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**Best Management Practices Plan,
Paducah Gaseous Diffusion Plant,
Paducah, Kentucky**

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**Best Management Practices Plan,
Paducah Gaseous Diffusion Plant,
Paducah, Kentucky**

Date Issued—May 2018

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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CONTENTS

ACRONYMS	v
EXECUTIVE SUMMARY	vii
1. INTRODUCTION.....	1
1.1 REGULATORY BACKGROUND.....	1
1.2 PGDP BACKGROUND AND INTERFACE	1
1.3 RECEIVING WATERS	2
1.4 BEST MANAGEMENT PRACTICES PLAN FORMAT	2
2. GENERAL CONDITIONS AND GENERAL REQUIREMENTS (SECTION 3 OF KPDES PERMIT KY0004049)	3
2.1 DOCUMENTATION	3
2.2 BEST MANAGEMENT PRACTICES	3
2.2.1 Training	3
2.2.2 Inspections/Walkthroughs	3
2.2.3 Engineered Controls	3
2.2.4 Spill Reporting and Countermeasures	3
2.2.5 Spill Equipment	4
2.2.6 Communication Systems	4
2.3 DOE FACILITY COMPONENTS OR SYSTEMS	4
2.4 SITUATION OUTLINES	6
2.4.1 Northwest Plume Groundwater System.....	6
2.4.2 Northeast Plume Containment System	7
2.4.3 Decontamination Facilities	7
2.4.4 Hazardous Waste Storage Facilities	8
2.4.5 C-404 Hazardous Waste Landfill	9
2.4.6 C-746-U Landfill	9
2.4.7 C-746-U Fuel Storage Tanks	10
2.4.8 Runoff Due to Disturbance of Historic Release/Spill Sites	10
2.4.9 Decontamination and Decommissioning Projects and other Projects Addressing Shutdown DOE Facilities	11
2.4.10 C-752-B Fuel Station.....	11
2.4.11 Outfalls, Creeks, and Ditches	11
2.4.12 Solid Waste Management Units	13
2.4.13 C-616-E Chromium Sludge Lagoon.....	13
2.4.14 C-616-F Phosphate Sludge Lagoon.....	13
2.4.15 Water Quality Monitoring Stations	14
2.4.16 Contaminated Scrap Yards	14
2.4.17 PCB Waste Storage Areas	14
2.4.18 DOE Laboratories.....	15
2.4.19 C-611 and C-616 Chemical Storage Tanks	15
2.4.20 C-750 Garage.....	15
2.4.21 Switchyards	16

3.	BEST MANAGEMENT PRACTICES PLAN-SPECIFIC REQUIREMENTS AND GENERAL CONDITIONS	17
3.1	BEST MANAGEMENT PRACTICES COMMITTEE	17
3.2	REPORTING OF BEST MANAGEMENT PRACTICES INCIDENTS.....	17
3.3	RISK IDENTIFICATION AND ASSESSMENT	18
3.4	INSPECTIONS AND RECORDS.....	18
3.5	PREVENTIVE MAINTENANCE	18
3.6	GOOD HOUSEKEEPING	18
3.7	MATERIALS COMPATIBILITY	19
3.8	SECURITY.....	19
3.9	MATERIALS INVENTORY	19
3.10	SPCC PLANS.....	20
3.11	HAZARDOUS WASTE MANAGEMENT	20
3.12	DOCUMENTATION	20
3.13	BEST MANAGEMENT PRACTICES PLAN MODIFICATION	21
3.14	MODIFICATION FOR INEFFECTIVENESS	21
4.	PECIFIC CONDITIONS.....	23
4.1	SOLID WASTE MANAGEMENT UNITS	23
4.2	PERIODICALLY DISCHARGED WASTEWATERS NOT SPECIFICALLY COVERED BY EFFLUENT CONDITIONS	23
4.3	ACCEPTANCE OF TENNESSEE VALLEY AUTHORITY SHAWNEE FOSSIL PLANT WASTEWATERS	24
4.4	USE OF HERBICIDES and pesticides AT PGDP	24
APPENDIX A:	PGDP STORM WATER FLOW	A-1
APPENDIX B:	EXAMPLES OF STORM WATER CONTROLS USED AT PGDP.....	B-1

ACRONYMS

BMP	Best Management Practice
CAA	Controlled Access Area
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
<i>CFR</i>	<i>Code of Federal Regulations</i>
CWA	Clean Water Act
D&R	Deactivation and Remediation
decon	decontamination
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
EPCRA	Emergency Planning and Right-to-Know Act
FFA	Federal Facility Agreement
GET	General Employee Training
HSS&Q	Health, Safety, Security, and Quality
IC	incident commander
<i>KAR</i>	<i>Kentucky Administrative Regulations</i>
KDOW	Kentucky Division of Water
KEEC	Kentucky Energy and Environment Cabinet
KPDES	Kentucky Pollutant Discharge Elimination System
<i>KRS</i>	<i>Kentucky Revised Statutes</i>
NEPCS	Northeast Plume Containment System
NWPGS	Northwest Plume Groundwater System
O&M	operations and maintenance
OSHA	Occupational Safety and Health Act
PA	public address
PGDP	Paducah Gaseous Diffusion Plant
PSS	plant shift superintendent
RCRA	Resource Conservation and Recovery Act
RCW	recirculating cooling water
SPCC	Spill Prevention Control and Countermeasures
SWMU	solid waste management unit
TSCA	Toxic Substances Control Act
TVA	Tennessee Valley Authority
UL [®]	Underwriters Laboratories Inc. [®]
USEC	United States Enrichment Corporation
WPCP	Work Planning and Control Program

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EXECUTIVE SUMMARY

The Best Management Practices (BMP) plan is required per Part V of the Kentucky Pollutant Discharge Elimination System Permits for the Paducah Gaseous Diffusion Plant (PGDP). The plan is required for “all permittees who use, manufacture, store, handle, or discharge any pollutant listed as (1) toxic under Section 307(a)(1) of the Clean Water Act (CWA); (2) oil, as defined in Section 311(a)(1) of the CWA; (3) any pollutant listed as hazardous under Section 311 of the CWA; or (4) is defined as a pollutant pursuant to *KRS* § 224.01-010(35) and who have ancillary manufacturing operations which could result in the (1) release of a hazardous substance, pollutant, or contaminant, or (2) an environmental emergency, as defined in *KRS* § 224.01-400, as amended, or any regulation promulgated pursuant thereto.” These operations include material storage areas; plant site runoff; in-plant transfer, process, and material handling areas; loading and unloading operations; and sludge and waste disposal areas.

The plan must be maintained consistent with 401 *KAR* 5:065 § 2(4) pursuant to *KRS* § 224.70–110, which prevent or minimize the potential for the release of “BMP pollutants” at PGDP. The BMP has general requirements for all operations and specific requirements for individual operations. The plan discusses a required BMP committee, the reporting of BMP incidents, and risk identification and assessment. The plan also discusses employee training, inspection records, preventative maintenance, housekeeping requirements, materials inventory, and security.

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1. INTRODUCTION

1.1 REGULATORY BACKGROUND

This Best Management Practices (BMP) Plan implements the regulatory requirements of regulations promulgated pursuant to the Federal Water Pollution Control Act and subsequent amendments, which is generally referred to as the Clean Water Act. Kentucky Pollutant Discharge Elimination System (KPDES) Permit No. KY0004049, Section 3, establish requirements for a BMP Plan pertaining to the U.S. Department of Energy (DOE) and its contractors' and subcontractors' activities at the Paducah Gaseous Diffusion Plant (PGDP). Nothing in this BMP Plan alters or supersedes obligations imposed in the KPDES permit. References herein to any plan or procedure refer to the most recent version of the plan or procedure in effect as of the date of this BMP Plan or, if subsequently revised, to the revised version of such plan or procedure.

1.2 PGDP BACKGROUND AND INTERFACE

PGDP is a former uranium enrichment facility consisting of a diffusion cascade and extensive support facilities. Plant construction began in 1951 and operations began in 1952. PGDP is located on a reservation consisting of approximately 3,556 acres in western McCracken County, approximately 10 miles west of Paducah, Kentucky. DOE owns the reservation and facilities at the plant, which previously was used to produce enriched uranium for national defense and energy. The facility no longer is used to produce enriched uranium. The facility now is undergoing deactivation, demolition and cleanup under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and other applicable regulations.

The United States Enrichment Corporation (USEC) operated the production facilities and most of the support facilities. DOE, as the owner of all facilities, retained responsibility for environmental restoration activities. Through a lease agreement between DOE and USEC, the facility consisted of USEC-leased space and DOE-retained space. USEC and DOE conducted operations in their respective spaces under separate KPDES permits. In May 2013, enrichment operations ceased and the facility began shutdown and cleanout of the process equipment. On October 21, 2014, USEC returned the formerly leased facilities to DOE. Four Rivers Nuclear Partnership, LLC, was awarded a contract that began in October 2017. The contractor is to furnish all personnel, facilities, equipment, material, supplies and services necessary to continue with deactivation of PGDP facilities; prepare facilities for future demolition, and perform environmental remediation activities required by the site Federal Facility Agreement (FFA) and the Site Management Plan.

This document represents the BMP Plan for DOE's Infrastructure and Deactivation and Remediation (D&R) contractor's activities. The Depleted Uranium Hexafluoride (DUF₆) Conversion contractor (currently Mid-America Conversion Services, which is a co-permittee on KPDES Permit KY0004049) has its own BMP, which addresses discharges from the DUF₆ Conversion facilities and associated cylinder storage yards discharges to Outfall 017.

DOE's activities at PGDP are carried out through its contractors. A portion of the required work is accomplished through subcontractors via direction from various DOE contractors. Requirements of this BMP Plan are communicated to projects and subcontractors through the Work Planning and Control Program (WPCP). The scope of work required for each contract, project, or other work activity is evaluated through the WPCP to ensure that environmental and safety controls such as BMPs are

implemented. As a part of the WPCP, inspection schedules and recordkeeping associated with the BMP Plan are established.

1.3 RECEIVING WATERS

Surface water from PGDP drains to two tributaries of the Ohio River: Bayou Creek located on the west side of the plant, and Little Bayou Creek located on the east side. These streams join north of the plant site and discharge into the Ohio River about 55 km (34 miles) upstream from the confluence of the Ohio and Mississippi Rivers. The flow in the streams fluctuates greatly as a result of the local precipitation. During a large part of the year, most of the flow in both streams is the result of plant effluents. With the exception of PGDP, the drainage basin from both creeks is mostly woodland and farmland. The PGDP Site is not in the Ohio River 100-year floodplain (elevation 101.6 m), nor would it be affected by the historical high water elevation of 104.2 m.

1.4 BEST MANAGEMENT PRACTICES PLAN FORMAT

The remainder of this BMP Plan is structured so that it parallels as closely as possible the requirements in KPDES Permit No. KY0004049. This structure facilitates ease of compliance demonstration. The plan generally follows the order of requirements in Part V of each permit so that compliance with each requirement is found easily in the plan. This format results in some redundant information throughout the plan, but ensures compliance with the content requirements of the KPDES permit.

2. GENERAL CONDITIONS AND GENERAL REQUIREMENTS (SECTION 3 OF KPDES PERMIT KY0004049)

2.1 DOCUMENTATION

This BMP is documented in narrative form and all necessary plot plans, drawings, and plans are included as appendices.

2.2 BEST MANAGEMENT PRACTICES

The following are general, plant-wide BMPs.

2.2.1 Training

General Employee Training (GET) is required and provided to all employees. Included in this training are instructions to report any spill or release to the plant shift superintendent (PSS), who serves as the incident commander (IC) during such occurrences. The PSS determines the level of effort needed to cleanup and or contain the spill and reportability of the spill. The training includes elements of this plan as well as other environmental training requirements. Additional training also is required for employees and their supervisors who work with hazardous Resource Conservation and Recovery Act (RCRA) waste, polychlorinated biphenyls (PCBs), asbestos, and/or radioactive/low-level wastes. Employees who operate mobile industrial equipment also are trained in accordance with Occupational Safety and Health Act (OSHA) requirements. In addition, standard operating procedures include preoperational inspections of equipment to identify and investigate potential releases.

2.2.2 Inspections/Walkthroughs

Contractors are assigned responsibility to perform walkthroughs of DOE facilities, including those with the potential to release BMP pollutants. The walkthroughs are performed according to various procedures and include a walkthrough checklist that includes criteria for leaks or spills, proper drainage, and proper chemical containment and storage. These walkthroughs help identify conditions that could result in release of BMP pollutants. Furthermore, each DOE facility's operating procedures (if applicable) contain inspection and/or maintenance requirements.

2.2.3 Engineered Controls

Major plant drainage ditches are equipped with inverted pipe dams designed to permit the passage of water, but contain floating material such as oil.

2.2.4 Spill Reporting and Countermeasures

Even small leaks and drips are to be reported to the PSS. These small leaks and drips are tracked to ensure they are adequately cleaned to prevent contamination of surface and/or ground waters.

All uncontained or emergency spills are to be reported immediately to the PSS, who then will serve as the on-scene IC. He will direct the emergency containment of any spill that may egress the building or immediate area or have the possibility of entering the environment. The IC, along with Environmental Health, Safety, Security, and Quality (HSS&Q) personnel, will help to determine the reportability of the spill.

2.2.5 Spill Equipment

An emergency response vehicle is maintained at PGDP, which contains items such as absorbent pads, pillows, booms, and loose material that may be used to clean up spilled chemicals or oil from the ground, ditches, or the surface of the quiet zone immediately upstream from the inverted pipe dams. Floating plastic booms may be used to divert or contain the flow of floating material to facilitate cleanup. The inflatable pipe stoppers and small spill cleanup kits also are stored in this truck. Self-contained breathing apparatus cylinders in the truck supply the inflating gas. Various operating groups in the plant also stock absorbent materials.

Following containment, the cleanup of spilled materials may be accomplished by using various portable pumps and containers capable of handling most of the liquids used at PGDP. Portable pumps are used by a number of plant operating maintenance support groups and may be used during cleanup operations. Storage capacity for spilled material is available in the form of a 400,000 gal tank formerly used to store fuel oil east of C-600. In addition, the PGDP maintains several large poly tanks for spill control operations in addition to other various containers that could be utilized in an emergency. Absorbent materials are stored in areas using chemicals and oils to use in containing and cleaning up small spills. A number of treatment options such as neutralization, precipitation, or evaporation are available.

2.2.6 Communication Systems

In an emergency situation, effective and rapid communication must be maintained throughout the emergency response and control organization. The five forms of communications that are available at PGDP are (1) emergency phone system, (2) radios, (3) public address (PA) system, (4) cellular telephone, and (5) messenger.

Emergency Phone System. Bell and PAX (interplant phone systems) are located throughout the plant. An emergency situation can be reported by dialing 333 Bell or 555 PAX. Emergency calls are answered by the C-300 Central Control Facility.

Radios. Radios are used by the PSS, fire services members, environmental personnel, security, and other response personnel to aid in emergency communications. Any radio in the plant can be used to summon emergency assistance. The C-300 Central Control Facility is utilized as the base station and monitors radio communications on all radio channels used at PGDP.

PA System. The PA system is used to communicate emergency instructions to all personnel. The PSS is in charge of all announcements made on the PA system.

Cellular Telephones. Most managers, technical workers, and foreman carry cellular phones and are trained to call emergency numbers as needed.

Messenger. A messenger may be used to notify the C-300 Central Control Facility of an emergency if it is determined to be a faster means of notification.

2.3 DOE FACILITY COMPONENTS OR SYSTEMS

Much of PGDP consists of the uranium enrichment facilities and support operations. The facility components or system(s) were examined for potential to cause a release of BMP pollutants (as established in applicable laws and regulations). Many of the facilities listed in this document are solid waste

management units (SWMUs) and will be addressed according to the “Specific Conditions” (Section 4) of this BMP Plan, as required by KPDES permit requirements for the BMP Plan.

The following existing facilities, components, or systems were examined for potential to cause a release of BMP pollutants. In addition to the general, plant-wide BMPs noted previously, facility-specific BMPs are listed in this document with each facility.

- Northwest Plume Groundwater System
- Northeast Plume Containment System
- Decontamination (Decon) Facilities
- Hazardous Waste Storage and Treatment Facilities
- C-404 Hazardous Landfill
- C-746-U Landfill
- C-746-U Fuel Storage Tanks
- Runoff Due to Disturbance of Historic Release/Spill Sites
- Decontamination and Decommissioning Projects and Other Projects Addressing Shutdown of DOE Facilities
- DOE Outfalls, Creeks, and Ditches
- SWMUs
- C-616-E Chromium Sludge Lagoon
- C-616-F Phosphate Sludge Lagoon
- Water Quality Monitoring Station
- Contaminated Scrap Yards
- PCB Waste Storage Facilities
- DOE Laboratories
- C-752-B Refueling Station
- C-600 Boiler System and Associated Fuel Oil Storage Tank
- C-400 and C-616 Chemical Storage Tanks

- C-750 Garage
- Switchyards

2.4 SITUATION OUTLINES

The following information outlines situations in which a reasonable potential for release of BMP pollutants from each DOE facility component or system could occur due to equipment failure, natural condition, or other circumstance. The map depicting the direction of flow of pollutants released is indicated on “PGDP Storm Water Flow,” which is presented as Appendix A to the BMP Plan.

2.4.1 Northwest Plume Groundwater System

Previous operations at PGDP resulted in contamination of groundwater with technetium-99 (Tc-99) and trichloroethene (TCE) in the Northwest Plume and TCE in the Northeast Plume. The contamination is traveling in the groundwater from the plant in two general directions, known as the Northwest Plume and the Northeast Plume. The Northwest Plume Groundwater System (NWPGS) goal is to control contamination and mitigate the spread of the highest TCE concentration portion of the northwest plume through groundwater extraction. The NWPGS consists of two extraction wells in one wellfield; a groundwater treatment system, including sand filtration and an air stripper with carbon treatment for off-gas emissions; and ion exchange units. The NWPGS is located outside the DOE security fence at the northwest corner of the plant.

The reasonable potential for release of BMP pollutants from the NWPGS arises with a release of untreated groundwater that is contaminated with TCE and Tc-99. Also, pumps, motors, and mobile industrial equipment in the facility contain lubricating oil. A small amount of waste also is stored at the facility. Releases from the NWPGS would drain through DOE KPDES Outfall 001.

NWPGS BMPs. The perimeter of the foundation of the building that houses the majority of NWPGS includes an 8-inch raised “lip” for containment of spills and releases. Ion exchange vessels and an air compressor are located in a trailer that has secondary containment and a sump that transfers any leaked material into the building where it would be contained as part of the facility’s secondary containment system. Leaks or releases within the building will flow to the building sump. The sump has a liquid level indicator, which shuts down the entire operation if the sump liquid level is raised beyond a specified point. Thus, leaks in the building will flow to the sump and result in collected water from the sump to be sent to the treatment system. If the sump level reached a secondary level alarm, automatic shutdown of the operation and the pumps supplying the operation would occur. Operation of the NWPGS is governed by the Operations and Maintenance (O&M) Plan. The *Operations and Maintenance Plan for the Northwest Plume Groundwater System Interim Remedial Action at the Paducah Gaseous Diffusion Plant*, DOE/OR/07-1253, outlines several BMPs, including required frequent inspections and walkdowns. Oil-absorbent pads are placed around operating motors for oil leak/spill control. The facility also is equipped with a spill response kit. Mobile industrial equipment is inspected daily, when used, per OSHA regulations. The D&R Contractor’s regulatory compliance organization and the PSS will be notified of leaks or spills of significant amounts of equipment oil into the sump. Waste at the facility is handled according to CP2-WM-0001, *Four Rivers Nuclear Partnership, LLC, Paducah Deactivation and Remediation Project Waste Management Plan*. CP2-ER-0067, *Health and Safety Plan for the Paducah Plumes Operations, Paducah, Kentucky*, establishes training, spill reporting, and containment requirements for NWPGS personnel.

2.4.2 Northeast Plume Containment System

The Northeast Plume Containment System (NEPCS) is a TCE treatment system that consists of two extraction wells, a transfer pump, pipeline, and an air stripping unit. The air-stripped groundwater is discharged through a CERCLA outfall to Little Bayou Creek. The objective of this system is to retard the migration of the highest concentration of TCE in the Northeast Plume.

The potential for release from this system is associated with a release of untreated groundwater from the piping that connects the extraction wells and the air stripping unit. A release from piping near the air stripping unit would drain to KPDES Outfall 002.

NEPCS BMPs. The NEPCS is an automated system with failure alarms and interlocks that will shut down the system on the occurrence of certain alarm conditions. During normal operations, the system has the capability to operate with minimal operational support. O&M of the NEPCS is operated and governed by the *Operations and Maintenance Plan for the Northeast Plume Containment System Interim Remedial Action at the Paducah Gaseous Diffusion Plant*, DOE/OR/07-1535. The operator conducts equipment inspections and system checks of key process variables, records system operational data, and ensures effective and safe system operation whenever the system is operating. NEPCS corrective and preventive maintenance and calibration are performed in accordance with manufacturer's recommendations, sound engineering practices, and in accordance with applicable procedures. Process information can be accessed locally by the main system control panel whenever the system is operating in accordance with applicable procedures. The NEPCS contains a dedicated automatic telephone dialer (auto-dialer) for calling designated on-call personnel when system alarm conditions occur. Abnormal operating conditions trigger alarms to the main system control panel. The auto-dialer, upon receipt of an alarm signal from the programmable logic controller, dials on-call personnel and delivers an alarm message.

2.4.3 Decontamination Facilities

DOE, through its contractors and subcontractors, operates several decon facilities at PGDP. The decon facilities consist generally of a concrete pad, a spray apparatus, and decon water storage. A decon pad sump collects decon water. The water is transferred to storage tanks, treated, analyzed, and appropriately disposed of in accordance with applicable requirements. The selection of the decon pad to be used during remediation projects is based on the location of the project, size of the facility, and available facilities such as roof or water supply.

C-752-C Decontamination Pad. The C-752-C decon pad is located outside the DOE security fence near the southwest corner of the plant, along Ohio Street, south of the C-743 Trailer Complex. The pad predominantly is used for decon purposes for various remediation projects around the plant. Each of four sumps has an estimated 1,000-gal capacity. Also, if any sump is full, the pad is designed so that some overflow from the sump can be contained on the pad itself. The fenced area surrounding the decon pad is used for supply and waste storage. Used decon water is stored in poly or frac tanks located on the concrete pad. The potential for release of BMP pollutants from this facility would arise with a leak or rupture from the storage tanks. Pollutants could include those similar to remediation projects, such as TCE, trichloroethane, radionuclides, lead, or PCBs. Discharges or releases from this facility would flow to KPDES Outfall 009 or Outfall 016.

C-416 Decon Pad. The C-416 decon pad is located between the C-631 Cooling Towers, and C-337 is used for decon of equipment used in remediation projects. It is not equipped with a sump; therefore, the decon water is collected in a small trough and transferred to holding tanks which are located on the pad. There are generally three 1,200-gal holding tanks on the pad, although this number can change depending upon the decon project requirements. This decon pad is used by The D&R contractor and its

subcontractors involved in remediation projects. Discharges or releases from C-416 would flow to KPDES Outfall 002.

Decon Facility BMPs. In addition to the general monthly inspection, decon pads are inspected daily prior to use by personnel assigned to the facility. The pads are designed so that releases on the pad will drain to the pad sumps. The decon pads are operated in accordance with procedures that comply with environmental protection procedures. Surveillances and audits also occur at the pads, and usually are associated with the various remediation projects that use the pads for decon purposes. Sump water is collected and characterized prior to discharge either by analytical data or process knowledge. Waters that meet KPDES requirements may be discharged to the ground outside of the facility or transported to an outfall conveyance. At the end of each project's use of the pads, collected water from the sumps is sampled. If the waters meet KPDES discharge requirements, the sumps no longer are sampled prior to discharge until a new project uses the facility.

2.4.4 Hazardous Waste Storage Facilities

The following are permitted hazardous waste storage facilities (Hazardous Waste Management Facility Permit, KY8-890-008-982) at PGDP.

C-733 Hazardous Waste Storage Area. This facility is located in the southwestern area of the plant, west of C-744. It is used to store spent solvents, paint waste, mineral spirits, waste chemicals, and other hazardous waste. It is considered the flammable storage area. The facility is diked with sumps. The facility has limited sides to help any fumes that may be generated from the waste to dissipate quickly and not develop explosive levels if a leak were to occur. Rainfall that blows into the facility is collected in sumps. The sumps are pumped to collection containers, sampled, and the results assessed for environmental effects prior to discharge to Outfall 001. PCBs also are stored here. PCB waste is stored in container(s) within covered storage boxes that protect the waste from the weather and prevent any discharges if a drum were to rupture or develop a leak. The facility is inspected at least weekly. Leaks are cleaned promptly and leaking containers are repackaged to contain the waste materials. Releases from C-733 would flow to KPDES Outfall 008.

C-746-Q Hazardous Waste Storage and Treatment Area. This area is located inside the western portion of C-746-Q and is permitted for batch chemical treatment of hazardous waste by neutralization, precipitation, oxidation, reduction, and stabilization. A bulb crusher also is located here. The facility is diked and protected from the weather. The facility is inspected at least weekly for leaking containers or loss of building integrity. Leaks are promptly cleaned and leaking containers are repackaged to contain the waste materials. Releases from C-746-Q would flow to KPDES Outfall 012. The eastern area of this facility is not included under the Hazardous Waste Management Facility Permit.

C-752-A Environmental Restoration Waste Storage Facility. This facility is an indoor permanent structure that stores environmental restoration derived waste as well as PCBs, low-level waste, and other miscellaneous waste. Permitted treatment activities include batch chemical treatment of hazardous waste by neutralization, precipitation, oxidation, reduction, absorption, decanting, filtration, and stabilization. The facility is diked and protected from the weather. The facility is inspected at least weekly for leaking containers or loss of building integrity. Leaks are promptly cleaned and leaking containers are repackaged to contain the waste materials. Discharges of treated wastewaters are characterized prior to discharge to Outfall 001. Releases from C-752-A would flow to KPDES Outfall 001.

Hazardous Waste Storage Areas BMPs. A Hazardous Waste Management Facility Permit has been issued to allow storage and treatment of hazardous waste at PGDP at the facilities listed above. The permit is U.S. Environmental Protection Agency (EPA) ID No. KY8-890-008-982. In accordance with

that permit and applicable state and federal regulations, a Contingency Plan has been developed to provide for emergency responses at the hazardous waste facilities at PGDP.

The Contingency Plan establishes policy and creates procedures for hazardous waste spills, containment, and countermeasures to minimize any adverse impact to the environment, to reduce safety and health hazards, and to meet standards that define the acceptable management of hazardous waste. The Contingency Plan uses past experience and BMPs to minimize hazards to human health or the environment from fires, explosions, or any unplanned release of hazardous waste to air, soil, or surface water. This plan is revised as necessary in accordance with applicable requirements.

This BMP Plan hereby incorporates the policies, procedures, and BMPs established in the current revision of the Contingency Plan to prevent and mitigate releases from hazardous waste storage and treatment areas at PGDP. Reference that document for additional information. Discharges of treated wastewaters are characterized prior to discharge to KPDES Outfall 001.

2.4.5 C-404 Hazardous Waste Landfill

The C-404 Landfill contains drummed, RCRA-hazardous radiologically contaminated filter cake. The facility includes a leachate collection system and collection sump. The sump is pumped to collection containers prior to reaching the overflow level of the sump and transferred to a permitted storage facility. The C-404 Landfill was certified closed in July 1987. Releases would flow to KPDES Outfall 015 and would be responded to in accordance with any applicable provisions of the Hazardous Waste Management Facility Permit (KY8-890-008-982).

C-404 Hazardous Waste Landfill BMPs. Information and BMPs pertaining to the C-404 Landfill are contained in Appendix I-2 Post Closure Plan C-404 Landfill of the Hazardous Waste Management Facility Permit, as of the publication date of this plan. These BMPs include a series of groundwater monitoring wells, a cap inspection schedule, and the requirements to maintain the cover. The BMPs pertaining to the C-404 Landfill listed in the current version of the Hazardous Waste Management Facility Permit are hereby incorporated into this BMP Plan. Collected leachate is moved to permitted storage, sampled, and then assessed for treatment and disposal options. The leachate may be shipped off-site for treatment/disposal or treated as necessary for any contaminants and discharged to KPDES Outfall 001.

2.4.6 C-746-U Landfill

The C-746-U Landfill is a permitted solid waste contained landfill. This landfill is permitted to receive industrial, construction, and sanitary waste. The surface runoff at the landfill flows to a sedimentation basin and is discharged to Outfall 019. Leachate is collected from both C-746-U and C-746-S Landfills and placed in the working face of the landfill, disposed of in the sewage treatment facility C-615 that is discharged to KPDES Outfall 008, treated at the C-752-A facility's carbon treatment system, or treated at the leachate treatment facility C-746-U-15 at the landfill. Leachate treated at the landfill is discharged to KPDES Outfall 020.

C-746-U Landfill BMPs. The burial area of the landfill where waste is disposed of is covered daily with Posi-Shell[®] or 6 inches of soil to promote runoff. A minimum of an additional 6 inches of cover is placed over all areas that will not receive additional waste within 30 days. A minimum of an additional 18 inches of cover is placed over all areas that will not receive any additional waste within four months by September 15 annually. The landfill is inspected each day of operation and after each large storm event to assure that erosion does not occur. Eroded areas are repaired and seeded to prevent further erosion. Other storm water management tools, as described in Appendix B, are utilized as necessary. The entire landfill

drains to a large sedimentation basin. The basin has treatment capabilities and enough holdup capacity to hold months of runoff under normal conditions. Water is treated/tested to ensure total suspended solids are in compliance prior to pumping to KPDES Outfall 019.

Water that penetrates the soil covering and percolates through the buried waste is collected through a leachate collection system. The landfill is lined to prevent leachate from escaping into the environment. Berms and diversion ditches are placed around the active area of the landfill where waste may be exposed to prevent surface runoff from entering that area. The leachate is treated prior to discharge.

2.4.7 C-746-U Fuel Storage Tanks

These tanks are located at the C-746-U Solid Waste Landfill, northeast of PGDP. There is one 1,000-gal diesel tank and one 500-gal gasoline tank. The gasoline tank currently is not in use. The 1,000-gal and 500-gal tanks located outside at C-746-U are manufactured by ConVault® and are UL®-listed. Each system consists of a primary steel tank and secondary containment consisting of a 30-mil (0.78-millimeters) thick polyethylene membrane enclosing the steel tank and insulation material. The primary steel tank and the secondary containment are encased in 6 inches of reinforced concrete, but no steel or insulating material comes in contact with the concrete. The tanks located at C-746-U are provided with a UL®-listed spill containment system that includes a normally closed valve to release any spilled product from refilling into the primary steel tank.

C-746-U Storage Tanks BMPs. BMPs for these fuel storage tanks are established in the DOE Spill Prevention Control and Countermeasures (SPCC) Plan, PAD-REG-1005. The BMPs for these tanks include secondary containment, administrative controls, integrity testing, and inspections. Releases from these tanks would flow to the C-746-U Basin, which flows to KPDES Outfall 019. The basin is not discharged until sample analysis indicates compliance with applicable KPDES requirements.

This BMP Plan hereby incorporates the policies, procedures, and BMPs established in the current revision of the SPCC for these tanks to prevent and mitigate releases from this facility. Refer to the SPCC document for additional information.

2.4.8 Runoff Due to Disturbance of Historic Release/Spill Sites

Construction of PGDP was begun in 1951 and operation commenced in 1952. There have been a number of releases throughout the years of operation and the soil and groundwater within and around the vicinity of the plant has experienced varying degrees of contamination with radionuclides, PCBs, TCE, polycyclic aromatic hydrocarbons, and other industrial chemicals. The potential of release arises when remediation or other projects disturb the soil in areas and the contaminated soil is carried by precipitation runoff to storm sewers and/or KPDES outfalls. The outfall affected is dependent upon the location of the project.

Runoff BMPs. Various controls have been implemented to prevent pollutants from entering plant outfalls during rainfall events. Each project is required to provide the BMPs that will be utilized during the project to the Regulatory Compliance Group through the WPCP. The protective BMPs are evaluated on a project by project basis to assure protection of the environment during rainfall events. Appendix B provides examples of storm water controls that may be used to prevent run off from resulting in a spread of contamination.

2.4.9 Decontamination and Decommissioning Projects and other Projects Addressing Shutdown DOE Facilities

DOE facilities at PGDP that are no longer in service will be scheduled for decontamination and decommissioning if they are radiologically or chemically contaminated. In addition, in some cases, other DOE facilities that are not contaminated also will be scheduled for shutdown and/or deconstruction. As decontamination and decommissioning progresses or other facilities are shutdown, these facilities will be scheduled for decontamination and decommissioning or deconstruction. The potential for release from decontamination and decommissioning and associated activities is unique to each project. Furthermore, any KPDES outfall that would be affected also would be dependent upon the location of the project.

Decontamination and Decommissioning and Other Projects BMPs. Each decontamination and decommissioning and other shutdown projects at PGDP are unique, and effective BMPs should be established during the planning phase of the project; therefore, the D&R contractor's HSS&Q functions will review each project during the planning phase and through the WPCP to ensure that BMPs are included in the project requirements. For projects accomplished by a subcontractor, appropriate BMPs are included in the requirements of the subcontract for the project. For self-performed work, regulatory compliance will ensure that appropriate BMPs are included in the work packages for all self-performed work. In addition to storm water control BMPs identified in Appendix B, the project will take measures to minimize contact of storm water with demolition debris and minimize potential for contaminated run-off to reach storm drains/outfalls.

2.4.10 C-752-B Fuel Station

Two aboveground storage tanks are located at the C-752-B facility south of PGDP, which serve as a satellite refueling station for mobile plant equipment. The two 4,000-gal Underwriters Laboratories Inc.[®] (UL[®])-listed, dual-wall tanks are located on the concrete-bermed C-752-B pad. Both tanks have a capacity of 4,000 gal; however, each tank is split internally into a 3,000-gal and a 1,000-gal tank to allow the tank to hold two different types of fuel at the same time. One tank contains E85 and unleaded gasoline; the other tank contains on-road and off-road diesel.

C-752-B Fuel Station BMPs. The two 4,000-gal steel tanks at C-752-B are UL[®]-listed, double walled, and staged on a bermed concrete pad. These two tanks are split internally into 1,000-gal and 3,000-gal sections. The second wall of the tanks is sufficiently impervious to contain oil per the 40 *CFR* § 112.7(c)(1)(i) requirement for secondary containment. Additional containment is provided by the bermed concrete pad [40 *CFR* § 112.7 (c)(1)(iii)]. Absorbent materials [40 *CFR* § 112.7(c)(1)(viii)] are available as a backup/defense in depth. Precipitation accumulated on the pad will be examined prior to manual discharge to ensure that no oily products are discharged. Appropriate and nonexpended absorbent devices will be used, as needed, to ensure only clean water is discharged. A spill collection pad along with spill collection devices (pans, pads, etc.) also may be used at the dispensing pumps to help ensure that oily products do not impact the environment if a spill occurs. Each tank contains an interstitial leak detection device, which is a continuous monitor with visible and audible alarms. BMPs for these storage tanks are established in the SPCC Plan, PAD-REG-1005. Releases from these tanks would flow to KPDES Outfall 009.

2.4.11 Outfalls, Creeks, and Ditches

Although outfalls, creeks, and ditches are not "facilities," BMPs associated with them can help prevent environmental damages due to the release of hazardous materials. The potential for release through the outfalls is dependent upon activities and facilities throughout the plant and the frequency and volume of precipitation events.

Outfalls, Creeks, and Ditches BMPs. KPDES Outfalls 001, 002, 008, 009, 010, 011, 012, 013, and 015 have inverted piped dams. Inverted pipe dams are engineered so that water is allowed to pass through the dam, but floating material, such as oil and debris, is contained. Of these outfalls, only Outfalls 001 and 008 routinely discharge industrial waste waters. New discharges or changes to existing discharges to Outfalls 001 and Outfall 008 are evaluated to ensure they will not impact water quality criteria or KPDES permit requirements.

Outfalls 002, 010, 011, and 012 receives water from most of the cascade facilities and runoff from a large portion of the eastern side of the plant. The four ditches are pumped to an equalization lagoon C-617, which also has treatment abilities for several KPDES permit parameters. The effluent from the lagoon is released either to Outfall 010 or 011 below the ditch lift station after treatment. During large rainfall events or lift station outages, the outfall will receive effluents from the outfall ditch. The KPDES permit allows these discharges that are monitored to prove compliance with KPDES discharge criteria.

Outfall 004 is an internal compliance point source for treated sewage plant effluent that flows to Outfall 008. The operators of the sewage treatment plant are certified in accordance with Kentucky Administrative Regulations to ensure proper operation of the plant.

Outfall 006 receives effluent from the C-611 water treatment facility, C-611 treats water withdrawn from the Ohio River by filtration and sedimentation ponds to produce drinking water and plant process water.

Outfall 009 drains mostly nonprocess storm water from buildings and grass-covered fields. It has dechlorination and neutralization capabilities, if necessary.

Outfall 013 drains storm water from uranium hexafluoride cylinder yards. The drainage ditch to Outfall 013 includes an in-line zinc treatment system to remove oxidized paint from the cylinders and a constructed wetland to minimize further zinc at the outfall.

Outfall 015 drains mostly nonprocess storm water from grass-covered fields. No treatment is needed for the outfall to meet KPDES permit limitations. Outfall 016 includes surface drainage from a small portion of the plant near the sewage treatment facility and fire training area.

Outfall 017 drains storm water from uranium hexafluoride cylinder yards and noncontact cooling waters, neither of which is expected to release any floating materials. The drainage ditch to Outfall 017 includes an in-line zinc treatment system to remove oxidized paint from the cylinders and a constructed wetland to minimize further zinc at the outfall.

Outfall 019 is designed to discharge surface water runoff from the C-746-U Landfill during rainfall events, but BMP plans for the facility dictate holding the area runoff in a sedimentation pond until the pond is nearly full and the water meets KPDES discharge limits. At that time, the pond is pumped to Outfall 019.

Outfall 020 discharges landfill leachate treated to meet KPDES discharge criteria. Treatment process precludes introduction of oils or other floating material. It is administratively controlled and sampled at the same location as Outfall 020.

All outfalls are inspected on a regular basis, usually during weekly/monthly monitoring/sampling events, as applicable. These inspections look for signs of a release, blockage of the discharge path, or any other unusual condition that could indicate the presence or potential presence of a BMP Pollutant.

2.4.12 Solid Waste Management Units

A number of SWMUs have been identified at PGDP. The potential for releases from SWMUs originates with the possibility historic waste or other material located in these areas. A potential exists for leaks, such as lubricating or cooling liquids, from equipment or supplies utilized in the characterization and disposal of the materials located in the SWMUs.

SWMU BMPs. All work in SWMUs requires approval from regulatory compliance. Work approval is captured on the review of the work instructions, task instructions, and releases. Regulatory compliance reviews work control documents to ensure BMPs are followed based upon this plan. Field follow-ups and inspections are conducted if the work plans indicate the work has the potential to disturb contaminants in a SWMU.

Several SWMUs at PGDP are located in areas without an outfall. These areas are grass covered and under normal conditions would not have discharges. During extreme rainfall events these areas may become saturated, which may allow storm water to flow over or through the SWMU, increasing the potential for surface water discharge. If the soils covering the SWMU become saturated, the SWMUs will be checked for signs of erosion. Storm water runoff periodically will be visually inspected to look for signs of contamination (e.g., an oily sheen, cloudy or discolored water) and, if necessary, sampled.

2.4.13 C-616-E Chromium Sludge Lagoon

The lagoon is unlined and formerly received treated wastewater from the Recirculating Cooling Water (RCW) Treatment Facility (C-616). The C-616 facility previously treated RCW, which contained hexavalent chromium. Hexavalent chromium use as a corrosion inhibitor in RCW was discontinued in the early 1990s. Hexavalent chromium was replaced with phosphate as a corrosion inhibitor. The C-616 facility then was used to treat phosphate. In 1998, USEC released C-616-E back to DOE and rerouted the RCW to the C-616-F Lagoon, no longer utilizing the C-616-E Sludge Lagoon. This lagoon contains sludge and water from the C-616 RCW Treatment Facility. The sludge and water contain trivalent chromium left from hexavalent chromium reduction/treatment at C-616. The potential for release from this facility comes with a degradation of the lagoon walls through erosion or damage. Releases from this lagoon would travel through KPDES Outfall 001.

C-616-E Chromium Sludge Lagoon BMP. The heavy metals (e.g., trivalent chromium) that constitute the major potential pollutant from this facility do not readily migrate to groundwater. Because this is an elevated lagoon with no flow into the lagoon, it has no effluent. Evaporation maintains a fairly constant lagoon elevation. This lagoon is inspected at least annually to ensure integrity of the structure of the lagoon.

2.4.14 C-616-F Phosphate Sludge Lagoon

The cooling towers are piped to C-616-F. The purpose of the C-616-F facility is to reduce the phosphates concentration discharged in treated blowdown from the plant cooling towers. Phosphate treatment is accomplished by precipitation in a clarifier. The effluent from the clarifier is discharged to the C-616-F sludge lagoon. The lagoon has a 26,000,000-gal capacity and a retention time of approximately 60 days. The lagoon also receives effluents from the North-South Diversion Ditch, which receives storm water and wastewaters from the central part of PGDP.

C-616-F Phosphate Sludge Lagoon BMPs. The lagoon is inspected routinely for any releases, blockage, or unusual conditions. Carbon dioxide is fed to the effluent of the lagoon to control pH as necessary to comply with KPDES permit limits.

2.4.15 Water Quality Monitoring Stations

Two abandoned water quality monitoring stations are located on the banks of Bayou Creek and Little Bayou Creek outside the PGDP security fence, downstream of all plant activity. There were mercury-filled manometers in the stations for water flow measurements. During high water flow, the mercury was released from the Bayou Creek manometer. The spilled mercury seeped through the cracks in the concrete floor of the facilities and into the soil underneath. In addition, the station was vandalized at one time, and mercury was spilled to the floor and into the soils underneath. The station on Bayou Creek was removed to slab in the mid-1990s. The station on Bayou Creek is a SWMU and is subject to SWMU BMPs. In the spring 2014, West Kentucky Wildlife Management Area personnel inadvertently broke the concrete for the Bayou Creek station and moved the concrete about 10–15 ft from the original location. The station on Little Bayou Creek remains standing.

Water Quality Monitoring Station BMPs. The Little Bayou Creek station is inspected at least annually to ensure the concrete floor cracks remain sealed. The cracks in the floor of the facility were sealed to prevent further infiltration and to prevent entry of water that would facilitate transfer of the mercury from the soil under the concrete floors into the environment

2.4.16 Contaminated Scrap Yards

The contaminated scrap yards were located in the northwest corner of PGDP and contained many types of contaminated scrap. The scrap was removed for disposal with only small residual pieces of metal left in the soils beneath the scrap metal piles. Much of the scrap that was disturbed during the removal process was contaminated with radioactive components. The potential for contamination from these scrap yards is from runoff from precipitation events. Releases from these scrap yards would flow to KPDES Outfall 001.

Contaminated Scrap Yard BMPs. Scrap yard BMPs are contained in the *Operations and Maintenance Plan for the Northwest Storm Water Collection Basin at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/OR/07-2044&D1/R4. Primary controls include the C-613 Sedimentation Basin that captures the runoff from the scrap yards and allows sedimentation and treatment, if necessary, of contaminants. The yard was vegetated following removal of the scrap materials. The O&M Plan includes routine inspections. When silt levels approach a level where discharge of the solids may occur, cleanout will be evaluated.

2.4.17 PCB Waste Storage Areas

PCBs have been in use at PGDP for years, and there is a significant amount remaining at the plant. PCBs are still used in electrical equipment and are present in ventilation gaskets in the process buildings and other site buildings. There are four areas where PCB waste is stored at PGDP:

- C-746-Q
- C-733
- C-752-A
- C-753-A

Additionally, temporary staging of PCB waste may occur in CERCLA storage areas near the SWMU or area of concern where PCB waste was removed based upon applicable or relevant and appropriate requirements.

PCB Waste Storage Area BMPs. PCB waste storage is diked per 40 *CFR* § 761.65(b) or protected from run-on/run-off per 40 *CFR* § 761.65(c). Regular inspections are performed and documented on PCB waste storage areas. Each storage facility is controlled by operating procedures. Stored PCB waste is protected from the weather, thus preventing runoff of PCB contaminants. Personnel assigned to work with PCB waste are required to complete PCB Awareness Training. The TSCA Uranium Enrichment Federal Facility Compliance Agreement of February 1992 and modified in 1997 and May 30, 2017, establish requirements pertaining to PCB/TSCA compliance.

2.4.18 DOE Laboratories

Investigation and remediation projects performed by DOE contractors occasionally include the use of laboratories for analysis of soils, water, effluents, etc. Some laboratories are permanently located on-site; others are temporary laboratories established by subcontractors in trailers. The laboratories generate hazardous and nonhazardous waste.

Laboratories BMPs. Laboratory sink drains are discharged to an elementary neutralization/equalization pit, which discharges into the plant sanitary sewer systems where treatment of wastewater occurs at the C-615 Sewage Treatment Facility. Laboratory procedures prohibit RCRA hazardous wastewater from being released to the sink drains. Nonliquid waste and RCRA hazardous wastewater generated in the laboratories are containerized for proper disposal.

2.4.19 C-611 and C-616 Chemical Storage Tanks

Chemicals used for water treatment are stored in bulk quantities at the treatment facilities located at C-611 and C-616.

C-611 and C-616 Chemical Storage Tanks BMPs. At C-611, all liquid drinking water treatment chemical storage tanks are diked or drain to a sump that pumps back into the system. Dry chemicals are stored in bins above the building. If the bins were to leak, the chemicals would go to floor drains that would wash to a storage basin, C-611 W basin, where treatment could occur. C-611 W overflows to basin C-611 Y, which has a large holdup capacity where further treatment could occur, if necessary. The basins flow to KPDES Outfall 006.

At C-616 phosphate reduction facility, all liquid chemical tanks are diked or would drain to sump that would feed back into the system. Solid chemicals are stored in bins. A leak from a bin would accumulate on the pad beneath the bin and be cleaned up. If rain washed some of the spilled material into the adjoining ditch, it would flow to the C-613 treatment basin. The basin discharges to KPDES Outfall 001.

2.4.20 C-750 Garage

Maintenance on plant vehicles, tow tractors, forklifts, etc., is partially performed at the plant's C-750 Garage. If oil changes are performed, the waste oil would be drained into a storage container and pumped to a 55-gal drum that would be picked up by Waste Management for final disposal. Additionally, plant vehicles can be washed in the garage.

C-750 Garage BMPs. Antifreeze in vehicles is not changed. When antifreeze is drained from a vehicle, it is put back into the vehicle. Small spills of oil and grease are controlled using an oil sorbent and good housekeeping practices. The majority of work performed at the garage is done in an enclosed building. When it becomes necessary to do work outside, extra care is taken. Oil and grease used outside are placed inside the building at the end of each day and in the event of rain. The water and soap used to wash vehicles flows to the C-615 Sewage Disposal Plant for treatment before it enters the environment.

2.4.21 Switchyards

Transformers oils and circuit breaker insulating oils (non-PCB approximately 1 million gal), in switchyards are not diked. Runoff from a leak or rupture would drain through the gravel base of the switchyard to drainage ditches.

Switchyards BMPs. KPDES ditches leading from switchyards are equipped with inverted pipe dams designed to permit the passage of water but contain floating materials such as mineral oil. The dams are designed to overflow only during severe rainstorms and will provide effective oil containment during moderately heavy rains.

The Annual Document of Polychlorinated Biphenyls at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, for January 1, 2016–December 31, 2016 (FPDP-RPT-0080) (PCB Annual Document 2016) indicates that two PCB-contaminated transformers (51 and 62 ppm) remain in service in the C-533, switchyard. The total amount of PCBs in all the PCB-contaminated equipment in the switchyards is noted to be 0.02 kg. In addition, several pounds of PCBs are contained in out-of-service equipment throughout the plant. Leaks from this equipment, if not cleaned up immediately, would travel to plant ditches with inverted pipe dam control systems.

3. BEST MANAGEMENT PRACTICES PLAN-SPECIFIC REQUIREMENTS AND GENERAL CONDITIONS

Section 3 of KPDES Permit KY0004049 establishes specific BMPs for the DOE BMP Plan at PGDP. The following BMPs establish the implementation of those requirements. This BMP Plan was developed to be consistent with the general guidance in EPA document EPA 833-B-93-004, “Guidance Manual for Developing Best Management Practices.”

3.1 BEST MANAGEMENT PRACTICES COMMITTEE

The PGDP BMP committee is chaired by the regulatory compliance manager. Its members can include personnel from safety, deactivation, decontamination, and decommissioning projects, remediation projects, and waste projects. Other members may include subcontractors responsible for environmental compliance activities. The membership is not static and may include temporary members based on initiation, shutdown, or completion of projects at PGDP that potentially could impact on water quality. The BMP Committee shall meet periodically as deemed necessary by new projects or the BMP chairperson. The BMP Committee shall review proposed modifications to this plan. Minutes of the meetings will be documented.

Major responsibilities of the BMP Committee include the following:

- Development and approval of the BMP Plan
- Review and revision of the BMP Plan as necessary
- Determination of BMPs for DOE projects at PGDP
- Reduce pollutant discharges (improve water discharge quality)
- Review changes to KPDES discharges

3.2 REPORTING OF BEST MANAGEMENT PRACTICES INCIDENTS

As established in GET, it is the responsibility of every person on-site to report a spill or release of any oil or suspected pollutant. This is established in the plant “See and Flee” policy that requires employees to ensure their personal safety if any release or danger is seen, and then report the incident. All leaks and drips are reported to the PSS. The PSS is an employee who serves as the plant emergency director, the OSHA on-scene commander, and as the incident commander or fire ground commander by the National Fire Protection Association.

The PSS, with support from the Emergency Operations Center cadre, determines if spills are reportable such as those that enter or have the potential to enter the environment and/or are above the reportable quantity under CERCLA and the Emergency Planning and Right-to-Know Act (EPCRA). In the event of a reportable spill, DOE, appropriate contractor/subcontractor personnel, the Kentucky Department for Environmental Protection, and other agencies will be notified. DOE Order 232.1A, *Occurrence Reporting and Processing of Operations Information*, also requires a system for notification, investigation, and reporting of unusual occurrences, such as BMP incidents. Procedures (e.g., CP3-ES-0003) also implement requirements for employees to report release of hazardous substances as required by CERCLA and EPCRA.

3.3 RISK IDENTIFICATION AND ASSESSMENT

Effluent discharges from the PGDP generally are well defined with little change since the mid-1990s. In April 2014, enrichment operations ceased at PGDP. Other than drastically reducing blowdown from cooling towers thus reducing the flow to Outfall 001 from the C-616 Phosphate Reduction Facility, little change was seen to plant effluents. Changes to effluent discharges are from specific work scopes that result from site cleanup and/or maintenance activities. These activities are administered through the WPCP, discharge approval process, and/or PGDP shared site process.

Work instructions/procedures are reviewed for the potential for the scope to cause a release of BMP pollutants. If a potential exists, appropriate controls from this plan are incorporated into the work instruction.

New or periodic discharges are approved on a case-by-case process using available analytical data and process knowledge to ensure compliance with in stream water quality criteria under 401 KAR 10:031. This approval obtained in accordance with contractor procedures.

The PGDP shared site process is used to coordinate activities between various groups and contractors. Work is evaluated to determine the potential to affect the discharges from each of the plant outfalls.

Weekly, monthly, and quarterly sampling of Outfalls provides a verification of the effectiveness of this BMP. Additionally, DOE and DOE contractors perform periodic assessment of work controls and projects to ensure BMPs are being implemented and remain effective. If issues are identified, DOE contractors will implement additional BMPs necessary to prevent/minimize impacts to the environment.

3.4 INSPECTIONS AND RECORDS

Inspections of areas with a potential for BMP release are conducted under various programs. For example, hazardous waste storage area inspections are conducted in accordance with regulatory and permit requirements. Emergency response equipment used in response to RCRA emergencies is required to be inspected regularly. Facilities are inspected by the designated contractor on a periodic basis pursuant to the contractor's procedure. Results of the inspection are recorded on a walkthrough checklist. Mobile industrial equipment trucks are inspected on a regular basis to help prevent releases of fuels and lubricating fluids. Inspection checklists are maintained at the facility/location for at least three years.

3.5 PREVENTIVE MAINTENANCE

DOE contractors have pieces of equipment associated with site remediation, deactivation, waste handling, and maintenance that require a preventive maintenance program. Requirements also exist for a preventive maintenance program in contract requirements between DOE contractors and subcontractors. Each subcontractor is contractually responsible for implementing a preventive maintenance program, if applicable, to reduce the potential for release of pollutants.

3.6 GOOD HOUSEKEEPING

Good housekeeping practices are essential for the maintenance of a clean and orderly working environment. The potential for accidents and spills is greatly reduced by a clean and orderly work area for employees that ultimately reduces safety hazards and potential release of BMP pollutants. Good

housekeeping practices include prompt response and cleanup of spills, leaks, and drips, and proper storage of drums, containers, and bags. Good housekeeping implementation for DOE facilities is included in DOE contractors' procedures. Additionally, the walkthrough checklist used in the monthly inspection of DOE facilities contains criteria for good housekeeping. Compliance surveillances are conducted on a non-routine basis and, as a part of that surveillance, housekeeping is reviewed. GET instructs all personnel to be aware of housekeeping and actively participate in good housekeeping measures.

3.7 MATERIALS COMPATIBILITY

Procedures implementing requirements for long-term and temporary storage of hazardous waste require that waste be compatible with the container and the surrounding containers. To prevent mixing of incompatible materials, procedures also implement labeling requirements of containers that contain hazardous materials or hazardous waste. Procedures also address proper packaging of hazardous materials for transport. RCRA regulations establish specific prohibitions for mixing of incompatible waste. These prohibitions are implemented in the Hazardous Waste Management Facility Permit. The compatibility of waste is to be determined using EPA-600/2-80-076, "A Method for Determining the Compatibility of Hazardous Wastes." If a spill of hazardous waste occurs, the Contingency Plan for Hazardous Waste at PGDP requires the PSS to ensure that no other waste is introduced into the spill area until cleanup procedures are completed.

3.8 SECURITY

Most of the facilities at PGDP are within the Controlled Access Area (CAA). The CAA is bounded by an 8-ft high, chain link security fence with three strands of barbed wire along the top of the fence. The public is excluded from the CAA except for special occurrences such as tours, media events, etc. This exclusion limits the possibility of accidental or malicious incidents due to public interactions with environmentally significant materials in the CAA. Entry into the CAA is allowed only to authorized personnel through entry portals located at various locations around the security fence and inside buildings. Employees, contractors, subcontractors, and visitors are required to display identification badges.

DOE and DOE contractors are responsible for facilities with a potential to release BMP pollutants both inside and outside the CAA at PGDP. For example, the NWPGS is located at the C-612 complex just outside the CAA, on the northwest corner of the fenced area.

Security police officers perform regular inspections, both inside and outside the CAA. Security police officers have direct communications with PGDP emergency response personnel at all times.

In summary, security restrictions at PGDP reduce the possibility of release of BMP pollutants, and the regular inspections performed by security officers enhance the ability to detect and respond to incidents that may occur.

3.9 MATERIALS INVENTORY

BMP pollutant materials at PGDP are stored either as a usable product, such as fuel oil, or waste. Hazardous waste is stored in permitted areas in accordance with regulatory requirements and the RCRA permit. Hazardous and mixed wastes are stored in the following areas:

- C-733
- C-746-Q
- C-752-A
- Other temporary 90-Day Accumulation Areas
- Satellite Accumulation Areas

In accordance with the Hazardous Waste Management Facility Permit, when waste is received at a permitted storage area, the waste type, date to storage, and amount is entered into a log sheet and a computer file. When waste is removed from the permitted storage areas, this is also noted in a log sheet and computer file; therefore, the waste inventory at permitted hazardous waste storage areas is maintained and available.

DOE also submits an annual Superfund Amendment and Reauthorization Act 312 report, as required by EPA regulations. This report outlines the hazardous materials, as defined in applicable regulations, which are present under DOE purview at PGDP above certain thresholds.

Fuel storage tanks and chemical storage areas are inventoried on a regular basis

3.10 SPCC PLANS

DOE and DOE contractors are responsible for spill prevention, control, and countermeasures at PGDP. The SPCC Plan provides controls and measures designed to prevent the unauthorized discharge of oil and hazardous substances into the waterways, air, soil, and groundwater. Extensive guidelines have been established in the plan to prevent releases of hazardous substances and to contain spills that do occur in a manner that best protects personnel and the environment.

The SPCC Plan is required to be reviewed and evaluated at least every five years or when otherwise necessary due to permit revisions, changes in construction, operation, etc., at the facility. When conditions change, such as the addition of new fuel storage tanks, the changes may be included in a revised SPCC Plan or a separate SPCC may be developed to address the new facility.

This BMP Plan incorporates by reference all the spill control countermeasures and contingencies in the D&R contractor's SPCC Plan, PAD-REG-1005.

3.11 HAZARDOUS WASTE MANAGEMENT

DOE and its contractors operate hazardous waste management facilities at PGDP under Permit No. EPA ID No. KY8-890-008-982. DOE and its D&R contractor have developed a Contingency Plan for responding to hazardous waste spills, releases, leaks, and emergencies in the permitted storage areas.

All hazardous waste in permitted storage is stored under roof with secondary containment to prevent run-on or run-off if a spill were to occur.

3.12 DOCUMENTATION

This BMP shall be maintained at the DOE D&R contractor's office. A copy will be forwarded to other site contractors, as appropriate, and DOE at PGDP. This BMP Plan will be available to representatives of the Kentucky Division of Water (KDOW) upon request.

3.13 BEST MANAGEMENT PRACTICES PLAN MODIFICATION

This BMP Plan shall be amended or modified whenever there is a change in the facility or change in the operation of the facility that materially increases the potential for the ancillary activities to result in the release of BMP pollutants. Modification of the plan will be evaluated and determined by the BMP Committee.

3.14 MODIFICATION FOR INEFFECTIVENESS

The goal of this BMP Plan is to prevent the release of pollutants. If this plan proves to be ineffective in its goal, the plan shall be revised to include new or revised BMPs. Effectiveness shall be determined by periodic audits and/or surveillances to determine if BMP pollutants are being released. These audits/surveillances shall determine documentation of administrative compliance with requirements established in the plan. This BMP Plan will be revised if found to be inadequate pursuant to a state or federal site inspection or plan review. The revision will incorporate changes necessary to resolve the inadequacies identified in the inspection or review.

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4. SPECIFIC CONDITIONS

4.1 SOLID WASTE MANAGEMENT UNITS

DOE and its contractors are actively involved in cleanups of a number of SWMUs at PGDP. These cleanups are being accomplished in accordance with the Hazardous Waste Management Facility Permit and PGDP FFA, DOE/OR/07-1707. The FFA requires that DOE submit to the Kentucky Energy and Environment Cabinet (KEEC) information regarding investigation and remediation of the SWMUs. This information is contained in (1) Remedial Investigation/Feasibility Study Work Plans for investigations of SWMUs and (2) Removal Action Work Plans and Remedial Action Work Plans for cleanup/remediation of the SWMUs. These work plans are submitted to KEEC for approval prior to the investigations, removals, or remediations.

These work plans contain the scope of the project and provisions (e.g., project-specific BMPs, in which DOE outlines measures to be taken during the investigation, removal, or remediation to prevent further migration of the SWMU pollutants and subsequent environmental degradation). The submittal of these work plans shall fulfill DOE's obligation to "address as separate sections under the BMP Plan the scope of the activity and the steps taken to prevent further migration of the pollutants to the local watersheds and subsequent degradation," as required under Section B of the BMP Plan requirements of the current KPDES Permit.

Section 4 of the PGDP FFA, "RCRA, CERCLA, and KPDES Coordination," commits the regulatory agencies involved in the SWMU investigation/cleanup to ensure that information such as the work plans pertaining to the SWMU investigation and remediation is shared among the regulatory agencies.

4.2 PERIODICALLY DISCHARGED WASTEWATERS NOT SPECIFICALLY COVERED BY EFFLUENT CONDITIONS

DOE and DOE contractors perform certain activities, such as testing fire water systems, calibration of meters, and hydrostatic testing of containers, that produce wastewater. In addition, DOE and its contractors generate wastewater when pipes break or spills of collected wastewaters are picked up for analysis and discharge. Any suspect contaminated wastewater produced as a result of remediation or investigation activities is sampled for appropriate contaminants, treated, and analyzed again if necessary to ensure pollutant concentrations are within the KPDES permit limitations. If necessary suspended solids are settled in the C-613 lagoon before the wastewater is introduced into the DOE KPDES Outfall 001.

Other sources of waste water that may be discharged into the C-613 Lagoon following characterization (and treatment, if necessary) include, but are not limited to, the following:

- Monitoring well purge water from routine sampling
- Groundwater sampling equipment decontamination water
- Drilling rig decontamination water
- Well development water from well rehabilitation activities
- Water decanted from stored waste
- Rainwater that collects in secondary containments
- Treated wastewater in which suspended solids remain to be treated

4.3 ACCEPTANCE OF TENNESSEE VALLEY AUTHORITY SHAWNEE FOSSIL PLANT WASTEWATERS

Previous operations at PGDP have led to contamination of groundwater with TCE and Tc-99. In May 2006, DOE entered into an agreement with Tennessee Valley Authority (TVA) Shawnee Fossil Plant concerning the management and disposal of Tc-99 contaminated groundwater from TVA. Under this agreement, TVA agreed to analyze groundwater and drilling/purge waters for Tc-99 and TCE and to provide data to DOE. DOE agreed to accept groundwater and drilling/purge waters containing detectable levels of Tc-99 for treatment/disposal. TVA agreed to manage any groundwater and drilling/purge waters not containing Tc-99 even if TCE were present.

Following review of the data, wastewaters that meet these acceptance criteria are received by the PGDP and managed based upon the data. Due to the low concentrations of TCE and Tc-99, these wastewaters generally are received at the C-612 (NWPGS) for treatment and discharge under KPDES Permit KY0004049. The PGDP maintains records of volumes and quality of wastewaters transferred, treatment of those wastewaters, and final disposition.

4.4 USE OF HERBICIDES AND PESTICIDES AT PGDP

PGDP only uses herbicides approved by the compliance organization. New herbicides under consideration for application will be evaluated for toxicity prior to approval and use. Herbicides will not be administered within 15 ft of the high water mark of plant ditches and outfalls. Manufacturer recommendations are followed exactly for all applications of herbicides and pesticides.

APPENDIX A

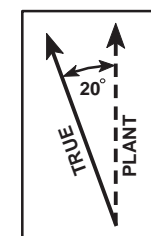
PGDP STORM WATER FLOW

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Kentucky Pollutant Discharge Elimination System (KPDES)

KY0004049

- 001 001, 002, 006, 008
- 009, 010, 011, 012
- 013, 015, 016, 017
- 019, 020*



* Note: KPDES 019 & 020 are in the same location.



U.S. DEPARTMENT OF ENERGY
DOE PORTSMOUTH/PADUCAH PROJECT OFFICE
PADUCAH GASEOUS DIFFUSION PLANT

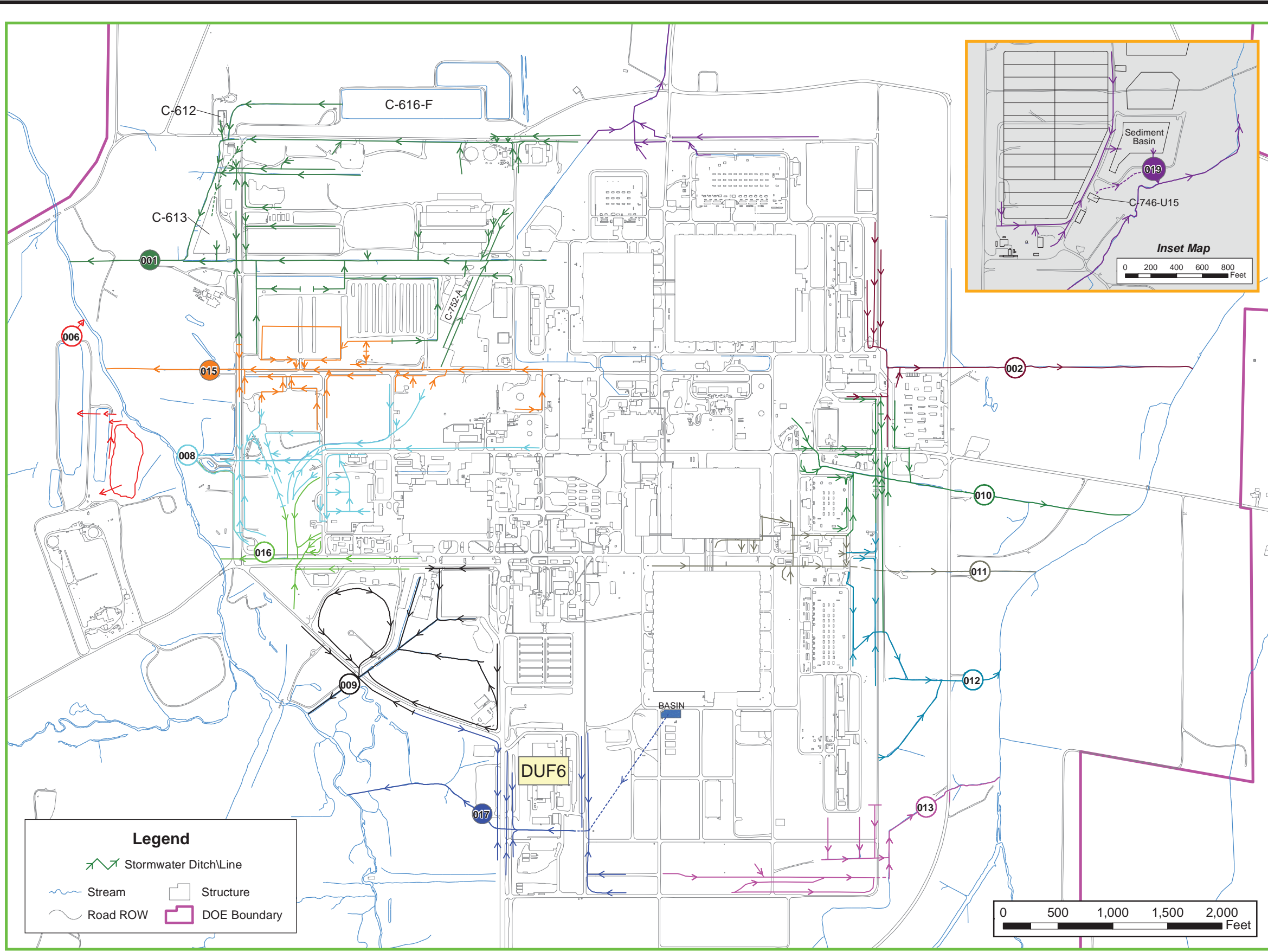


Figure A.1. PGDP Storm Water Flow

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This figure shows storm water flow. Some of the depicted structures shown may have been demolished as part of the mission of the site, but would not have impacted the surface water storm flow path.

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APPENDIX B

EXAMPLES OF STORM WATER CONTROLS USED AT PGDP

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B. EXAMPLES OF STORM WATER CONTROLS USED AT PGDP

This Appendix provides examples of best management controls that are incorporated on a case-by case basis into work control documents/instructions for projects with a potential to disturb contaminated soils. This information is utilized as guidance in establishing such controls for individual projects during initial work planning. Controls that deviate from these guidelines may be established, as appropriate, for a project.

B.1 EROSION AND SEDIMENT CONTROL MEASURES

Unless otherwise indicated, all vegetative and structural erosion and sediment control practices will be constructed and maintained according to the project drawings and specifications. The following specific measures are identified for each project during initial work control planning sessions. The project scope is defined and the necessary storm water controls are evaluated and prescribed by the deactivation and remediation contractor's regulatory compliance organization. Once work on each project begins, the effectiveness of the prescribed controls is evaluated and the controls are modified as necessary to control the release of BMP pollutants.

B.2 STRUCTURAL PRACTICES

B.2.1 Silt Fences

Silt fences are installed to intercept and detain sediment from the disturbed areas during demolition and construction operations in order to prevent sediment from leaving the site or entering storm drains. Silt fences are installed at the toe of all exterior slopes, before clearing and grubbing. Silt fences are placed around soil stockpiles until sufficient vegetation can be established to prevent erosion. The drainage area served by a silt fence shall not exceed 1/4 acre per 100 ft of silt fence. The maximum length of slope behind the silt fence shall not exceed 100 ft for slopes of 50% (2:1) or less.

B.2.2 Straw Bale Barriers

Straw bale barriers (staked) are installed in temporary or permanent grass lined swales or ditch lines where the maximum contributing drainage area is no greater than 2 acres. The bales are installed at intervals such that the top of one barrier is at the approximate same elevation as the bottom of the adjacent upstream barrier. Straw bale barriers trap suspended sediment in ditches while decreasing ditch velocities. The staked bales are replaced and sediments removed when the bales are no longer functional.

B.2.3 Riprap Check Dams

Riprap check dams are installed in grass lined swales or ditches where the maximum contributing drainage area is no greater than 10 acres. Riprap check dams are spaced so that the top of one check dam will be at the same approximate elevation as the bottom of the adjacent up stream check dam. Trapped sediments are removed from behind riprap check dams when the sediment level reaches one-half the height of the structure. Riprap check dams are removed when the project area is stabilized and the drainage channel has an established armor of grass.

B.2.4 Sediment Basins

Sediment Basins are used for projects that will expose more than 10 acres of soils. Sediment basins are used in addition to the control mechanisms listed above. The sediment basins may be used for holdup capacity for chemical treatment as necessary (e.g., flocculation or pH adjustment).

B.2.5 Riprap Ditches

All ditches with design velocity exceeding 3 ft per second are lined with riprap in order to control velocities and thus erosion.

B.2.6 Grass Lined Ditches

All ditches with design velocity of 3 ft per second or less will be grassed as soon as feasible.

B.2.7 Stabilized Roadways

Site and Access roadways are stabilized with aggregate and filter fabric or paved with asphaltic concrete to prevent erosion from roadbeds.

B.2.8 Discharge Control

When discharges are controllable such as when fire water is used to practice firefighting or when contained water is released, the flow is controlled and the discharge location is controlled to prevent erosion or the spread of contamination to surface waters.

B.3 VEGETATIVE PRACTICES

To the extent feasible, appropriate cover is applied within 14 days on areas that are scheduled to remain as bare soil for more than 21 calendar days.

B.3.1 Topsoil Stockpiling

Any required topsoil stockpiling is protected by temporary seeding and mulching when the stockpile will not be redisturbed for 21 days or more.

B.3.2 Temporary Seeding

Topsoil stockpiles and any areas to be rough-graded during the initial phase of construction will be seeded with temporary vegetation. The appropriate seed mixture is specified in the construction documents.

B.3.3 Permanent Seeding

As soon as possible following finished grading, permanent seeding is applied. All surfaces disturbed by construction and not replaced with aggregate, pavement, or other structures are sown with an appropriate grass to ensure a good growth of grass in a timely manner.

B.4 MANAGEMENT STRATEGIES

Construction traffic is limited to access roads, demolition areas, areas to be graded, and areas designated by the Facilities Manager. Off-site vehicle tracking of sediments and the generation of dust is minimized. Clearing and earthwork is held to the minimum necessary for grading and equipment operation.

Construction is sequenced so that grading operations can begin and end as soon as possible after demolition operations.

Silt fences and other erosion and sediment control devices are installed as a first step in demolition and grading and maintained throughout the construction period. New vegetative areas are seeded and mulched immediately following completion of grading. Temporary measures may be removed at the beginning of the work day, but must be replaced at the end of the work day.

Areas which are not to be disturbed are clearly marked by flags, signs, etc.

All control measures are checked and repaired as necessary in accordance with the maintenance and inspection requirements described in Section B.8.

Accumulated silt deposits are removed as necessary to maintain the function and condition of all erosion control structures. Areas eroded during construction are promptly repaired as necessary.

Areas that are scheduled to remain unfinished for 21 days or more are vegetated.

When practicable, topsoil stockpiles are covered with plastic, if temporary seeding is not required.

All pumping of accumulated water as may be required from graded areas is in accordance with the applicable, "Paducah Site Procedure for Discharge of Accumulated Water for Paducah Gaseous Diffusion Plant Site."

B.5 STORM WATER DISCHARGE QUALITY

Storm water releases to permitted outfalls from the project site must meet the effluent limitations and monitoring requirements of the KPDES permits.

Muddy water to be pumped from excavation and work areas is treated by filtration or sedimentation prior to its discharge into surface waters.

There shall be no distinctly visible floating scum, oil, or other matter contained in the storm water discharge.

The storm water discharge must not cause a distinctly visible color contrast in the receiving stream.

The storm water discharge must not contain materials in concentrations sufficient to be hazardous or detrimental to humans, livestock, wildlife, plant life, or fish and aquatic life in the receiving stream.

If the "Discharge Quality," as discussed above, is not obtained, the storm water controls are modified to meet the standard.

B.6 PERMANENT STABILIZATION

All areas disturbed by demolition and construction are stabilized with permanent seeding following finished grading. Seeding is done in accordance with the requirements of the project construction specifications.

B.7 STORM WATER MANAGEMENT

Sediment basins, diversion ditches, silt fencing, and straw bales are installed as shown on the construction drawings and noted in storm water control plans utilized during construction operations to control erosion and the transport of sediment.

Rainfall run-on is directed away from sites where bare soils exist. Diversion ditches direct on-site rainfall runoff into the sediment basins and drainage ditches. Ditch slopes exceeding 3% will be lined with riprap to control sediment scour. Ditch slopes equal to 3% and less are seeded with grass.

To control migration of silt from fill areas, silt fencing is installed at the toe of exterior slopes. Areas disturbed by construction and not surfaced with aggregate, pavement, or other structures are sown with grass as soon as possible to establish vegetation for erosion control.

B.8 MAINTENANCE AND INSPECTION

In general, erosion and sediment control measures are checked and repaired, as necessary, weekly during dry periods and within 24 hours after any rainfall of 0.5 inches or more during a 24-hour period using the checklist included in Attachment B.1. During prolonged rainfall, all control devices are checked daily and repaired as necessary. The project manager maintains records of checks and repairs. Projects with a total disturbance area less than 5 acres would be exempt from checks other than during normal plant working hours. The following items will be checked in particular.

- The straw bale barriers are checked monthly for undermining or deterioration of the bales.
- All seeded areas are inspected regularly for bare spots, washouts, and to see that a good stand of healthy growth is maintained. Areas shall be fertilized and reseeded as needed.
- Built up sediments are removed from the silt fence when it reaches one-half the height of the fence.
- Silt fences are inspected for depth of sediment, and tears to ensure that the fabric is securely attached to the posts, and to ensure that the posts are firmly in the ground.
- The sediment basins are inspected regularly and after every major storm event. Necessary repairs are made to ensure the working order of the basin; for example, any installed baffles are checked for placement and checked to make sure they are working properly. The embankment is checked regularly to make sure it is structurally sound and that wildlife has not impacted the embankment.
- If during an inspection it is noted that sediment control structure may have failed resulting in a potential migration of contaminants, contact regulatory compliance and complete checklist.

ATTACHMENT B1

BMP EROSION AND SEDIMENT CONTROL CHECKLIST

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BMP EROSION AND SEDIMENT CONTROL CHECKLIST

Name of Project:	Date:
Facility Owner/Manager:	Location of BMP Control: (Facility/SWMU#)
Outfall Receiving Discharge:	Size of project (Acres):
Type of BMP Control: <input type="checkbox"/> silt fence <input type="checkbox"/> straw bale <input type="checkbox"/> riprap check dams (May check more than 1) <input type="checkbox"/> sediment basins <input type="checkbox"/> riprap ditches <input type="checkbox"/> grass lined ditches	
Additional Controls (List):	
Name of Inspector(s):	Event Triggering Inspection: (e.g., routine, > 25 year rain event, BMP failure, etc.).

Inspector(s): Check “N/A” to indicate that the requirement does not apply to the facility being inspected. Check “SAT” to indicate compliance with the requirement. Check “UNSAT” to indicate that unsatisfactory condition(s) exists and describe the condition(s) under “Deficient Condition.”

	N/A	SAT	UNSAT ¹	Deficient Condition
No signs of serious erosion exist that could threaten the integrity of the site				
No signs of unusual muddy/murky discharge from facility/SWMU (If UNSAT conditions, contact sampling lead for immediate sampling of discharge)				
No evidence exists of extensive removal of vegetation (e.g., bare spots, washout areas)				
No evidence exists of sediment removal				
No evidence exists of unnatural discoloration of vegetation				
No evidence that riprap should be replaced				
No signs of serious erosion of concrete				
No evidence of dirt erosion from under concrete				
No signs of sediments against silt fence or riprap check dam (if greater than ½ of the height of fence or structure, sediment needs to be removed)				
No signs of deterioration of straw bales				
No evidence of silt fences tears or damages				
No evidence sediment basin baffles are not working				
No evidence that sediment basin embankment structure is impacted				

Mitigation Measure:
Notice of Potential Release: (List Personnel Notified)

Regulatory Compliance Complete Following Notification of Potential Release:	
Potential contaminants released:	
Release potentially off-site: <input type="checkbox"/> Yes <input type="checkbox"/> No	Reportable incident? <input type="checkbox"/> Yes <input type="checkbox"/> No (KPDES, HWFP, NRC, etc.)
If Reportable, when reported and to whom:	
Compliance Personnel: (Print and Sign)	Date:

¹ If any element reviewed is deemed UNSAT, contact Regulatory Compliance for further evaluation.

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