF ENERGY MATERIALS STORAGE AREA OS-09, SOLID WASTE MANAGEMENT UNIT ASSESSMENT REPORT FOR SOLID WASTE MANAGEMENT UNIT 220—HAZARDOUS WASTE MANAGEMENT FACILITY PERMIT NUMBER KY8-890-008-982, AGENCY INTEREST NUMBER 3059 | DOE | KDEP, USEPA-4 | $\begin{aligned} & \text { INF-RECMGMT-PPPO-02- } \\ & \text { 10021862-22-DMSA OS-09 SWMU } \\ & 220-2022-07-29 \end{aligned}$ | 8/16/2022 |
| ARF ARR | 6/29/2022 | PPPO-02-10021558 22B, DOE/LX/070107\&D2/R13/V1 | TRANSMITTAL OF THE METHODS FOR CONDUCTING RISK ASSESSMENTS AND RISK EVALUATIONS AT THE PADUCAH GASEOUS DIFFUSION PLANT, PADUCAH, KENTUCKY, VOLUME 1. HUMAN HEALTH, DOE/LX/07-0107\&D2/R13/V1 | DOE | KDEP, USEPA-4 | INF-RECMGMT-PPPO-02-10021558-22B-TRANS RISK ASSESS-2022-06-29 | 7/20/2022 |
| ARF ARR | 7/5/2022 | $\begin{array}{\|l\|} \hline \text { FR-22-0716, } \\ \text { DOE/LX/07- } \\ \text { 0107\&D2/R13/V1 } \end{array}$ | ACKNOWLEDGEMENT RECEIPT OF THE METHODS FOR CONDUCTING RISK ASSESSMENTS AND RISK EVALUATIONS AT THE PADUCAH GASEOUS DIFFUSION PLANT, VOLUME 1. HUMAN HEALTH (DOE/LX/070107\&D2/R13/V1) PADUCAH SITE PADUCAH, MCCRACKEN COUNTY, KENTUCKY \#KY8-890-008-982 | KDEP | DOE | INF-RECMGMT-FR-22-0716-KY ACK RISK ASSESSMENTS-2022-07-05 | 7/20/2022 |
| ARF ARR | 7/6/2022 | $\begin{array}{\|l\|} \hline \text { FR-22-0714, } \\ \text { DOE/LX/07- } \\ \text { 0107\&D2/R13/V1 } \end{array}$ | U. S. ENVIRONMENTAL PROTECTION AGENCY ACKNOWLEDGEMENT OF RECEIPT AND REVIEW FOR THE REVISED METHODS FOR CONDUCTING HUMAN HEALTH RISK ASSESSMENTS AND RISK EVALUATIONS AT THE PADUCAH GASEOUS DIFFUSION PLANT, PADUCAH, KENTUCKY, VOLUME 1, DOE/LX/07-0107\&D2/R13/V1 (RISK METHODS DOCUMENT), TRANSMITTAL DATE OF JUNE 29, 2022 | USEPA-4 | DOE | INF-RECMGMT-FR-22-0714-EPA ACK HUMAN HEALTH RISK-2022-07-06 | 7/20/2022 |

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## APPENDIX E

## C-749 URANIUM BURIAL GROUND (SWMU 2)

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Figure E.1. SWMU 2 Wells Location


Figure E.2. TCE Trends in SWMU 2 Wells


Figure E.3. Tc-99 Trends in SWMU 2 Wells

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[^0]:    ${ }^{1}$ Schedules are included for information and planning purposes only; enforceable schedules are established in the site management plan (SMP).

