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Pollution Prevention/Waste Minimization Plan for the Deactivation and Remediation Project, Paducah Gaseous Diffusion Plant, Paducah, Kentucky

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David Hayden — 5-15-18

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Pollution Prevention/Waste Minimization Plan for the Deactivation and Remediation Project, Paducah Gaseous Diffusion Plant, Paducah, Kentucky

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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

APPROVALS

Pollution Prevention/Waste Minimization Plan for the Deactivation and Remediation Project, Paducah Gaseous Diffusion Plant, Paducah, Kentucky

CP2-ES-0005/FR1A

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ACRONYMS

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	*Code of Federal Regulations*
D&R	deactivation and remediation
DOE	U.S. Department of Energy
EMS	Environmental Management System
EPA	U.S. Environmental Protection Agency
ISMS	Integrated Safety Management System
PGDP	Paducah Gaseous Diffusion Plant
P2/WM	Pollution Prevention/Waste Minimization

EXECUTIVE SUMMARY

The contractor responsible for deactivation and remediation is required by conditions in Kentucky Hazardous Waste Management Facility Permit, KY8-890-008-982, to have a Pollution Prevention/Waste Minimization (P2/WM) Awareness Program. This plan satisfies that requirement by establishing policy, goals, roles and responsibilities, and internal training and awareness programs related to P2/WM. This program also discusses the implementation of P2/WM through the Integrated Safety Management System/Environmental Management System.

1. INTRODUCTION

1.1 PURPOSE

The purpose of this plan is to establish a Pollution Prevention/Waste Minimization (P2/WM) Program that includes policy, goals, and roles and responsibilities for contractor tasked with deactivation and remediation (D&R) at the Paducah Gaseous Diffusion Plant (PGDP) site. The P2/WM Program is an integral part of the sustainability practices in the current Sustainability Plan. The P2/WM Program is implemented through the Integrated Safety Management System (ISMS)/Environmental Management System (EMS) Program.

1.2 SCOPE

This program applies to all D&R teaming partners and subcontractors. This document also addresses U.S. Department of Energy (DOE) Orders and requirements for sustainability and general waste minimization practices. There may be additional requirements specified by state permits. The ISMS/EMS Program also includes other pollution prevention activities. Examples of these activities include minimization of water pollution by implementation of Best Management Practices, and the Spill Prevention Control and Countermeasure Plan. These activities are included in the ISMS/EMS Program and permits and are not discussed in detail within this plan.

1.3 PROGRAM PLAN STRUCTURE AND UPDATES

This program was prepared based upon requirements and guidance contained in the following documents:

- Agreed Order DWM-30039-042 between DOE and the Kentucky Natural Resources and Environmental Protection Cabinet, September 10, 1997;
- DOE Order 436.1, *Departmental Sustainability*; and
- Hazardous Waste Management Facility Permit, KY8-890-008-982.

This P2/WM Program Plan will be reviewed and updated, as appropriate, considering changing organizational structure and projects.

1.4 SITE DESCRIPTION AND MISSION

PGDP is located in McCracken County, Kentucky. The primary activity at PGDP was operation of a uranium enrichment diffusion cascade. Construction of PGDP began in 1951, and shutdown occurred in 2013. In 1988, DOE began environmental remediation activities concurrent with PGDP operations. In 2011, DOE began operation of a facility to convert the stored depleted uranium hexafluoride (DUF_6) to a more stable uranium oxide, primarily U_3O_8. Deactivation of PGDP began in 2014 when the manufacturing operator returned the production and related facilities to DOE. The major operational responsibilities of the D&R contractor are environmental remediation, waste management, deactivation, decontamination and decommissioning, and surveillance and maintenance of facilities.

2. POLICY

The D&R contractor supports DOE's P2/WM Program mission "to reduce and, where possible, eliminate the generation and release of DOE wastes and pollutants by implementing cost-effective pollution prevention techniques, practices, and policies." This program also supports the targets and objectives established in each contractor's ISMS/EMS Program.

2.1 POLICY STATEMENT

The Portsmouth/Paducah Project Office and the D&R contractor are committed to pollution prevention and waste minimization as a part of sustainable operations. As required by the Hazardous Waste Management Facility Permit, D&R contractor management has adopted a policy statement as an indication of management support for the concepts of P2/WM.

2.2 ANNUAL PROGRAM CERTIFICATION

The D&R contractor is fully committed to minimizing the generation and toxicity of waste by giving preference to source reduction, material substitution, and environmentally sound recycling over treatment and disposal or release of such waste.

An annual certification statement will be signed by the D&R contractor and made a part of the Resource Conservation and Recovery Act facility operating record in accordance with Part V of the Hazardous Waste Management Facility Permit.

- V.A. "General Restrictions: Pursuant to the specified regulation(s) in this condition, the Permittee must certify, no less often than annually, that:

  V.A.1 "The Permittee has a program in place to reduce the volume and toxicity of hazardous waste generated to the degree determined by the Permittee to be economically practicable;

  V.A.2 "The proposed method of treatment, storage, or disposal is the most practicable method available to the Permittee which minimizes the present and future threat to human health and the environment."

- V.B. "Recordkeeping Requirements: The Permittee shall maintain copies of this certification in the facility operating record as required by the regulation(s) specified in this condition."

3. ROLES AND RESPONSIBILITIES

Each project manager is responsible for pollution prevention activities for each project; however; the success of the program is dependent on the actions of each employee. Roles and responsibilities of site personnel are described below and discussed further in Sections 4 and 5.

3.1 PROJECT MANAGER

Each project manager is responsible for supporting the commitment to a successful P2/WM Program. The project manager approves related plans and policies and is responsible for ensuring that all P2/WM program submittal requirements to DOE and/or regulatory agencies, including the certification discussed in Section 2.2, are fulfilled.

3.2 PROCUREMENT MANAGER

The procurement manager is responsible for compliance with DOE sustainable acquisition purchasing requirements in accordance with contractual requirements. The procurement manager is also responsible for including all necessary requirements in subcontracts in order to ensure successful implementation of the site P2/WM Program.

3.3 REGULATORY COMPLIANCE MANAGER

The regulatory compliance manager is responsible for ensuring compliance with appropriate sustainability and P2/WM requirements such as the Hazardous Waste Management Facility Permit and sustainability plan goals. The manager also will ensure that activities and their associated waste streams are reviewed for waste minimization and pollution prevention opportunities.

The regulatory compliance manager is responsible for communicating with other contractors as needed to support achievement of sustainability and P2/WM goals and to ensure support for various reporting requirements.

3.4 EMS MANAGER

The regulatory compliance manager serves as the EMS manager. The regulatory compliance manager or subject matter expert coordinates with the ISMS lead to ensure that sustainability and waste minimization are fully incorporated into the ISMS.

3.5 WASTE GENERATOR MANAGER

The waste generator manager is responsible for ensuring that wastes are properly segregated and managed prior to disposal and for ensuring the uniform hazardous waste manifests, as appropriate, include the certification that the waste minimization statement in 40 *CFR* § 262.27(a) or (b) is true.

3.6 WASTE GENERATORS AND WASTE HANDLERS

All employees generate waste and are, therefore, waste generators. Waste generators are responsible for properly managing their waste to minimize releases and the inadvertent mixing of incompatible waste streams. Waste generators and waste handlers also are required to support and promote pollution prevention.

4. SITE P2/WM PROGRAM STRATEGY AND GOALS

4.1 STRATEGY

The D&R contractor is committed to the goals of sustainable performance, preventing pollution, and minimizing waste generation, and is implementing activities to achieve these goals. Specific strategies to accomplish these goals will be developed and revised as needed to accommodate new and ongoing projects and programs and organizational changes.

Activities at PGDP result in the generation of cleanup, stabilization, deactivation, and decommissioning wastes, as opposed to "routine" process waste. The principles of waste minimization that have been formulated by U.S. Environmental Protection Agency (EPA), included in permits, and generally adopted by industry are geared toward large-scale industrial processes with little change in material feedstock, end product, and routine waste generation. The EPA methodology revolves around a thorough analysis of processes and concentrates on material substitution and process changes. EPA's methodology is not well suited to addressing highly variable waste streams such as those generated by cleanup, stabilization, deactivation, and decommissioning activities. For instance, each environmental remediation, deactivation, or maintenance activity generates a unique set of waste streams, so it often becomes necessary to develop innovative methods for measuring and achieving P2/WM. It is preferable to measure deactivation or environmental remediation P2/WM achievements by gains in efficiency, economy, and reduction of secondary waste.

In instances where EPA's methodology can be applied to waste generators at PGDP, it will be applied to those wastes (e.g., office wastes) and waste generators.

4.2 PROGRAM OBJECTIVES

The primary objectives of the PGDP P2/WM Program are (1) to eliminate or reduce the volume and toxicity of all waste generated at the site through appropriate planning and implementation; and (2) to comply with federal and state regulations and DOE requirements for pollution prevention and waste minimization. Secondary objectives include the following:

- Conducting pollution prevention and waste minimization assessments, as needed for specific projects or programs;
- Determining during the planning process where the application of P2/WM principles will have the greatest effect, including the identification of potential options and techniques and their costs;
- Implementing planned P2/WM activities and the documenting of appropriate metrics (e.g., waste minimized) and any savings achieved;
- Planning to ensure that remedial actions take into account the costs and risks associated with the management of waste;
- Developing management tools that give useful measures of program success;
- Using existing resources to the maximum extent practicable;

- Researching new and available technologies for minimizing waste; and
- Tracking and reporting waste generation and waste minimization data.

Some potential activities that will minimize waste generation include the following:

- Meeting Site Sustainability Goals, such as diversion of nonhazardous waste destined for landfill disposal or uncontaminated construction and demolition waste;
- Recycling used oil;
- Incorporating green and sustainable remediation technologies and approaches;
- Optimizing long-term remedial actions;
- Managing waste water including treatment to remove hazardous constituents;
- Segregating, to the extent practicable as appropriate, waste types;
- Reusing and recycling amenable office waste;
- Reusing equipment and waste containers;
- Managing chemical inventories to facilitate reuse;
- Achieving operating economy and efficiency by applying the principles of waste minimization;
- Conducting activities in a manner that conserves energy and resources such as green remediation;
- Promoting the use of nonhazardous materials to minimize the risks to human health and the environment;
- Reducing the risk of environmental impacts from the site, such as removal of source material;
- Replacing old equipment with new more efficient equipment;
- Including the cost of waste handling and disposal when evaluating the project costs; (Contractors subject to the Hazardous Waste Management Facility Permit also have permit-specific requirements.)
- Reducing waste disposal costs;
- Exchanging waste minimization information through technology transfer, outreach, and educational networks; and
- Enhancing employee awareness of pollution prevention goals, objectives, methods, and responsibilities.

4.3 ISMS/EMS

Each organization considers P2/WM when environmental aspects are identified as part of ISMS/EMS. Environmental aspects are elements of an organization's activities, products, or services that can interact with the environment. The environmental aspect of an activity is that part that creates a possibility for an environmental impact. Environmental impacts are changes to the environment, whether adverse or beneficial, wholly or partially resulting from site activities, products, or services. Once the significant environmental aspects of activities are identified, the objectives and targets can be established.

4.4 GOALS, OBJECTIVES, AND TARGETS

The D&R contractor has established objectives and targets based on the environmental policy, legal and other requirements, consideration of the significant environmental aspects, sustainability plan goals, DOE's goals for environmental cleanup, and input from its stakeholders. P2/WM is included in the development of EMS objectives and targets.

Attainment and reporting of P2/WM and sustainability plan goals may require communication with other contractors. Such communication will be initiated among the affected P2/WM and sustainability plan managers to establish program goals and direction and may be delegated to their respective staffs, as appropriate, for implementation.

The ISMS/EMS, which includes P2/WM, is part of the work planning process for all activities. ISMS/EMS is reviewed and updated periodically. These reviews and updates will include P2/WM values.

5. POLLUTION PREVENTION ACTIVITIES AND RESOURCE REQUIREMENTS

5.1 EMPLOYEE INVOLVEMENT AND PARTICIPATION

All contractor personnel are affected by and, therefore, need to be involved in the P2/WM Program. Successful program participation and employee involvement is enhanced by the following:

- Providing up-to-date P2/WM information and training to site personnel;
- Publicizing pollution prevention progress in reports, bulletins, and other publications;
- Involving employees in project-specific pollution prevention activities including development of work controls;
- Involving employees through ISMS/EMS; and
- Partnering with employee-supported charitable organizations.

5.2 POLLUTION PREVENTION AWARENESS

Pollution prevention awareness is required by DOE and is a key element to program success. A long-term goal is to incorporate P2/WM into all levels of the decision making process through ISMS/EMS. The

ISMS/EMS process includes work controls, incorporating pollution prevention, waste minimization, environmental sustainability, and proper waste management actions.

5.3 TRAINING

P2/WM training is provided by various methods including distribution of bulletins and messages. All new employees receive P2/WM awareness level training in their initial training and receive a refresher as part of the General Employee Training. Copies of training materials and each employee's training record are maintained by the Training Department.

5.4 IMPLEMENTATION

P2/WM is implemented through ISMS/EMS incorporation into the work control process. As noted in Section 3.4, it is the responsibility of the ISMS/EMS Manager to ensure that the requirements of this P2/WM Plan are incorporated fully into ISMS/EMS. The compliance organization provides oversight of work plans and work instruction to verify P2/WM work practices are used. Section 3 also describes the role and responsibilities of other managers to ensure ongoing P2/WM efforts including capital planning, operations, and maintenance in 401 *KAR* 34:050 Section 4(2)(i).

5.5 PROGRAM EVALUATION—QUALITY ASSURANCE

P2/WM will comply with the Quality Assurance Plan required by DOE Order 414.1D, Chg 1. In accordance with the Hazardous Waste Management Facility Permit, waste minimization assessments will be conducted as required.

5.6 REPORTING REQUIREMENTS

The D&R contractor has tracking and reporting systems in place that are used to document P2/WM decisions for each project; the types, amounts, and hazardous constituents of each waste stream; and source and date of generation of each waste stream. This information can be compiled and used to prepare or provide input to various reports to comply with federal and state regulations and DOE requirements related to P2/WM. Some of these reports include the following:

- Support DOE preparation of an annual P2/WM accomplishments report, if requested;
- Provide P2/WM information for the DOE Sustainability Dashboard; and
- Emergency Planning and Community Right-to-Know Act Report, Section 313.

5.7 RECYCLING AND REUSE PROGRAMS

Recycling and reuse are crucial to the D&R contractor P2/WM mission. There are many waste streams that have the potential for beneficial reuse by being sent to off-site vendors for recycling or by reusing on-site.

5.7.1 Recycling and Reuse Opportunities

Materials and equipment that can be recycled vary from one project to another. Examples of materials that can be recycled include toner cartridges, aluminum cans, office paper, batteries, pallets, and

electronics. The Project Manager will continue to determine whether a waste stream is a good candidate for recycling based on the following criteria: (1) cost/benefit of recycling versus disposal, (2) feasibility of the material for radiological release, (3) availability of vendors to recycle the material, (4) recycling technology, (5) liability, (6) resource allocation, and (7) sustainability goals.

5.7.2 Contaminated Material Including Scrap Metal

DOE will use the Authorized Limits Process to determine what material can be released for public use including recycling or reuse. Material that does not meet the authorized limits public release criteria will not be recycled.

DOE has issued policy guidance for recycling scrap metal from contamination areas. For the past several years this policy has been called the scrap metal moratorium. The policy is that metal items cannot be recycled as scrap if they have ever been located in a radiation, high radiation, very high radiation, contamination, high contamination, or airborne radioactivity area. DOE may revise the scrap metal policy in the future. The D&R contractor will comply with the current and appropriate DOE policy at the time scrap metal is generated.

Scrap metal from other areas not subject to the moratorium can be recycled, if it is not contaminated. The recyclability of scrap metal is reviewed on a case by case basis.

Recycling of material associated with Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) activities may require EPA approval. Recycling of these materials should be reviewed on a case-by-case basis as part of the CERCLA planning process.

5.7.3 Universal Waste

Recycled materials, such as batteries, fluorescent bulbs, mercury switches, and unused portions of pesticides and herbicides, are handled as universal waste (as defined by 401 *KAR* 43:010 and 40 *CFR* § 273). Universal waste is not subject to hazardous waste regulations. This encourages recycling the materials rather than disposal. DOE and its contractors segregate these wastes for recycling whenever practical based on the criteria in Section 5.7.1.

5.8 POLLUTION PREVENTION COST ALLOCATION

The Hazardous Waste Management Facility Permit requires the costs of waste management be included in the liability, transportation, recordkeeping, personnel, pollution control, treatment, disposal, compliance, and oversight costs to the extent feasible. Each department manager is accountable for the waste they generate through the budgeting process. Each department manager is responsible for evaluating cost savings considering waste minimization and recycling options available for the types of waste generated.