On-Site Waste Disposal Facility
Operations and Maintenance Plan
Final Design
Portsmouth Gaseous Diffusion Plant
Decontamination & Decommissioning Project
Piketon, OH

PAUL LARSEN (Affiliate)

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Director, OSWDF

Date

ON-SITE WASTE DISPOSAL FACILITY (OSWDF) OPERATIONS AND MAINTENANCE PLAN

FINAL DESIGN

**Portsmouth Gaseous Diffusion Plant,
Decontamination & Decommissioning Project
Piketon, Ohio**

**U.S. Department of Energy
DOE/PPPO/03-0701&D5**

April 2023

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FINAL DESIGN

Portsmouth Gaseous Diffusion Plant, Decontamination & Decommissioning Project Piketon, Ohio

U.S. Department of Energy
DOE/PPPO/03-0701&D5

April 2023

Prepared for
U.S. Department of Energy

Prepared by
Fluor-BWXT Portsmouth LLC, Under Contract DE-AC30-10CC40017
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ACRONYMS

ACM	asbestos-containing material
ALARA	as low as reasonably achievable
AOC	area of contamination
ARAR	applicable or relevant and appropriate requirement
ASCE/SEI	American Society of Civil Engineers/Structural Engineering Institute
CAMU	Corrective Action Management Unit
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Action of 1980, as amended
CFR	*Code of Federal Regulations*
CQA	Construction Quality Assurance
CQC	Construction Quality Control
D&D	decontamination and decommissioning
DFF&O	*The April 13, 2010 Director's Final Findings and Orders for Removal Action and Remedial Investigation and Feasibility Study and Remedial Design and Remedial Action, including the July 16, 2012 Modification thereto*
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
dpm	disintegrations per minute
ECR	engineering change request
EPA	U.S. Environmental Protection Agency
EMWMF	Environmental Management Waste Management Facility
FBP	Fluor-BWXT Portsmouth LLC
FMCSR	Federal Motor Carrier Safety Regulations
GPS	global positioning system
HAP	hazardous air pollutant
HAZWOPER	Hazardous Waste Operations and Emergency Response
ILTS	Interim Leachate Treatment System
IMPP	Impacted Material Placement Plan
IMTA	Impacted Material Transfer Area
ISMS	Integrated Safety Management System
ISWMS	Impacted Surface Water Management System
LCS	Leachate Collection System
LDS	Leak Detection System
LISWSP	Leachate and Impacted Surface Water Systems Plan
LLW	low-level (radioactive) waste
MAGLC	maximum acceptable ground level concentration
MLTS	Modular Leachate Treatment System
NCS	Nuclear Criticality Safety
O&M	operation and maintenance
OAC	*Ohio Administrative Code*
Ohio EPA	Ohio Environmental Protection Agency
OSHA	Occupational Safety and Health Administration
OSWDF	On-site Waste Disposal Facility
PCB	polychlorinated biphenyl
PGE	process gas equipment
PM-10	particulate matter less than 10 microns in diameter
PORTS	Portsmouth Gaseous Diffusion Plant

PPE	personal protective equipment
PSS	Plant Shift Superintendent
PSVP	Performance Standards Verification Plan
QA	quality assurance
QC	quality control
RCRA	Resource Conservation and Recovery Act of 1976, as amended
RD/RA	remedial design/remedial action
RFID	radio-frequency identification
RI/FS	Remedial Investigation/Feasibility Study
RMDC	Records Management Document Control
ROD	Record of Decision
S&M	surveillance and maintenance
SADQ	Sample Analysis Data Quality Assurance Project Plan
TBC	to-be-considered (guidance)
TCE	trichloroethene
TSCA	Toxic Substances Control Act of 1976
VOC	volatile organic compound
WAC	waste acceptance criteria
WAO	Waste Acceptance Organization

1. INTRODUCTION

The Ohio Environmental Protection Agency (Ohio EPA) and the U.S. Department of Energy (DOE) entered *The April 13, 2010 Director's Final Findings and Orders for Removal Action and Remedial Investigation and Feasibility Study and Remedial Design and Remedial Action, including the July 16, 2012 Modification thereto* (DFF&O) (Ohio EPA 2012). This administrative order establishes the regulatory framework for conducting decontamination and decommissioning (D&D) activities at the Portsmouth Gaseous Diffusion Plant (PORTS) under the Comprehensive Environmental Response, Compensation, and Liability Action of 1980, as amended (CERCLA). The *Record of Decision for the Site-wide Waste Disposition Evaluation Project at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (Waste Disposition Record of Decision [ROD]) (DOE 2015a) selected Alternative 2, on-site disposal with an off-site component, as the remedy for disposition of waste generated under the *Record of Decision for Process Buildings and Complex Facilities Decontamination and Decommissioning Evaluation Project at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (Process Buildings D&D ROD) (DOE 2015b). The *Comprehensive On-Site Waste Disposal Facility Remedial Design/Remedial Action Work Plan for the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (Comprehensive On-site Waste Disposal Facility [OSWDF] Remedial Design/Remedial Action [RD/RA] Work Plan) (DOE 2018a) presents the plan for developing the remedial design and remedial action for the on-site waste disposal component of the remedy, including information regarding the design, construction, operation and maintenance (O&M), closure, and reporting activities. The Comprehensive OSWDF RD/RA Work Plan states that two remedial design packages (i.e., Interim Leachate Treatment System [ILTS] Remedial Design Package and OSWDF Remedial Design Package) will be prepared in accordance with the DFF&O to implement the on-site disposal remedy at PORTS, as illustrated on Figure 1.

This *On-Site Waste Disposal Facility Operations and Maintenance Plan* (hereinafter referred to as the OSWDF O&M Plan) is a component of the OSWDF Design Package, as identified in Figure 1. The OSWDF Design Package includes components required to implement the waste transport and waste placement aspects of the remedial action. The OSWDF Design Package also includes the components required to collect and transfer leachate to a treatment facility prior to discharge. Construction and operation of these components will occur in phases.

This OSWDF O&M Plan coincides with the final (100%) maturity of the OSWDF Design Package, as required by the DFF&O RD/RA Statement of Work and the Comprehensive OSWDF RD/RA Work Plan. This OSWDF O&M Plan is written in the present tense to avoid changes to verb tenses when the document is revised as part of future updates.

1.1 PURPOSE AND SCOPE

The purpose of this OSWDF O&M Plan is to describe the operations, maintenance, and monitoring activities associated with on-site disposal of waste in the OSWDF. This plan is only for on-site waste disposal operations; it does not cover activities associated with off-site disposal of waste. Specific objectives of this OSWDF O&M Plan are to:

- Describe the operations, maintenance, and routine monitoring activities associated with the waste disposal operations
- Identify potential operating problems and alternative operating protocols

- Identify requirements for record keeping and reporting associated with operations, maintenance, and monitoring activities

- Define the intended approach for compliance with the applicable or relevant and appropriate requirements (ARARs) found in Appendix A

- Refine three of the seven OSWDF waste acceptance criteria (WAC) components: (4) Waste Physical Characteristic Standards, (5) Waste Packaging Standards, and (7) Waste Transportation Standards.

The scope of this OSWDF O&M Plan includes waste placement operations associated with the OSWDF, Impacted Material Transfer Area (IMTA), and supporting infrastructure contained in the OSWDF Design Package. This plan also addresses start-up activities that will be performed to verify that operations can proceed safely and in compliance with applicable requirements. The process and requirements for transportation of waste under DOE Order 460.1C, *Packaging and Transportation Safety*, (now 460.1D as cited hereafter) from the generating project to the OSWDF or IMTA are included in the Transportation Plan found in Section 4. Operational requirements to accept, place, and compact impacted material (waste) in the OSWDF are included in the Impacted Material Placement Plan (IMPP) found in Appendix B. The operations, maintenance, and monitoring activities associated with the Leachate and Impacted Surface Water Management System are included in the Leachate and Impacted Surface Water Systems Plan (LISWSP) found in Appendix C.

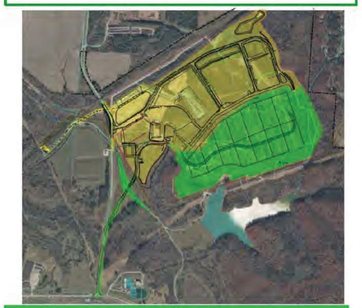
O&M activities related to leachate treatment and the conveyance of leachate from the OSWDF to the ILTS and discharge after treatment are found in the ILTS Design Package and procedures.

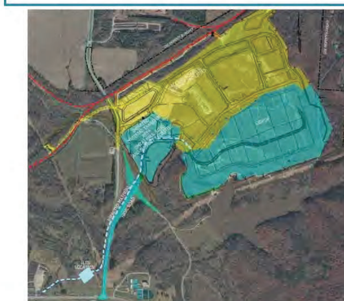
Although conducted in parallel with operations activities, construction work follows the design plans and specifications and associated support documents described in Table 1. This OSWDF O&M Plan does not provide direction for construction work, including construction of cell liners or cell covers constructed in parallel with waste placement operations, or construction of the ILTS Phase 1 – MLTS or ILTS Phase 2.

Site-wide Waste Disposition Evaluation Project Record of Decision

RD/RA Work Plan for OSWDF Initial Site Preparation (Phase I) and Initial Site Construction (Phase II)

Comprehensive OSWDF RD/RA Work Plan (Phase III Balance of the On-Site Disposal Remedy)





Portsmouth Gaseous Diffusion Plant
On-Site Waste Disposal Remedy

Project Deliverable Overview

Submittal Timing	Phase I/Phase II: Initial Site Preparation	Phase I/Phase II: Initial Site Construction	Phase III: ILTS Design	Phase III: OSWDF Design
Submittals During Design *Necessary to Begin Construction*	☑ Design Plans and Specifications (included in work plan)	☑ Design Plans and Specifications (included in work plan)	ILTS Intermediate Design Package ☑ Intermediate Design Plans and Specifications ☑ Intermediate ILTS O&M Plan ILTS Prefinal Design Package ☑ Prefinal Design Plans and Specifications • Prefinal ILTS Operations & Maintenance Plan • Prefinal ILTS Performance Standards Verification Plan ILTS Final Design Package • Final Design Plans and Specifications	Predesign Studies ☑ Geosynthetic Direct Shear Testing Program Report ☑ Geosynthetic Clay Liner-Leachate Compatibility Study ☑ Geomembrane Leachate Compatibility Study OSWDF Prefinal Design Package ☑ Prefinal Design Plans and Specifications ☑ Prefinal Construction Quality Assurance Project Plan ☑ Prefinal Surface Water Management & Erosion and Sediment Control Plan ☑ Prefinal OSWDF Operations & Maintenance Plan ☑ Prefinal OSWDF Performance Standards Verification Plan ☐ Prefinal WAC Implementation Plan OSWDF Final Design Package ☑ Final Design Plans and Specifications ☑ Final Construction Quality Assurance Project Plan ☑ Final Surface Water Management & Erosion and Sediment Control Plan
Submittals During Construction *Necessary to Begin Operations*	Included with appropriate Phase III Construction Completion / Certification Reports		• Final ILTS Operations & Maintenance Plan • Final ILTS Performance Standards Verification Plan • Final Cost Estimate • Prefinal Inspection Report(s) • Construction Completion / Certification Report(s)	• Final OSWDF Operations & Maintenance Plan ← YOU ARE HERE • Final OSWDF Performance Standards Verification Plan • Final WAC Implementation Plan • Prefinal Inspection Report(s) • Construction Completion / Certification Report(s)
Submittals During Operations *Necessary for Closure*	Not Applicable		• Permanent Leachate Treatment System Design	• Draft Closure Plan • Final Closure Plan • Closure Certification Report (after closure)
Reporting	Not Applicable – See Phase III		DFF&O Quarterly Progress Report and Projected Milestone Activities Report Project-specific annual update Five Year Review Work Plan Five Year Review Report	

Notes: For information only and subject to revision based on current project planning.
All elements of a design package may not be submitted at the same time.
Acronyms defined on reverse side.

Effective July 18, 2019

☑ Ohio EPA review, concurrence, or approval process for deliverable is complete.
☐ Deliverable has been submitted to Ohio EPA and is in the review process.

Figure 1. Project Deliverable Overview

Table 1. Elements of the OSWDF Design Package

Design Package Component	General Description
	Design Plans and Specifications
OSWDF Design Criteria Package	Design criteria for OSWDF, IMTA, IMTA Haul Road, and related support facilities and infrastructure
OSWDF Calculations	Calculations for OSWDF, IMTA, IMTA Haul Road, and impacted material placement
OSWDF Drawings	Construction drawings for OSWDF liners and final cover system
IMTA, IMTA Haul Road, and Support Facility Construction Drawings	Construction drawings for OSWDF, IMTA, and IMTA Haul Road
OSWDF consolidated set of Specifications	Technical specifications for OSWDF, IMTA, IMTA Haul Road
	Support Plans
Construction Quality Assurance Project Plan	Describes the quality control monitoring, testing, documentation, and nonconformance resolution activities during construction, waste placement, and closure of the OSWDF. Establishes both material and construction method conformance with the requirements of the Technical Specifications, appropriate regulatory requirements and guidance, and good construction practices.
Surface Water Management and Erosion and Sediment Control Plan	Describes the surface water management and erosion and sediment control practices to be implemented during construction of the OSWDF, infrastructure support area, and support facilities, including liner construction, infrastructure construction, and final cover construction.
WAC Implementation Plan	Establishes the processes used to determine that waste intended for disposal in the OSWDF meets the approved WAC. The WAC Implementation Plan defines the responsibilities of waste generators, the WAO, and OSWDF Organization, and specifies the documentation requirements. Also establishes the following components of the OSWDF WAC: (3) Waste Characterization and Evaluation Standards and (6) Waste Safe Handling Standards.
OSWDF O&M Plan	Describes O&M activities for transport, receipt, and placement of waste in the OSWDF, leachate, and potentially impacted surface water management, and storage of waste at the IMTA. Addresses maintenance and performance monitoring associated with the OSWDF, IMTA, Haul Road, support facilities, and infrastructure. Also establishes the following components of the OSWDF WAC: (4) Waste Physical Characteristic Standards, (5) Waste Packaging Standards, and (7) Waste Transportation Standards.
Impacted Material Placement Plan (Appendix B of the OSWDF O&M Plan)	Establishes the operational requirements to accept, place, and compact waste in the OSWDF for long-term performance of the disposal facility. Describes run-on/runoff management in the active cells, compaction testing, and documentation requirements. The IMPP is the design basis for WAC Component (4), Waste Physical Characteristic Standards, which is provided in this OSWDF O&M Plan.
Leachate and Impacted Surface Water Systems Plan (Appendix C of the OSWDF O&M Plan)	Guides the inspection, monitoring, maintenance, and operation of the leachate and impacted surface water management systems associated with construction, operation, and closure of the OSWDF, IMTA, and IMTA support systems.
OSWDF PSVP	Consolidates the required testing, sampling, and analysis to be performed for verification that waste placement operations are being conducted in a manner that is protective of human health and the environment and that remedy components are functioning as designed. Includes sampling and analysis plan and data quality objective for monitoring leachate, groundwater, seeps, surface water, air, and external radiation. (Note: Routine operational monitoring such as inspections for leaks and measurements of flow rates are addressed in this OSWDF O&M Plan. Monitoring activities included in the PSVP are not duplicated in the OSWDF O&M Plan.)

IMPP = Impacted Material Placement Plan
IMTA = Impacted Material Transfer Area
O&M = operation and maintenance
OSWDF = On-site Waste Disposal Facility
PSVP = Performance Standards Verification Plan
SAP = sampling and analysis plan
WAC = waste acceptance criteria
WAO = Waste Acceptance Organization

1.2 TERMINOLOGY

Terminology used throughout this OSWDF O&M Plan is defined below:

- OSWDF − Refers to all of the cells where waste will be dispositioned; individual cells are referred to as a "cell."

- OSWDF Project Area − Refers to the area constructed under the OSWDF Design Package (OSWDF, IMTA, and supporting infrastructure). The OSWDF Project Area is facility X-780 at PORTS.

- IMTA − Refers to a lined gravel pad, with an integral leachate collection system (LCS), used to temporarily store waste in the OSWDF Project Area.

- Operations − Operation activities include transportation, waste placement, waste tracking, and compaction of waste; environmental and operational monitoring; and support activities such as erosion and sediment control, dust control, surveying, decontamination, equipment and materials management, haul roads management, and liquids management. Operation of the OSWDF is divided into two phases.

  - Initial Operations − Placement of waste in the OSWDF prior to construction of the ILTS Phase 2, IMTA, the IMTA Haul Road, the equipment maintenance areas, the Impacted Surface Water Management System (ISWMS), and the Wheel Wash Facility. Initial operations utilize the ILTS Phase 1 – MLTS for treatment of leachate.

  - Full-scale Operations − Placement of waste in the OSWDF after construction of the ILTS Phase 2, IMTA, the IMTA Haul Road, the equipment maintenance areas, the ISWMS, and the Wheel Wash Facility. Full-scale operations utilize the ILTS Phase 2 for treatment of leachate.

- Construction − Construction of support infrastructure, as well as the liner and cover systems, occurs during the operations phase. As discussed in Section 3, one or more cell liners may be in the construction phase while an adjacent cell is operating (receiving waste). A physical barrier will delineate the boundary between operating cells and liner construction as described in Section 2.3.

- Waste − Waste generated during D&D of PORTS facilities and other environmental media cleanup activities at PORTS is referred to as D&D waste, engineered fill, and impacted material in other regulatory and design documents. All soil and debris that meets the OSWDF WAC and is intended for disposition in the OSWDF will hereafter be referred to as "waste" in this plan.

- ILTS Phase 1 – MLTS − The ILTS Phase 1 – MLTS consists of a modular leachate treatment system (MLTS) that has the capacity to treat leachate from a portion of the OSWDF, but not the entire OSWDF. Unlike the ILTS Phase 2, the ILTS Phase 1 – MLTS does not have the capacity to treat impacted water from the IMTA, IMTA support systems, the entire OSWDF, or other site operations.

- ILTS Phase 2 − The ILTS Phase 2 utilizes larger-scale equipment to treat leachate and wastewater to remove contaminants of concern to allow safe discharge of the liquids. The ILTS Phase 2 replaces the ILTS Phase 1 – MLTS and has the capacity to treat leachate from multiple active cells within the OSWDF. The ILTS Phase 2 also has the capacity to treat liquids from the IMTA operations and other site operations.

- Liquids − The OSWDF design categorizes liquids generated during operations in three categories, based on the source materials from which the liquids are generated and the corresponding likelihood the liquid will come in contact with waste. A detailed description of liquid categories and sources is provided in the LISWSP (Appendix C). The three general categories are summarized below:

    - Leachate − Precipitation or water from dust control originating from active OSWDF cells, inside closed OSWDF cells, and the IMTA. (Note: Wheel washing at the Wheel Wash Facility at the IMTA occurs only during full-scale operations. By regulatory definition, liquid from wheel washing is considered wastewater, not leachate. However, the wastewater from the Wheel Wash Facility is collected and managed with the IMTA leachate prior to treatment.)

    - Potentially impacted surface water − Precipitation or water from dust control that falls in areas adjacent to waste handling areas or on haul roads inside the OSWDF radiologically controlled area prior to wheel washing.

    - Surface water − Precipitation or water from dust control that falls in areas that are maintained to be free of contamination.

1.3 PROJECT OVERVIEW

On-site waste disposal at PORTS entails construction of a new, engineered disposal facility located in the northeast corner of the PORTS property (Figure 2). The OSWDF is designed to accommodate up to 12 cells that are built in modular fashion with individual lining systems. Ten cells will accept the approximately 5 million cy of waste and engineered fill resulting from D&D of PORTS. The overall OSWDF design of 12 cells can accommodate approximately 5.7 million cy. The modular design of the OSWDF allows for progressive construction, filling, and closure of cells on a flexible schedule consistent with the rate of waste generated by D&D activities and funding. The IMTA is designed adjacent to the OSWDF to improve the efficiency of on-site disposal operations. The IMTA provides a temporary storage area for waste to optimize placement and allow receipt of waste from generators when OSWDF operations are temporarily closed (typically in the winter season when meeting compaction requirements is unachievable due to freezing conditions).

Planned support infrastructure includes a surface water management system, leachate management systems, haul roads, truck scale, Wheel Wash Facility, access roads, security fencing, temporary and permanent offices and trailers, equipment maintenance areas, parking areas, and utilities. The surface water management system separates potentially impacted surface water (i.e., surface water that has the potential to be contaminated) from nonimpacted surface water (i.e., noncontaminated) to provide proper collection, analysis, and release. The leachate management systems provide collection and transmission for treatment of leachate and wastewater generated by on-site disposal activities. The IMTA Haul Road, a dedicated waste hauling route outside of Perimeter Road, is designed to facilitate efficient transfer to the IMTA and OSWDF. The haul routes shown on Figure 2 are determined by the projects generating waste. These routes are shown for information and will change based on the location and the requirements of the project generating waste. In the future, it will not be necessary to revise this OSWDF O&M Plan to reflect changes in haul routes within the boundaries of Perimeter Road or to reflect changes in temporary haul routes within the boundaries of the OSWDF.

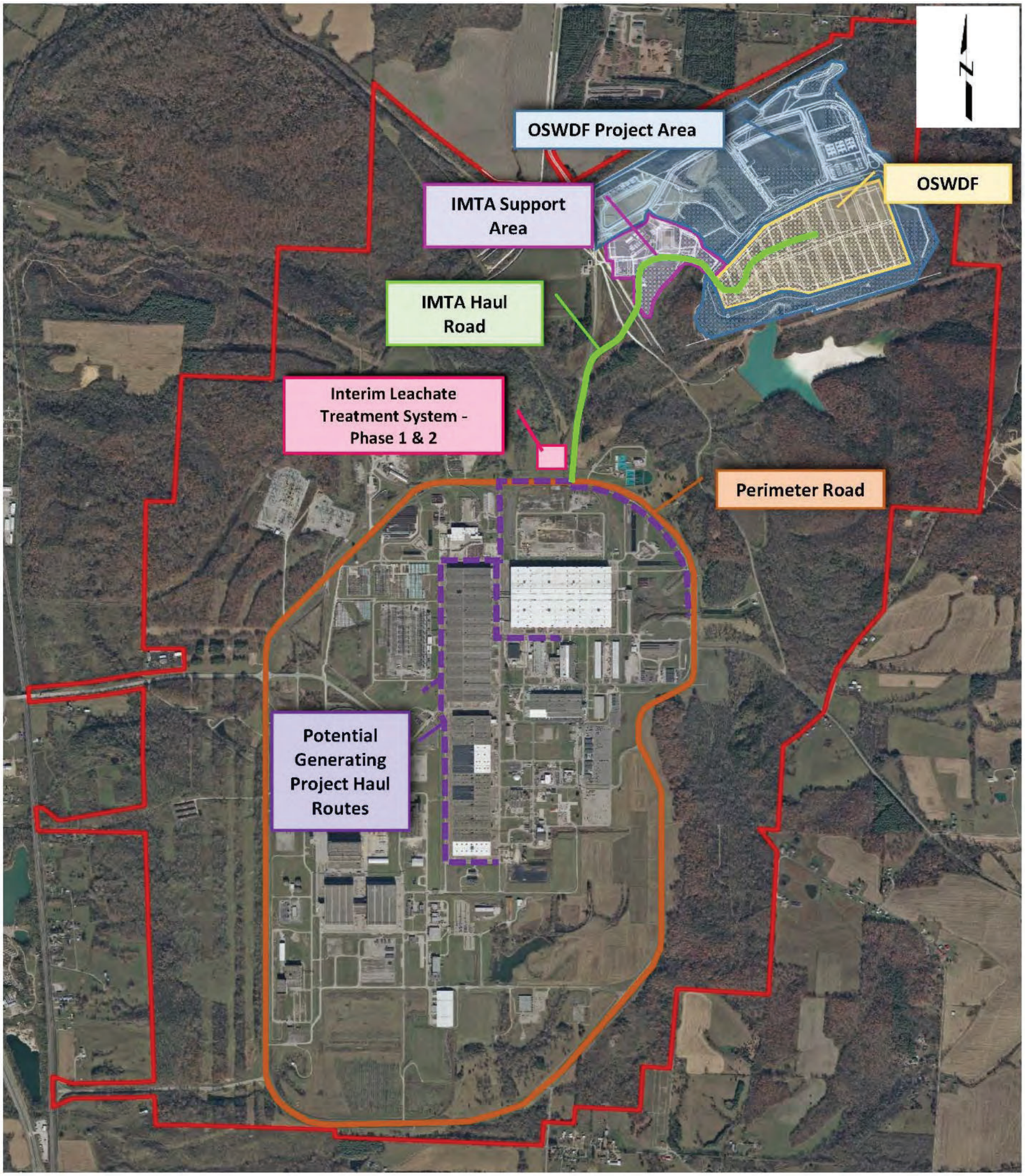


Figure 2. OSWDF and Supporting Infrastructure Locations at PORTS

On-site waste disposal is part of a single remedial action per the Waste Disposition ROD. Based on the size of the remedial action and potential variability of funding, the project is being implemented in phases. Waste placement operations are divided into two distinct phases: (1) initial operations and (2) full-scale operations. These phases are described in the following sections.

1.3.1 Initial Operations Phase Overview

This section provides an overview of initial operations. A detailed description of the initial operations phase is provided in Section 2.

Initial operations involve placement of waste in the OSWDF before the IMTA, IMTA Haul Road, IMTA ISWMS, Wheel Wash Facility, and the ILTS Phase 2 are constructed. During initial operations, leachate is treated by the ILTS Phase 1 – MLTS, which is constructed at the location of the future ILTS Phase 2. During initial operations, waste can be placed in a maximum of three active cells (Cells 1, 4, and 5) based on the treatment capacity of the ILTS Phase 1 – MLTS. Placement of waste in these cells will continue during full-scale operations.

The initial operations phase implements the options described in the Comprehensive OSWDF RD/RA Work Plan to operate the OSWDF prior to IMTA and IMTA Haul Road construction with use of modular leachate treatment system (i.e., ILTS Phase 1 – MLTS). Although less efficient, placement of waste in the OSWDF can occur compliantly without the IMTA infrastructure.

The initial operations phase is summarized as follows:

- Vehicles transfer waste to the OSWDF using existing site roads, including portions of the North Access Road and Perimeter Road.
- Vehicles offload waste into the OSWDF using transfer ramps located at the edge of the waste placement area.
- Equipment inside the waste placement area moves the off-loaded waste to a designated grid location.
- ILTS Phase 1 – MLTS treats leachate from OSWDF initial operations.

The roads used to transfer waste to the OSWDF are removed from commerce during waste transfer activities. A southern section of the North Access Road and northern portion of Perimeter Road are closed to public and site traffic once OSWDF operations begin. A controlled road crossing is established to close the Fog Road intersection with the North Access Road during waste transfer activities. The crossing can be opened to allow site traffic to cross the intersection if waste hauling activities are stopped and the crossing released for public use. The site layout and route for dispositioning waste during initial operations is presented in Section 2.

The transfer of waste from the point of generation to the OSWDF is performed "out of commerce" in accordance with DOE Order 460.1D and 49 *CFR* 171.1(d). At no time will the public have unfettered/uncontrolled access to interact with these shipments. Packaging and transport vehicles must meet specific release criteria before leaving the generating project to prevent contamination of the haul road or environment. Roads used to transfer waste to the OSWDF, including the intersection with Fog Road, are to remain free of removable surface activity requiring radiological controls. Section 4, Transportation Plan, describes in detail the implementation of DOE Order 460.1D for safe on-site transfer of waste to the OSWDF. Section 2.2, Waste Load-out and Transfer During Initial Operations, provides a step-by-step description of the process and controls associated with loading and transport of waste, including management of the crossing. Section 4.7, Contamination Control, specifically addresses contamination control limits and the release of the Controlled Fog Road Crossing for public use.

Because the IMTA and Wheel Wash Facility are not yet available during this phase, waste is always transferred directly to the OSWDF for placement and transport vehicles do not enter the active waste placement area. Vehicles bring waste to the edge of the waste placement area using ramps for offloading. Equipment that remains inside the active waste placement area moves the waste to the designated final disposal location inside the OSWDF.

The ILTS Phase 1 – MLTS consists of a modular leachate treatment system that has the capacity to treat leachate from up to three active cells within the OSWDF. The treatment capacity of the ILTS Phase 1 – MLTS is approximately 400 gpm. Unlike the ILTS Phase 2, the ILTS Phase 1 – MLTS does not have the capacity to treat impacted water from the IMTA, IMTA support systems, the entire OSWDF, or other site remediation activities operations. Information regarding the design and operations of the ILTS Phase 1 – MLTS are included in the ILTS Design Package and procedures.

1.3.2 Full-scale Operations Phase Overview

This section provides an overview of full-scale operations, which allows for the most efficient operation of the full-scale demolition and waste placement projects. A detailed description of the full-scale operations phase is provided in Section 3.

Full-scale operations begin when the IMTA, IMTA Haul Road, the IMTA ISWMS, Wheel Wash Facility, and ILTS Phase 2 are constructed and operational. As cells are filled to capacity, cell cover systems are constructed and maintained as newer cells are being filled.

The full-scale operations phase is summarized as follows:

- Vehicles transfer waste from project generators on dedicated roads, which includes the IMTA Haul Road.

- Waste can be stored in the IMTA before it is transferred to the OSWDF.

- Waste transport vehicles drive directly into the OSWDF active waste placement area to offload waste, and undergo wheel washing and release prior to returning to waste-generating areas,

- ILTS Phase 2 can treat the maximum anticipated flow of leachate and impacted surface water from OSWDF full-scale operations (multiple cells, IMTA, IMTA Haul Road).

During full-scale operations, waste is transferred from project generators via project-specific haul routes and the dedicated IMTA Haul Road. The crossing used during initial operations is eliminated. Site traffic may be rerouted or overpasses constructed to allow non-OSWDF traffic to continue without intersecting the haul routes. The site layout and process for dispositioning waste during full-scale operations is presented in Section 3.

The transfer of waste from the point of generation to the OSWDF is conducted under DOE Order 460.1D. The IMTA Haul Road used to transfer waste to the OSWDF during full-scale operations will be maintained free of removable surface activity requiring radiological controls. Section 4, Transportation

Plan, describes in detail the implementation of the Order for safe on-site transfer of waste to the OSWDF, including contamination control.

As OSWDF construction and operations progress and infrastructure is added, the volume and the sources of leachate and potentially impacted surface water to be managed will increase. Waste placement in a fourth cell will increase the volume of leachate. Operation of the IMTA and portions of the IMTA Haul Road will increase the volume and sources of leachate and potentially impacted surface water will be introduced. The IMTA, IMTA Haul Road, IMTA Surface Water Management System, Wheel Wash Facility, and a fourth cell can be constructed but cannot be operated until the ILTS Phase 2 is constructed and operational. When the remaining OSWDF infrastructure and the ILTS Phase 2 are constructed and operational, the OSWDF will begin full-scale operations.

The IMTA is an approximately 7-acre area adjacent to the OSWDF. The IMTA allows waste from generators to be stored when OSWDF operations are closed or for logistical purposes to support the optimal placement of waste.

Because the Wheel Wash Facility provides the capability to remove potentially contaminated soil or debris from the exterior of waste transport vehicles, waste can be hauled directly to the designated final disposal location inside the active waste placement areas of the OSWDF during full-scale operations. The transfer ramps used during initial operations are designed to remain in the cell and are therefore disposed in situ. Because this phase allows for direct entry to the impacted areas of the OSWDF and IMTA, trucks are required to utilize the Wheel Wash Facility before leaving the radiologically controlled portions of the OSWDF Project Area. Precipitation that falls on the road surfaces between the OSWDF and the Wheel Wash Facility (i.e., potentially impacted surface water) is collected in Tanks 2A and 2B for proper treatment prior to discharge.

Cell cover systems are constructed once associated cells have been filled to capacity. The first cover system will be constructed after Cells 1 and 2 are filled. The overall liner and cell cover construction sequence for the OSWDF is illustrated on Figure 3.

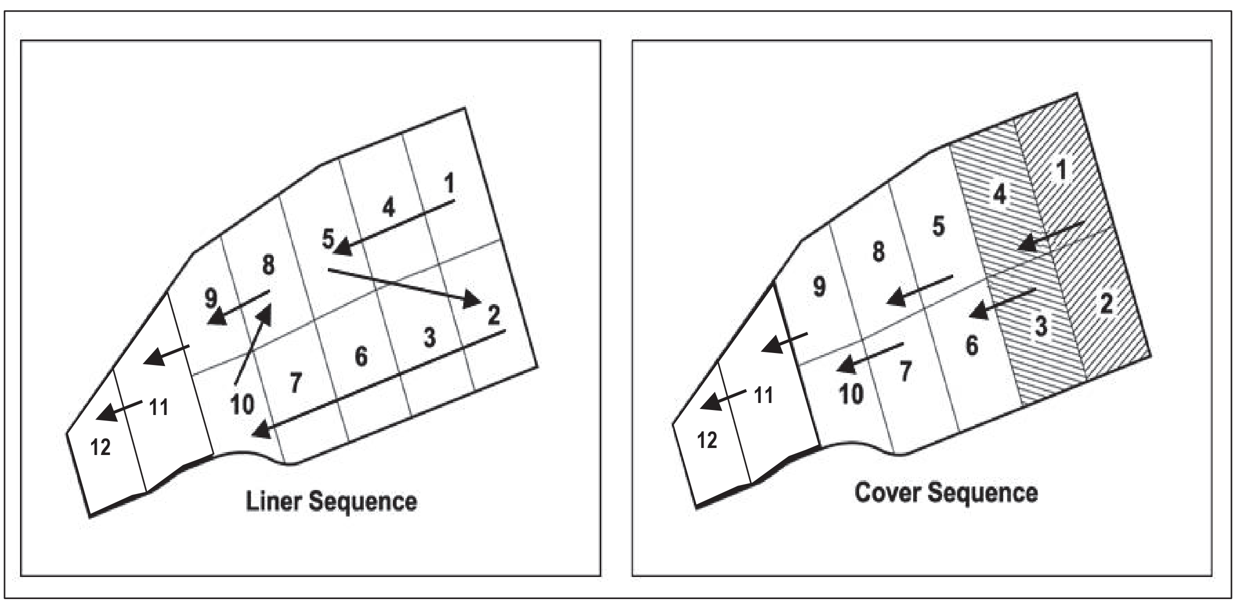


Figure 3. OSWDF Construction Sequence

1.4 OVERVIEW OF OSWDF REGULATORY AND DESIGN DOCUMENTS

The PORTS D&D Project is a complex undertaking that could take decades to complete. The majority of the waste generated by D&D will be transferred to the OSWDF for disposition on site. D&D waste not meeting the OSWDF WAC must be dispositioned off site.

Due to the magnitude and level of detail required for design of the on-site disposal remedy, DOE has divided the remedial design for the on-site disposal remedy into two remedial design packages: the OSWDF Design Package and the ILTS Design Package (see Figure 1). A design package is a collection of design plans and specifications, support plans, and other information that, when taken as a whole, demonstrate that the actions undertaken will meet the objectives of the ROD, including ARARs and other performance standards. The OSWDF Design Package includes design for the OSWDF, IMTA, IMTA Haul Road, leachate collection and conveyance system, surface water management system, and support infrastructure.

The design, operations, maintenance, and monitoring associated with leachate treatment are contained in the ILTS Design Package and procedures. The conveyance of liquids from the OSWDF and IMTA into the leachate treatment system is included in the scope of the ILTS Design Package.

This OSWDF O&M Plan is a support plan included as part of the OSWDF Design Package. Because this plan is a component of a larger design package, several other support plans and drawings are to be used in conjunction with this plan. These elements are described in Table 1.

1.5 ORGANIZATION OF THE DOCUMENT

The remainder of this OSWDF O&M Plan is organized as follows:

Section 2 – Initial Operations Phase

Section 2 presents the primary tasks associated with initial operations, including start-up, waste transfer, OSWDF operations, OSWDF Leachate Management System operations, surface water management, and operational limits and monitoring.

Section 3 – Full-Scale Operations Phase

Section 3 provides a description of the primary tasks associated with full-scale operations, including start-up, waste transfer, OSWDF operations, OSWDF Leachate Management System operations, IMTA operations, IMTA Leachate Management System operations, surface water management, and operational limits and monitoring.

Section 4 – Transportation Plan

Section 4 describes the implementation of the Transportation plan for the transfer of waste to the OSWDF for disposal.

Section 5 – Support Infrastructure and Equipment

Section 5 discusses operation, maintenance, and monitoring of the support facilities, including the Surface Water Management System, Leachate Management System, ISWMS, Wheel Wash Facility, truck scale, access roads, security fencing, offices and trailers, equipment maintenance areas, parking areas, and utilities. This section also includes a description of system and facility inspection, testing, and maintenance requirements; describes equipment necessary for O&M of the OSWDF; and addresses the replacement schedule for equipment and critical spares.

Section 6 – Monitoring and Maintenance
Section 6 provides a description of inspection and maintenance of the OSWDF facility and support systems to identify and correct conditions that could lead to an environmental or health hazard or negatively affect long-term performance of the remedy.

Section 7 – Waste Acceptance Criteria
This section provides the three WAC components that are refined by this OSWDF O&M Plan: (4) Waste Physical Characteristic Standards, (5) Waste Packaging Standards, and (7) Waste Transportation Standards.

Section 8 – Potential Operating Problems
Section 8 addresses potential operating problems and alternative O&M protocols. This section also describes the means of detecting problems in the operating systems and common remedies that may be employed to address identified operating problems.

Section 9 – Safety and Emergency Response
Section 9 discusses safety, radiological protection, and emergency response for the OSWDF Project. This section also describes the emergency response equipment and emergency response protocols.

Section 10 – Management of Secondary Wastes
Section 10 addresses how secondary waste generated by operations, maintenance, and monitoring activities associated with the OSWDF Project will be managed and dispositioned.

Section 11 – Records, Notifications, and Reporting
Section 11 identifies the records to be generated under this OSWDF O&M Plan and the record-keeping requirements for the OSWDF Project. This section also presents the scope of information to be provided in the DFF&O Quarterly Progress Reports and an OSWDF Project Specific Annual Status Report.

Section 12 – Project Management
Section 12 outlines activities associated with management of the project, including roles and responsibilities, operating costs, and training for the project.

Section 13 – References
Section 13 provides a list of references cited in this OSWDF O&M Plan.

Appendix A presents the subset of the ARARs from the Waste Disposition ROD that are applicable to implementation of this scope of work, and identifies the section in this OSWDF O&M Plan that explains or references the compliance approach needed to satisfy the ARARs.

Appendix B presents the IMPP. The IMPP establishes the operational requirements to accept, place, and compact impacted material (waste) in the OSWDF in a manner that protects the underlying liner system and also maintains the overall stability of the OSWDF with negligible impact to the performance of the final cover (cap) system.

Appendix C presents the LISWSP. The LISWSP describes the start-up, operation, inspection, maintenance, and monitoring activities associated with management of leachate by the OSWDF Leachate Management System and IMTA Leachate Management System, and the management of potentially impacted surface water by the IMTA ISWMS. The LISWSP also includes the sampling and analysis plan for the characterization of potentially impacted surface water.

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2. INITIAL OPERATIONS PHASE

The primary tasks associated with initial operations described in this section are start-up, waste transfer, OSWDF operations, OSWDF Leachate Management System operations, surface water management, and operational limits and monitoring.

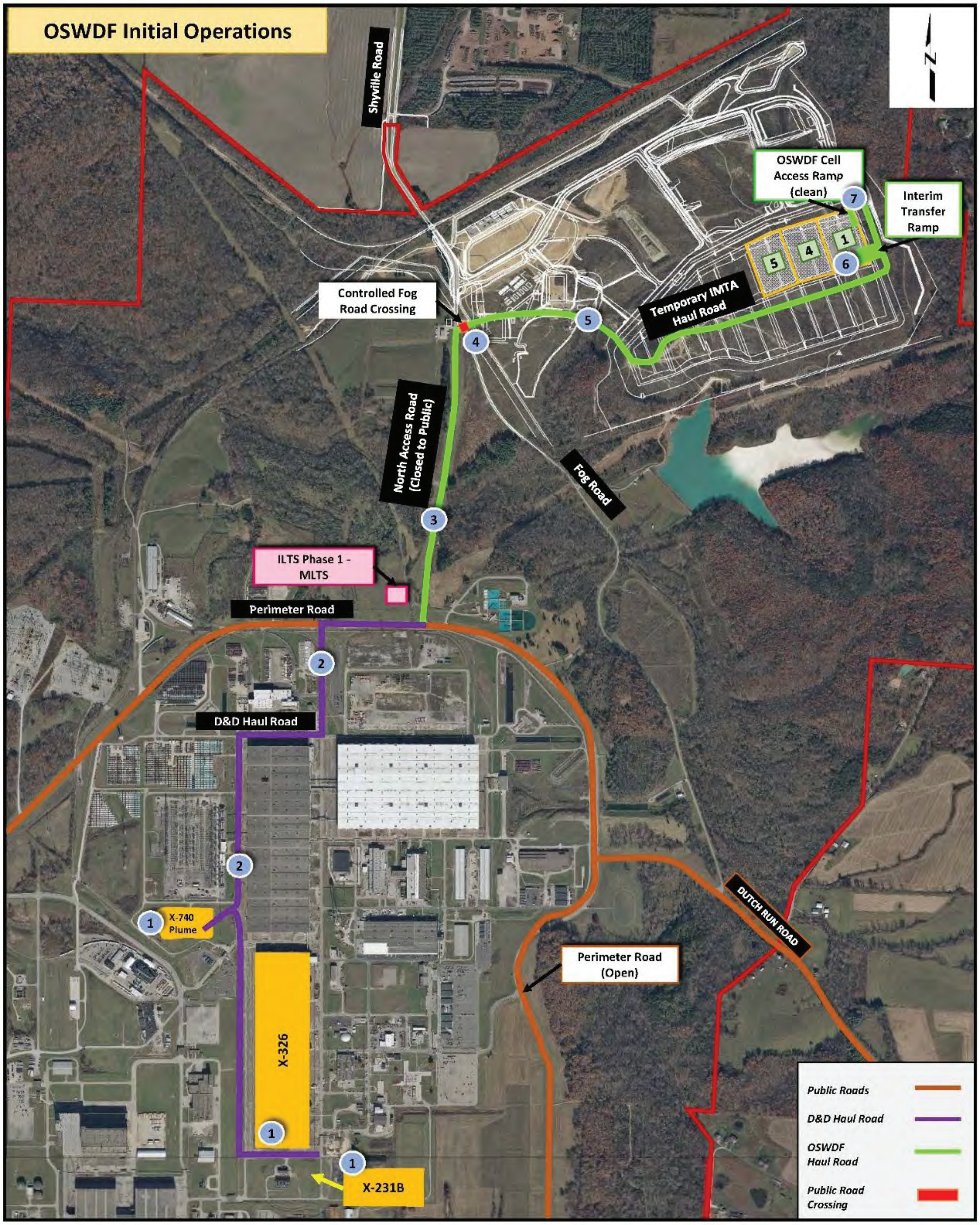
Operation of the OSWDF begins when waste material is placed in the OSWDF (i.e., first waste placement). Leachate is treated by the ILTS Phase 1 – MLTS. The number of cells that can receive waste during initial operations is limited by the capacity of the ILTS Phase 1 – MLTS to treat leachate while still meeting discharge requirements. Therefore, waste can be placed in a maximum of three active cells (Cells 1, 4, and 5) during initial operations. Placement of waste in these cells will continue during full-scale operations if they are not filled to capacity during initial operations.

Waste is transferred along existing site roads and OSWDF construction/access roads directly to the OSWDF for placement. Roads and the exterior of waste transport vehicles are to remain free of removable surface activity that would require radiological controls to be established. Therefore, ramps are used to allow transport vehicles to back up to the contamination boundary at the OSWDF to offload waste without the transport vehicle entering the OSWDF active waste placement area.

At a minimum, the following remedy components are constructed and operationally ready prior to first waste placement:

- Cell 1 liner and valve house
- Interim Transfer Ramp(s) and OSWDF Cell Access Ramp
- North Leachate Transmission System
- ILTS Phase 1 – MLTS (including ILTS influent and effluent conveyance lines)
- Temporary haul roads and access roads within the OSWDF Project Area
- Security fencing, utilities, and other support facilities.

Figure 4 provides an illustration of the OSWDF Project Area during initial operations.



Note: Numbered circles in this figure correspond to text in Section 2.2 and identify the locations of activities described in the text.

Figure 4. Initial Operations

2.1 START-UP FOR INITIAL OPERATIONS

Prior to first waste placement, the following activities will be performed to confirm operations are prepared to proceed safely and in compliance with applicable requirements:

- **Functional checkout of OSWDF support systems.** Functional checkout is performed to verify that electrical, mechanical, and instrumentation are correctly installed and support systems (e.g., LCS and the Leak Detection System [LDS]) are operationally ready. The functional checkout may include limited system operation to verify system interlocks and full system operation to confirm operation is consistent with design criteria.

- **ILTS Phase 1 – MLTS start-up and testing.** Start-up of the ILTS Phase 1 – MLTS will be performed to verify that the systems and associated controls operate as designed. Testing, the initial operational period following start-up during which adjustments are made, will be performed to ensure that the performance standards for the system are being reliably achieved. (Note: The ILTS Phase 1 – MLTS start-up and testing is addressed in the ILTS Design Package and is not included in the scope of this OSWDF O&M Plan).

- **Construction Completion Report.** Final Construction Completion Report(s), including a certification from the engineer of record that the liner is acceptable for waste placement, shall be prepared by the Construction Quality Assurance (CQA) Officer and concurred with by Ohio EPA prior to first waste placement in each cell and operation of the leachate management system.

- **Sufficient fill available.** Engineered fill is necessary for use in placing D&D waste, filling voids, and compacting impacted material to minimize the potential for differential settlements within the OSWDF. Fill required for placement of waste in the OSWDF will be obtained from site sources as described in the Comprehensive OSWDF RD/RA Work Plan. Excavation of fill is conducted under project-specific excavation plans that are submitted to Ohio EPA and is not included in the scope of this OSWDF O&M Plan.

- **Environmental monitoring.** Monitoring systems are operational and background samples specified in the OSWDF Performance Standards Verification Plan (PSVP) have been collected for use as baseline data.

- **Development of field work instructions.** Field work instructions provide direction to workers for implementing engineering plans and manufacturer's instructions in the field. Work packages and standard operating procedures are examples of field work instructions. Work packages provide direction for work that is construction-oriented or varied in nature (e.g., impacted material placement, equipment maintenance). Standard operating procedures are used for work that is repetitive and requires adherence to step-by-step instructions (e.g., operation of the leachate management system). These internal documents are available for Ohio EPA's information at PORTS.

- **Training.** A training program has been developed and OSWDF personnel and subcontractors have successfully completed a program of classroom training and on-the-job training that meets the requirements of 40 *Code of Federal Regulations (CFR)* 264.16, *Personnel Training* and *Ohio Administrative Code (OAC)* 3745-54-16.

- **Management self-assessment.** A management self-assessment is performed to meet DOE's standards for verifying readiness to operate. The management self-assessment verifies that the appropriate aspects of the project (e.g., documentation, training, equipment testing and calibration) have been completed for safe operations of the facility.

Management self-assessments may also be performed at other times during the OSWDF operations, such as after prolonged shutdowns and prior to first waste placement in each OSWDF cell. Each management self-assessment is tailored to the specific conditions that prompt the assessment to be conducted.

2.2 WASTE LOAD-OUT AND TRANSFER DURING INITIAL OPERATIONS

The OSWDF Project is responsible for the physical hauling of waste from the location of waste generation to the OSWDF. The transfer of waste from the point of generation to the OSWDF is performed "out of commerce" in accordance with DOE Order 460.1D and 49 *CFR* 171.1(d). At no time will the public have unfettered/uncontrolled access to interact with these shipments. Section 4 of this OSWDF O&M Plan describes the implementation of the Order for on-site transfer of waste to the OSWDF in detail. Figure 4 provides an illustration of the transfer routes during initial operations.

NOTE: The numbers in the colored circles below correspond to the matching numbered circles on Figures 4 through 9, 11, 12, and 15. The following descriptions refer to activities that take place at the matching locations marked on the figures.

1 **Waste Load-out.** Waste generators conduct the load-out of waste onto vehicles for transfer to the OSWDF. Waste generators are responsible for ensuring that waste has been certified to meet the OSWDF WAC and verified by the Waste Acceptance Organization (WAO) in accordance with the WAC Implementation Plan. The WAO has been established to provide independent oversight of the waste generators and is responsible for verifying waste compliance with the OSWDF WAC.

WAO visually verifies waste being loaded is compliant with the waste profile, inspects the load-out process to check for prohibited items, and confirms that the waste safe handling, packaging, and transportation WAC have been met. In accordance with the WAC Implementation Plan (shown on Figure 1), vehicles are not released without WAO authorization that the waste load meets WAC requirements.

Waste transfers to the OSWDF during initial operations will utilize some of the same types of equipment and processes being successfully employed at the DOE Environmental Management Waste Management Facility (EMWMF) in Oak Ridge, TN. The most pertinent example of this similarity is the waste transfer vehicle. Bulk transfer of debris and soil from the point of generation to the OSWDF will predominantly use on-road dump trucks. Like the EMWMF, these trucks will have heavy-duty dump bodies equipped with hydraulic lift gates. A thick gasket or similar material at the rear face of the dump body seals the lift gate to the body and prevents leakage. Redundant locking mechanisms are provided on the hydraulic lift gate (e.g., hydraulic lock and manual lock) to protect against accidental opening of the lift gate. The locks also seal the lift gate tightly to the gasket and dump body. The truck is also equipped with a heavy duty, sift-proof tarp that is permanently attached to the front-most part of the dump body and to the front of the body's side rail.

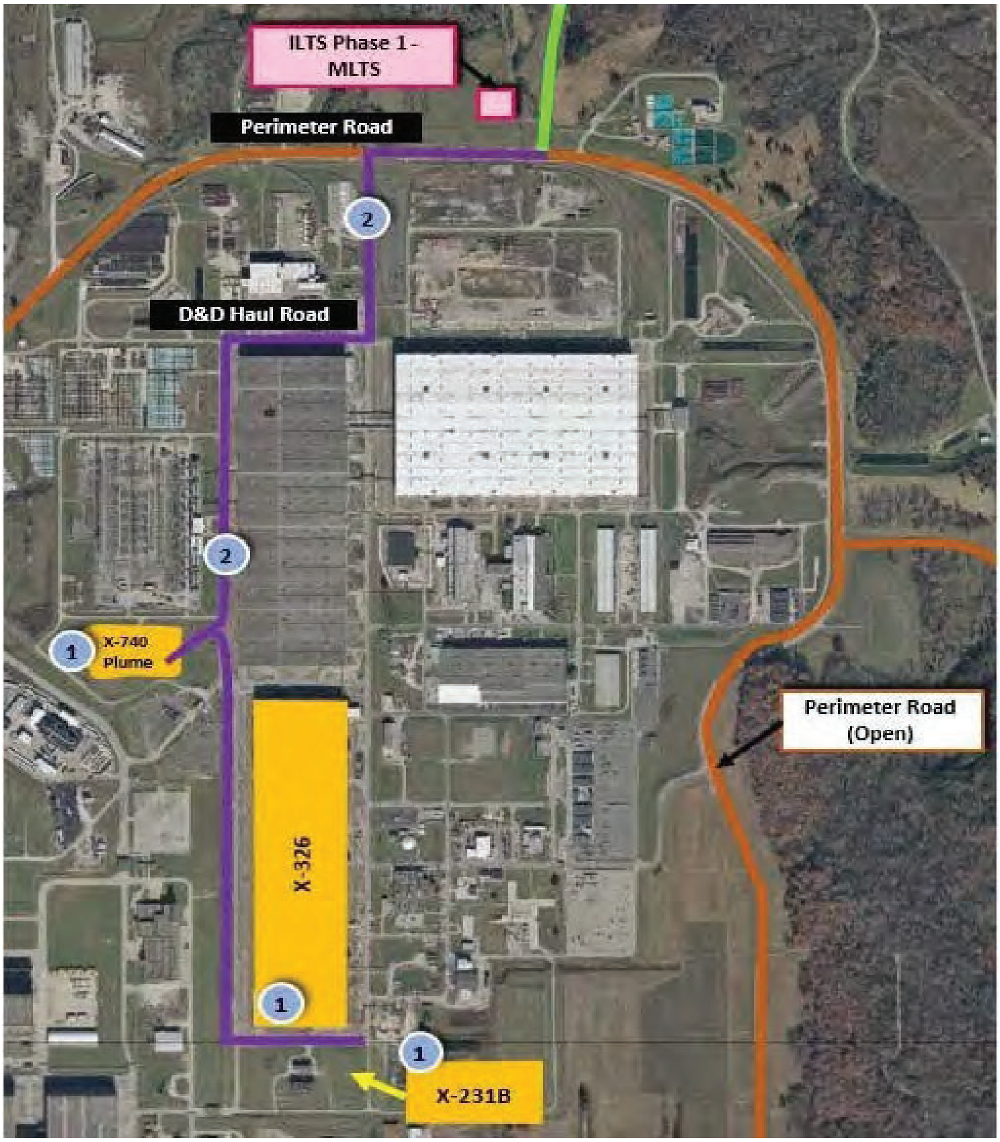
As described in Section 4.4, Packaging, generators are responsible for visually inspecting each waste package before use and preventing damage during loading. This inspection includes the truck dump body, gate, gasket, locks, and tarp. The visual inspection looks for breaches in the containment system including damaged lift gates or covers. Waste is loaded in a controlled manner to prevent damage. Damaged packaging that cannot provide the required containment is removed from service and repaired.

Once a truck or other package has been loaded the cover is applied. The loaded truck enters a manned tarping station (e.g., catwalk-type platforms adjacent to the truck body) to be covered for transfer. The tarp is manually pulled across the open dump body. (Note: the tarp is unfolded such that the bottom side [tarp interior] is draped over the bed rails and does not contact the exterior surface of the tarp during loading). The tarp drapes about 18 in. over the side rails and rear lift gate. Hold-downs that are pre-attached to the tarp eyelets are hooked to the side of the bed to draw the tarp down tightly on the body rails and tail gate creating a “sift proof” container/package. WAO representatives will verify that the package is consistent with requirements approved by the Transportation Manager, and in a condition appropriate for the transfer of materials. Packages damaged during load-out are not released from the generating project.

Finally, the project verifies that the exterior of the vehicle is free of visible waste material and radiological control personnel perform radiological surveys to confirm the vehicle meets release criteria for travel to the OSWDF (see Section 4.7, Contamination Control, for release criteria and survey requirements). These criteria are established to meet or exceed DOT packaging equivalency requirements and prevent inadvertent transfer of hazardous materials to the haul road. Decontamination, as appropriate, is conducted by the generator inside the project area prior to release of the transport vehicle.

2 **Waste Transfer to North Access Road.** Existing site roads are used to transfer waste from the generating project to the North Access Road. Figure 5 shows this route for waste associated with X-326 demolition and X-740, X-231A, and X-231B excavations. A temporary truck scale located along this route is used to determine the weight of material being transferred; this weight is verified by the WAO. The portion of Perimeter Road used for waste transfer is closed to public and site traffic at the onset of initial operations. At no time will the public have unfettered/uncontrolled access to interact with these shipments. Controls (e.g., barriers, gates, personnel, route restrictions, speed limits) which are described further in Section 4.2 are utilized to ensure the safety of workers and the public.

Trained OSWDF personnel working with radiological control technicians will visually inspect the haul route for evidence of suspect material release if the road is used for waste transfer activities that day. The road is maintained free of removable surface activity that would require radiological controls to be established (less than 1,000 disintegrations per minute (dpm)/100 cm^2). Performance of radiological surveys and monitoring of the road is further described in Section 4.7, Contamination Control. (Note: The OSWDF Project intends to keep the Perimeter Road segment closed for the duration of initial operations. Reopening the road is not prohibited, however, as long as the surface contamination limits of 10 *CFR* 835, *Occupational Radiation Protection,* are met and waste transfers paused).

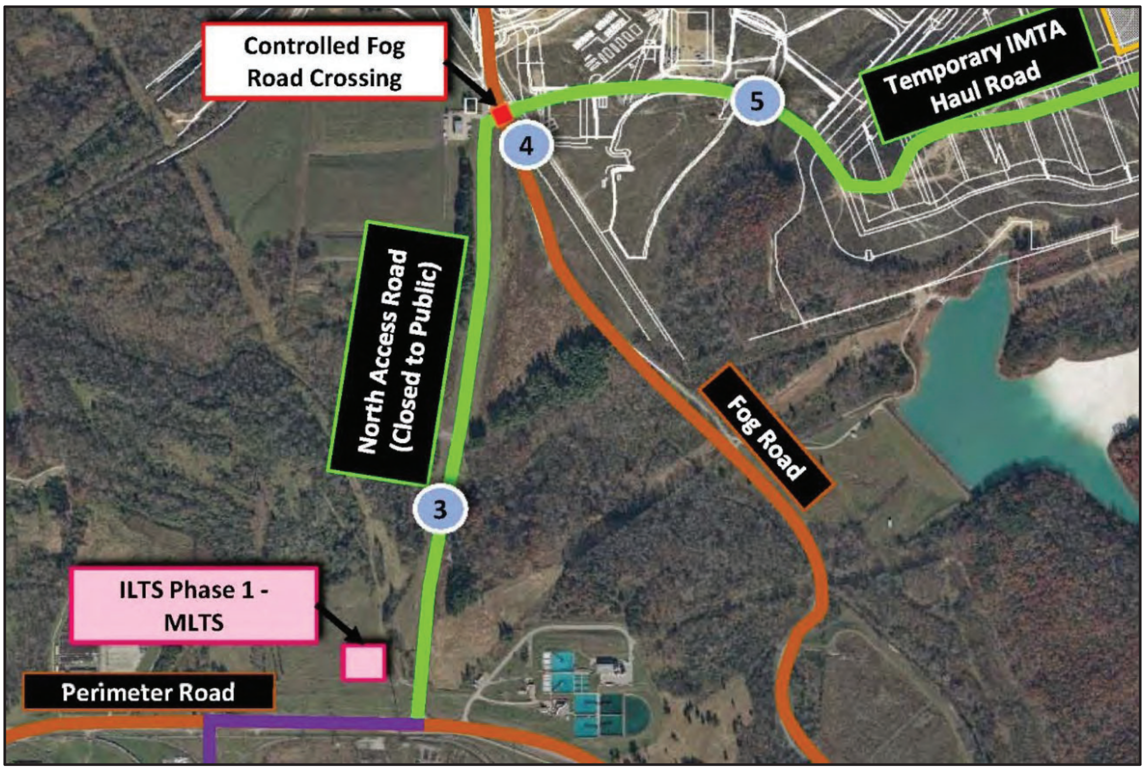


Note: Numbered circles in this figure correspond to text in Section 2.2 and identify the locations of activities described in the text.

Figure 5. Planned Haul Route inside the PORTS Limited Area during Initial Operations

3 **North Access Road.** Waste transport vehicles proceed along the North Access Road to the intersection with Fog Road. Figure 6 shows the North Access Road section of the waste transfer route. The North Access Road will be closed to public and site traffic between Perimeter Road and Fog Road at the onset of the initial operations phase. Controls (e.g., barriers, gates, personnel, route restrictions, speed limits) which are described further in Section 4.2, Waste Transfer Authorization, are utilized to ensure the safety of workers and the public. The road is maintained free of removable surface activity that would require radiological controls to be established (less than 1,000 dpm/100 cm^2). Performance of radiological surveys and monitoring of the road is further described in Section 4.7, Contamination Control. (Note: The OSWDF Project intends to keep the North Access Road segment closed for the duration of initial operations. Reopening the road is not prohibited, however, as long as the surface contamination limits of 10 *CFR* 835, *Occupational Radiation Protection,* are met and waste transfers paused).

4 **Controlled Fog Road Crossing.** As shown on Figure 6, the waste transfer route intersects Fog Road at the OSWDF Project Area. The Controlled Fog Road Crossing is established to prevent public access to this intersection during waste transfer activities. The Controlled Fog Road Crossing can be opened to allow public traffic to proceed on Fog Road after controls are in place to stop waste transport vehicles and radiological surveys have been completed. Section 4.7 provides complete details for opening the crossing to the public. Responsible personnel will ensure that emergency vehicles have unfettered access through the intersection and that radiological follow-up surveys and procedures are implemented, as necessary.

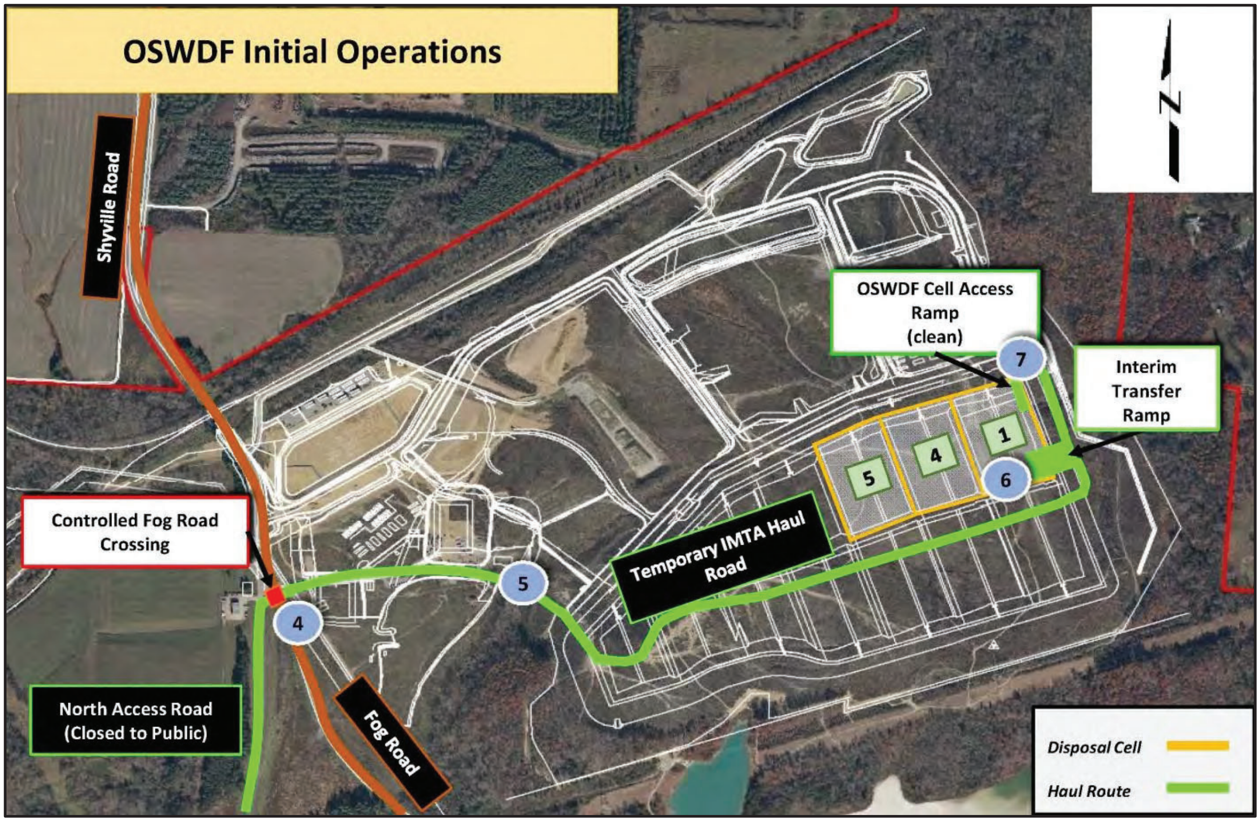


Note: Numbered circles in this figure correspond to text in Section 2.2 and identify the locations of activities described in the text.

Figure 6. Section of North Access Road Closed to the Public and Site Workers

5 **Transfer Route within the OSWDF Project Area.** Temporary gravel roads are used to move waste within the OSWDF Project Area during initial operations. A Temporary IMTA Haul Road begins just after the Controlled Fog Road Crossing. Figure 7 shows the waste transfer route within the OSWDF Project Area.

Temporary haul roads and ditches are graded to prevent clean runoff from draining into the OSWDF from surrounding areas. Water or dust suppressants are applied to gravel roads, as necessary, to prevent or mitigate dust. Vehicle speeds are controlled to minimize dust generation on unpaved (aggregate) surfaces.



Note: Numbered circles in this figure correspond to text in Section 2.2 and identify the location of activities described in the text.

Figure 7**. Temporary Haul Roads within the OSWDF Project Area**

Waste Offloading. During the initial operations phase, ramps are used to offload waste across the contamination boundary of the OSWDF. Waste transport vehicles do not enter the active waste placement area to offload waste during this phase. A description of waste offloading follows and is illustrated on Figure 7.

6 Vehicles with beds that can be raised for unloading (e.g., dump truck, roll-off truck) bring waste to an Interim Transfer Ramp located at the edge of Cell 1. Waste is unloaded over the back of the Interim Transfer Ramp onto a protected working surface inside the cell.

7 Certain waste streams, such as oversize waste, transite panels, bagged asbestos, and bagged beryllium-containing waste, cannot be unloaded from the Interim Transfer Ramp. Bagged asbestos-containing material (ACM) and beryllium-contaminated wastes require special handling to maintain integrity of the package and prevent any dispersion of the contents in compliance with ARARs 10 *CFR* 850.32 and *OAC* 3745-20-06 (Appendix A). Unbagged asbestos, such as transite, must also be handled in a manner that prevents breakage or dispersion of the ACM and prevents visible emissions.

Wastes that require special offloading are typically delivered by an on-road truck/flatbed trailer combination that will use the OSWDF Cell Access Ramp shown at the northeast corner of Cell 1. (Note: The precise location of the Clean Access Ramp in the cell can change based on construction timing). Trucks remain on the ramp while the waste is off-loaded from the truck or trailer over the contamination boundary line and into the cell. Offloading is performed manually or with equipment, as appropriate. The road surface of both the Interim Transfer Ramp and the OSWDF Cell Access Ramp will be maintained free of removable surface activity the same as the haul road (see Section 4.7, Contamination Control).

Although waste is verified by the WAO prior to and during load-out, the WAC Implementation Plan states that the WAO will again visually verify waste for prohibited items when received at the OSWDF. In the unlikely event that an anomaly occurs and a prohibited item is found in the waste, it is handled in accordance with the processes contained in the WAC Implementation Plan. Section 8.1 summarizes this process and the management of this potential operating issue.

Contamination Control. Although the waste transport vehicles never enter the active cell, the exterior of the vehicle and packaging are verified to meet the release criteria provided in Section 4.7, Contamination Control (e.g., removable surface activity less than 1,000 dpm/cm^2; no visible waste on exterior surfaces) before it is released from the offloading area. The waste handling area of the vehicle (e.g., truck bed, roll-off box interior) must be closed and contaminated material contained (e.g., gasket and cover integrity checked, tarp secured, lift gate closed and locked), before the vehicle exits the area. These criteria are established to meet DOT packaging equivalency requirements and prevent inadvertent transfer of hazardous materials to the haul road. Release criteria and conduct of radiological surveys are fully described in Section 4.7. (Note: If deficiencies are identified, repairs will be made before the vehicle is returned to service. Release of hazardous materials will be prevented with a temporary patch or similarly effective means while the vehicle is moved to a controlled location for repair. A more thorough inspection is performed after the vehicle returns to the waste generator and before load-out).

Environmental Monitoring. Environmental monitoring is conducted under the OSWDF PSVP to confirm waste transfer activities are being conducted in a manner that meets performance standards established by ARARs for protection of human health and the environment. Surface water is sampled downgradient of the North Access Road to confirm contamination controls during waste transfer. Air monitoring confirms the effectiveness of emission controls used to mitigate the release of contaminants to the air. Analytical results are evaluated against conservative criteria established by the OSWDF PSVP to provide early detection of conditions that, left unaddressed, could result in performance standards being exceeded.

2.3 OSWDF WASTE PLACEMENT OPERATIONS

This section provides a general description of OSWDF initial operations within the active waste footprint. Detailed waste placement and compaction requirements of the OSWDF design are provided in the IMPP (Appendix B).

Waste Placement and Compaction. After waste is offloaded into the active cell, the impacted material is moved to the designated disposal location using heavy equipment that remains inside the waste placement area.

OSWDF Operations personnel place and compact waste in accordance with the IMPP (Appendix B). Waste is placed in a manner that protects the liner system, minimizes differential settlement and the generation of fugitive dust, protects the health and safety of workers and the public, and isolates the waste from the environment. The Construction Quality Control (CQC) Organization performs waste placement compaction testing in accordance with the OSWDF CQA Project Plan and the IMPP water or a fixative may be applied to the OSWDF working face (i.e., active waste placement area) and other disturbed areas to prevent or suppress dust during waste placement. Fires hazards are prevented by wetting waste prior to and during placement. Waste that creates a fire hazard is covered by OSWDF operations on a daily basis.

Placement of classified material is performed in accordance with the OSWDF Security Planning Document.

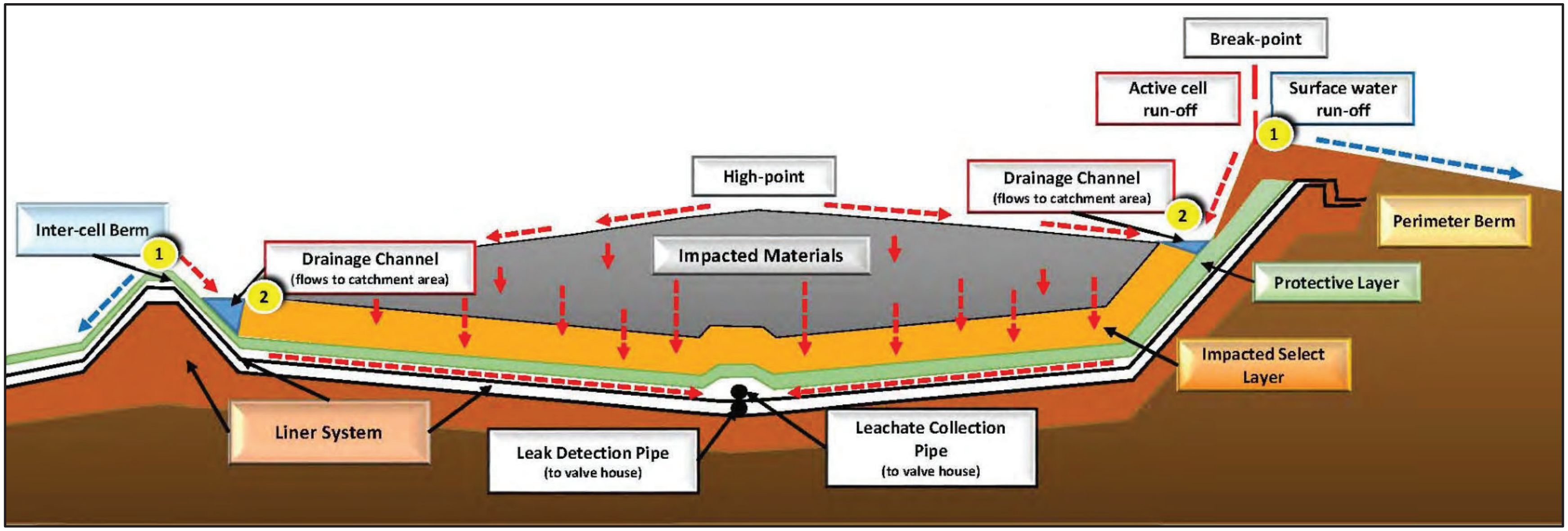
Prior to waste placement, each cell is divided into grids and each grid is marked with a letter and number that is used to track final horizontal disposal locations. The boundaries and locations of each grid are located and mapped by means of a land survey. Waste is also placed in layers within the OSWDF. These layers are called "lifts." The vertical location of waste in the OSWDF is tracked by lift. This process is described in detail in the IMPP (Appendix B).

The IMPP, Appendix B, defines five materials types: Type 1 – Soil and Soil-like Material, Type 2 – Debris, Type 3 – Individually Handled Large Debris, Type 4 – Decomposable, and Type 5 – Special Handling. Type 1 waste may be stored in the active cell to cover Types 2 to 5 wastes, to cover classified material waste, or for other actions as needed. Type 2 waste may be temporarily stored, as approved by the OSWDF Operations Manager, if it cannot be placed due to operating problems such as inclement weather or equipment malfunction. Special handling/placement plans are developed under the IMPP for waste with specific handling or disposal needs (Type 5) (e.g., ACM, beryllium-contaminated waste, segmented converters). ACM and beryllium-contaminated waste must be disposed of in a manner that protects the integrity of the package, prevents breakage of unbagged ACM, and avoids dispersion of material. The IMPP requires waste received by the OSWDF to be segregated by these material types.

Waste Tracking. The OSWDF Organization provides daily tracking of waste placement, including daily truck counts for each type of waste, daily waste placement volumes, and the location of each lift (material layer within a cell) of waste as it is placed in the OSWDF. The WAO verifies waste placement within the designated cell and waste documentation. Waste is considered disposed of once it has been placed in the appropriate grid/lift/cell and the recorded disposal location verified by the WAO. The CQC Contractor prepares daily placement sketches showing waste type, lift numbers, and grid designation after waste is dispositioned.

Dust Control. Dust control is implemented proactively during waste handling activities in the OSWDF to prevent the airborne release of contaminants above air quality standards. Fugitive dust may carry radiological, chemical, and asbestos contaminants. Water or other fixatives are applied as necessary to waste being dispositioned at the OSWDF to prevent dust and minimize airborne emissions. Water or a soil fixative may be applied to access roads within the OSWDF, the working face, and other disturbed areas using hand-held sprayers or mobile water trucks to prevent or suppress dust. Monitoring of fugitive dust is performed visually. OSWDF personnel are responsible to observe the work areas for the potential for or actual generation of dust. Dust conditions shall be reported to the supervisor or foreman in the work area, who will arrange for immediate wetting of the area and implement other dust control measures as needed. If necessary, work activities will be modified or stopped until dust is controlled. Dust control water which falls within the active cells of the OSWDF is collected and managed as leachate.

Run-on and Runoff Control. During waste placement operations, precipitation generates runoff inside active cells of the OSWDF that must be captured and managed. Runoff inside the active cells is managed as leachate. A description of run-on and runoff management follows and is illustrated on Figures 8 and 9.

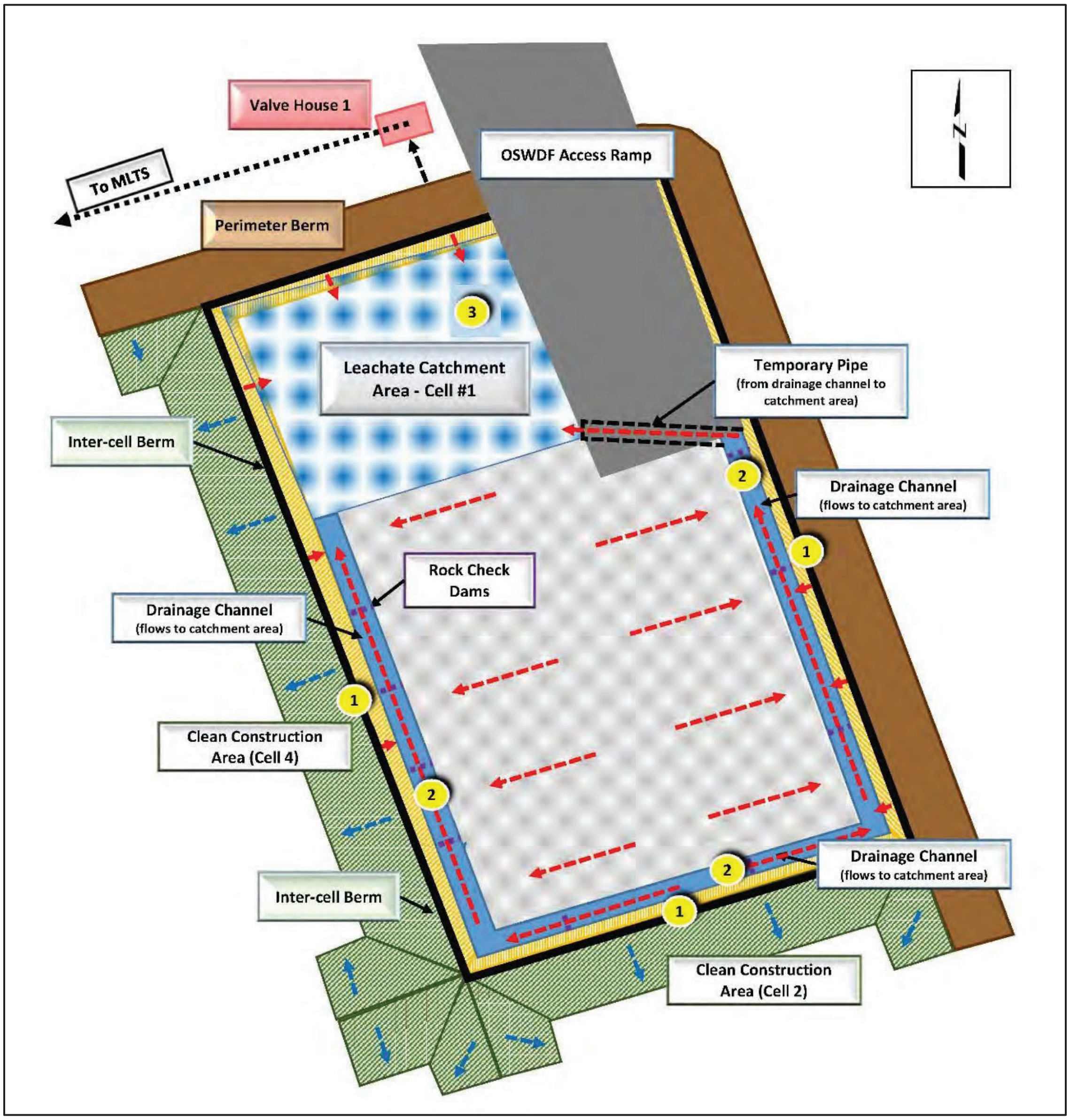


Note: Numbered circles in this figure correspond to text in Section 2.2 and identify the location of activities described in the text.

Figure 8. Run-on and Runoff Management at Active Waste Placement Cells – Cross-Section

1 The inter-cell berm provides a physical barrier between the contaminated operating cells and clean liner construction in adjacent cells. A radiological boundary (e.g., temporary fencing) for the operating cell is also established at the inter-cell berm in accordance with 10 *CFR* 835, *Occupational Radiation Protection*, and in coordination with the OSWDF Operations Manager and site security. The inter-cell berm is a raised part of the OSWDF floor and liner system that creates individual cells within the OSWDF. The inter-cell berm consists of Compacted Clay Liner (thickness of the clay varies depending on height of the berm at a particular location but is always at least 3 ft thick), Secondary Liner (Geosynthetic Clay Liner (GCL) Geomembrane, Geotextile); LDS; Primary Liner (GCL, Geomembrane, Geotextile); LCS; Geotextile Filter; and Protective Layer. Graded slopes at the cell perimeter berm and inter-cell berm provide a break-point to prevent run-on flow into the active waste placement area (40 *CFR* 264.301[g] and *OAC* 3745-57-03[G]) and to contain runoff inside the active cell area.

2 Temporary drainage channels located along the perimeter of the active cell convey runoff to a Leachate Catchment Area.



Note: Numbered circles in this figure correspond to text in Section 2.2 and identify the location of activities described in the text.

Figure 9. Run-on and Runoff Management at Active Waste Placement Cells – Plan View

3 The Leachate Catchment Area is located at the low point of the cell. Runoff collected in the Leachate Catchment Area is managed through the LCS, which is described in detail in the LISWSP (Appendix C).

The IMPP (Appendix B) provides the specific requirements for control and management of runoff inside the active cell. Similar to the surface water runoff controls used outside the OSWDF footprint, the IMPP describes use of erosion and sediment controls inside the active cell including filter socks, check dams, and silt fence. Silt fences are used on vertical slopes to reduce erosion. The temporary drainage channels installed to convey runoff inside the cell to the Leachate Catchment Area include check dams and outlet protections installed to reduce runoff velocity and promote settling.

Environmental Monitoring. Environmental monitoring is conducted under the OSWDF PSVP to confirm OSWDF waste placement activities are being conducted in a manner that meets performance standards established by ARARs for protection of human health and the environment. Surface water samples are collected from streams downgradient of the OSWDF Project Area, air samples are collected and external radiation is monitored around the project perimeter, groundwater wells installed upgradient and downgradient of OSWDF cells are sampled to verify groundwater remains protected, and groundwater seeps in the area, if present, are identified and characterized to confirm absence of contamination. Analytical results are evaluated against conservative criteria established by the OSWDF PSVP to provide early detection of conditions that, left unaddressed, could result in performance standards being exceeded.

2.4 OSWDF LEACHATE MANAGEMENT SYSTEM OPERATIONS

The purpose of the OSWDF Leachate Management System is to manage (i.e., capture, contain, and convey) leachate that is generated within the OSWDF and to provide early detection of leaks.

Leachate from the OSWDF is collected in the LCS, detected (if present) in the LDS, and conveyed by gravity to the valve houses that are located outside the limits of impacted material in close proximity to the perimeter of the OSWDF. Each cell has a dedicated valve house, which provides access to the valves, piping, fittings, monitoring and sampling ports, and other ancillary equipment required to regulate, monitor, and maintain performance of the LCS, LDS, and the Leachate Transmission System. The valve houses are shown on Figure 10. Valve house numbering corresponds to the associated cell (e.g., VH-1 is the valve house dedicated to Cell 1).

This section provides a general description of Leachate Management System functions. Detailed information for the O&M on the OSWDF Leachate Management System, including operating parameters, potential operating problems, and alternate operation, is provided in the LISWSP (Appendix C).

OSWDF Leachate Collection System. The OSWDF LCS is designed to (1) remove leachate that accumulates on the OSWDF liner system and (2) remove leachate that accumulates within the Leachate Catchment Area of active cells during impacted material placement. Leachate is collected separately for each cell liner system and conveyed by gravity towards the perimeter of the cell and into the cell’s designated valve house.

Leachate Transmission System. Figure 10 also shows how leachate is conveyed from the individual valve houses to the ILTS Phase 1 – MLTS for treatment. Leachate from valve houses of Cells 1, 4, and 5 flows by gravity via the North Leachate Transmission System to the North Lift Station. The lift station allows leachate from the gravity drainage system to be transferred to a forcemain (pumped) system (i.e., the North Forcemain). This forcemain ultimately merges with the influent conveyance line to transfer leachate to the ILTS Phase 1 – MLTS for treatment.

Detailed O&M of the OSWDF Leachate Management System, including start-up, operating parameters, potential operating problems, and alternate operation is detailed in the LISWSP (Appendix C). The LISWSP describes the process for monitoring flow in the LCS and LDS as required by ARARs (40 *CFR* 761.75[b][7] and 40 *CFR* 264.303[c][1]).

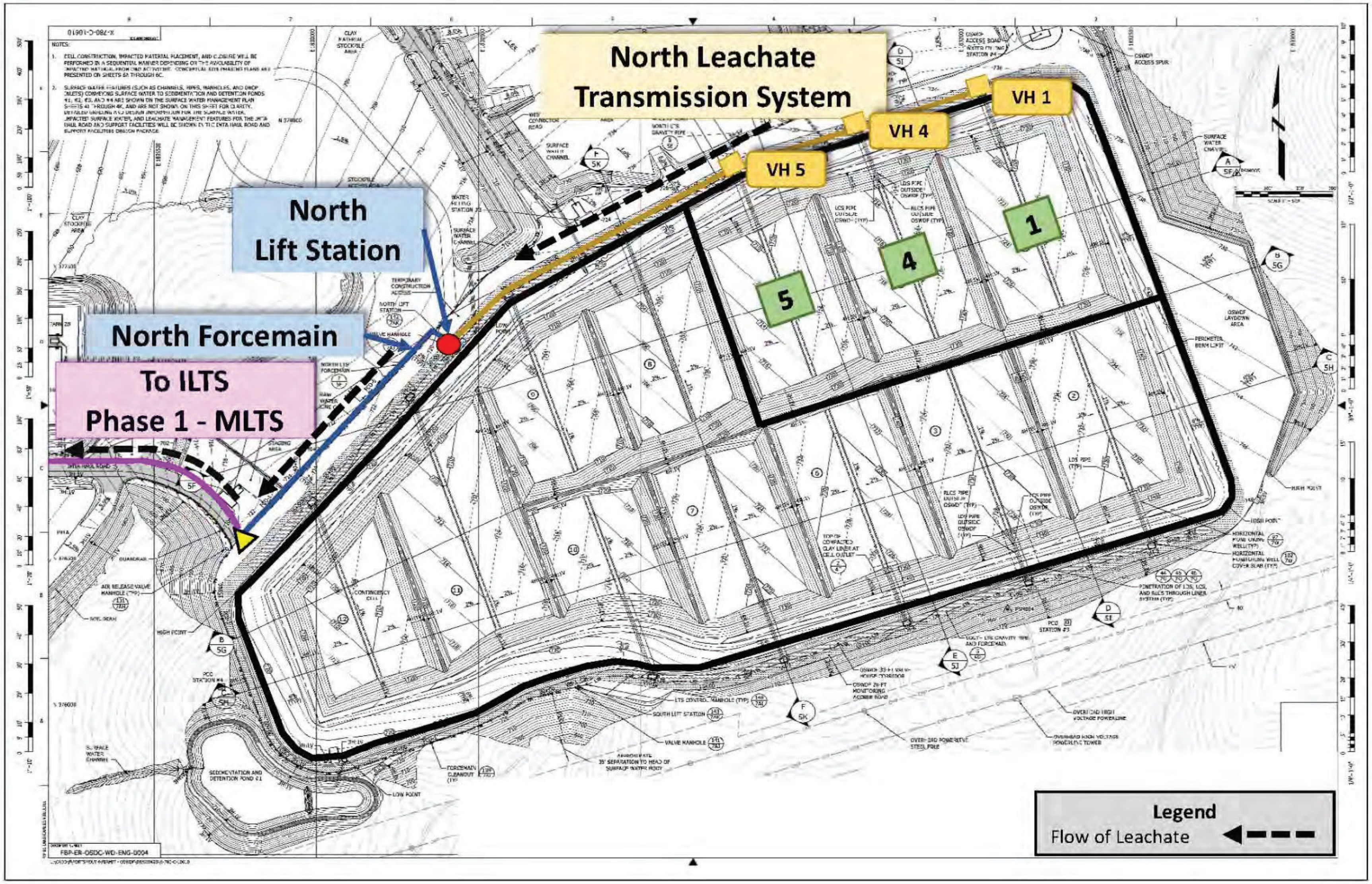


Figure 10. OSWDF and Leachate Management System

Leachate Monitoring. The OSWDF PSVP provides the leachate monitoring program for the OSWDF that has two primary elements: (1) a leachate collection and characterization component, which satisfies regulatory requirements for leachate collection and characterization; and (2) a leak detection component, which provides information to verify the ongoing performance and integrity of the OSWDF. Leak detection involves (1) tracking the quantity of liquid produced within the LCS and LDS over time and (2) regular monitoring of the leachate, horizontal monitoring wells, and groundwater in a manner that allows comparison and correlation of results. O&M of the equipment used to track the quantities of leachate in the LCS and LDS is described in the LISWSP (Appendix C).

2.5 SURFACE WATER MANAGEMENT

The OSWDF Design Package divides management of surface water into two categories: (1) surface water and (2) potentially impacted surface water (i.e., surface water that has the potential to be contaminated).

As defined in Section 1.2 surface water consists of precipitation or water from dust control that falls in areas maintained to be free of contamination. Surface water is managed in accordance with the Surface Water Management, Erosion, and Sediment Control Plan shown on Figure 1. Surface water runoff is directed to sedimentation and detention basins via channels and pipes. The sedimentation basins serve as temporary settling ponds that release surface water at a controlled rate, detaining it long enough to allow most of the sediment to settle.

During initial operations, roads and vehicle exteriors are maintained free of loose contamination (as described in Section 2.2) to allow precipitation and water from dust control that falls on the roads to be managed as surface water.

Environmental Monitoring. Surface water monitoring is conducted under the OSWDF PSVP to confirm OSWDF initial operations are conducted in a manner that meets performance standards established by ARARs for protection of human health and the environment. Surface water samples are collected from streams in the OSWDF Project Area, including points downstream of Sedimentation and Detention Ponds 2, 3, and 4 and the North Access Road, to confirm that contaminants are not migrating into surface water bodies and to allow early detection of conditions that, left unaddressed, could result in performance standards being exceeded. Analytical results are evaluated against criteria established by the OSWDF PSVP to provide early detection of conditions that, left unaddressed, could result in performance standards being exceeded.

2.6 OPERATIONAL LIMITS DURING INITIAL OPERATIONS

Operational limits for the OSWDF are provided in the following sections.

2.6.1 Operational Limits Derived from the Hazard Categorization

The OSWDF is categorized in *Hazard Analysis for the Operations of the Portsmouth Gaseous Diffusion Plant X-780 On-Site Waste Disposal Facility and Interim Leachate Treatment Facility* (OSWDF Hazard Analysis) (Fluor-BWXT Portsmouth LLC [FBP] 2017) as a Less than Category 3 nuclear facility in accordance with DOE requirements. There are specific operational limits established by the OSWDF Hazard Analysis to maintain this categorization.

The OSWDF Hazard Analysis evaluates waste destined for on-site disposal generated from the three process buildings and contaminated fill sources; however, not every waste stream destined for on-site disposal has been evaluated by the current hazard analysis. These waste streams must be evaluated before transfer to the OSWDF, which is reflected in these operational limits. This requirement, as well as other restrictions on waste characteristics is included in the WAC Implementation Plan as WAC Component 6, Waste Safe Handling Criteria.

The operational limits associated with waste handling at the OSWDF from the OSWDF Hazard Analysis are summarized in this section to demonstrate the rigor applied to operations with respect to nuclear materials. Operations will comply with the most current version of the Hazard Analysis. Therefore, limits expressed in any future revisions of the OSWDF Hazard Analysis supersede those listed here.

- The OSWDF Operations Manager must follow approved procedures to ensure that all activities at the OSWDF are within the approved safety basis, or that appropriate safety documentation is generated before radioactive or hazardous materials are received by the OSWDF.

- The Operations Manager will ensure that all activities are within the approved safety basis, or that proper safety documentation is generated before an activity is performed.

- Waste streams designated for placement into the OSWDF must be evaluated and authorized for disposal by the OSWDF Hazard Analysis.

- Waste streams designated for placement into the OSWDF containing fissile isotopes (uranium-235) with enrichment greater than or equal to 1.0 wt. percent must comply with the requirements of the OSWDF Hazard Analysis and Nuclear Criticality Safety (NCS) Determination for establishing criticality incredible. (Note: Criticality incredible is defined as a condition in which an inadvertent nuclear criticality is a non-credible event without implementation of any further Nuclear Criticality Safety specific controls).

- Sealed radioactive sources that are engineered to pass the special form testing specified by the U.S. Department of Transportation (DOT) in 49 *CFR* 173.469, or testing specified by the American National Standards Institute N43.6 “Sealed Radioactive Sources, Categorization,” may be excluded from summation of a facility’s radioactive inventory.

- Check sources used at the OSWDF shall be in compliance with the PORTS sealed source program.

- Internally grouted process gas components may not be placed at the OSWDF until they are analyzed by NCS personnel and the OSWDF Operations Manager.

- Internal filling of components (i.e., sand filling, grouting) may not be performed at the OSWDF prior to being analyzed by NCS personnel and the OSWDF Operations Manager.

- No size reduction of intact process gas equipment (PGE) components (convertors, compressors, coolers) is allowed at the OSWDF.

- Operations may not be conducted at the OSWDF during severe weather (i.e., high winds, lightning, or other severe weather).

- No more than 12 trucks may unload in the OSWDF simultaneously. This is based on a maximum individual dump truck capacity of 87,000 lb (e.g., a Caterpillar Model 740/740b articulated truck) unless adjusted based on analysis and proper authorization.

- No more than 26 intact PGE components (i.e., compressors) shall be allowed uncovered in a cell at a time unless adjusted based on analysis and proper authorization.

- Dispersible wastes shall be limited to an exposed surface area of 21 acres. Maximum exposed surface area may be adjusted based on analysis and proper authorization. Exposed surface area includes the portion of active cells that are receiving or have received waste and have not been covered with either clean fill or membrane, or have not had a wetting agent or chemical fixative applied to prevent wind erosion.

- The leachate tanks are designed to exceed the 85-mph wind loading per American Society of Civil Engineers/Structural Engineering Institute (ASCE/SEI) 7-05, *Minimum Design Loads for Buildings and Other Structures.*

2.6.2 Operational Limits for Air Emissions Control During Waste Transfer and Placement

Trichloroethene (TCE) and other contaminated particulate matter are present in D&D and excavation material intended for disposal in the OSWDF. The OSWDF Project has conducted initial emissions assessment and dispersion modeling to evaluate potential emissions of volatile organic compounds (VOCs), hazardous air pollutants (HAPs) including TCE and PCBs, and particulate matter less than 10 microns in diameter (PM-10) and radionuclides from OSWDF operations. This assessment is being used to determine whether operational limits (via administrative or engineering controls) may be necessary to protect site workers, the public, and the environment during material handling operations at the OSWDF.

OAC 3745-15-07 does not allow the emission of smoke, ashes, dust, dirt, grime, acids, fumes, gases, vapors, or any other substances or combination of substances into open air from any source in such a manner or in such amounts as to endanger the health, safety, or welfare of the public. *OAC* 3745-15-05(B) exempts sources of air pollution from regulation under Chapter 3704 of the *Revised Code* unless: 1) the potential emissions exceed 10 lb per day of any contaminant; 2) the source emits more than 1 ton per year of any hazardous pollutant, or combination of hazardous pollutants; or 3) if the source emits radionuclides. The OSWDF is anticipated to emit more than 1 ton/year of the HAPs and is a source of radionuclide emissions; therefore, the facility does not qualify for the exemption.

The air dispersion modeling used AERMOD, a steady-state plume model that incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts, including treatment of both surface and elevated sources, and both simple and complex terrain. The initial steps of the evaluation method described in an Ohio EPA document titled “Option A – Review of New Sources of Air Toxic Emissions” (issued May 1986 and sometimes known as the Air Toxic Policy) were completed as part of this modeling effort. The potential emissions of VOCs, HAPs (toxics), and PM-10 were calculated and the AERMOD air dispersion model was used to assess the potential concentrations of pollutants on site and off site. Radiological emissions were evaluated using the CAP-88 model and the potential dose to the maximally exposed individual is less than 0.1 mrem from the air pathway.

Initial air modeling evaluates placement of waste in Cells 1, 4, and 5 of the OSWDF, D&D of the X-326 Process Building, and excavation of the X-740 Plume, X-231B Oil Biodegradation Plot, and X-231A Oil Biodegradation Plot. Preliminary model runs indicate potential emissions of TCE and other HAPs in ambient air from OSWDF operations do not exceed on-site or off-site maximum acceptable ground level concentrations (MAGLCs) established by Ohio EPA. Uncontrolled emissions of PM-10 meet the MAGLC for on-site emissions of PM-10 but may exceed the MAGLC calculated for off-site emissions of

PM-10. Emissions of PM-10 from gravel haul roads are the biggest contributor to the off-site PM-10 concentrations. An overall air modeling report will be provided to Ohio EPA for review as a separate submittal that supports OSWDF, D&D, and excavation project planning.

Controls will be used to mitigate particulate air emissions during OSWDF activities. Water and dust suppressants will be used to mitigate dust on roads in the project area. Dust suppression will also occur in the OSWDF to during off-loading and waste handling activities as described in Sections 2 and 3 of the OSWDF O&M Plan.

The OSWDF PSVP provides the plan for monitoring ambient air during OSWDF operations. Under the OSWDF PSVP, samples are collected from a network of air monitoring stations and evaluated to proactively determine if controls for ambient air emissions are effective and whether changes to the controls are warranted. Operational activities are adjusted, as necessary, based on the results of this evaluation.

3. FULL-SCALE OPERATIONS PHASE

Full-scale operations begin when the IMTA, IMTA Haul Road, the IMTA ISWMS, Wheel Wash Facility, and ILTS Phase 2 are constructed and operational. The primary tasks associated with full-scale operations described in this section are start-up, waste transfer, OSWDF operations, OSWDF Leachate Management System operations, IMTA operations, IMTA Leachate Management System operations, surface water management, and operational limits and monitoring.

Waste is transferred along dedicated haul roads to the OSWDF Project Area. The IMTA Haul Road replaces use of the North Access Road, and the IMTA is available for temporary storage of waste outside the OSWDF. Waste is hauled directly to the designated final disposal location inside the OSWDF or to the IMTA for storage during full-scale operations, and vehicles undergo wheel washing to remove potential contamination before leaving the OSWDF Project Area. Leachate and wastewater are treated at the ILTS Phase 2. The remaining cells of the OSWDF are filled during the full-scale operations, and the first cell cover system is constructed after both Cells 1 and 2 are filled. (Note: installation of cell cover systems are an example of construction activities as defined in Section 1.2 that occur adjacent to OSWDF operations activities.)

The following support infrastructure is also included in the full-scale operations phase:

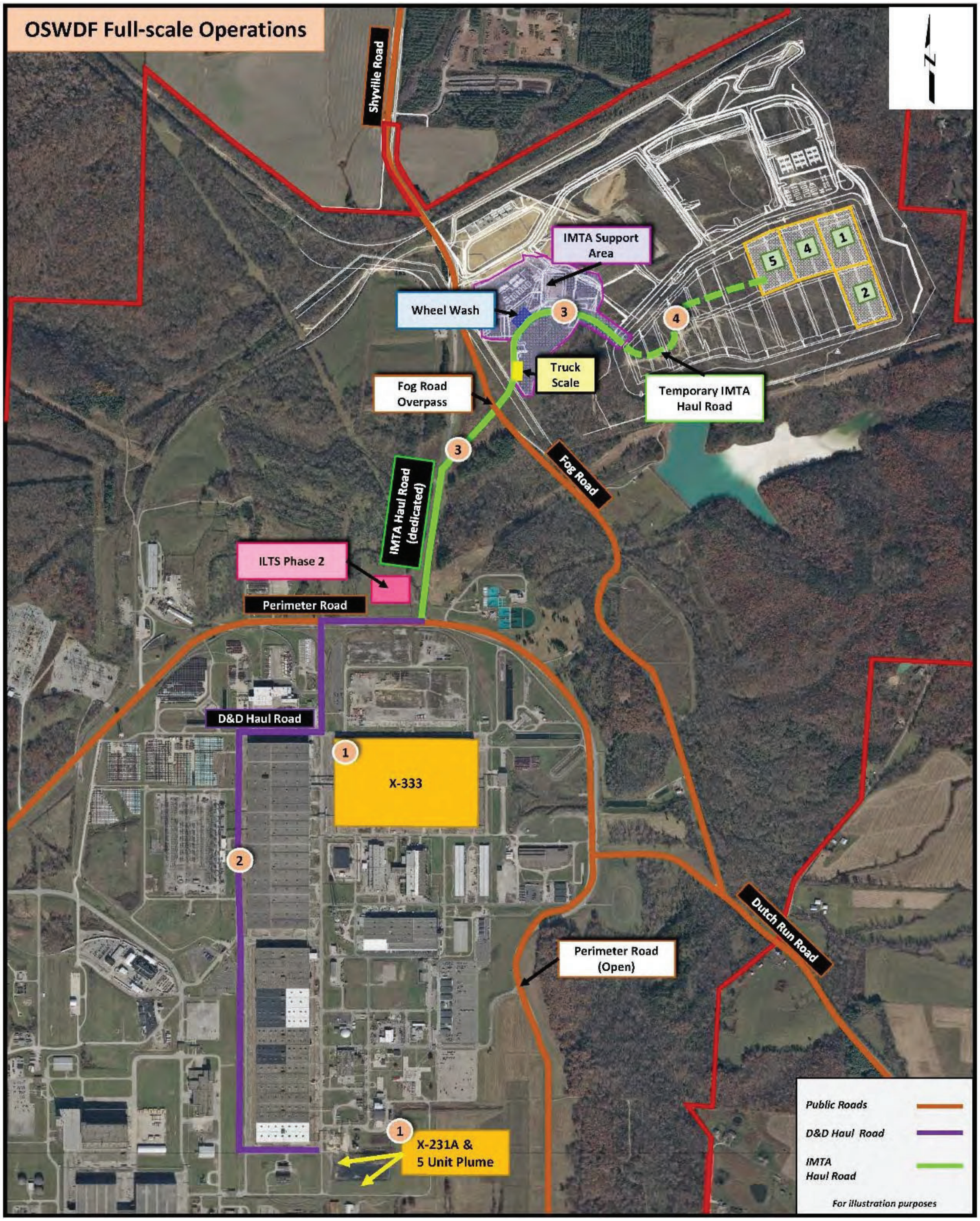
- IMTA
- IMTA Haul Road
- IMTA ISWMS
- Wheel Wash Facility
- ILTS Phase 2 (ILTS influent and effluent conveyance lines constructed prior to ILTS Phase 1 – MLTS)
- Permanent Truck Scale
- South Leachate Transmission System.

Figure 11 provides an illustration of the site during full-scale operations. The following sections describe the operational activities conducted during this phase.

3.1 START-UP FOR FULL-SCALE OPERATIONS

Prior to first waste placement, the following activities will be performed to ensure that operations can proceed safely and in compliance with applicable requirements:

- **Functional Checkout of OSWDF Support Systems.** Functional checkout will be performed for the newly constructed systems (e.g., IMTA Leachate Management System and IMTA ISWMS) to verify that electrical, mechanical, and instrumentation components are correctly installed and functional. The functional checkout includes limited system operation to verify system interlocks and full system operation to confirm operation is consistent with design criteria.



Note: Numbered circles in this figure correspond to text in Section 3.2 and identify the location of activities described in the text.

Figure 11. Full-Scale Operations

- ILTS Phase 2 start-up and testing. Start-up of the ILTS Phase 2 will be performed to verify that the systems and associated controls operate as designed. Testing, the initial operational period following start-up during which adjustments are made, will be performed to ensure that the performance standards for the system are being reliably achieved. (Note: The ILTS Phase 2 start-up and testing is addressed in the ILTS Design Package and is not included in the scope of this OSWDF O&M Plan).

- Construction Completion Report. Final Construction Completion Report(s) shall be prepared by the CQA Officer and concurred with by Ohio EPA as specified in the Comprehensive OSWDF RD/RA Work Plan for newly constructed remedy components.

- Environmental monitoring. Baseline groundwater samples specified in the OSWDF PSVP for the IMTA have been collected and analyzed.

- Development of field work instructions. Work packages and standard operating procedures will be developed for newly constructed remedy components.

- Training. The training program developed for the initial operations phase will be updated for the newly constructed remedy components. OSWDF personnel (and subcontractors) will successfully complete appropriate classroom and on-the-job training.

- Management self-assessment. Management self-assessments will be performed to verify training, procedures and work control documents, supporting documents and plans, facility and equipment modifications, and equipment testing, calibration, and inspection; to ensure that safety documents are current, approved, and properly controlled; and to review administrative and engineering controls to prevent and mitigate hazards. The management self-assessment covers safety documentation, training, resources, hazard identification and mitigation, equipment, roles and responsibilities, procedures, and environmental compliance.

The same graded approach to start-up used during initial operations will be performed following prolonged shutdowns, seasonally, and prior to first waste placement in each OSWDF cell during full-scale operations.

3.2 WASTE LOAD-OUT AND TRANSFER

Transfer of waste to the OSWDF during full-scale operations continues to be performed as described in Section 4. The haul route intersection with Fog Road that existed during initial operations is eliminated during full-scale operations. An overview of waste loadout and transfer operations follows.

> NOTE: The numbers in the colored circles below correspond to the matching numbered circles on Figures 4 through 9, 11, 12, and 15. The following descriptions refer to activities that take place at the matching locations marked on the figures.

1 Waste Load-out. The waste load-out process during full-scale operations is the same as during initial operations. Waste generators continue loading waste into vehicles for transfer to the OSWDF. The generating project verifies the vehicle exterior is free of visible waste material and meets the radiological release criteria for the road provided in Section 4.7 before it exits the project area. The generating project decontaminates the vehicle as necessary. The WAO visually verifies waste being loaded is compliant with the waste profile, inspects the load-out process to check for prohibited items, and

confirms that the waste safe handling, packaging, and transportation WAC have been met. Vehicles are not released without WAO authorization (see Figure 11).

2 **Project-Specific Haul Routes.** Project-specific haul routes are established by waste generators to provide controlled transfer of waste from the point of generation to the IMTA Haul Road. Similar to initial operations, site traffic is prevented from accessing these roads when waste hauling is occurring. Removable surface activity on project-specific haul routes is maintained below levels requiring radiological controls to be established.

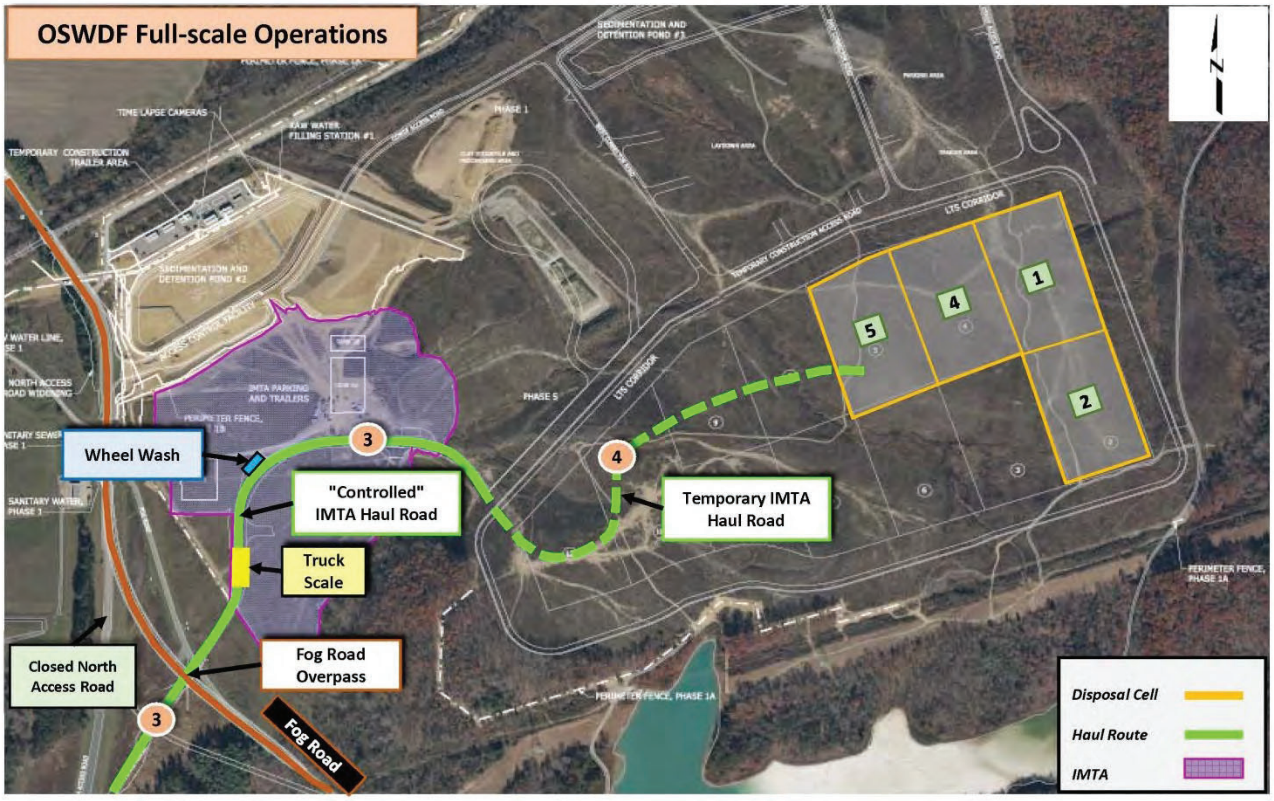
3 **IMTA Haul Road.** The IMTA Haul Road is specifically dedicated to transferring waste from Perimeter Road to the OSWDF and IMTA. Overpasses or alternate traffic routes are used to allow public and site traffic to travel around the PORTS site using Perimeter Road without crossing the haul route. The security fence is extended along the length of the IMTA Haul Road to prevent unauthorized access. The IMTA Haul Road outside the OSWDF Project area is maintained free of removable surface activity that would require radiological controls to be established.

Transport vehicles haul waste on the IMTA Haul Road to the OSWDF truck scale, where personnel weigh the vehicle and record the vehicle weight. From the truck scale, vehicles are directed to the IMTA or to the OSWDF.

4 **Temporary IMTA Haul Road.** At the edge of the OSWDF, the paved haul road through the IMTA becomes a gravel haul road. The Temporary IMTA Haul Road is used to move waste directly into the OSWDF active waste placement area. As an example, Figure 12 shows this temporary road leading to Cell 5; the actual location will vary as necessary to facilitate cell construction. Water is applied to the gravel road, as necessary, to control dust. Runoff from the road is managed as potentially impacted surface water and directed to the IMTA ISWMS.

Waste Offloading. Loaded vehicles drive directly into the active waste placement area to the grid designated for disposal of the waste in accordance with the IMPP (Appendix B). Bulk wastes are unloaded from the vehicle bed directly into the grid. Waste streams that require special handling during offloading (e.g., oversize waste, transite panels, bagged asbestos, and bagged beryllium-containing waste) are removed from the vehicle manually or with equipment, as appropriate, and placed inside the waste placement grid. Bagged ACM and beryllium-contaminated wastes require special handling to maintain integrity of the package and prevent any dispersion of the contents in compliance with ARARs 10 *CFR* 850.32 and *OAC* 3745-20-06 (Appendix A). Unbagged asbestos, such as transite, must also be handled in a manner that prevents breakage or dispersion of the ACM and prevents visible emissions.

Although waste is verified by the WAO and the generators prior to and during load-out, the WAC Implementation Plan states that the WAO will again visually verify the waste for prohibited items when received at the OSWDF. In the unlikely event that an anomaly occurs and a prohibited item is found in the waste, it is handled in accordance with the processes contained in the WAC Implementation Plan. Section 8.1 of this OSWDF O&M Plan summarizes this process and the management of this potential operating issue.



Note: Numbered circles in this figure correspond to text in Section 3.2 and identify the location of activities described in the text.

Figure 12. Transfer Route Inside OSWDF Project Area

Contamination Control. After offloading waste, the waste handling area of the vehicle (e.g., truck bed, roll-off box interior) is closed and contaminated material contained before the vehicle leaves the waste placement area. Vehicles proceed to the Wheel Wash Facility to remove visible waste material that may contain radiological contamination or other contaminants of concern. An automatic sprayer will spray the bottom of the haul trucks and a manually operated hose will be available for use to remove particulate matter from the sides of the vehicle if needed. Radiation Protection personnel inspect the vehicle for visible waste material and verify the vehicle meets radiological release criteria before it is released to travel the dedicated haul road and return to the D&D or excavation site (see Section 4.7, Contamination Control, for release criteria and survey requirements). If visible waste material is detected or radiological release criteria are not met, the vehicle will repeat the wheel wash or will be more aggressively decontaminated until it can be released to travel the dedicated haul route.

Environmental Monitoring. Environmental monitoring continues to be performed under the OSWDF PSVP to confirm waste transfer activities are being conducted in a manner that meets performance standards for protection of human health and the environment. Surface water is sampled downgradient of the IMTA Haul Road to confirm contamination controls during waste hauling are effective. Air monitoring confirms the effectiveness of emission controls used to mitigate the release of contaminants to the air. Analytical results are evaluated against conservative criteria established by the OSWDF PSVP to provide early detection of conditions that, left unaddressed, could result in performance standards being exceeded.

3.3 OSWDF WASTE PLACEMENT OPERATIONS

This section provides a general description of OSWDF operations. Detailed waste placement and compaction requirements of the OSWDF design are provided in the IMPP (Appendix B).

Waste Placement and Compaction. Waste placement and compaction during full-scale operations is the same as during initial operations. OSWDF Operations personnel accept, place, and compact waste in designated grids of the OSWDF in accordance with the IMPP. The CQC Contractor performs waste placement compaction testing in accordance with the OSWDF CQA Project Plan and the IMPP. Placement of classified material continues to be performed in accordance with the OSWDF Security Planning Document. Type 1 waste (soil) may be stored in the active cell, as approved by the OSWDF Operations Manager, to cover Types 2 to 5 wastes, to cover classified material waste, or for other actions as needed. Type 2 waste (debris) may be temporarily stored, as approved by the OSWDF Operations Manager, if it cannot be placed due to operating problems such as inclement weather or equipment malfunction. Water or a fixative may be applied to the OSWDF working face and other disturbed areas to prevent or suppress dust during waste placement. As described in Section 2.3, ACM and beryllium-contaminated waste require special handling and are disposed of as Type 5 waste per requirements under the IMPP (Appendix B).

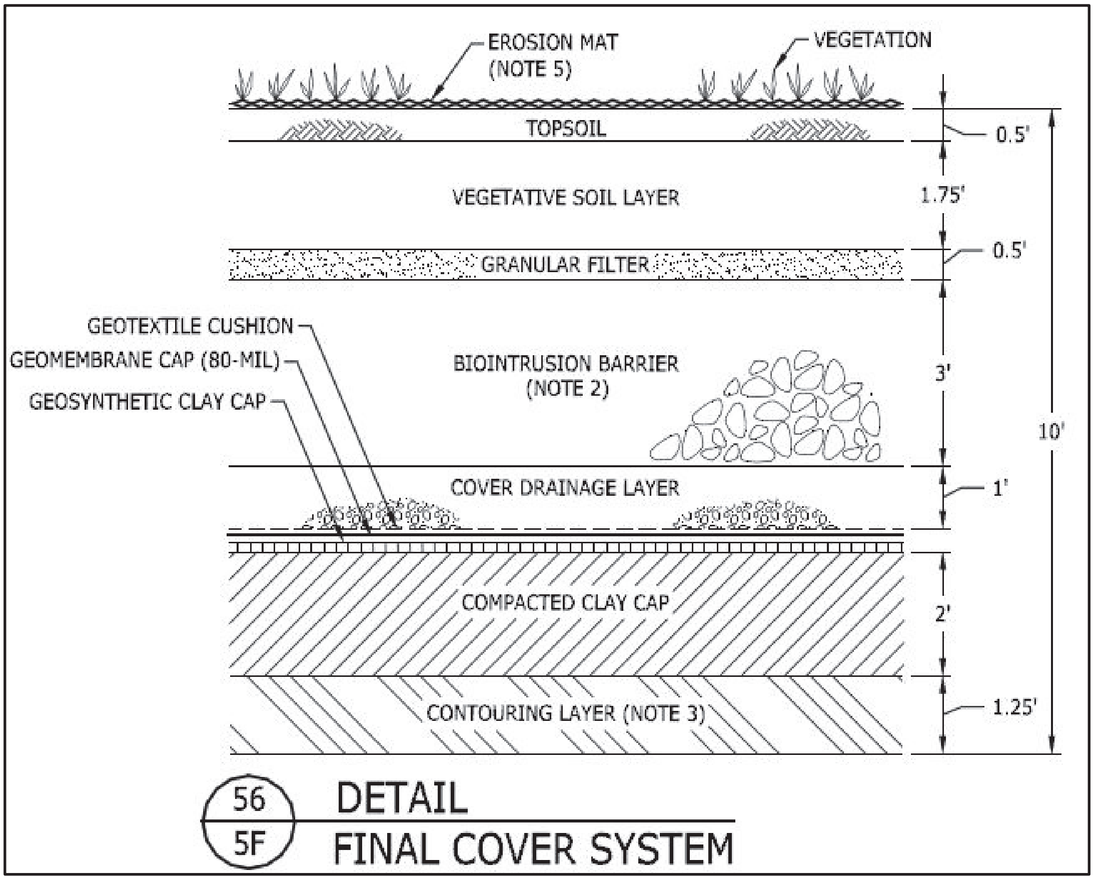
Waste Tracking. Waste tracking during full-scale operations is the same as during initial operations. Waste is considered disposed of once it has been placed in the appropriate grid/lift/cell and the recorded disposal location has been verified by the WAO. The CQC Contractor prepares daily placement sketches showing waste type, lift numbers, and grid designation after waste is dispositioned.

Dust Control. Dust control is implemented proactively during waste handling activities in the OSWDF to prevent the airborne release of contaminants above air quality standards. Water or fixatives will be applied to waste being dispositioned at the OSWDF as necessary to prevent dust and minimize airborne emissions. Water or a soil fixative may be applied to access roads within the OSWDF, the working face (i.e., waste placement area), and other disturbed areas using hand-held sprayers or mobile water trucks to prevent or suppress dust. Monitoring of fugitive dust is performed visually. OSWDF personnel are responsible to observe the work areas for the potential for or actual generation of dust. Dust conditions shall be reported to the supervisor or foreman in the work area, who will arrange for immediate wetting of the area and implement other dust control measures as needed. If necessary, work activities will be modified or stopped until dust is controlled. Dust control water that falls within the active cells of the OSWDF is collected and managed as leachate.

Run-on and Runoff Control. Management of liquids inside the active cell during full-scale operations is the same as during initial operations. Runoff caused by precipitation must be contained within the OSWDF active waste placement area. Temporary drainage channels convey runoff inside the cell to the Leachate Catchment Area. The working face (i.e., active waste placement area of the cell) is protected using erosion and sediment control materials (e.g., silt fencing).

Because the OSWDF is constructed in modular fashion, full-scale operations may have cells where waste is actively being placed while the liner of an adjacent cell is constructed and the cover of another adjacent cell is constructed. For example, the liner of Cell 6 may be under construction while Cell 3 is actively receiving waste and the final cover of Cells 1 and 2 is being installed.

During construction of the cover system, runoff is managed as leachate during installation of the contouring layer and until the second lift of the compacted clay cap (roughly 1 ft of the clay cap) has been compacted (see Specification Section 02240 – Protective and Contouring Layers). This runoff is directed to the LCA of the adjacent cell for collection and treatment. Once the second lift of the compacted clay cap has been compacted, runoff from the cover is directed outside the OSWDF footprint and managed as surface water. These layers of the cover system are shown on Figure 13.



Source: OSWDF Design Drawing X-780-C-10634, Revision K.

Figure 13. Final Cover System Detail

Precipitation that falls outside the active waste placement area of the OSWDF (Cells 2 and 6 in the example) is managed as surface water. Precipitation that falls into the active waste placement area (Cell 3 in the example) is managed as leachate.

Environmental Monitoring. During full-scale operations, environmental monitoring continues to be conducted under the OSWDF PSVP to confirm waste placement activities are conducted in a manner that meets performance standards for protection of human health and the environment. Surface water samples continue to be collected from streams downgradient of the OSWDF Project Area; air samples are collected and external radiation is monitored around the project perimeter; groundwater wells are sampled to verify groundwater remains protected; and groundwater seeps in the area, if present, are observed and characterized. Analytical results are evaluated against criteria established by the OSWDF PSVP to provide early detection of conditions that, left unaddressed, could result in performance standards being exceeded.

3.4 OSWDF LEACHATE MANAGEMENT SYSTEM OPERATIONS

The purpose of the OSWDF Leachate Management System remains the same as initial operations: to manage (i.e., capture, contain, and convey) leachate that is generated within the OSWDF and to provide early detection of leaks.

Leachate from the OSWDF is collected in the LCS, detected (if present) in the LDS, and conveyed by gravity to the valve houses that are located outside the limits of impacted material in close proximity to the perimeter of the OSWDF. Each new cell has a dedicated valve house, which provides access to the valves, piping, fittings, monitoring and sampling ports, and other ancillary equipment required to regulate, monitor, and maintain performance of the LCS, LDS, and the Leachate Transmission System. The valve houses and leachate transmission lines used during full-scale operations are shown on Figure 14. Valve house numbering corresponds to the associated cell (e.g., VH-1 is the valve house dedicated to Cell 1).

This section provides a general description of Leachate Management System functions. Detailed O&M of the OSWDF Leachate Management System, including start-up, operating parameters, potential operating problems, and alternate operation is detailed in the LISWSP (Appendix C). The LISWSP also provides the methodology and priorities for pumping leachate to the ILTS Phase 2.

OSWDF Leachate Collection System. Operation of the OSWDF LCS during full-scale operations is the same as during initial operations. The LCS removes leachate that accumulates on the OSWDF liner system as well as liquid that accumulates within the Leachate Catchment Area of active cells. Runoff inside the active cells continues to be conveyed by temporary drainage channels to a Leachate Catchment Area inside the active cell area.

Leachate Transmission System. Figure 14 shows how leachate is conveyed from the individual valve houses to the ILTS Phase 2 for treatment during full-scale operations. Leachate from valve houses serving the north cells of the OSWDF (including Cells 11 and 12) flows by gravity via the North Leachate Transmission System to the North Lift Station. Leachate from valve houses serving the south cells of the OSWDF flows by gravity via the South Leachate Transmission System to the South Lift Station. The lift stations allow leachate from the gravity drainage system to be transferred to a forcemain (pumped) system. Leachate from the North Leachate Transmission System is transferred to the North Forcemain; leachate from the South Leachate Transmission System is transferred to the South Forcemain. These forcemains ultimately merge with the influent conveyance line to the ILTS Phase 2.

Leachate Monitoring. Leachate monitoring under the OSWDF PSVP continues during full-scale operations. Because each cell has its own engineered LCS and LDS drainage layers, a horizontal monitoring well, and upgradient and downgradient groundwater wells, the performance of the liner system of each cell can be monitored individually. Leachate monitoring commences in each cell as it becomes operational and continues after installation of the cover system.

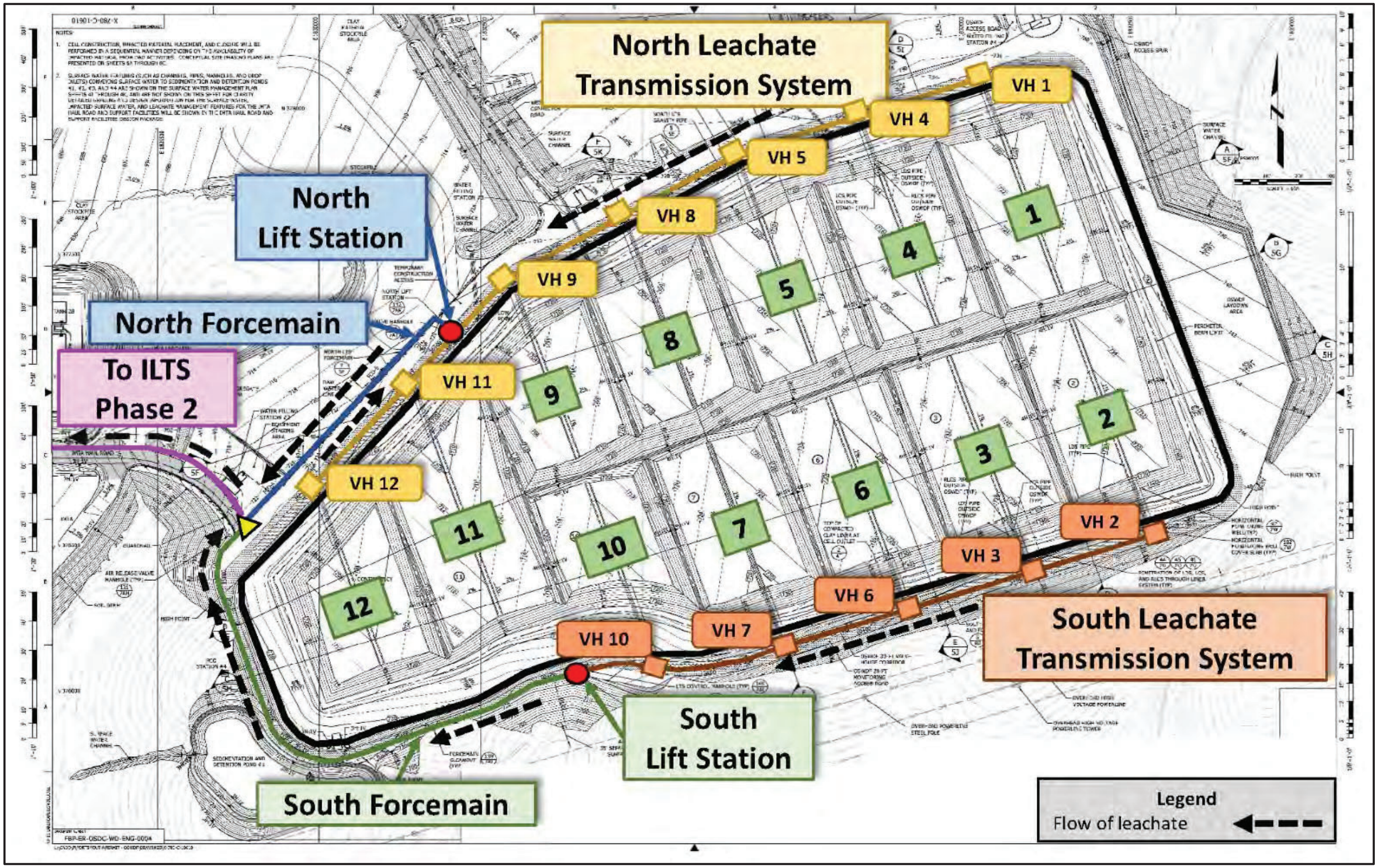


Figure 14. OSWDF and Leachate Management System

3.5 IMTA OPERATIONS

The IMTA is a secured, radiologically controlled area used to temporarily store waste when OSWDF operations are closed or for logistical purposes to support the optimal placement of waste. The IMTA is an approximately 7–acre area, constructed of gravel atop a geosynthetic liner and compacted clay liner, located adjacent to the OSWDF. Precipitation that falls on waste stored at the IMTA and water used to control airborne emissions are captured and managed by the IMTA Leachate Management System, which is further described in Section 3.6. Management of surface water outside the IMTA boundaries is described in Section 3.7.

The Waste Disposition ROD designates the IMTA as a treatment and storage Corrective Action Management Unit (CAMU) that is approved to operate until OSWDF operations are completed. IMTA operations must comply with requirements of *OAC* 3745-57-72(F)(2) for management of waste in a CAMU that is intended to be operated more than 2 years. No waste storage piles will be created within the OSWDF Project Area outside the IMTA or the OSWDF. Therefore, only ARARs associated with CAMU storage piles are included in this OSWDF O&M Plan.

Although the ROD allows for size reduction, pretreatment, and treatment of waste at the IMTA, the WAC Implementation Plan requires waste to meet the OSWDF WAC before it leaves the generating project. A change in this approach would require modification of the WAC Implementation Plan and this OSWDF O&M Plan.

Ignitable, reactive, and incompatible hazardous wastes will not be accepted at the IMTA. These wastes are prohibited from disposal in the OSWDF without prior treatment and there are no plans or processes established in this OSWDF O&M Plan for treating hazardous waste at the IMTA. Regulated ACM and beryllium-containing waste stored at IMTA must be packaged in accordance with the OSWDF WAC and disposed of as soon as practicable.

Should anomalous waste be identified at the IMTA, it will be handled in accordance with the WAC Implementation Plan. An overview of this anomalous waste handling process is provided in Section 8.1.

Waste Receipt. The IMTA is managed by the OSWDF Operations Manager and used, when necessary, to temporarily store waste accepted for disposal at the OSWDF. The OSWDF Operations Manager is responsible for overall coordination between all parties as it relates to storing waste within the IMTA, directing IMTA Operations personnel, and management and accountability of waste stored within the IMTA prior to final disposal in the OSWDF.

If waste is directed to the IMTA, then IMTA personnel will unload the waste for temporary storage. Although waste is verified by the WAO and the generators prior to and during load out, the WAO will again visually verify the waste for prohibited items when received at the IMTA. In the unlikely event that an anomaly occurs and waste that is not compliant with the WAC is received, it is handled in accordance with the processes contained in the WAC Implementation Plan. Section 8.1 of this OSWDF O&M Plan summarizes this process and the management of this potential operating issue. When the OSWDF is ready for the staged waste, IMTA personnel will reload waste for movement into the OSWDF. Vehicles leaving the IMTA are closed and must meet release criteria provided in Section 4.7 before the vehicle exits the OSWDF Project Area. Vehicles traveling between the IMTA and OSWDF do not undergo wheel washing.

Waste Storage. Most waste staged at the IMTA is managed in bulk storage piles. Due to the size limitations of the IMTA and the limited variety of waste which can be staged, it is anticipated that waste may be comingled by waste type. Waste identified in Section 11.1.1, Table 10, requires burial locations to be included in disposal records, and therefore must be coordinated with the OSWDF Organization prior to shipment. The waste staged in the IMTA prior to disposal in the OSWDF requires waste tracking documentation upon its removal from the IMTA. Characteristics of waste put into the pile are allocated proportionally to what is taken out of the pile. The waste tracking documentation shall be in accordance with the WAC Implementation Plan and is verified by the WAO.

Waste may also be staged at the IMTA in containers, as approved by the OSWDF Operations Manager. All containers shall be nonleaking and chemically compatible with the waste being staged, properly marked and dated, remain closed until waste must be removed from or added to the container, and meet all regulations and requirements pertaining to NCS. Incompatible wastes cannot be placed in the same storage pile (*OAC* 3745-57-74[F][2]). Containerized radioactive waste containing fissile uranium must be determined to be criticality incredible and must be authorized by the OSWDF Hazard Analysis for disposal in the OSWDF.

Contamination and Dust Control. After offloading waste at the IMTA, the waste handling area of the vehicle (e.g., truck bed, roll-off box interior) must be closed and contaminated material contained (e.g., covers/tarps reapplied). Vehicles exit the IMTA and proceed to the Wheel Wash Facility to remove visible waste material that may contain radiological contamination or other contaminants of concern, as described in Section 3.2, before they are released to return to the D&D or excavation site (see Section 4.7, Contamination Control, for release criteria and survey requirements that are established to meet DOT packaging equivalency requirements and prevent inadvertent transfer of hazardous materials to the haul road).

Control of dust and airborne contamination is implemented proactively during waste handling activities in the IMTA to prevent the spread of contamination. Dust suppressants (e.g., water, fixatives) are used during unloading and loading at the IMTA; suppressants are applied to waste being transferred and temporarily stored at the IMTA as necessary to mitigate dust and airborne emissions. Engineering controls such as misters and wind barriers may also be employed to mitigate dust and airborne contamination from waste stored in the IMTA during working and nonworking hours.

Monitoring of fugitive dust is performed visually. OSWDF personnel are responsible to observe the work areas for the potential for or actual generation of dust. Any dust condition shall be reported to the supervisor or foreman in the work area, who will arrange for immediate wetting of the area and implement other dust control measures as needed. If necessary, work activities will be modified or stopped until dust is controlled. Water applied to waste within the IMTA is collected and managed as leachate.

Environmental Monitoring. During full-scale operations, environmental monitoring is conducted under the OSWDF PSVP to confirm IMTA operations are conducted in a manner that meets performance standards established by ARARs for protection of human health and the environment. Surface water samples are collected from streams downgradient of the IMTA, groundwater wells installed upgradient and downgradient of the IMTA are sampled to verify groundwater remains protected, and the east side of the IMTA is monitored for groundwater seeps. Air sampling and external radiation monitoring is also conducted and specifically includes a location on the west side of the IMTA near the publicly accessible road. Analytical results are evaluated against criteria established by the OSWDF PSVP to provide early detection of conditions that, left unaddressed, could result in performance standards being exceeded.

Handling and Storage of Polychlorinated Biphenyl (PCB) Remediation Waste and PCB Items. The D&D of the building and facilities at PORTS will generate PCB remediation waste. PCB remediation waste that will be generated during D&D include building materials and man-made materials that may have PCB contamination (e.g., ducts, gaskets, flanges, piping, concrete floors, walls, porous surfaces), PCB-containing equipment that is demolished in place with the building and part of the building demolition waste, and nonliquid PCB waste such as rags and debris.

Handling and storage of PCBs at the IMTA shall be conducted in accordance with ARARs and the *Modification to the February 20, 1992 Toxic Substances Control Act Compliance Agreement between the U.S. Department of Energy and the U.S. Environmental Protection Agency* (DOE and EPA 2017).

3.6 IMTA LEACHATE MANAGEMENT SYSTEM OPERATIONS

The IMTA Leachate Management System includes the IMTA liner system, a perimeter drainage channel, Tank 1, and the Tank 1 Pump Station and Forcemain. Components of the IMTA Leachate Management System are illustrated on Figure 15. An overview of system operations follows.

1 Liquids that percolate through the aggregate base of the IMTA are collected as leachate in the drainage layer of the IMTA liner system. Leachate from the liner system drains to a perimeter leachate runoff channel and is collected in Tank 1, an aboveground tank located on the west side of the IMTA.

2 Liquids from the Wheel Wash Facility, located adjacent to the IMTA, are also collected in Tank 1. The contents of Tank 1 are pumped to the ILTS Phase 2 for treatment.

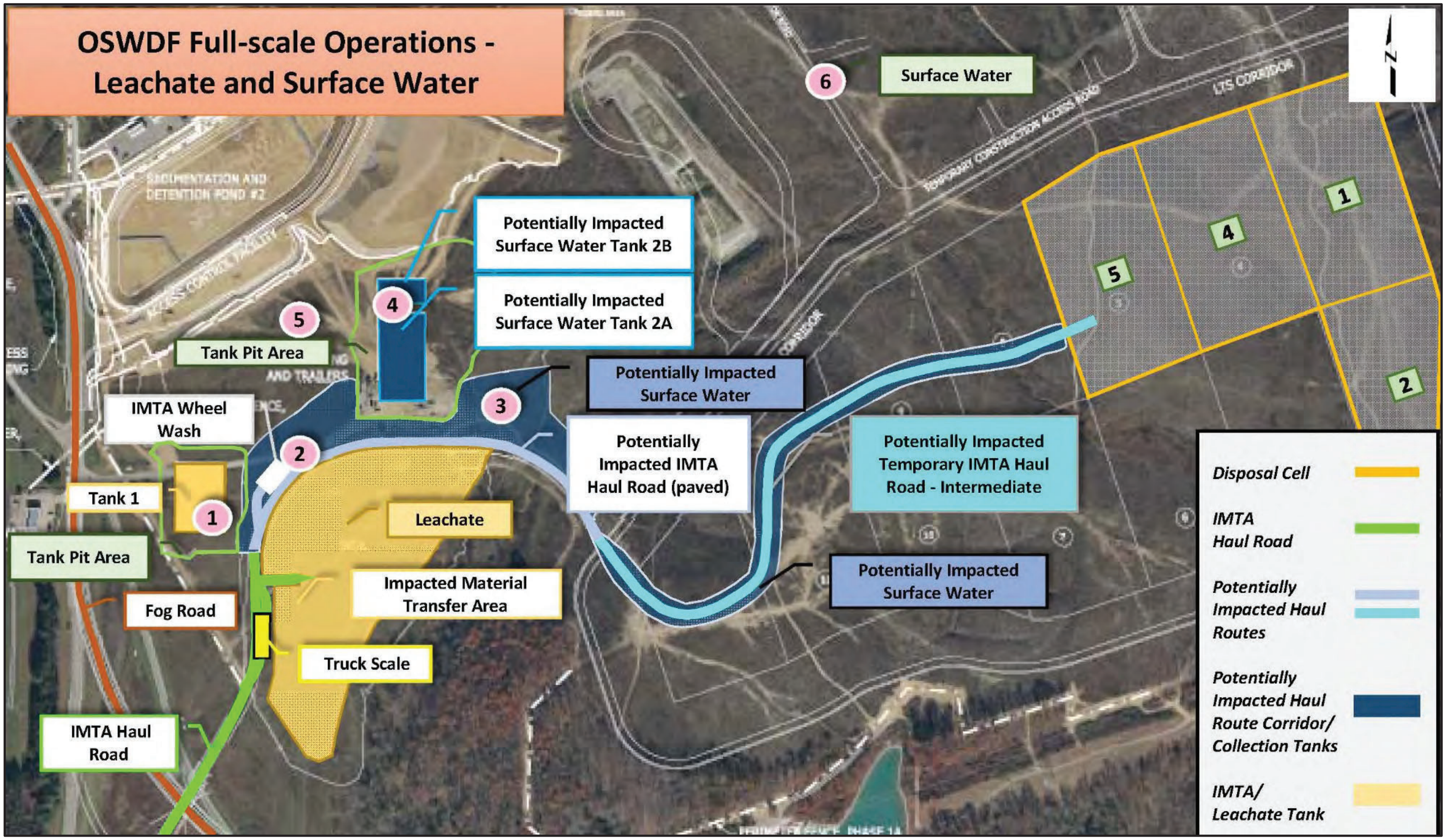
Details for operation of the IMTA Leachate Management System are provided in the LISWSP (Appendix C). The IMTA Leachate Management System will be removed with the IMTA prior to final closure of the OSWDF. Unlike the OSWDF, monitoring of IMTA leachate in support of a long-term leak detection program is not required.

3.7 IMTA IMPACTED SURFACE WATER MANAGEMENT SYSTEM OPERATION

The OSWDF Design Package divides management of surface water into two categories: (1) surface water and (2) potentially impacted surface water (i.e., surface water that has the potential to be contaminated). Potentially impacted surface water is captured and managed by the IMTA ISWMS; components of the IMTA ISWMS are illustrated on Figure 15. An overview of system operations follows.

3 Potentially impacted surface water is generated from the Temporary IMTA Haul Road, the section of the IMTA Haul Road between the Wheel Wash Facility and the OSWDF, and from the potentially impacted areas adjacent to the IMTA.

4 The potentially impacted surface water is collected in Tanks 2A and 2B then pumped to the ILTS Phase 2 for treatment. Sediment controls such as filter socks, check dams, and silt fencing are used in drainage channels along the roads to minimize the amount of sediment received in Tank 2A.



Note: Numbered circles in this figure correspond to text in Section 3.6 and identify the location of activities described in the text.

Figure 15. IMTA Surface Water Management During Full-scale Operations

The Tank 2A/2B system does have the capability to release the water to Sedimentation and Detention Pond 2 if the water already meets criteria for safe discharge without prior treatment. This operation is not authorized unless a sampling and analysis plan and discharge levels is concurred upon by Ohio EPA. The SAP is to include parameters listed in the Priority Pollutant List, 40 *CFR* Part 423, Appendix A, that may be present in potentially impacted surface water. Until such time that a SAP and discharge levels are concurred upon by Ohio EPA, the valves or piping involved in releasing water to Sedimentation and Detention Pond 2 will be secured by installing a blind flange, welded cap, or other positive means.

Operation of the OSWDF Leachate Management System, the IMTA Leachate Management System, and the IMTA ISWMS, including initial start-up, operating procedures, maintenance, monitoring and inspection activities, potential operating problems, and alternate operation, is detailed in the LISWSP (Appendix C). The LISWSP also provides the strategy for prioritizing transfer of liquids to the ILTS Phase 2 for treatment from the leachate catchment area, Tank 1, and Tanks 2A and 2B during and after storm events.

3.8 SURFACE WATER MANAGEMENT

Surface water consists of precipitation that falls in uncontaminated areas of the OSWDF Project Area. Surface water runoff is directed to the permanent sedimentation and detention basins and a temporary sediment pond via channels and pipes. The sedimentation basins serve as temporary settling ponds that release surface water at a controlled rate, detaining it long enough to allow most of the sediment to settle. Surface water management components illustrated on Figure 15 are described below.

5 Precipitation falling into Tank Pits around Tanks 2A/2B and surrounding areas is considered surface water and flows to Sedimentation and Detention Pond #2.

6 Runoff originating from closed OSWDF cells, construction laydown/stockpile areas, and other uncontaminated support areas is directed to sedimentation basins.

Surface water from the section of the IMTA Haul Road between the Wheel Wash Facility and Perimeter Road is captured and released into a tributary of Little Beaver Creek on the west side of the haul road. A surface water isolation valve at this location can be closed if necessary to temporarily prevent release of the water. Should future project needs require runoff from this section of the IMTA Haul Road to be captured, the system could be modified at the isolation valve to divert flow into storage tanks or the ILTS.

Environmental Monitoring. Surface water monitoring conducted during initial operations under the OSWDF PSVP continues during full-scale operations. Samples are collected from streams in the OSWDF Project Area to confirm that contaminants are not migrating into surface water bodies. Analytical results are evaluated against criteria established by the OSWDF PSVP to provide early detection of conditions that, left unaddressed, could result in performance standards being exceeded.

3.9 OPERATIONAL LIMITS DURING FULL-SCALE OPERATIONS

Operational limits for the OSWDF remain the same as described for the initial operations phase. Operations limits for the IMTA are provided in the following sections.

3.9.1 Operational Limits Derived from the Hazard Categorization for IMTA

The OSWDF (including the IMTA) is categorized as a Less than Category 3 nuclear facility by the OSWDF Hazard Analysis discussed in Section 2.6.1. Similar to the OSWDF, there are specific operational limits in place for the IMTA to maintain this categorization. These operational limits are documented in the OSWDF Hazard Analysis and are summarized below (note that limits expressed in any future revisions of the OSWDF Hazard Analysis supersede those listed here):

- Operations may not be conducted at the IMTA during severe weather (e.g., high winds, lightning, or other severe weather).

- No more than 12 trucks may unload in the OSWDF and IMTA simultaneously. This is based upon a maximum individual dump truck capacity of 87,000 lb unless adjusted based on analysis and proper authorization.

- No more than 26 intact PGE components (i.e., compressors) shall be allowed uncovered in a cell or the IMTA at a time unless adjusted based on analysis and proper authorization.

3.9.2 Operational Limits for Air Emissions

The IMTA was not included in the air modeling described in Section 2.6.2. Air monitoring data obtained during the initial operations phase will be used to determine the appropriate controls for operation of both the OSWDF and the IMTA during full-scale operations. If necessary, the actual data obtained during initial operations will be supplemented by air modeling. This OSWDF O&M Plan will be updated prior to full-scale operations to include the operational limits for air emission at IMTA and OSWDF based on this information.

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4. TRANSPORTATION PLAN

The Waste Disposition ROD requires the transfer of D&D waste and contaminated engineered fill from the point of generation to the OSWDF or to the IMTA for staging. In support of this requirement, the Waste Disposition ROD identified DOE Order 460.1C(4)(b) as a to-be-considered (guidance) (TBC) and states that the on-site transfer of waste to the OSWDF must meet the substantive requirements of 49 *CFR* Parts 171–174, 177, and 178 or the site- or facility-specific transportation safety document. (Note: DOE Order 460.1C is now DOE Order 460.1D as cited in this plan).

PORTS has a mature transportation program and movement of hazardous materials is conducted by DOE's D&D Contractor in a manner fully compliant with the DOE Orders and applicable regulations. All off-site transfers of hazardous materials are conducted in accordance with DOT requirements. The transfer of hazardous and nuclear materials on the 3,700-acre federal reservation is conducted in a manner fully compliant with DOE Order 460.1D. Consistent with Order requirements, the site will prepare the necessary compliance documentation for approval by DOE establishing the specific transportation requirements to be met at PORTS during the transfer of all hazardous and nuclear materials within the federal reservation. As such, this compliance documentation prepared for and approved by DOE in accordance with the requirements of the DOE Order establishes the federal compliance requirements for the transfer of any contaminated materials, including soil and debris, from the point of generation within the federal reservation to the OSWDF or IMTA. The D&D contractor at PORTS is required to comply with these DOE-approved requirements, subject to DOE oversight, to ensure all waste transfers are completed in a manner fully protective of human health and the environment. This section describes many of the controls DOE requires as part of its compliance requirements to ensure the safe transfer of the D&D waste and engineered fill from the point of generation to the OSWDF or IMTA.

As previously stated and consistent with DOE Order 460.1D, DOE is responsible for the review and approval of the site-specific requirements for the transfer of waste materials within the federal property boundaries at PORTS. Similarly, DOE maintains oversight authority to ensure compliant implementation of these on-site waste transfer requirements. The Transportation Manager of the D&D Contractor is the designated official responsible to DOE for the safe and compliant implementation of DOE Order 460.1D and the approved PORTS-specific transportation requirements, including establishing and approving transportation requirements specific to discrete projects at PORTS, such as the OSWDF. The Transportation Manager is also responsible for both establishing and approving any waste stream-specific transportation requirements, to the extent aligned with the DOE-approved requirements, and overseeing their compliant implementation. The OSWDF Operations Manager is responsible for ensuring day-to-day compliance with these approved transportation requirements. The OSWDF Operations Manager is also responsible for aligning waste delivery schedules with generating projects, implementing dust control, and implementing spill response requirements. The WAO is responsible for overseeing the compliant implementation of these transportation requirements on a waste stream and individual waste load basis. The WAO is empowered as the final authority for the release of discrete waste loads from the generating site and with it, for acceptance for disposal at the OSWDF.

4.1 PROGRAM OVERVIEW

On-site transfers and movements are not considered to be in commerce if they occur within an area to which the public does not have access, in accordance with DOE Guide 460.1-1, Attachment 1. In the case of the transportation of hazardous materials from the waste generators to the OSWDF (or IMTA) the shipments will be performed "out of commerce" in accordance with DOE Order 460.1D and 49 *CFR* 171.1(d). At no time will the public have unfettered /uncontrolled access to interact with these shipments. Barriers and/or protective force personnel are used to close roads to public access. By restricting public access, such movements of hazardous material are not subject to the DOT Hazardous Materials Regulations or the Federal Motor Carrier Safety Regulations (FMCSR), and the requirements of the approved DOE Order 460.1D compliance documents for PORTS then apply.

Consistent with the requirements of DOE Order 460.1D, on-site hazardous material transfers to the OSWDF Project Area (e.g., D&D waste, excavated soil) will be conducted in a manner that provides a level of safety equivalent to that afforded if the requirements of 49 *CFR* Parts 171-180 and 49 *CFR* Parts 350-399 were implemented. All transfers of nuclear and hazardous materials at PORTS will meet or exceed this equivalent level of safety.

Site documents and procedures implementing DOE Order 460.1 define the term “transfer” as a change in location within on-site boundaries where access by the general public has been excluded. These same documents define the term “transportation” as any change in location conducted on a vehicle designed for over-the-road transport, outside of a structure. A change in location that is within a contiguous boundary defined by the scope of the safety basis and associated documents is called a “movement.” Movements may be between buildings, pads, or other structures that are within the safety basis contiguous boundaries.

This OSWDF O&M Plan uses the terminology consistent with site procedures. “Transfer” of waste at PORTS occurs between generating projects and the OSWDF or the IMTA. “Movements” occur between the IMTA and the OSWDF. “Transportation” occurs when waste is shipped off site for disposal. The off-site transportation of waste will be conducted in accordance with DOT regulations.

4.2 WASTE TRANSFER AUTHORIZATION

DOE requires that on-site transfers to the OSWDF or IMTA attain an equivalent level of safety to that provided by DOT requirements for off-property commercial conveyances to ensure the safety of the workers and the public. The equivalent level of safety, as defined by the DOE-approved transportation safety documents, identifies the specific controls and processes required for hazardous material transfers. The level and type of safety controls consider several factors, including location of sending and receiving facilities on site, radiological and chemical characterization of the waste, the vehicle intended to be used for the transfer, and the transfer route. Once a transfer has been approved, additional like transfers are also authorized.

Consistent with DOE Order 460.1D, requirements are established for any aspect of a given waste transfer that are necessary to ensure safety, including packaging, communication (e.g., placarding, container marking/labeling, shipping papers), load securement, vehicle inspections, training, load restrictions, radiation protection, and waste segregation.

The following controls will be applied specifically for the transfer of materials from the points of generation to the OSWDF:

- Dedicated haul routes for the exclusive use of the transfers are being prescribed for the common portions of the route from the points of waste generation to the OSWDF or IMTA.

- Route restrictions are being imposed on all other portions of the transfer route not controlled as a dedicated haul route.

- All waste transfers will be made out of commerce, requiring public access to the transfers to be discontinued through physical barriers or other restrictive means.

- Speed limits are being imposed on all transfers, conservatively based on the conditions of the haul route.
- Weather restrictions are being imposed, restricting transfers during severe weather conditions including wind, ice, snow, and heavy rainfall.
- Time restrictions are being imposed as necessary to ensure the safety and efficiency of the workforce and plant operations.
- Traffic restrictions will be imposed on the number of trucks or other types of conveyances released for movement, as necessary, based on the conditions of the route.
- Waste conditioning (e.g., moisture, fixatives) requirements will be imposed, if deemed necessary, to address waste stream-specific hazards (i.e., fixatives applied to transite panels prior to transfer or absorbents applied to address the presence of free liquids). (Note: absorbents must be non-biodegradable. Use of absorbents in accordance with 40 *CFR* 270.1(c)(2)(vii) is not considered treatment under the Resource Conservation and Recovery Act of 1976, as amended [RCRA]).
- Tarping is required on all hazardous material transfers in roll-offs and open-top tandem or articulated dump trucks, unless otherwise approved by the Transportation Manager.
- Tight-fitting, leak-resistant dump gates are required on all equipped dump trucks, roll-offs, or other gate-equipped conveyance.
- Radiological controls, including decontamination and release surveys in accordance with 10 *CFR* 835 *Occupational Radiation Protection* and equivalent in safety to 49 *CFR* 173, *Shippers – General Requirements for Shipments and Packagings* are being applied to the control and release of all conveyances from the point of generation to the OSWDF or IMTA. Similarly, the haul routes will be controlled per these regulatory standards.
- Use of spotters will be required for the proper loading and potentially offloading of all conveyances, unless the conditions do not warrant these controls and with the approval of the Transportation Manager.
- Concurrence must be obtained by the WAO for the release of a loaded conveyance from the point of generation to the OSWDF or IMTA following their inspection of the materials being loaded and completion of the necessary tracking documentation.
- Emergency response, including spill response, personnel must be notified in advance of the planned transfer activities.
- Transportation safety training will be required of all drivers of conveyances involved in hazardous materials transfers to the OSWDF.

As discussed in Section 2.2, the initial operations phase will require haul routes to be closed to public access during waste transfer activities. Public access to the section of the North Access Road and Perimeter Road used for waste transfer activities will not be permitted. A crossing is established at the

North Access Road intersection with Fog Road to remove the intersection from commerce during waste transfer. Personnel and/or necessary physical barriers are positioned at the crossing to ensure only waste transport vehicles use the crossing until it has been reopened for public use. Emergency vehicles will be provided unfettered access to the crossing.

During full-scale operations, the IMTA Haul Road is used specifically to transfer waste from the former production area to the OSWDF and IMTA. The entire IMTA Haul Road will be inaccessible to the public by means of continuous security fencing on both sides of the road. The fencing connects the OSWDF to the former production area fencing, making the IMTA Haul Road a dedicated haul road. Mechanically operated gates are utilized to allow emergency traffic access on the IMTA Haul Road and operated using mobile devices as needed by the Fire Department and security operations. Waste transfer is suspended if emergency access is required during all phases of operations.

4.3 VEHICLES

Transport vehicles (i.e., conveyances) shall be maintained in compliance with the FMCSR or the Occupational Safety and Health Administration (OSHA), as indicated. The FMCSR applies to off-site transport, but compliance with these regulatory requirements on site will ensure safe transfer or movement conditions. FMCSR-type vehicles used will include, but not be limited to tractor-trailers, roll-off trucks, and dump trucks. Articulating dump trucks will be in compliance with OSHA requirements, the same as other industrial equipment (cylinder haulers, stackers, forklifts, etc.).

Properly trained and qualified personnel must operate all vehicles on site. Workers who operate a commercial motor vehicle (such as flat bed, semi-tractor truck) or transfer quantities of hazardous materials that would require a placard in accordance with DOT requirements are required to meet appropriate DOT training regulations, including the FBP Driver Qualification Program and Driver Controlled Substances and Alcohol Use and Testing Policy. Industrial equipment is driven by a qualified equipment operator, as defined in OSHA requirements.

Load restrictions for vehicles, if applicable, are specified by the Transportation Manager as necessary to ensure equivalent safety standards are maintained. These requirements are incorporated into WAC Component 7, Waste Transportation Standards, which is presented in Section 7.

4.4 PACKAGING

Packaging is considered a containment system for a hazardous material. The containment system requirements are determined based on the chemical, radiological, and physical hazards associated with the material, as well as the conditions of transfer, to minimize the potential for and the consequences of a hazardous material release. Packaging requirements are specified by DOT, RCRA, and the Toxic Substances Control Act of 1976 (TSCA). Hazardous materials, as defined and regulated by DOT, include radiologically contaminated items/materials whether or not they are waste. Directives required by DOE to be implemented for packaging and transportation are contained in DOE Orders and regulations including, but not limited to DOE Order 435.1, *Radioactive Waste Management*, DOE Order 458.1, *Radiation Protection of the Public and the Environment*, and 10 *CFR* 835, *Occupational Radiation Protection*.

The following ARARs provide packaging standards for waste associated with PORTS D&D and soil excavation:

- PCB waste other than PCB bulk product or PCB remediation waste such as PCB articles, PCB items, and PCB equipment shall be containerized in accordance with 40 *CFR* 761.65(c)(6).

- Containerized PCBs and PCB items at concentrations greater than or equal to 50 ppm will be labeled in accordance with 40 *CFR* 761.40(a)(1).

- Regulated beryllium-containing waste and beryllium-contaminated equipment must be packaged and disposed of in sealed, impermeable bags, containers, or enclosures per 10 *CFR* 850.32(b).

- Packages of regulated beryllium-containing waste and beryllium-contaminated equipment must be labeled with the following information in accordance with 10 *CFR* 850.38(b): "DANGER, CONTAMINATED WITH BERYLLIUM, DO NOT REMOVE DUST BY BLOWING OR SHAKING, CANCER AND LUNG DISEASE HAZARD."

- Regulated asbestos-containing material shall be managed per 40 *CFR* 61.150(b)(1)-(3) and *OAC* 3745-20-05(A).

- Regulated asbestos-containing containers shall be labeled in accordance with 40 *CFR* 61.150(b)(1)-(3) and *OAC* 3745-20-05(A).

Waste must be transferred to the OSWDF or IMTA in a DOT–approved package, a DOT-equivalent package, or packaging that meets an equivalent level of safety that is approved by the Transportation Manager. DOT-equivalent means packaging that can be shown conclusively to provide performance equivalent to packaging meeting the requirements of DOT for off-site shipment. Packaging falling into this category will generally be a slight modification of a DOT-compliant packaging or a Defense Programs packaging.

Equivalent safety requirements for waste packaging are specified on a waste stream basis. These requirements for waste packaging are incorporated into WAC Component 5, Waste Packaging Standards, which is presented in Section 7. The WAO will verify through direct visual inspection that individual packages meet the packaging and transportation standards established by the Transportation Manager prior to approval of a waste load for transfer to the OSWDF or IMTA.

Packaging Types. Most waste transfers to the OSWDF or IMTA will be as bulk materials, as unpackaged items, or will use non-DOT performance-based packaging and must be approved by the Transportation manager as providing an equivalent level of safety. Examples of non-DOT performance-based packaging that will be used for on-site disposal operations include truck dump-beds (i.e., sift proof packaging) and roll-off boxes. Control measures selected for DOT-nonequivalent packaging or deviations from the FMCSR are developed to compensate the transport system by providing additional protection and adequate safety for the on-site transfer or movement of hazardous material. Requirements for this type of waste packaging are specified and approved by the Transportation Manager on a waste stream basis to ensure an equivalent or better level of safety is maintained.

While used infrequently, DOT packaging and DOT equivalent packaging are also acceptable containment systems for waste transferred to the OSWDF. Use of such packaging must be approved by the Transportation Manager based upon the characteristics of the waste materials. DOT packaging or DOT equivalent packaging will likely be used to transfer bagged asbestos or beryllium-contaminated materials; the bags of such waste materials will be removed from their conveyance packages prior to waste placement and the package reused. Any required control measures, such as for absorbents within packages, will be specified by the Transportation Manager and verified by the WAO prior to release of the packages for transport.

Package Integrity. The trucks transporting the waste in bulk from the project generators are required to meet containment standards consistent with DOT regulation 49 *CFR* 173.24, *General Requirements for Packagings and Packages*. Each truck shall be designed, constructed, maintained, filled with contents so limited, and closed such that under conditions normally incident to transportation there will be no identifiable release of materials, the effectiveness of the containment will not be reduced and there will be no hazardous material adhering to the outside of the transport.

Consistent with site procedures, waste generators are responsible for ensuring a visual inspection of each waste package is performed before use. Reusable packaging devices such as the truck dump-beds and roll-off boxes are to be visually inspected prior to each loading. The visual inspections will look for breaches in the containment system such as cracks, punctures, and rust, deteriorated seals, and damaged dump gates and covers. Damaged containers that cannot provide the required containment will be removed from service and appropriately repaired in accordance with site Quality Assurance program requirements.

To maintain package integrity, waste will be loaded in a controlled manner to ensure no dents, gouges, holes, or other damage to the containment system. Personnel will notify project supervision immediately if any breach is observed during loading. The Transportation Manager has oversight of this process and authority to reject packages prior to or following waste loading if he or she believes package integrity is questionable or unsatisfactory. WAO representatives will also provide a verification that the package is consistent with requirements approved by the Transportation Manager, and are in a condition appropriate for the transfer of materials.

4.5 HAZARD COMMUNICATION

It is essential to communicate the hazards of the materials being transferred on site. The hazards associated with on-site transfers at PORTS, including those made to the OSWDF, are lower than those in commerce due to additional administrative controls such as speed restrictions, detailed work planning, trained personnel, maintenance programs, availability of emergency response, transit time, traffic restrictions, and security which affords an equivalent degree of safety compared to full DOT compliance for off-site shipments.

On-site transfers of hazardous materials do not require shipping papers as defined by DOT or EPA requirements. The equivalent information is maintained via the waste tracking system established in accordance with the WAC Implementation Plan for disposal of waste in the OSWDF (e.g., eMWaste). This waste stream information will be available electronically or accompany the waste and transport vehicle during on-site transfers and movements of waste to the OSWDF. As described in the WAC Implementation Plan, it is DOE's intent to track waste with an electronic manifesting system.

On-site transfers of hazardous materials do not require marking and labeling as required by DOT. Containers and conveyances used for waste transfers and movements will be for the exclusive use of the OSWDF Project; therefore, conditions are equivalent to DOT exclusive use rules. Additionally, as a result of the reduced hazards associated with the on-site transfers discussed above, an equivalent degree of safety to that provided by DOT commercial transport regulations is provided. Hazard communication information specific to the waste stream will be provided in the waste tracking documentation.

4.6 SECUREMENT

Securement of an item, article, or containment system is performed to provide adequate safety of the load. The FMCSR provides the standards for safe securement in commerce and serves as the on-site standard for securement of hazardous material on vehicles defined as commercial motor vehicles unless an equivalent means of securement is evaluated and approved. A DOT equivalency may be used for on-site transfer or movement of hazardous material items depending on the transport conditions and the method evaluated. These equivalent load securement requirements are specified by the Transportation Manager if deemed necessary to ensure an equivalent level of safety.

4.7 CONTAMINATION CONTROL

Contamination control during transfer of waste to the OSWDF is accomplished through engineering and administrative requirements, such as:

- Packaging and transfer of waste to the OSWDF implements the requirements as presented in Section 7 to prevent loss of contents during routine conditions of transport.
- Vehicles/packages are visually inspected before each use to verify their integrity.
- Waste transport vehicles are not released unless the exterior is verified free of visible waste material and meets radiological release criteria designed to prevent contamination of the haul roads.
- The trucks transporting the waste in bulk from the project generators are required to meet containment standards consistent with DOT regulation 49 *CFR* 173.24, *General Requirements for Packagings and Packages*.
- Liquids are drained before waste is loaded into the transport vehicle to meet the OSWDF WAC.
- The WAO verifies the WAC, including packaging and transfer controls, have been met before each load of waste leaves the generating project.

Release Criteria for On-site Transfers. In order to prevent contamination of the haul road or environment, packages and vehicles must meet release criteria described in this section. These criteria are established in accordance with 10 *CFR* 835, *Occupational Radiation Protection.* The surveys and limits meet (and in some cases exceed) DOT requirements found in 49 *CFR* 173, *Shippers – General Requirements for Shipments and Packagings*.

Radiological surveys of packages and transport vehicles will be conducted in accordance with 10 *CFR* 835, *Occupational Radiation Protection*, and release limits will be determined based upon radiological evaluation of data and the surface contamination values in 10 *CFR* 835 Appendix D. For waste where the primary radionuclides of concern are uranium and technetium-99, such as the process buildings, the release limit is 1,000 dpm/100 cm^2. It should be noted that this removable surface activity limit is more restrictive than the DOT release limit. DOT regulation 49 *CFR* 173.443, *Contamination Control,* allows up to 2,400 dpm/100cm^2 removable surface activity on exterior surfaces for the same shipments if made in commerce (i.e., roads shared by the general public). The instruments used for radiological surveys will be calibrated for the primary nuclides of concern (e.g., uranium and technetium), but will be able to detect alpha and beta activity associated with other nuclides present on site. Equivalent compliance with DOT regulation 49 *CFR* 173 also requires visual confirmation that packaging exteriors are free of visible waste material. Inspection results and surveys will be documented. Packaging and vehicles that do not meet release criteria will be appropriately decontaminated and reevaluated. (Note: These criteria do not apply to vehicle movements between OSWDF, IMTA, and the Wheel Wash Facility during full-scale operations. Surface water runoff from that road is captured and managed by the IMTA ISWMS as described in Section 3.7).

Haul Road Monitoring. Before waste transfer operations begin, the haul route will be surveyed and inspected by trained OSWDF personnel and radiological control technicians to establish and document pre-operational road conditions. Anomalies in the road surface (e.g., stains, fixed contamination) will be identified and documented. This thorough baseline inspection is expected to take approximately three weeks.

Trained OSWDF personnel working with radiological control technicians will continuously patrol the road for evidence of suspect material release when the road is used for waste transfer activities. Inspection results and surveys will be documented. Previous inspection and survey results (including the preoperational baseline survey) will assist personnel in identifying changed conditions. Radiological surveys will be conducted in accordance with 10 *CFR* 835, *Occupational Radiation Protection*, to ensure removable surface activity does not exceed 1,000 dpm/100 cm^2 (i.e., same limit as waste package and transport vehicle based on primary nuclides of concern). The haul road does will not require radiological controls when maintained at or below these limits.

Because of the many controls described above, drips and loose material observed on haul routes should not be automatically considered a spill of waste without further investigation. The source of an oil spot on the road is more likely from the transport vehicle itself than the waste inside, because the OSWDF WAC requires oil to be drained from waste prior to disposal. Radiological and non-radiological field instruments, smears, inspections of vehicles, and waste transfer logs are examples of non-intrusive data sources that will be used to determine whether a spill has occurred and, if so, what was spilled. Intrusive sampling of the material would be conducted if a conclusion cannot be reached using non-intrusive data sources. Sampling can also be conducted at DOE's discretion to confirm conclusions reached using non-intrusive means.

Monitoring personnel are equipped with spill response kits and will initiate the spill response program described in Section 8.7 if it is determined a spill has occurred.

Controlled Fog Road Crossing Monitoring and Release. A radiological control technician will be staffed at the Controlled Fog Road Crossing during waste hauling if there are plans to open the crossing to public traffic intermittently during daily waste hauling operations. DOT regulations do not require survey of roads for hazardous materials being returned to commerce if the containment has not failed and the transport has been verified to meet release limits for removable external surface activity prior to shipment. Nonetheless, this technician will perform visual inspections for evidence of suspect material release and perform confirmatory radiological surveys to ensure removable surface activity is below 1,000 dpm/100 cm^2before opening the crossing to the public. Inspection results and surveys will be documented. Previous inspection and survey results (including the preoperational baseline survey) will assist personnel in identifying changed conditions.

If the Fog Road Crossing is not being opened intermittently during daily waste hauling operations, the crossing will not be staffed by a radiological control technician, but radiological surveys will be performed before allowing public access. Radiological surveys will be conducted in accordance with 10 *CFR* 835, *Occupational Radiation Protection*, to ensure removable surface activity is below the release limit of 1,000 dpm/100 cm^2. The instruments used for radiological surveys will be calibrated for the nuclides of concern, primarily uranium and technetium, but will be able to detect alpha and beta activity associated with other nuclides present on site.

Noncompliant packaging or accident conditions response will dictate actions to decontaminate any roadways. The cleanup levels will be required to meet the requirements of DOE Order 458.1, *Radiation Protection of the Public*, in order to release the roadway for public use. It should be noted that the release limits for removable external surface activity prescribed for on-site transfers to the OSWDF Project Area (i.e., 1,000 dpm/100 cm^2) are more restrictive than the DOT release limits. DOT regulation 49 *CFR* 173.443, *Contamination Control*, allows up to 2,400 dpm/100cm^2 removable surface activity on exterior surfaces for shipments made in commerce (i.e., roads shared by the general public).

The OSWDF PSVP has included surface water monitoring locations downstream of the North Access Road and the IMTA Haul Road. This monitoring is designed to confirm that contaminants are not migrating to surface water from OSWDF operations and waste transfer activities.

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5. SUPPORT INFRASTRUCTURE AND EQUIPMENT

Support infrastructure includes the truck scale, Wheel Wash Facility, access roads, security system, temporary and permanent offices and trailers, equipment maintenance areas, and utilities. The tasks associated with O&M of the support infrastructure include development of O&M procedures, surveillance and maintenance (S&M), facility assessments, inspections, repairs, and fire protection inspections. Equipment for the OSWDF includes heavy equipment, instruments, fixed equipment, and system equipment and pumps. Support infrastructure and equipment associated with OSWDF operations is provided in the following sections.

5.1 TRUCK SCALES

Transport loads are weighed to establish an estimated inventory of the volume of waste materials transferred to the OSWDF. The truck scale provides a convenient means of estimating waste volumes received by the OSWDF or IMTA to support project planning; the scale is not used to meet the regulatory reporting requirements for disposed volume of ACM. A portable truck scale is utilized during initial operations at the direction of the OSWDF Operations Manager. A fixed truck scale will be installed along the IMTA Haul Road prior to beginning full-scale operations. DOE's D&D Contractor is responsible for operating and coordinating maintenance of the portable and fixed truck scales in accordance with the manufacturers' instructions. The truck scales are calibrated in accordance with the manufacturer's recommendations, considering the frequency and conditions of use and the degree of accuracy required in the results. Because an estimated waste density is used to convert weight into volume, a high degree of accuracy is not required in truck scale results.

5.2 ACCESS ROADS

Access roads are constructed as needed to provide access for construction, operation, closure, and monitoring of the OSWDF and for access to support facilities, borrow areas, surface water management areas, and other areas requiring access. Access roads are not used for waste transfers, except as identified during the initial operations phase in Section 2.2. The access roads and ditches are graded to drain runoff towards the sedimentation and detention ponds. Access roads are maintained in a manner that can withstand the anticipated degree of use and allow passage of trucks with minimum erosion and dust generation. Fugitive air emissions are controlled using water, crusting agents, surfactants, or other appropriate dust control methods. Access roads are inspected in accordance with procedures for erosion and rutting that could create dangerous conditions.

5.3 SECURITY SYSTEM

Requirements for operation and maintenance of the OSWDF Security System are provided by DOE Order 435.1, *Radioactive Waste Management* (435.1-1 [IV][P][6][a]), Ohio Department of Health regulation (*OAC* 3701:1-54-08[B][5]), sanitary landfill regulation (*OAC* 3745-27-19 [E][2]), and hazardous waste landfill regulations (40 *CFR* 264.14 and *OAC* 3745-54-14). The security system physical components include signs, security fencing, and access controls that are detailed in the plans and specifications. One of the primary features of the security system is installation of a security fence around the OSWDF Project Area, encompassing the waste handling and placement areas as well as support and administration areas. The fencing is required to prevent unauthorized access to or contact with the OSWDF or waste in active portions of the facility.

Warning signs are posted at all entrances and along the OSWDF Project Area boundary at intervals specified in the design plans and specifications for asbestos disposal facility signage per *OAC* 3745-20-06(B)(5) and hazardous waste disposal facility signage per 40 *CFR* 264.14(c) and *OAC* 3745-54-14(C). Signage is maintained as described in Section 6.8.

Access controls, including lock and key controls and electronic locks operated by smart card readers, limit access to authorized personnel only. OSWDF personnel have access to enter and leave the OSWDF Project Area based on access authorization levels commensurate to the area being accessed. The vehicle access control facility to the OSWDF is controlled by barrier arm gates operated with card readers or by attending personnel, as applicable. Access by nonproject personnel requires escort by appropriately authorized OSWDF or DOE project personnel.

Emergency response/emergency management on site is handled by the Plant Shift Superintendent (PSS). The PSS is on duty 24 hours per day, 7 days per week and is located in the X-300 Plant Control Facility. To make contact in case of an emergency, a sign with the phone number for the PSS will be placed at the primary entrance to the OSWDF, which is the Access Control Facility. The sign will read as follows: "In case of emergency dial 740-897-2444 to reach the Plant Shift Superintendent." If an individual happens to dial 911 on a cell phone they will be connected to the local (not connected with the plant) 911 Operator. The protocol for the local 911 Operator is to call the PSS.

Maintenance of the Security Protection Program facilities is performed in accordance with DOE Order 470.4B Change 2, *Safeguards and Security Program*, and the OSWDF Security Planning Document. Fence lines are kept clear of vegetation, trash, equipment, and other objects that could impede observation or facilitate bridging. The OSWDF, including the cells, and the OSWDF perimeter security fence and associated lighting are inspected periodically to verify that safety and security systems are operating as designed and accountability of the radiological inventory is preserved per *OAC* 3701:1-54-08(B)(5).

5.4 OFFICES AND TRAILERS

Trailers are designed to provide office space and restrooms. Routine maintenance activities for the office trailers and restrooms are performed on a regular basis in accordance with site S&M protocols. Maintenance activities include general housekeeping as well as repairs to doors, windows, flooring, plumbing, roofs, and interior walls.

5.5 EQUIPMENT MAINTENANCE AREAS

An on-site equipment maintenance area is located near the IMTA. The maintenance area contains one or more covered facilities for on-site maintenance of heavy equipment working outside and inside of active cells of the OSWDF and IMTA.

Haul trucks and heavy equipment are refueled in equipment maintenance areas and the equipment maintenance buildings, or other designated area, unless otherwise approved by the OSWDF Operations Manager. During refueling, secondary containment is placed around mobile fuel tanks if they do not have built-in double containment. To identify potential leaks from fuel tanks, routine visual checks are performed or a continuous leak monitoring system with alarm capabilities is installed. Connection ports must be secured when not in service or when in standby service for an extended time.

Materials are stored in equipment maintenance areas in a neat and orderly manner. The maintenance building areas are equipped with spill prevention and response controls as required for compliance with the PORTS *Spill Prevention, Control, and Countermeasure Plan* (FBP 2014a) that has been developed for the site in accordance with 40 *CFR* 112.8. Such measures include engineering controls for purging or gravity draining of fuel lines, secondary containment (i.e., dikes or catchment basins) for oil containers, and spill response kits. Mixing, pumping, transferring, or other handling of maintenance chemicals (e.g., fuel, pesticides, used oils, or other potentially hazardous materials) are performed away from water courses, ditches, and storm drains. Management of secondary waste from equipment maintenance is described in Section 10.

5.6 UTILITIES

Utilities associated with the OSWDF Project include raw water, potable water, sanitary sewer, electrical power, and communications. Raw water is provided for dust suppression during waste transportation and handling operations, moisture control during construction and waste placement, the Wheel Wash Facility and Water Filling Stations, and the sanitary facilities (toilets). Potable water is provided for the office trailers and showers. Sanitary sewage is collected from the office and restroom trailers and conveyed to the existing on-site X-6619 Sewage Treatment Plant. Electrical power and communications is provided to the support area to power the Access Control Facility Trailer Complex, card-activated gate locations, and Permanent Office Area Trailer Complex; yard lighting around constructed facilities; and power for the Booster Pump Station.

5.7 HEAVY EQUIPMENT

Heavy equipment required for OSWDF operations includes steel-wheeled landfill compactors, rubber-tired compactors, track-type loaders, backhoes, bulldozers, excavators, grapples, motor graders, forklifts, water trucks, and fuel trucks. Additional equipment required for placement and compaction of waste is added if necessary. Heavy equipment is maintained on site in the designated area, sent off site for repairs, or replaced as needed. A radiological survey and release is required for heavy equipment taken off site. Vehicles are also cleaned, if necessary, to remove visible oil/greases and dirt.

5.8 INSTRUMENTS AND ELECTRONICS

Instruments required for O&M of the OSWDF include radios, cameras, radiological monitoring instruments, air monitoring instruments, and groundwater monitoring instruments. Instruments used for environmental monitoring are maintained and calibrated in accordance with the *Sample Analysis Data Quality Assurance Project Plan (SADQ) at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (SADQ) (DOE 2014a). Other instruments are calibrated in accordance with the site-wide Measuring and Test Equipment Control and Calibration Program.

Electronic equipment required for OSWDF operations includes the radio-frequency identification (RFID) system and global positioning system (GPS). The RFID system is a commercially available system. It includes RFID tags containing waste-related information, which are attached to the haul trucks, and tracking hardware positioned at various locations (e.g., OSWDF truck scale) that automatically uploads information into the waste tracking database. The GPS system is a commercially available system with a base station, satellite booster station, repeater, and transmitter. The GPS base station, mounted in the OSWDF Project Area, sends signals that are used by GPS-equipped heavy equipment and surveyors.

5.9 FIXED EQUIPMENT

Fixed equipment used during O&M of the OSWDF includes the camera systems, OSWDF truck scale, and the Wheel Wash Facility. The OSWDF truck scale is addressed in Section 5.1. The camera system includes commercially available cameras installed at key locations within the OSWDF Project Area to monitor waste handling activities and investigate incidents, if needed. The camera system will be installed prior to initial operations. Wheel washing removes particulate matter from the wheels and undercarriage of hauling equipment. The Wheel Wash Facility includes an automatic sprayer to decontaminate the bottom of the equipment and a manually operated hose to allow targeted washing as needed. Contact water from the Wheel Wash Facility is collected in Tank 1 and pumped to the ILTS Phase 2 for treatment, while solids are collected and disposed of in the OSWDF. Additional details regarding management of the Wheel Wash Facility water are provided in the LISWSP (Appendix C). Fixed equipment is operated and maintained in accordance with manufacturers' instructions.

5.10 OSWDF AND IMTA LEACHATE MANAGEMENT SYSTEMS EQUIPMENT

The LISWSP (Appendix C) describes the equipment required for the OSWDF Leachate Management System and the IMTA Leachate Management System. Equipment for these systems includes tanks, pumps, valves, lift stations, flow meters, alarms, instrumentation, controls, and heating and ventilating equipment.

5.11 POTENTIALLY IMPACTED SURFACE WATER MANAGEMENT EQUIPMENT

The LISWSP (Appendix C) describes the equipment required for the IMTA ISWMS. Equipment for this system includes tanks, pumps, valves, instrumentation, alarms, and controls.

5.12 CRITICAL SPARES

The spare parts list, including critical spares, is developed as the manufacturers' data are received. Critical spares are those spare parts that need to be replaced as quickly as possible to prevent or mitigate insult to the environment. The OSWDF Design Engineering Manager reviews the complete spare parts list and identifies critical spares with support from operations, safety, and environmental project personnel. Spare parts are stored in a climate-controlled environment if required by manufacturer recommendations.

PORTS has 24-hour, 7-days-a-week emergency response capability to manage spills and other emergencies. Additional detail on the safety and emergency response support for on-site disposal operations is provided in Section 9.

6. SURVEILLANCE AND MAINTENANCE

The OSWDF facility and support systems are inspected and maintained, as described in this section, to identify and correct conditions that could lead to an environmental or health hazard or negatively affect long-term performance of the remedy. The activities described in this section apply until final closure of the OSWDF. The Draft Closure Plan submitted to Ohio EPA before construction of the first cell cover will include the Post-Closure Care and Inspection Plan. This plan provides the inspection, monitoring, and maintenance requirements of the OSWDF after installation of first cell cover. The Final Closure Plan will address long maintenance and performance monitoring for the remedy post-closure. The Comprehensive OSWDF RD/RA Work Plan established Milestones for submittal of the Draft and Final Closure Plans to Ohio EPA.

Any problems identified by inspections will be repaired to conform to the original construction specifications and drawings. To the extent possible, the cause for identified problems will be evaluated and documented in the inspection logs. Problems that are observed repeatedly are evaluated to determine whether alternate responses should be implemented. Repairs are initiated as soon as possible after discovery. If redesign is necessary, prior Ohio EPA concurrence with the alteration or modification will be obtained as specified in the Comprehensive OSWDF RD/RA Work Plan (i.e., minor changes are reported to Ohio EPA but do not require prior concurrence; significant changes require prior Ohio EPA concurrence). Section 3.4.2, Design Changes during Construction, of the Comprehensive OSWDF RD/RA Work Plan explains this process in more detail. Management of S&M records, such as inspection and maintenance logs, is described in Section 11.

The primary tasks associated with monitoring of OSWDF operations include worker health and safety monitoring, operational monitoring to verify systems are working properly and to provide early warning of potential problems, and environmental monitoring to demonstrate compliance with performance standards. Worker health and safety monitoring is performed under the *Worker Safety and Health Program* (FBP 2019). Environmental monitoring to demonstrate compliance with performance standards is addressed in the OSWDF PSVP. The OSWDF PSVP also provides criteria for evaluating sample results to provide early detection of conditions that, left unaddressed, could result in performance standards being exceeded. Operational monitoring for the OSWDF Leachate Management System is addressed in the LISWSP (Appendix C). An overview of monitoring contained in the LISWSP is provided in Sections 6.2 and 6.4.

6.1 OSWDF SURVEILLANCE AND MAINTENANCE

The OSWDF facility and associated support systems are inspected and maintained to identify and correct conditions that could lead to an environmental or health hazard or negatively affect long-term performance of the remedy. The OSWDF will be inspected and maintained in accordance with the schedule and activity requirements outlined in Table 2. The surface conditions of the OSWDF will be maintained throughout the year, including periods of inactivity, as described in the IMPP (Appendix B).

Sediment in the leachate catchment area is removed using low-impact equipment such as fire hoses, plastic shovels, or low-ground-pressure equipment. Fabric (geotextile filter), check dams, and outlet protections damaged during sediment removal are repaired. Fabric repair typically involves cutting out torn sections and sewing in a replacement. Any standing water will be pumped to another catchment area or alternative disposal area.

Table 2. OSWDF Inspection and Maintenance Activities

Worker safety shall always take precedence over compliance with specified inspection frequencies. If an inspection is not performed due to safety concerns (e.g., severe weather), it will be performed as soon as practicable once conditions are safe.

Component	Activity Frequency[a]	Activity	Response/Maintenance
OSWDF Perimeter Berm	Daily[b]	Visually inspect for ponding or erosion.	Repair depressions and erosion damage.
OSWDF Perimeter Drainage Channel[c]	Weekly and after storm events	Inspect for depressions, excessive sediment/vegetation build-up, and erosion damage.	Repair depressions and erosion damage, remove sediment build-up, and remove woody vegetation.
Temporary Diversion Channels[c]	Weekly and after storm events	Inspect for damage (e.g., torn fabric), sediment build-up, and scouring.	Remove sediment when it reaches one-half of check dam height, replace missing riprap, and repair scoured areas.
Leachate Catchment Area[c]	Weekly and after storm events	Inspect for sediment build-up that may affect drainage to LCS.	Remove sediment.
Erosion and Runoff Controls Inside Cell[c]	Weekly and after storm events	Inspect for damaged or missing controls.	Replace damaged or missing silt fencing.
Outlet Protection[c]	Weekly and after storm events	Inspect for sediment build-up.	Repair and replace missing riprap, and remove accumulated sediment.
Benchmarks	Annually	Inspect benchmarks for physical damage due to erosion, settlement, or tampering or vandalism, and verify that benchmarks are readable.	Reestablish survey control monuments.
OSWDF Surface Conditions During Periods of Inactivity[c]	Weekly and after storm events	Inspect condition of wind dispersal controls (e.g., surface compaction, crusting agents) and for surface erosion.	Repair damage and compact loose material.

Notes:
[a]Frequencies are based on the judgment of the Architect-Engineer if not specified by ARARs. These frequencies shall be followed to the extent practicable.
[b]Daily inspections are performed on working days only.
[c]Frequency is specified by *OAC* 3745-57-05(B).

Storm events are defined as greater than 0.5 in. of rain in 24 hours.

ARAR = applicable or relevant and appropriate requirement
LCS = Leachate Collection System
OAC = Ohio Administrative Code
OSWDF = On-site Waste Disposal Facility

6.2 OSWDF LEACHATE MANAGEMENT SYSTEM SURVEILLANCE AND MAINTENANCE

Maintenance and monitoring of the OSWDF Leachate Management System, including a schedule for routine inspections and maintenance, is provided in the LISWSP (Appendix C).

Inspection activities addressed in the LISWSP include video inspection of LCS and LDS pipe networks; inspection of valve houses and lift stations to check the condition of instruments/valves; testing alarms; checking tubing and hoses for physical wear and poor connections; and inspection of tanks, pumps and piping for leaks or signs of damage and proper functioning of shut-off valves and alarms. Maintenance activities described in the LISWSP include activities such as calibration, service, and repair of mechanical and electrical equipment and flushing of pipes. Monitoring the quantity of liquids in the LCS and LDS is also addressed in the LISWSP.

6.2.1 Action Leakage Rate

The action leakage rate calculated for each OSWDF cell is 212 gal/acre/day, as documented in the OSWDF Design Package calculations. OSWDF personnel determine the weekly flow rate from the LDS in each OSWDF cell, use the weekly flow rate to calculate an average daily flow rate in gal/acre/day, and then compare the result to the action leakage rate. If the average daily flow rate exceeds 20 gal/acre/day, then OSWDF Operations personnel should perform an initial investigation of the sources and causes of the elevated flow rate. If the average daily flow rate exceeds the action leakage rate in any cell, then an action leakage rate response plan will be developed and implemented.

The action leakage rate response plan will include, but is not limited to the following:

- Calculation of the daily leakage rate for the OSWDF LDS
- Schedule of agency notifications
- Assessments for location, size, and cause of the leak
- Assessments for the impact of the leak and whether waste receipt should be curtailed
- Short-term corrective actions
- Long-term corrective actions.

Monitoring conducted under the OSWDF PSVP provides data (e.g., leachate characterization, groundwater monitoring) for use in identifying the source of liquids. A field change notice to the OSWDF PSVP will be prepared in accordance with the SADQ if additional data is required to develop a response plan. If it is determined that the primary liner has failed, then an OSWDF response action will be required. A response action may include evaluating the operation of the LCS to minimize the hydrostatic head on the primary liner, initiating liner repair, investigating whether contamination has breached the compacted clay liner component of the secondary liner that lies beneath the LDS, increasing groundwater monitoring, or a combination of these actions. In accordance with the OSWDF PSVP, if it is determined that a release from the OSWDF has impacted the groundwater, compliance monitoring and corrective action will be established in accordance with the substantive requirements of *OAC* 3745-54-99 Compliance Monitoring and *OAC* 3745-54-100 Corrective Action Program.

Additional information concerning response actions and notifications is provided in Section 11.2.

6.3 IMTA SURVEILLANCE AND MAINTENANCE

The IMTA is inspected and maintained in accordance with the schedule and activity requirements outlined in Table 3 after they become operational.

Sediment is removed using water, when appropriate, to prevent damage to the leachate runoff channel.

Table 3. IMTA Inspection and Maintenance Activities

Worker safety shall always take precedence over compliance with specified inspection frequencies. If an inspection is not performed due to safety concerns (e.g., severe weather), it will be performed as soon as practicable once conditions are safe.

Component	Activity Frequency[a]	Activity	Response/Maintenance
IMTA Working Surface	Weekly	Visual inspection for ponding, erosion, or other damage to the working surface	Repair depressions and erosion damage. Damage with potential to have an impact on the geotextile membrane located below the working surface requires evaluation of membrane integrity and appropriate repair.
IMTA Perimeter Leachate Runoff Channel	Weekly	Visual inspection for damage, ponding, sediment build-up, and scouring	Repair damaged materials, and remove sediment that can prevent drainage or become dispersible.
Controlled Temporary IMTA Haul – Intermediate Stage	Weekly	Visual inspection of drainage channels for damage and sediment build-up	Repair torn fabric, remove sediment when it reaches one-half the original height of check dams, replace missing riprap, and repair scoured areas.

Notes:
[a]Frequencies are based on the judgment of the Architect-Engineer if not specified by ARARs. These frequencies shall be followed to the extent practicable.

IMTA = Impacted Material Transfer Area

6.4 IMTA LEACHATE MANAGEMENT SYSTEM AND IMPACTED SURFACE WATER MANAGEMENT SYSTEM SURVEILLANCE AND MAINTENANCE

Maintenance and monitoring of the IMTA Leachate Management System and IMTA Surface Water Management System, including a schedule for routine inspections and maintenance, is provided in the LISWSP (Appendix C).

Inspection activities addressed in the LISWSP (Appendix C) include inspection of valve houses and lift stations to check the condition of instruments/valves; testing alarms; checking tubing and hoses for physical wear and poor connections; and inspection of tanks, pumps, and piping for leaks or signs of damage and proper functioning of shut-off valves and alarms. Maintenance activities described in the LISWSP include activities such as calibration, service, and repair of mechanical and electrical equipment and flushing of pipes. Due to sediment controls, the amount of sediment accumulating in Tanks 2A and 2B is expected to be minimal. If necessary, sediment will be removed using appropriate measures (e.g., vacuum truck, manual removal, flushing to the ILTS).

6.5 ROADS SURVEILLANCE AND MAINTENANCE

Roads used during on-site disposal activities are maintained to withstand the degree of use and passage of vehicles using the road with a minimum of erosion and dust generation. Spills and leaks are cleaned up immediately as described in Section 8.7 and detailed in Section 4. Roads will be inspected and maintained in accordance with the schedule and activity requirements outlined in Table 4.

Table 4. Road Inspection and Maintenance Activities

Worker safety shall always take precedence over compliance with specified inspection frequencies. If an inspection is not performed due to safety concerns (e.g., severe weather), it will be performed as soon as practicable once conditions are safe.

Component	Activity Frequency[b]	Activity	Response/Maintenance
Paved and unpaved waste haul routes during initial operations	Daily[a]	Visual inspection and survey for visible material and contamination	Respond as specified in Section 4.
Project-specific haul routes and IMTA Haul Road west from Wheel Wash Facility to Perimeter Road	Daily[a]	Visual inspection and survey for visible material and contamination	Respond as specified in Section 4.
Paved and unpaved road surfaces	As needed	Visual inspection for damage such as rutting, potholes, and erosion	Repair damage as necessary to withstand usage associated with road.
IMTA Haul Road Catch Basins	Quarterly	Testing of shut-off valves	Repair if not fully functional.

Notes:
[a]Inspections are performed if road is used for waste transfer that day.
[b]Frequencies are based on the judgment of the Architect-Engineer if not specified by ARARs. These frequencies shall be followed to the extent practicable.

IMTA = Impacted Material Transfer Area

6.6 SURFACE WATER MANAGEMENT SYSTEM SURVEILLANCE AND MAINTENANCE

The requirements for materials, installation, maintenance, and inspection of specific surface water management and erosion and sediment controls are provided in the Construction Drawings, Technical Specifications (i.e., Sections 02270 – Surface Water Management and Erosion Control, 02721 – Surface Water Control Structures and Pipes, and related sections). Additional inspection and maintenance activities for the surface water management system are provided in Table 5.

Table 5. Surface Water Management System Inspection and Maintenance Activities

Worker safety shall always take precedence over compliance with specified inspection frequencies. If an inspection is not performed due to safety concerns (e.g., severe weather), it will be performed as soon as practicable once conditions are safe.

Component	Activity Frequency[a]	Activity	Response/Maintenance
Sedimentation and Detention Ponds and Pond Structures	Quarterly	Visually inspect for erosion, clogging, and failure.	Repair eroded areas, bare vegetation, and sloughing of banks; replace riprap; repair damaged or clogged spillways or other structures.
Sedimentation and Detention Pond Cleanout Indicator Stake	Quarterly	Determine whether sediment depth in pond has reached the cleanout indicator mark on the cleanout indicator stake.	Remove sediment from pond to restore the pond's design capacity.
Drainage Channels	Quarterly	Visually inspect for erosion, sediment and/or vegetation buildup and sloughing of banks.	Remove sediment build-up, repair eroded and sloughing areas, and replace riprap or rock fill.
Culverts and Outlet Protection	Quarterly	Visually inspect for structural damage, erosion at the outfall, sedimentation, and plugging.	Repair damage and remove plugged materials.

Note:
[a]Frequencies are based on the judgment of the Architect-Engineer if not specified by ARARs. These frequencies shall be followed to the extent practicable.

6.7 OTHER SUPPORT INFRASTRUCTURE, SYSTEMS, AND EQUIPMENT SURVEILLANCE AND MAINTENANCE

6.7.1 Fixed Equipment, Instruments, and Electronics

Maintenance of instruments, fixed equipment, and electronics is conducted in accordance with the site-wide PORTS Maintenance Program. While part of the operating plan for the OSWDF, the equipment, instruments, and electronics identified in Sections 5.8 and 5.9 provide functional support to operations but are not critical to safety and environmental protection. Failure of some of these items may cause cessation of operations, but would not cause a risk of contaminant release or personnel safety. Therefore, a detailed monitoring and maintenance schedule is not provided for these components. Maintenance is performed according to manufacturers' recommendations. PORTS site procedures are followed when decontaminating and moving equipment out of radiologically controlled or otherwise contaminated areas. Calibration of equipment and instruments verifies that instrument readings are properly controlled and adjusted at specified periods to maintain accuracy within prescribed limits, and is conducted in accordance with the PORTS Measuring and Test Equipment Control and Calibration Program. The replacement schedule for equipment is based on the hours logged, engineering review, and manufacturers' recommendations.

6.7.2 Fire Protection

Hazardous waste landfill regulations (40 *CFR* 264.31 and *OAC* 3745-54-31) require the OSWDF to be operated and maintained in a manner that prevents fire or explosions. Inspections will be conducted in accordance with the PORTS Fire Protection Program to review and assess overall conditions relative to Fire Protection Program requirements including housekeeping, storage, and egress; flammable liquid and gas storage and use; fire protection equipment and systems; fire lanes; welding and hot work activities; fire hazards; review of the facility emergency packet; and familiarity with the facility.

6.7.3 Utilities

Utilities required for OSWDF operations include raw water, electric supply, and lighting. The OSWDF Project Area also has potable water and sanitary sewer, but these systems are not part of OSWDF operations.

Visual inspection of the raw water system to monitor for visible leaks and monitor and record flow meter readings, influent and effluent manifold pressures, settings, and other operating parameters is conducted regularly to ensure proper operation. The raw water system is used in dust suppression and waste placement operations, as necessary; therefore, frequent inspection is warranted to ensure operations.

Inspection of interior light fixtures, exterior light fixtures, and emergency lighting to identify nonfunctioning lights and replace bulbs as needed is conducted periodically. Visual inspection of the potable water system and sanitary sewer system for leaking valves and other obvious problems is conducted periodically. Inspection of the electrical switch gears, transformers, motor control centers, circuit breakers and electrical supply to the Leachate Management System and the ISWMS for functional checkout and cleanliness is conducted periodically.

Repairs are conducted as needed depending on the scope and severity of the problem. In the event of severe weather (e.g., freezing temperatures, high winds, or lightning), these systems may be inspected more frequently to confirm they are not being affected by the weather.

6.8 SECURITY SYSTEM SURVEILLANCE AND MAINTENANCE

The security system established for the OSWDF includes fencing, gates, locks, and warning signs. The routine custodial maintenance and repair of the security systems include conducting visual inspections and repairing or replacing affected components. Possible problems include deterioration, erosion, or frost heave of fence post anchors resulting in fence damage. Normal wear, deterioration, and vandalism are also possible on fencing, gates, locks, and signs.

Table 6 presents the inspection and maintenance activities for these features.

Table 6. Site Security System Inspection and Maintenance Activities

Worker safety shall always take precedence over compliance with specified inspection frequencies. If an inspection is not performed due to safety concerns (e.g., severe weather), it will be performed as soon as practicable once conditions are safe.

Component	Activity Frequency[a]	Activity	Response/Maintenance
Fence	Quarterly	Visual inspection for damaged fence fabric or posts, and under fence erosion	Repair or replace as necessary; repair erosion or extend fence; provide erosion and sediment controls as appropriate.
Gates	Quarterly	Visual inspection for tampering or damage to locks	Repair or replace as necessary; install alternate locks.
Warning signs	Quarterly	Inspection for damaged, deteriorated, or missing warning signs	Repair or replace to meet the original signage specifications.

Note:
[a]Frequencies are based on the judgment of the Architect-Engineer if not specified by ARARs. These frequencies shall be followed to the extent practicable. Site security system shall be inspected after the occurrence of earthquakes, severe rain events such as the 100-year storm, tornados, or other such natural events.

If a breach in the fencing is discovered, security personnel will secure the area and notify local authorities and DOE of the breach. Upon completion of any required investigative actions, repairs and or replacement will be completed. Additional monitoring or added security may be considered as necessary.

Signage is maintained in accordance with DOE Order 473.3A, *Protection Program Operations*, to meet the following original signage specifications for an asbestos disposal facility and hazardous waste disposal facility:

- Maintain legible signs at all entrances and at intervals of 300 ft or less along the OSWDF Project Area boundary or the waste placement area that read: "ASBESTOS WASTE DISPOSAL SITE, DO NOT CREATE DUST, BREATHING ASBESTOS IS HAZARDOUS TO YOUR HEALTH."

- Maintain signs at any entrance to the waste placement area that read: "DANGER – UNAUTHORIZED PERSONNEL KEEP OUT." These signs need to remain legible from at least 25 ft away.

7. WASTE ACCEPTANCE CRITERIA

Waste must satisfy each component of the WAC before it is disposed of in the OSWDF. The generator is responsible for demonstrating compliance with each component of the WAC as detailed in the WAC Implementation Plan. The OSWDF WAC consists of seven components: (1) Prohibited Items, (2) Activity and Concentration Criteria, (3) Waste Evaluation and Characterization Standards, (4) Waste Physical Characteristic Standards, (5) Waste Packaging Standards, (6) Waste Safe Handling Standards, and (7) Waste Transportation Standards (DOE 2015a).

WAC Components 1 and 2 were established by the Waste Disposition ROD. Because the other five components of the WAC deal specifically with the engineering features of the OSWDF and would be modified as further design and operations plans are developed, the Waste Disposition ROD identifies two design and operations documents that would contain the remaining five WAC components: the WAC Implementation Plan and this OSWDF O&M Plan. The WAC Implementation Plan is to contain (1) Prohibited Items, (2) Activity and Concentration Criteria, (3) Waste Evaluation and Characterization Standards, and (6) Waste Safe Handling Standards. This OSWDF O&M Plan is to contain (4) Waste Physical Characteristic Standards, (5) Waste Packaging Standards, and (7) Waste Transportation Standards. Following approval/concurrence by Ohio EPA of the OSWDF final design and this O&M Plan containing these three design-related components of the WAC, DOE will submit a new revision to the WAC Implementation Plan to incorporate all the approved WAC Components into a single document.

WAC Components 4, 5, and 7 are provided in this section.

7.1 WAC COMPONENT 4: WASTE PHYSICAL CHARACTERISTIC STANDARDS

WAC Component 4 is the waste physical characteristic standards identified in the IMPP (Appendix B).

The IMPP establishes the operational requirements to receive, place, and compact impacted material in the OSWDF in a manner that will (1) be protective of the OSWDF liner system, leachate management system, and final cover system; (2) result in an OSWDF waste mass that is stable and does not undergo unacceptable levels of differential settlement; (3) result in the disposal of impacted material in a manner that prevents unacceptable worker exposure to health and safety hazards; and (4) achieve the long-term performance goals of the OSWDF. The IMPP classifies impacted materials as Types 1, 2, 3, 4, and 5 based on handling, placement, and compaction requirements. Placement requirements are provided for each type of waste as well as size and waste form restrictions. The physical requirements for each waste type are the Waste Physical Characteristics Standards WAC for the OSWDF provided in Table 7. Consistent with the IMPP, the standards presented in Table 7 are identified by waste type.

Table 7. WAC Component 4: Waste Physical Characteristic Standards

Materials shall be segregated by waste type prior to delivery to the IMTA or OSWDF and shall meet the physical characteristic standards associated with the waste type.
Type 1 – Materials shall contain no hard agglomerations greater than 12 in. in the greatest dimension.
Type 1 – Type 1 material must be graded so as to permit compaction with standard construction equipment and measurement using the Standard Proctor test, in accordance with the IMPP.
Type 2 – Materials including, but not limited to general building rubble consisting of drywall; heating, ventilation, and air conditioning systems; electrical systems; plumbing systems; size-reduced compressors from X-330 and X-333; and minor equipment shall be sufficiently reduced in size to be gradable into a 21 in. ±3 in. lift by equipment similar to a Caterpillar D-8 bulldozer or equivalent.

Table 7. WAC Component 4: Waste Physical Characteristic Standards (Continued)

Type 2 – The maximum length (and width) of irregularly shaped metals or other components of a building superstructure or finish component shall be 10 ft, with a maximum thickness of 18 in. Occasional large pieces of debris with these maximum dimensions may be accepted for placement as Type 2 material with prior authorization by the OSWDF Operations Manager (or his/her designee).
Type 2 – Piping and cylinders with a nominal diameter larger than 12 in., except the piping containing asbestos, shall be split in half lengthwise or crushed to reduce void space and shall have a maximum length of 10 ft. (Note: piping containing asbestos is Type 5).
Type 2 – Pressurized cylinders shall be visibly identifiable as empty and free of pressure (e.g., breached and clearly marked empty).
Type 2 - Whole, shredded, or sheared scrap tires may be placed as Type 2 waste as long as they meet the exception requirements of *OAC* 3745-27-19 (E)(8)(g)(i)-(iv) and the size and void space limitations for Type 2 material.
Type 3 – Transite panels should be bundled with like sizes (e.g., one bundle would contain transite panels that are 4 ft wide by 4 ft long and stacked up to 4 ft high, while another bundle might consist of transite panels that are 4 ft wide by 12 ft long stacked up to 4 ft high).
Type 3 – Containerized waste shall have no more than 10 percent internal voids (i.e., at least 90 percent full) or shall be very small containers (e.g., ampules).
Type 3 – Intact (i.e., not split) tanks and cylinders with a maximum cross-sectional dimension of 4 ft may be placed as Type 3 impacted material if the internal void space is reduced in accordance with the IMPP Type 3 placement requirements.
Type 3 – Items must be suitable for having Type 1 material placed around and against them. The specific configuration of an item may make this difficult; in those cases, filling around and against these items may be augmented with materials approved by Nuclear Safety to assure that excessive voids will not exist. While these items are acceptable to be placed as Type 3, they should not be sent to the OSWDF without authorization from the OSWDF Operations Manager (or his/her designee).
Type 3 – The maximum cross-sectional dimension of an individual concrete member or other component of a building slab or substructure shall be 4 ft when the item is handled individually and is a regular rectangular shape having no concrete protrusions greater than 18 in.
Type 3 – PCB containers and PCB articles that must be placed in a manner that prevents damage to the container or article shall be clearly identified.
Type 3 – Containers holding free liquids cannot be placed in the OSWDF unless free-standing liquid has been removed and mixed with sorbent or solidified, or the container otherwise complies with *OAC* 3745-57-14. Sorbents used to treat free liquids must be nonbiodegradable.
Type 4 – Uncontaminated vegetative waste (e.g., waste from clearing, stripping, grubbing, mowing) shall not be placed in the OSWDF to the extent practicable. Vegetative waste disposed of in the OSWDF shall be included in Type 4 disposal volume tracking.
Type 4 – Decomposable materials (i.e., organic-based materials that produce methane gas upon decomposition) shall be sized such that they can be placed within a 1-ft-thick lift with minimal voids. The total quantity of Type 4 impacted material placed in the OSWDF shall be limited to 5,744 cy total and 479 cy per cell under a 12-cell configuration.
Type 5 – Asbestos-containing pipe with a nominal diameter of greater than 18 in. shall be split lengthwise or the internal void space filled prior to placement in the OSWDF.
Type 5 – Converters will be segmented. Each segmented converter shell shall be appropriately size-reduced to meet the WAC as Type 2, 3, or 5 waste, balancing the cost of size reduction, the risks to workers, and the efficiency of final waste placement.
Type 5 – Placement of Type 5 material not previously addressed in the IMPP (e.g., whole compressors, large containers) requires development of special placement and compaction requirements that are approved by the Architect-Engineer Contractor responsible for design of the OSWDF.

ACM = asbestos-containing material
IMPP = Impacted Material Placement Plan
IMTA = Impacted Material Transfer Area
OSWDF = On-site Waste Disposal Facility
WAC = waste acceptance criteria

7.2 WAC COMPONENT 5: WASTE PACKAGING STANDARDS

WAC Component 5 defines the minimum packaging requirements for waste acceptance and transfer to the OSWDF. The majority of the waste will be transported and disposed of as bulk waste in which the transport vehicle serves as the package or container. Packaging requirements are specified by DOT, RCRA, and TSCA. Transfer of hazardous material to the OSWDF at PORTS will be performed in accordance with the ARARs and TBCs. The on-site transfer of waste to the OSWDF shall be performed in a manner that will provide a level of safety equivalent to that provided if transportation were conducted in accordance with DOT requirements, as discussed in Section 4. Table 8 provides the waste packaging standards of the OSWDF WAC. It should be noted that containers disposed of in the OSWDF must comply with other WAC requirements (e.g., physical characteristic standards for void space and prohibited contents, such as liquids).

Table 8. WAC Component 5: Waste Packaging Standards

Hazardous materials must be transferred to the OSWDF in a DOT–approved package, a DOT-equivalent package, or in accordance with DOT packaging equivalency requirements developed per DOE Order 460.1D requirements and approved by the Transportation Manager for the discrete waste stream.
All hazardous material transfers in roll-offs and open top truck beds shall be covered (e.g., tarped) unless otherwise approved by the Transportation Manager. This approval shall be documented, available for inspection, and utilized by the WAO to verify loads are in compliance and ready for transfer.
Tight fitting, leak resistant tailgates are required on all equipped truck beds, roll-off boxes, or other gate-equipped conveyances unless otherwise approved by the Transportation Manager. This approval shall be documented, available for inspection, and utilized by the WAO to verify loads are in compliance and ready for transfer.
PCB waste other than PCB bulk product or PCB remediation waste such as PCB articles, PCB items, and PCB equipment shall be containerized in accordance with 40 *CFR* 761.65(c)(6).
Containerized PCBs and PCB items at concentrations greater than or equal to 50 ppm will be labeled in accordance with 40 *CFR* 761.40(a)(1).
Regulated beryllium-containing waste and beryllium-contaminated equipment must be packaged and disposed of in sealed, impermeable bags, containers, or enclosures per 10 *CFR* 850.32(b).
Packages of regulated beryllium-containing waste and beryllium-contaminated equipment must be labeled with the following information in accordance with 10 *CFR* 850.38(b): "DANGER, CONTAMINATED WITH BERYLLIUM, DO NOT REMOVE DUST BY BLOWING OR SHAKING, CANCER AND LUNG DISEASE HAZARD."
Waste lacking long-term structural stability that has not otherwise been processed to provide structural stability must be placed in a disposal container or structure that provides stability after disposal.
Regulated asbestos-containing material shall be managed per 40 *CFR* 61.150(b)(1)-(3) and *OAC* 3745-20-05(A).
Regulated asbestos-containing containers shall be labeled in accordance with 40 *CFR* 61.150(b)(1)-(3) and *OAC* 3745-20-05(A).
Containerized waste shall be evaluated prior to containerization, provided with an appropriate vent, and marked if there is potential to generate gas pressure.
Containers shall be marked to indicate if waste requires continued management in containers and whether the container must remain intact during placement.

ACM = asbestos-containing material
CFR = *Code of Federal Regulations*
DOE = U.S. Department of Energy
DOT = Department of Transportation
OAC = *Ohio Administrative Code*
OSWDF = On-site Waste Disposal Facility
RACM = regulated asbestos-containing material
WAO = Waste Acceptance Organization

7.3 WAC COMPONENT 7: WASTE TRANSPORTATION STANDARDS

As described in Section 4, transfer of hazardous material to the OSWDF at PORTS is performed in a manner that provides a level of safety equivalent to that provided if transportation were conducted in accordance with DOT requirements and in full compliance with DOE Order 460.1D. Waste packaging and conveyance requirements will be documented and approved by the Transportation Manager based on the characteristics of the individual waste stream. Documentation of this evaluation and approval of the package and conveyance for a discrete waste stream will be included in the project documentation that accompanies the Waste Certification Package submitted by waste generators. The WAO verifies compliance with WAC Component 7 before the vehicle is released from the generating project.

The Waste Transportation Standards provided in Table 9 are based on the process for transferring waste from the location of waste generation to the OSWDF as described in Section 4.

Table 9. WAC Component 7: Waste Transportation Standards

Waste transfer to the OSWDF will be conducted exclusively within the Department of Energy facility boundary and out of commerce. Public access will be restricted. If movement crosses a public road, then that crossing will be restricted by signals, lights, gates, or similar controls. The OSWDF Project and the FBP Transportation Department will verify and monitor compliance [49 *CFR* 171.1 (4)].
RACM that is transported and disposed of in bulk shall be handled in a manner that causes no visible emissions [*OAC* 3745-20-05(B)(2)].
Each motor vehicle used to transport waste materials to the OSWDF must, when transporting hazardous materials, be secured to prevent the cargo from leaking, spilling, blowing, or falling from the motor vehicle. The load must be contained, immobilized, or secured to prevent shifting upon or within the vehicle to the extent that the vehicle's maneuverability is not adversely affected. These requirements shall be documented, available for inspection, and utilized by the WAO to verify loads are in compliance and ready for transfer (49 *CFR* 393 Subpart I).
Waste transport vehicles must be equipped and operated to the standards for commercial motor vehicles per the Federal Motor Carrier Safety Regulations. The D&D Contractor Transportation Department will verify and monitor all motor vehicles used for transport to ensure compliance with this standard (49 *CFR* 393 Subpart I).
Radiation protection requirements established in 10 *CFR* 835 must be met prior to transfer of the waste stream. These requirements shall be documented, available for inspection, and utilized by the WAO to verify loads are in compliance and ready for transfer.
Waste streams will be evaluated to be compatible prior to loading and transfer to the OSWDF. Separation and segregation of hazardous materials will be evaluated by D&D Contractor Transportation per 49 *CFR* 177.848. These requirements shall be documented, available for inspection, and utilized by the WAO to verify loads are in compliance and ready for transfer.
Transfer of waste will be conducted in accordance with approved control measures (e.g., speed limits, weather restrictions, public accessibility) established for the waste streams. On-site transfer or movement conditions historically are less hazardous than those encountered in commerce. Deviations will be accomplished through approved equivalent levels of safety documents. When operations deviate from 49 *CFR* requirements, the equivalent safety requirements will be addressed in work packages, procedures, and other forms of peer reviewed written instructions available for inspection, and utilized by the WAO to verify loads are in compliance and ready for transfer.

CFR = *Code of Federal Regulations*
PORTS = Portsmouth Gaseous Diffusion Plant
OSWDF = On-site Waste Disposal Facility
RACM = regulated asbestos-containing material
WAO = Waste Acceptance Organization

8. POTENTIAL OPERATING PROBLEMS

Sections 1 through 4 of this OSWDF O&M Plan describe OSWDF routine operation plans during normal operating conditions. Good planning must also recognize that the potential exists for issues to arise during OSWDF operations, and plan accordingly. Potential operating problems recognized are based on identified risks for the OSWDF, experience from operation of CERCLA on-site disposal cells at other DOE sites, and lessons learned from other DOE sites, and are described in this section. These potential operating problems include:

- Anomalous waste received
- Truck or heavy equipment issues
- Liner torn or damaged
- Loss of raw water
- Loss of electrical power
- Severe weather
- Leak or spill on road.

Potential operating problems related to the OSWDF Leachate Management System, the IMTA Leachate Management System, and the IMTA ISWMS, (e.g., clogged pipes, system alarms, liquids in containment pipe annular space) are addressed in the LISWSP (Appendix C).

8.1 RECEIPT OF ANOMALOUS WASTE

Recognizing that elimination of the receipt of anomalous waste is in the best interest of OSWDF operations, it is acknowledged that some anomalies may get through even the most carefully implemented anomaly prevention processes. The WAC Implementation Plan describes the anomaly detection and response program that will be implemented at the OSWDF. The OSWDF Operations personnel will be trained to look for anomalous waste in accordance with the WAC Implementation Plan.

The WAC Implementation Plan provides a three-tiered response program for anomalous waste and conditions. OSWDF Operations personnel will be appropriately trained in this response program. Response is based on risk/impact priority and focused on protection of human health, safety, and the environment. If a prohibited item is found in waste at the IMTA or OSWDF, then OSWDF Operations personnel will respond in accordance with the response program. In most cases, and as described in the WAC Implementation Plan, receipt of anomalous waste at the OSWDF will require returning the waste to the generator and dispositioning it in accordance with the generator's waste management plan. The WAC Implementation Plan allows the OSWDF to make anomalous items WAC compliant under existing OSWDF approved work processes; if possible, OSWDF Operations may correct the issue and not return the anomalous item. An example of this situation could involve receipt of Type 2 debris at the OSWDF or IMTA that fails to meet a Type 2 physical size limitation. OSWDF Operations could elect to size-reduce the waste or place the waste as Type 3 – Individually Handled Large Debris instead of returning the debris to the generator.

The full description of management of unexpected anomalies in waste, including the three-tiered response program and trend analysis, is provided in the WAC Implementation Plan. DOE and Ohio EPA will be notified by the WAO or OSWDF personnel of the detection of any anomalies in the OSWDF or IMTA, as required by the WAC Implementation Plan.

8.2 TRUCK OR HEAVY EQUIPMENT ISSUES

If a transport vehicle malfunctions on a site road during OSWDF operations, it will be repaired in place, in the OSWDF Project Area, or at another facility inside the Limited Area based on the problem and the need for contamination control during repair. If waste must be removed from the vehicle to allow repair, the waste will be transferred to another vehicle using appropriate controls to prevent spills/releases. If off-site repair is required, the vehicle will be decontaminated to meet DOE release requirements. If a spill occurs while repairing a haul truck or transferring waste, the spill response protocol will be implemented per Section 8.7 of this document.

If heavy equipment malfunctions in the OSWDF during initial OSWDF operations, it will be repaired in place, if possible. The tools and equipment used to repair the heavy equipment will be decontaminated and surveyed for release. If the heavy equipment cannot be repaired in place, then the heavy equipment will be decontaminated, surveyed for release, and taken off site for repair.

If heavy equipment malfunctions in the OSWDF during full-scale OSWDF operations, it will be moved to the equipment maintenance area, if possible. If the heavy equipment cannot be moved, it will be repaired in place. The tools and equipment used to repair the heavy equipment will be decontaminated and surveyed for release if they leave the radiologically controlled area.

If a vehicle or equipment tips over while operating inside an active cell, the OSWDF Operations personnel will follow required lifting protocols and spill response procedures, as needed. If a vehicle or equipment becomes stuck in soft ground at the OSWDF, the OSWDF Operations personnel will provide rigging per the OSWDF Hoisting and Rigging Procedure and Site Rigging Manager.

An adequate heavy equipment fleet will be maintained in operable condition as necessary to create end-of-day surface conditions described in the IMPP (Appendix B) should this operating problem occur.

8.3 CELL LINER TORN OR DAMAGED

If a cell liner is torn or damaged during OSWDF operations, the Project Director, DOE, and Ohio EPA will be notified. The OSWDF Operations Manager and the OSWDF Field Engineering Manager will evaluate the situation to determine the liner material and protocol for repair. Geosynthetic clay liners are repaired on a case-by-case basis. The general process for geosynthetic clay liner repairs includes stopping work, contacting the OSWDF Engineering Manager, performing an engineering evaluation, developing a repair plan, obtaining required approvals for the repair plan, and conducting repairs per the repair plan. Repairs to cell liners will be done in a manner that fully restores the original performance specification of the liner. DOE and Ohio EPA will also be provided an opportunity to inspect the completed repairs.

8.4 LOSS OF RAW WATER

If there is a loss of raw water at the OSWDF, then the OSWDF Operations Manager will determine if waste transfer, movement, handling, and placement operations shall be suspended until a replacement water source is found.

8.5 LOSS OF ELECTRIC POWER

The electric power supply to the OSWDF is designed with a redundant feed. However, if the redundant feed is also lost, then the OSWDF Operations personnel will manually operate the card-activated access control gate(s), use the back-up paper system in lieu of the RFID system, and utilize portable generators to power the leachate and other sump pumps if the liquid level on the liner approaches the action leakage rate.

8.6 INCLEMENT WEATHER

If severe weather (e.g., high winds, heavy rain, hail, snow, thunderstorms, tornados) is approaching, then waste transport vehicles will proceed to the waste generating projects or the OSWDF and the OSWDF Operations personnel will place heavy equipment in a safe configuration. In the event of inclement weather, the OSWDF Operations personnel will follow existing site protocols for inclement weather as described in Section 9.4.3.1.

8.7 SPILL RESPONSE

All efforts will be made to operate and maintain the site in a manner that prevents hazardous conditions resulting from spilled liquids and windblown materials. Spills and releases during O&M of the OSWDF and IMTA are responded to in accordance with the spill response protocols contained in the Comprehensive OSWDF RD/RA Work Plan.

Spill kits will be maintained throughout the project sites associated with this scope of work. Additionally, PORTS maintains an adequate supply of spill control equipment to respond to spills at the plant. This spill response equipment is maintained throughout the site, but the bulk of the response equipment exists at the X-1007 Fire Station, the X-700, and X-326 where response personnel can promptly access them. Materials maintained at the facility include booms, absorbent materials, spill pads, socks, gloves, tools, etc. The PORTS Fire Department in X-1007 is operational 24 hours/day, maintains a spill response trailer, and is capable of responding to emergencies at PORTS.

Spills and releases that may occur during implementation of this action will be responded to immediately and recovered material dispositioned in accordance with ARARs (Appendix A). For clarity in planning response actions, DOE considers the following three spill classifications: incidental, minor, and significant. Responses to these spills are further described below.

Incidental Spill. A spill of a hazardous substance of less than 1 gal is considered an incidental spill provided it does not exceed a reportable quantity. These spills, if visible, will be cleaned up and managed as appropriate but will not entail any special notifications or location tracking. Examples of these types of spills are leaks/releases from heavy equipment.

Minor Spill. A spill of a hazardous substance of greater than 1 gal, or any spill of hazardous waste regardless of volume (except spills of hazardous waste meeting the definition of a significant spill or release), is considered a minor spill provided it does not exceed a reportable quantity. Minor spills contained within the project area will be cleaned up, if visible, and managed primarily by project personnel with the appropriate regulatory and waste management support. Minor spills will be reported to Emergency Management and/or the Plant Shift Superintendent (PSS). Ohio EPA will be notified by documenting the spill in the OSWDF project-specific annual update (i.e., the OSWDF Annual Project Status Report), and the spill locations will be identified using Geographic Information System equipment. The OSWDF Annual Project Status Report will document the material spilled; the date, time and location of the spill; the actions taken to remove the spill; and disposition of the waste generated. DOE will ensure adequate excavation is completed in the spill area (i.e., the spill area will be overexcavated).

Significant Spill. A significant spill or release infers that there are serious consequences to human health or the environment requiring immediate and coordinated spill response. Ohio EPA will be promptly informed of any significant spills, including significant spills of any legally reportable quantity of any particular substance. For the purposes related to the scope of this project, the definition of a significant spill or release includes the following examples:

- A fire that causes the release of toxic fumes
- A fire that spreads, possibly igniting materials at other locations or causing heat-induced explosions
- The spill that results in the release of flammable liquids or vapors, thus causing a fire or gas explosion hazard
- The spill that cannot be contained on PORTS, resulting in off-PORTS soil contamination and/or groundwater or surface water pollution
- A release into the environment of a petroleum product with the potential for impacting streams by causing a sheen, or a significant quantity of oil (i.e., 25 gal or greater) that has reached or can potentially reach beyond the project boundary.

The PSS is delegated the responsibility by PORTS management to supervise site emergency response activities, including responses to significant spills and releases. The PSS is authorized to make protective action recommendations for both on-site personnel and off-site populations.

PORTS emergency protocols and other regulatory-required spill response plans (e.g., RCRA Part B Contingency Plan and PORTS Spill Prevention Control and Countermeasures Plans) will be consulted and utilized as appropriate or as required. The OSWDF Annual Project Status Report will document the material spilled; the date, time and location of the spill; the actions taken to remove the spill; and disposition of the waste generated. DOE will ensure adequate excavation is completed in the spill area.

In addition to the requirements of this section, if a spill or leak occurs on the IMTA Haul Road during full-scale OSWDF operations, the IMTA Haul Road Surface Water Isolation Valve will be closed to prevent release. In this scenario, emergency measures would be implemented to pump water captured in the catch basins and piping, via manholes or other structures, to portable tanks or other storage to prevent off-site release. The collected water would be processed through the ILTS prior to release.

9. SAFETY AND EMERGENCY RESPONSE

DOE places the protection of human health and the environment above all else. Safety of employees, visitors, and the public is supported by the implementation of the site Safety and Health Program, Radiation Protection Program, and Emergency Response Program.

9.1 OPERATING SCHEDULE

The OSWDF Project standard work week is Monday through Thursday, between the hours of approximately 7:00 a.m. and 5:30 p.m. Waste placement typically occurs during daylight hours; the last truckload of waste will typically be accepted no less than 45 minutes prior to sundown. The OSWDF Operations Manager or designated representative may provide approval for variations to the normal operating schedule. Operations outside of daylight hours require appropriate lighting for worker safety and effective operations.

Waste placement in the OSWDF will typically occur from March through December, but may proceed year-round (weather permitting). Waste placement activities will cease for the winter when the OSWDF Operations Manager determines that satisfactory compaction of waste or safe working conditions are no longer achievable due to weather conditions. Alternatively, the OSWDF Operations Manager, in consultation with the OSWDF Field Engineering Manager, may elect to develop a winter placement plan to allow waste placement during the winter. If the winter placement plan alters the placement approach in the IMPP, a design change will be submitted to Ohio EPA for review and concurrence prior to implementation. The IMTA and haul roads may remain open year-round providing all operational requirements can be satisfied.

9.2 SAFETY AND HEALTH PROGRAM

Site health and safety practices associated with operations, maintenance, and monitoring activities are based on the Worker Safety and Health Program. The health and safety of employees is controlled through adherence to the job hazard analysis. Prior to the start of operation, maintenance, and monitoring activities, DOE's D&D Contractor (or subcontractor) analyzes the hazards and identifies appropriate work controls. Safety requirements are discussed during prejob briefings. Line managers and workers ensure that hazard controls are properly implemented during performance of the work by using the Guiding Principles of the Integrated Safety Management System. Subcontractors are required to adhere to the Worker Safety and Health Program or submit an equivalent for approval by DOE's D&D Contractor.

Additional health and safety considerations may apply, such as measures to prevent or minimize danger associated with animals and insects (such as wasps, spiders, and snakes) and the application of herbicides or pesticides (personnel who use chemicals will review the safety data sheets, be trained in safe work practices, and wear appropriate personal protective equipment [PPE]). Site procedures for lockout/tagout will be followed when working where electrical hazards or stored energy are present. All employees have the authority to stop or pause work, if needed.

9.3 RADIATION PROTECTION PROGRAM

Site radiological protection practices associated with operations, maintenance, and monitoring activities are based on 10 *CFR* 835, *Radiological Protection.* A DOE-approved Radiation Protection Plan, applicable to all work activities that involve radioactive materials unless otherwise excluded from the requirements of 10 *CFR* 835, addresses the radiation protection elements that are applicable to PORTS. Radiation protection of humans and the environment is controlled through adherence to radiological work permits. DOE ensures that radiation exposure to workers and the public and releases of radioactivity to the environment are below regulatory limits established in DOE Order 458.1(h)(1)(c). Monitoring is discussed in the OSWDF PSVP. Deliberate efforts are taken to further reduce exposure and releases to as low as reasonably achievable (ALARA) levels. Subcontractors are required to adhere to site Radiation Protection plans, protocols, and procedures.

DOE complies with applicable requirements and the site Radiation Protection program through establishment of radiologically controlled areas, radiological monitoring, and the appropriate use of radiation protection. Radiological technician(s) will be assigned to the OSWDF Project. In conjunction with the OSWDF Safety and Health Representative, the radiological technician(s) will help to ensure radiological compliance throughout the project. Radiological compliance includes the radiological monitoring of equipment and materials entering and leaving the job site; radiological monitoring of soil during excavations to help ensure proper segregation, storage, or disposition; radiation work permit compliance; routine inspection, monitoring, and recording of area radiation detection monitoring; and radiological monitoring of personnel, as necessary.

9.4 EMERGENCY MANAGEMENT PROGRAM

Site emergency management is based on DOE Order 151.1D, *Comprehensive Emergency Management System*. The emergency management program is supplemented with a Contingency Plan and a Facility Emergency Action Plan. The Contingency Plan describes the actions facility personnel will take in response to fire, explosions, or unplanned sudden or nonsudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water. The substantive elements of the Contingency Plan are implemented immediately whenever one or more of these occurrences could threaten human health or the environment. These situations are identified as significant spills in Section 8.7, along with the specific response actions. The Emergency Action Plan, prepared by the OSWDF Facility Manager, addresses potential emergencies at the OSWDF Project Area. The OSWDF Facility Manager is also responsible for preparing facility emergency packets for the OSWDF Project Area, ensuring training of personnel within the OSWDF, ensuring building emergency plans are in place (as needed), and being knowledgeable about all activities that may affect emergency responders. All emergencies associated with the OSWDF Project Area will be reported to the PSS. The OSWDF Project Area will also rely on the PORTS Fire Department and other on-site and off-site first responders for medical, fire, and other emergencies as directed by the PSS. The PORTS Emergency Response Plan will be updated to include the OSWDF prior to waste placement operations.

9.4.1 Emergency Communications

The PSS serves as the Emergency Coordinator for the OSWDF Project Area and is delegated the responsibility by PORTS management to supervise site emergency response activities, including responses to significant spills and releases. The PSS is familiar with the Contingency Plan, activities at the facility, the locations and characteristics of waste handled, the location of records within the facility, and the facility layout. The PSS has the authority to commit the resources needed to implement the Contingency Plan, as well as the authority to make protective action recommendations for both on-site personnel and off-site populations. The PSS is on duty or on call at all times.

Reliable and redundant communication systems (e.g., telephone, e-mail, public address system, radios, etc.) provide OSWDF personnel with the means to notify the PSS as well as off-site organizations and agencies during waste operations and in the event of an emergency. OSWDF personnel shall always have immediate access to an internal alarm or emergency communications device.

9.4.2 Emergency Response Equipment

Emergency response equipment located within the OSWDF Project Area includes communications equipment, alarm systems, fire extinguishers, spill control equipment, decontamination equipment, portable fire extinguishers, and tornado shelters. The emergency response equipment will be tested and maintained as necessary to assure its proper operation in the event of an emergency. Emergency response or inclement weather alarms from the PORTS plant area may be heard at the OSWDF Project Area and shall be responded to accordingly. Field personnel carry radios, allowing them to receive site announcements.

Spill kits are maintained throughout the OSWDF project Area (Section 8.7). In addition, PORTS maintains an adequate supply of spill control equipment to respond to spills at the plant. Materials maintained at the facility include booms, absorbent materials, spill pads, socks, gloves, tools, etc. The PORTS Fire Department in X-1007 is operational 24 hours a day, maintains a spill response trailer, and can respond to emergencies at the OSWDF Project Area.

9.4.3 Emergency Response Protocols

Site protocols have been developed for emergencies such as inclement weather, medical emergencies, fires, and spills or unplanned releases as summarized in the following subsections. In the event of an emergency, emergency response protocols provided in Section 8.7 for spills or releases will be immediately implemented.

9.4.3.1 Inclement and severe weather

The OSWDF Operations Manager or designated representative monitors the current weather conditions and weather forecasts. Inclement weather may include winds, rain, snow, and thunderstorms. Waste is not to be placed during periods of significant precipitation, lightning, or high wind conditions. Significant precipitation and high wind conditions are determined by the OSWDF Operations Manager and the OSWDF Environmental Safety and Health Manager. Waste placement activities shall not resume after inclement weather shutdown until approval is provided by the OSWDF Operations Manager based on the weather forecasts, including temperature and chances for precipitation or lightning; the condition of haul roads; potential for additional erosion of waste; nature of waste to be placed; and conditions within the OSWDF.

Severe weather events include high winds, heavy rain, hail, heavy snow or ice, severe thunderstorms, tornados, or earthquakes. In the event of severe weather, a Take Cover or evacuation order may be given by the PSS or the OSWDF Operations Manager. A severe weather shelter in the OSWDF Project Area provides protection for project personnel. The OSWDF Operations Manager or designated representative will inspect the OSWDF Operations Area after the event. If there is significant damage caused by the event, the OSWDF Operations Manager will contact the Emergency Coordinator who will activate an emergency response team.

9.4.3.2 Medical emergencies

PORTS maintains emergency medical coverage consistent with the activities being conducted on site. The PSS will notify appropriate occupational health services and medical personnel in the event of medical emergencies ranging from industrial accidents to toxic or radiological releases.

9.4.3.3 Fire

Fires may include wildfire or fires within the OSWDF Project Area. In the case of threat from a wildfire or smoke from a wildfire, instructions from the PSS will be followed (e.g., take cover instruction, facility evacuation). In the case of a fire within the OSWDF Project Area, personnel response instructions will be given by the OSWDF Operations Manager.

10. MANAGEMENT OF SECONDARY WASTE

The operations and maintenance activities described in this plan will generate secondary waste (e.g., PPE, waste from equipment maintenance) to be managed. Management of secondary waste is conducted in accordance with the PORTS Waste Management Program. Waste Management personnel assure that secondary waste is properly characterized, packaged, labeled, transported, and disposed; interface with the WAO and treatment and disposal vendors; and implement quality control (QC) measures to ensure that secondary waste is compliantly managed and dispositioned. CERCLA Point-of-Generation Waste Staging Areas are set up in areas near that which waste is being collected and containerized prior to movement to a CERCLA storage area, the OSWDF, or for off-site disposal. No waste staging piles will be created outside of the OSWDF or IMTA within the OSWDF Project Area.

As noted in the *Supplement No. 1 to the Remedial Investigation and Feasibility Study Report for the Side-wide Waste Disposition Evaluation Project Proposed Corrective Action Management Unit and Area of Contamination Designations for Alternate 2 at the Portsmouth Gaseous Diffusion Plant, Piketon, OH* (DOE 2014b), secondary waste generated because of a remedial action is considered CAMU-eligible waste, whether or not it is a hazardous waste. This includes PPE and other secondary waste streams (e.g., leachate treatment sludges and spent resins, spill cleanup waste, tank sediments, and equipment decontamination wastes) as they are generated during remediation efforts, not during industrial operations. Secondary wastes generated by OSWDF operations, maintenance, and monitoring activities may include, but are not limited to the following:

- **Hazardous Waste.** Hazardous wastes generated from maintenance of the haul trucks, heavy equipment, and support infrastructure include cleaning fluids and TCE-contaminated decontamination wastes. These CAMU-eligible wastes are not subject to the land disposal treatment requirements in the *OAC* 3745-270, but shall not exceed the WAC limit for TCE of 5,000 ppm.

- **Universal Waste.** Universal wastes generated from O&M activities include lead-acid batteries from vehicle maintenance. Universal waste is prohibited by the OSWDF WAC and is disposed of off site.

- **Used Oil.** Used oil is generated from the maintenance of haul trucks and heavy equipment in the maintenance buildings and includes transmission fluids, engine oil, and brake fluids. Used oils identified as hazardous waste are managed and disposed of as hazardous waste; nonhazardous used oils are either recycled or disposed of at an appropriately registered off-site treatment facility.

- **Solid/Sanitary Waste.** Solid/sanitary wastes generated from O&M activities include PPE, oil rags, empty cans, and packing materials. These wastes may be disposed of in the OSWDF in accordance with the WAC (e.g., aerosol cans shall be visibly identifiable as empty and free of pressure) or disposed of off site. Decomposable (Type 4) solid and sanitary waste will be sent off site for disposal.

- **Low-level (radioactive) Waste (LLW).** Secondary LLW is generated during operations from sources like worker PPE, broken equipment, and maintenance of radiologically contaminated equipment. These items may be disposed of in the OSWDF in accordance with the WAC.

- **Spill Cleanup Waste.** Waste generated from hazardous waste or solid waste spills that occur during O&M of the OSWDF are considered D&D waste for disposition purposes. Spill cleanup waste may be disposed of in the OSWDF in accordance with the WAC.

Secondary waste is characterized in accordance with ARARs as identified in Appendix A and published EPA guidance. Information for the characterization of waste is based on process knowledge or historic data first, consistent with EPA guidance "Waste Analysis at Facilities that Generate, Treat, Store, and Dispose of Hazardous Waste – Final" (EPA 2015), which states that a facility may apply acceptable knowledge of the waste in lieu of testing the waste. All hazardous waste is evaluated based on process knowledge or analytical characterization to determine the waste codes and underlying hazardous constituents.

Hazardous waste, universal waste, and used oil are disposed of as soon as practicable given the need to accumulate sufficient quantities necessary to facilitate proper recovery or treatment and disposal, which could require a longer time frame specified by regulations (e.g., 1 year for universal waste). Full containers of these wastes requiring storage prior to transportation and disposal will be moved to CERCLA storage areas within the Limited Area at PORTS that meet the substantive requirements of waste storage ARARs.

CERCLA Point-of-Generation Waste Staging Areas are established for hazardous waste, universal waste, used oil, and solid wastes. Waste is accumulated in a manner that prevents a nuisance or release of waste or hazardous constituents to the environment. Waste disposal containers are provided for the proper collection of waste material. Containers are properly marked, are made or lined with materials compatible with the waste to be stored, and containers holding incompatible wastes types are separated and kept closed during storage, except to add or remove waste. Containers are opened, handled, and stored in a manner that will not cause them to rupture or break. If a container deteriorates or begins to leak, then the container is overpacked or waste is transferred to another container. Spilled or leaked material is cleaned up in a timely manner, in accordance with Section 8.7.

In Appendix B of the Waste Disposition ROD, a portion of the PORTS site has been identified as an Area of Contamination (AOC). The AOC boundary encompasses much of the PORTS site, including the OSWDF Project Area where the IMTA, the Wheel Wash Facility, and equipment maintenance areas are to be located. Per the CAMU Supplement to the Waste Disposition Remedial Investigation/Feasibility Study, "Using the AOC would allow for the unencumbered movement of D&D wastes, waste not within DFF&O (non-DFF&O waste), and other remediation waste within the confines of the AOC, without triggering the generation of hazardous waste that would result in the need for additional handling requirements to be implemented."

Wastes generated from maintenance activities at the OSWDF that are prohibited from on-site disposal (e.g., lead batteries, used oil) are disposed of at appropriately registered off-site disposal facilities. Waste sent off site for disposal will be sent to facilities approved by EPA pursuant to 40 *CFR* 300.440, the CERCLA off-site rule. Transportation of wastes off site complies with all applicable DOE and DOT requirements.

11. RECORDS, NOTIFICATIONS, AND REPORTING

This section addresses records, notifications, and reporting requirements associated with the O&M of the OSWDF. Per the DFF&O, all work performed shall be documented and maintained. Copies of all documents and information requested by Ohio EPA will be provided in accordance with the DFF&O, Section XIX, *Access to Information.*

11.1 RECORDS

Original data collected in the field (e.g., field logbooks, inspection forms, equipment calibration records, maintenance records, cost data, drawings, and photographs) are considered records. Records shall be maintained and controlled in a manner that prevents loss, damage, and deterioration, filed in accordance with the subject file index, and retained in accordance with the DFF&O and DOE Orders, including DOE Order 435.1, *Radioactive Waste Management*. Records shall be authorized by the signature and date of the originator. Errors shall be corrected by crossing with a single line through the error and entering the correct information. Corrections shall be initialed and dated by the person making the correction. Electronic reports, forms, or other documentation shall have a means of electronically tracking changes and corrections. Short-term storage of records in the field, which are considered active for operational use, shall follow established site procedures that dictate storage requirements. Long-term storage of records shall be provided at the Records Management Document Control (RMDC). The PORTS Records Management Program adheres to the requirements in the most current version of DOE Order 243.1B, *Records Management Program*.

11.1.1 Operating and Disposal Records

Examples of records generated from OSWDF activities include electronic tracking data, disposal records, test results (e.g., compaction tests), and operating logs generated by the OSWDF Organization, the WAO, and the CQC Contractor.

The OSWDF Operations Manager maintains a field activity log and generates daily truck counts for each type of waste, daily waste placement volumes, and disposal records. The field activity log includes a narrative record of events occurring during the day, unusual events, visitors at the site, calibration verification, subcontractor progress and specifications, communication with regulatory agencies, and weather conditions.

Upon receipt of the waste, the OSWDF Project is responsible for tracking waste during staging and through final placement. The OSWDF Operations Manager is responsible, with the independent oversight of the WAO, for tracking the ongoing and cumulative placement of Type 4 impacted materials within individual cells and in the overall OSWDF. The WAC Implementation Plan requires the OSWDF Organization and the WAO to exercise diligence and conservatism in the tracking of any compliant Type 4 waste purposefully released for placement within the OSWDF to ensure the established, albeit conservative, limit of 479 cy per cell and a total of 5,744 cy for the entire OSWDF are not exceeded.

ARARs and TBCs require disposal records to include the burial locations for certain types of waste. These requirements are presented in Table 10.

As described in Section 2.3, each cell of the OSWDF is divided into grids for placement of waste. The locations of these grids are recorded relative to permanent survey benchmarks. The records of waste dispositioned in the OSWDF will include the material type established by the IMPP (Appendix B), generator source of waste at PORTS, cell number, cell grid (i.e., the horizontal location of the waste in the cell), and cell lift (i.e., the elevation location of the waste in the cell). If applicable, hazardous waste, PCB, and asbestos information identified in Table 10 will also be included in the disposal record, as well as radionuclide inventory information in accordance with DOE Order 435.1-1 implementing documents. The quantity of asbestos dispositioned will be determined by surveying the volume placed in the asbestos grid of the cell.

Table 10. Disposal Tracking Requirements

Regulation/Regulatory Citation	Summary of Requirement
Hazardous Waste Landfills 40 *CFR* 264.309 *OAC* 3745-57-09	Record on a map the exact location and dimensions, including depth, of each cell in reference to permanently surveyed benchmarks and document the contents of each cell and the approximate location of each hazardous waste type within each cell.
TSCA Landfills 40 *CFR* 761.75(b)(8)(iv)	Disposal records shall include information on the PCB concentration in the liquid wastes and the three dimensional burial coordinates for PCBs and PCB items.
ACM Disposal 40 *CFR* 61.154(f) *OAC* 3745-20-06(C)(2)	Maintain until closure records of the location, depth and area, and quantity in cubic yards of asbestos-containing waste material within the disposal site on a map or diagram.
Radionuclides DOE Manual 435.1-1 (IV)(P)(6)(e)[a]	Operations shall include a process for tracking and documenting low-level (radioactive) waste placement in the facility by generator source.

Note:
[a]TBC

ACM = asbestos-containing material
CFR = Code of Federal Regulations
DOE = U.S. Department of Energy
OAC = Ohio Administrative Code
PCB = polychlorinated biphenyl
TBC = to-be-considered (guidance)
TSCA = Toxic Substances Control Act of 1976

The CQC Contractor generates field forms and daily reports regarding waste placement in accordance with the CQA Project Plan. CQC Contractor field forms, as-built drawings, completed field forms, daily and weekly field reports, waste placement compaction test reports, and other pertinent waste placement documentation will be submitted to RMDC for placement in the OSWDF project file.

The WAO verifies that waste is tracked to the final disposal location in accordance with the WAC Implementation Plan. A documented record will be created and maintained. The WAO verifies that waste transported to the OSWDF is accompanied by the appropriate waste tracking documentation in accordance with the WAC Implementation Plan. A WAO representative reviews waste tracking documentation and completes portions regarding receipt of waste at the OSWDF prior to releasing the waste for placement in the OSWDF or staging at the IMTA. It is DOE's intent to track waste materials released from the generating site to acceptance within the boundary of the OSWDF with an electronic manifesting system. This system will provide real-time capability, through bar coding or radio frequency identification, for the WAO to ensure that only waste approved for release is received at the OSWDF. In the event of a system failure or outage, a fall-back paper manifesting system will be proceduralized and made available for use by the WAO. Copies of completed waste records are sent to the respective generator organization and to the OSWDF Organization for their record files.

These responsibilities include the need to conservatively identify and segregate Type 4 materials from the bulk waste materials destined for placement in the OSWDF and to exercise care in tracking any Type 4 materials purposefully released for placement in the OSWDF. Generators and the WAO are to exercise diligence during demolition, excavation, and waste loading processes to exclude Type 4 materials from entering other waste types destined for placement in the OSWDF. Prior to open air facility demolition, effort shall be expended by the waste generators with WAO oversight to identify and mark any Type 4 materials remaining in a facility to enable proper segregation prior to bulk debris waste loading and transportation to the OSWDF. Similarly, during landfill and foundation excavation, care shall be exercised by the waste generators and the WAO in a best efforts approach to segregate Type 4 materials from entering the waste materials loaded for transportation to the OSWDF. Excavation efforts shall include safely setting aside suspect Type 4 materials during bulk excavation for closer examination by field personnel. OSWDF personnel and the WAO shall exercise similar best efforts within the footprint of the OSWDF in identifying and segregating for removal or quantifying incidental Type 4 waste materials present within loads of other waste Types (i.e., Types 1, 2, 3, and 5) received into the OSWDF. Finally, the OSWDF Project Organization and the WAO shall exercise diligence and conservatism in the tracking of any compliant Type 4 waste purposefully released for placement within the OSWDF to ensure the Type 4 volume limits contained in the OSWDF WAC are not exceeded.

11.1.2 Maintenance Records

Maintenance records generated from OSWDF activities include test plans and test records, inspection records, maintenance forms, and equipment calibration records. Test plans are developed by engineering with the assistance of QA and the requesting organization. Test records are established and maintained to indicate the ability of the item to satisfactorily perform its intended function or to meet its documented requirements. Inspection records are generated by the performing organization. Maintenance forms document all inspections, preventive maintenance, and repairs. Equipment calibration records include the information and data necessary for interpretation of the calibration results and verification of conformance to applicable requirements.

11.1.3 Monitoring Records

Records generated from monitoring activities include instrument calibration records, sample collection logs, chain-of-custody forms, and analytical sample data from air, radiation protection, and groundwater sampling. Monitoring data collected under the OSWDF PSVP is managed in accordance with procedures described in the SADQ to facilitate retrieval as needed for data evaluation and reporting activities.

11.1.4 Other Records

Other records generated during operation, maintenance, and monitoring of the OSWDF include records for operating costs, training records, and radiation protection records.

11.2 NOTIFICATIONS

Notifications may be required during the operational life of the OSWDF. Potential notifications may include, but are not limited to the following:

- Action leakage rate exceedance
- Spills or leaks
- Nonconformance and issue reports
- Anomalous waste
- Deficiency involving the radioactive material inventory or a safety or security system.

11.2.1 Action Leakage Rate Exceedance

If the flow rate exceeds the action leakage rate in any OSWDF cell, then the OSWDF Project shall develop and implement an action leakage rate response plan as described in Section 6.2.1 and perform the following notifications (40 *CFR* 264.253[b]; *OAC* 3745-56-53[B]):

- DOE's D&D Contractor will notify DOE at the time the flow exceedance of the action leakage rate is identified.

- DOE will provide written notification to Ohio EPA that the flow is determined to have exceeded the action leakage rate as soon as practical after making the determination (40 *CFR* 264.253[b]; *OAC* 3745-56-53[B]).

- DOE will provide written information to Ohio EPA regarding the amount of liquids; possible location, size, and cause of any leaks; recommendation on whether waste receipt should be curtailed and if waste should be removed from the cell for inspection, repairs, or controls; and short-term actions taken and planned.

- DOE will submit a corrective action plan detailing the results of analyses, actions taken, and corrective actions planned. The corrective action plan will be developed in consultation with Ohio EPA.

- DOE will prepare and submit quarterly notices to Ohio EPA detailing additional actions taken and actions planned as long as the flow rate exceeds the action leakage rate.

11.2.2 Spills or Leaks
As described in Section 8.7, Ohio EPA will be promptly informed of any significant spills, including significant spills of any legally reportable quantity of any particular substance. Problem reports are prepared to document spills or leaks and associated response actions.

11.2.3 Nonconformance and Issue Reports
Ohio EPA will be notified of nonconformances during placement of waste in the OSWDF and issues will be identified in the DFF&O Quarterly Progress Report, as appropriate.

11.2.4 Anomalous Waste
In accordance with the WAC Implementation Plan, DOE and Ohio EPA will be notified in the unlikely event that any of the PORTS internal review mechanisms discover that waste not compliant with the OSWDF WAC was received into the OSWDF or disposed of incorrectly. DOE and Ohio EPA may mutually agree to modify the reporting obligations for identified anomalous conditions based on operational experience.

11.2.5 Radiological Inventory Security
In accordance with *OAC* 3701:1-54-08(B)(5), Ohio EPA will be notified if routine inspections identify a deficiency with the radioactive material inventory or a safety and security system. If a breach in the fencing is discovered, Security personnel will secure the area and notify local authorities and DOE of the breach. DOE will notify Ohio EPA.

11.3 REPORTING
11.3.1 DFF&O Quarterly Reports
During operation of the OSWDF, the progress of the work is documented in the DFF&O Quarterly Progress Report. A separate quarterly report for this project will not be submitted. The DFF&O Quarterly Progress Report provides a summary of the operations, maintenance, and monitoring activities accomplished during the previous quarter and discusses upcoming activities.

11.3.2 Annual Reports

Data generated from operation, maintenance, and monitoring activities are reported on a calendar year basis in the project-specific annual update (i.e., OSWDF Annual Project Status Report) in accordance with the Comprehensive OSWDF RD/RA Work Plan. The OSWDF Annual Project Status Report will include the waste placement report for the year, including updates of tracked limits for placement of Type 4 materials in each cell and the OSWDF overall, as specified in the WAC Implementation Plan.

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12. PROJECT MANAGEMENT

This section describes activities associated with management of the project, including roles and responsibilities, operating costs, and training for the project.

12.1 SITEWIDE ROLES AND RESPONSIBILITIES

DOE is responsible for D&D at PORTS. DOE has multiple contractors managing DOE programs at PORTS. DOE's D&D Contractor is responsible for (1) D&D of the former gaseous diffusion process buildings and associated facilities, (2) environmental restoration of the contaminated areas, (3) monitoring and reporting on environmental compliance, (4) disposition of legacy radioactive waste, (5) uranium management, (6) operations of the site's waste storage facilities, and (7) construction and operation of the OSWDF. DOE's Infrastructure Support Services Contractor is responsible for (1) maintenance of facilities, grounds, and roadways, (2) janitorial services, (3) security access for DOE's facilities, (4) site security training, (5) records management, and (6) information technology/network support for DOE Operations.

Development of Operating and Maintenance Procedures. DOE's D&D Contractor coordinates functional organizations to develop O&M procedures based on test plans and manufacturers' instructions. The assigned functional organization performs O&M activities in accordance with work packages or approved procedures.

Surveillance and Maintenance. DOE's D&D Contractor is responsible for S&M of the Surface Water Management System, OSWDF and IMTA Leachate Management Systems, IMTA ISWMS, Wheel Wash Facility, interior of some offices and trailers, equipment maintenance areas, gravel parking areas, and utilities. DOE's Infrastructure Support Services Contractor performs S&M of the access roads, security fencing, exteriors of the offices and trailers, and asphalt parking areas. S&M is performed on all associated OSWDF structures, systems, and components owned by DOE consistent with the requirements of DOE Order 430.1C, *Real Property Asset Management*.

Repairs. Repairs associated with the support infrastructure are conducted as needed by DOE's D&D Contractor, DOE's Infrastructure Support Services Contractor, or a specialized subcontractor, depending on the scope and severity of the problem.

12.2 OSWDF PROJECT ROLES AND RESPONSIBILITIES

The DOE OSWDF Federal Project Director is responsible for obtaining the funding to implement the work and overseeing DOE's D&D Contractor. The OSWDF Organization is responsible for the O&M of the OSWDF. OSWDF Operations personnel may include personnel directly employed by DOE's D&D Contractor or subcontractor, or another DOE Contractor to perform waste placement. The CQC Contractor and the WAO provide independent oversight of waste placement operations. The roles and responsibilities of each position and organization are discussed briefly in this section.

12.2.1 OSWDF Organization

O&M of the OSWDF is conducted by DOE's D&D Contractor under the direction of the DOE OSWDF Federal Project Director. The OSWDF Organization of the D&D Contractor conducts day-to-day implementation of the project. Roles and responsibilities of the OSWDF Organization include:

- OSWDF Project Director – The OSWDF Project Director is the authorized representative for the OSWDF Project who has overall administrative responsibility for the successful completion of the OSWDF Project through cost-effective integration of management, engineering, construction, environmental, safety, health, and quality.

- OSWDF Environmental Safety and Health Manager – The OSWDF Environmental Safety and Health Manager is the authorized representative for the OSWDF Project responsible for oversight of project environmental, safety, and health.

- OSWDF Design Engineering Manager – The OSWDF Design Engineering Manager is the authorized representative for the OSWDF Project for engineering design services. The Design Engineering Manager provides day-to-day engineering support to the entire OSWDF Project including oversight of the Engineer of Record, development of design packages for regulatory review and certified for construction documents, Engineering Change Request (ECR) reviews, support plan development, management of Title III Engineering Services, and responding to client and stakeholder concerns.

- OSWDF Field Engineering Manager – The OSWDF Field Engineering Manager is the authorized representative for the OSWDF Project for field engineering services. The Field Engineering Manager has overall responsibility to evaluate field conditions requiring engineering guidance and develop ECRs as required.

- Engineer of Record – The Engineer of Record reports to the Design Engineering Manager and has overall authority for design, including preparation of certified for construction drawings, and overall authority for clarification and interpretation of construction drawings and technical specifications.

- OSWDF Operations Manager – The OSWDF Operations Manager is the authorized representative for the OSWDF Project who has overall responsibility for OSWDF operations related to activities as described in this OSWDF O&M Plan. The OSWDF Operations Manager is responsible for management of impacted materials within the IMTA and for final placement and documentation within the OSWDF. The OSWDF Operations Manager is also responsible for the day-to-day implementation of waste transfer activities and maintenance of vehicles used to transfer waste to the OSWDF.

- OSWDF Facility Manager – The OSWDF Facility Manager is responsible for ensuring compliance with site procedures and DOE Orders by coordinating with site maintenance and utilities organizations to ensure the buildings and grounds are maintained. This includes daily and weekly cleaning schedules, access and road maintenance, and storm drainage system maintenance, as well as determining and scheduling repairs, renovation projects, waste reduction improvements, and housekeeping/safety inspections.

- OSWDF Project Quality Assurance (QA) Manager – The OSWDF Project QA Manager is the authorized representative for the OSWDF Project who has overall responsibility for QA activities during construction and operation of the OSWDF Project. The Project QA Manager will lead the CQA Officer, in-house QA/QC resources, CQC Contractor, and laboratories to implement the CQC requirements of the CQA Project Plan. The QA Manager and QA personnel will perform oversight during all phases of the OSWDF Project through the performance of audits, assessments, and surveillances, including supplier assessments and surveillances.

12.2.2 Construction Quality Control Organization

The CQC Contractor is led by the Project QA Manager and is independent from the OSWDF Project. The CQC Contractor is responsible for monitoring, testing, verification and compliance, and documenting activities related to OSWDF waste placement and compaction activities. The CQC Contractor includes in-house QA/QC resources, a CQA Officer, supporting inspection staff, and testing laboratories.

12.2.3 Waste Acceptance Organization

The WAO provides independent oversight from the point of waste generation to final waste disposition for each load of waste in the OSWDF. The WAO is organizationally distinct from both the waste generation project organizations and the OSWDF Project Organization. This organizational structure provides for a WAO project team that functions independently of both the waste generating project and the OSWDF Project and independent of project delivery schedule and budget pressures. The WAO is responsible for verifying generator and OSWDF compliance with the WAC. This responsibility includes verifying waste documentation meets the waste characterization standard of the WAC, visually inspecting waste at the point of generation for prohibited items, verifying waste is separated as one of five engineered waste types, verifying compliance with waste packaging and transportation WAC prior to release of the transport vehicle from generating projects, and visually inspecting the waste again for prohibited items when unloaded at the OSWDF or IMTA. The WAO also has a role in monitoring and tracking anomalous conditions and corrective actions. Complete roles and responsibilities of the WAO are contained in the WAC Implementation Plan.

12.2.4 Waste Transportation Roles and Responsibilities

The Transportation Manager for DOE's D&D Contractor has programmatic responsibility for ensuring sitewide transportation is compliant with the Transportation Plan presented in Section 4, and oversees the transfer of waste to the OSWDF or IMTA.

12.3 ANNUAL O&M BUDGET

Funding for D&D and OSWDF operations is determined on an annual basis by the federal appropriations process. As such, the O&M budget for OSWDF can increase or decrease on an annual basis. Table 11 provides an example breakdown of the OSWDF O&M budget in net present value, based on funding levels projected at the time this plan was written. These amounts will increase or decrease in relative proportion should overall funding for the project change. These costs do not include treatment of leachate and wastewater. Each activity includes labor, materials, and subcontract costs.

Table 11. Estimated Annual OSWDF O&M Budget – Net Present Value

Activity Description	Budget ($ million)
a. Cost for Personnel	5.2
b. Cost for Preventative and Corrective Maintenance	0.1
c. Cost for Equipment and Supplies	4.7
d. Cost of Contractual Obligations (e.g., laboratory expenses) (not at this time)	0
e. Cost of Operation (e.g., energy, other utilities) (included with items b and c)	0.01
Total	**10.0**

Note:
Budget numbers originated from the Waste Disposition Remedial Investigation/Feasibility Study (DOE 2014b) estimate and were recalculated using current life-cycle schedule and duration.
DOE = U.S. Department of Energy
O&M = operation and maintenance
OSWDF = On-site Waste Management and Disposal Facility

12.4 TRAINING

Trained and qualified people are provided as required by DOE Acquisition Regulation Clause 48 *CFR* 970.5223-1, *Integration of Environment, Safety, and Health into Work Planning and Execution*, and DOE Order 414.1D, *Quality Assurance*.

Training is performed to provide information on OSWDF hazards and associated controls, procedures, and requirements for access. Personnel working at the OSWDF Project have the 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training, as required by CERCLA regulations. Additionally, OSWDF Operations personnel are trained to meet the requirements of 40 *CFR* 264.16 and *OAC* 3745-54-16, and appropriate OSWDF training requirements. All OSWDF training is developed, conducted, and maintained in accordance with the PORTS sitewide QA Program and procedures to ensure the PORTS workforce is properly trained and qualified to work safely and effectively. Specific training and qualification program requirements for workers are based on the hazards involved, the complexity of the operation, and the risk associated with operation of the facility.

The OSWDF Operations Manager is responsible to ensure that personnel have an adequate level of facility knowledge, including a general overview of the facility, facility-specific hazards, safety, waste handling and emergency response protocols, and applicable procedures. Personnel requiring OSWDF operations, supervisory or position-specific qualifications, or certifications must complete the necessary training prior to initiating OSWDF activities. As appropriate, a qualified instructor or subject matter expert conducts and documents the training in accordance with PORTS procedures.

Site procedures specify requirements for prejob and postjob briefings. Operational activities require an initial prejob briefing conducted by a supervisor or lead person. During this briefing, tasks associated with OSWDF operations are outlined, hazards are identified, hazard controls/mitigation are reviewed, PPE requirements are discussed, waste minimization opportunities are communicated, and questions are answered. Following the completion of operational activities, a postjob briefing may be conducted with an emphasis on capturing lessons learned and process improvement for future operations.

PORTS sitewide policies establish the requirements to ensure that personnel have the training to work safely in and around radiological areas and to maintain their individual exposures and the exposure of others ALARA. All individuals requiring access to radiological areas receive radiation safety training. The radiation safety training is consistent with the guidance provided in DOE-STD-1174-2013, *Radiation Protection Functional Area Qualification Standard*, emphasizes the nature of radiological conditions and control of radiation exposure, and follows the DOE standardized core training materials. The level of training is based on each individual’s prior training, work assignments, and degree of exposure to potential radiological hazards, and meets the requirements of 10 *CFR* 835.901. All Radiation Protection personnel meet the requirements and are trained per the terms and conditions of 10 *CFR* 835.901 and PORTS policies and procedures. The Radiation Protection personnel qualification consists of the standardized DOE core course training material, on-the-job training per the qualification standards of PORTS company policies and procedures, and passing scores on both a final comprehensive written examination and a final oral examination board. Individuals performing duties as Radiation Protection personnel are retrained and qualified in accordance with DOE core course requirements every 2 years. Visitors either receive radiation safety training or are escorted by a fully trained and qualified escort if they enter radiological areas, upon approval by the site Radiation Protection Manager.

13. REFERENCES

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FBP 2017, *Hazard Analysis for the Operations of the Portsmouth Gaseous Diffusion Plant X-780 On-Site Waste Disposal Facility and X-790 Interim Leachate Treatment Facility*, FBP-HA-780-00001, Revision 5, Fluor-BWXT Portsmouth LLC, Piketon, OH, November.

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APPENDIX A: ARARS COMPLIANCE MATRIX

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The applicable or relevant and appropriate requirements (ARARs) crosswalk table in this appendix discusses compliance for each ARAR/to-be-considered (guidance) (TBC) originally identified in the Waste Disposition Record of Decision and associated with the scope of work addressed by this document.

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ARARs and TBCs for the Site-wide Waste Disposition Evaluation Project On-Site Disposal Alternative at PORTS, Piketon, Ohio

Media/Location/Action	Requirements[a]	Prerequisite	Citation	Compliance Approach
HAZARDOUS WASTE				
	Design, construction, operation and closure of a hazardous waste landfill			
Action leakage rate testing for the RCRA leachate detection system	To determine if the action leakage rate has been exceeded, must convert the weekly or monthly flow rate from the monitoring data obtained under 40 *CFR* 264.303(c) to an average daily flow rate (gal/acre/day) for each sump. The average daily flow rate for each sump must be calculated weekly during the active life and closure period, and monthly during the postclosure period when monthly monitoring is required under 40 *CFR* 264.303(c).	Construction and operation of a RCRA hazardous waste landfill—**applicable**	40 *CFR* 264.302(b) *OAC* 3745-57-04(B)	Section 6.2.1, *Action Leakage Rate* Appendix C, LISWSP for flow rate monitoring.
Monitoring of liners and cover systems during and after construction and installation	Must record the amount of liquids removed from the leak detection system sumps at least weekly during the active life and closure period.	Construction and operation of a RCRA landfill—**applicable**	40 *CFR* 264.303 (c)(1)	Appendix C, LISWSP
Response actions for RCRA leachate detection system	Must develop actions to be taken if action leakage rate has been exceeded.	Operation of a RCRA landfill leak detection system—**applicable**	40 *CFR* 264.304(a) *OAC* 3745-57-06(A)	Section 6.2.1, *Action Leakage Rate*
	If the flow rate into the leak detection system exceeds the action leakage rate for any sump, must determine:	Flow rate into the leak detection system exceeds action leakage rate for any sump—**applicable**	40 *CFR* 264.304(b) *OAC* 3745-57-06(B)	See above.
	• To the extent practicable, the location, size, and cause of any leak		40 *CFR* 264.304 (b)(3) *OAC* 3745-57-06 (B)(3)	See above.

[a]The requirements portion of the ARARs table is intended to provide a summary of the cited ARAR. The omission of any particular requirement does not limit the scope of the cited ARARs.

Media/Location/Action	Requirements[a]	Prerequisite	Citation	Compliance Approach
Response actions for RCRA leachate detection system (continued)	• Whether waste receipt should cease or be curtailed, whether any waste should be removed from the unit for inspection, repairs, or controls, and whether or not the unit should be closed		40 *CFR* 264.304 (b)(4) *OAC* 3745-57-06 (B)(4)	See above.
	• Any other short-term and longer-term actions to be taken to mitigate or stop any leaks.		40 *CFR* 264.304 (b)(5) *OAC* 3745-57-06 (B)(5)	See above.
	Must assess the source of liquids and amounts of liquids by source; conduct a fingerprint, hazardous constituent, or other analyses of the liquids in the leak detection system to identify the source of liquids and possible location of any leaks, and the hazard and mobility of the liquid; and assess the seriousness of any leaks in terms of potential for escaping into the environment; or document why such assessments are not needed	Leak and/or remediation determinations required—**applicable**	40 *CFR* 264.304 (c)(1) and (2) *OAC* 3745-57-06 (C)(1) and (2)	See above.
Security system for a RCRA landfill	Must prevent the unknowing entry, and minimize the possibility for the unauthorized entry, of persons or livestock onto the active portion of this facility, unless:	Construction and operation of a RCRA hazardous waste landfill—**applicable**	40 *CFR* 264.14(a) *OAC* 3745-54-14(A)	Section 5.3, *Security System*
	• Physical contact with the waste, structures, or equipment within the active portion of the facility will not injure unknowing or unauthorized persons or livestock which may enter the active portion of a facility		40 *CFR* 264.14 (a)(1) *OAC* 3745-54-14 (A)(1)	See above.

Media/Location/Action	Requirements[a]	Prerequisite	Citation	Compliance Approach
Security system for a RCRA landfill (continued)	• Disturbance of the waste or equipment, by the unknowing or unauthorized entry of persons or livestock onto the active portion of a facility, will not cause a violation of the requirements of this part.		40 *CFR* 264.14 (a)(2) *OAC* 3745-54-14 (A)(2)	See above.
	Must have a 24-hour surveillance system which continuously monitors and controls entry onto the active portion of the facility; or an artificial or natural barrier which completely surrounds the active portion of the facility; and a means to control entry, at all times, through the gates or other entrances to the active portion of the facility.		40 *CFR* 264.14(b) *OAC* 3745-54-14(B)	See above.
	Must post a sign with the legend "Danger – Unauthorized Personnel Keep Out" at each entrance to the active portion of a facility and at other locations in sufficient numbers to be seen from any approach in the active portion. Legend must be written in English and be legible from a distance of at least 25 ft.		40 *CFR* 264.14(c) *OAC* 3745-54-14(C)	See above.
Run-on/runoff control systems	A run-on control system must be designed, constructed, operated, and maintained that is capable of preventing flow onto the active portion of the landfill during peak discharge from at least a 25-year storm.	Construction and operation of a RCRA hazardous waste landfill—**applicable**	40 *CFR* 264.301(g) *OAC* 3745-57-03(G)	OSWDF O&M Plan addresses operations only. Section 2.3, *OSWDF Operations* (Initial Operations Phase) Section 3.3, *OSWDF Operations* (Full-scale Operations Phase)

Media/Location/Action	Requirements[a]	Prerequisite	Citation	Compliance Approach
Run-on/runoff control systems (continued)	Runoff management system must be able to collect and control the water volume from a runoff resulting from a 24-hour, 25-year storm event.		40 *CFR* 264.301(h) *OAC* 3745-57-03(H)	Appendix C, LISWSP, for operation of Impacted Surface Water Management System. See also SWMESC Plan for nonimpacted surface water.
	Collection and holding facilities must be emptied or otherwise expeditiously managed after storm events to maintain design capacity of the system.		40 *CFR* 264.301(i) *OAC* 3745-57-03(I)	See above. Section 6.6, *Surface Water Management System Surveillance and Maintenance.* Appendix C, LISWSP, for operation of Impacted Surface Water Management System.
Wind dispersal control system	If the landfill contains any particulate matter which may be subject to wind dispersal, must cover or manage the landfill to control wind dispersal of particulate matter.	Operation of a RCRA hazardous waste landfill**—applicable**	40 *CFR* 264.301(j) *OAC* 3745-57-03(J)	Appendix B, IMPP.
Postconstruction monitoring of liners, leak detection, run-on/runoff systems during active life of facility	Must inspect landfill weekly and after storm events to ensure proper functioning of the run-on and runoff control system, wind dispersal control systems, and the leachate collection and removal systems.	Operation of a RCRA hazardous waste landfill**—applicable**	40 *CFR* 264.303(b) *OAC* 3745-57-05(B)	Section 6.1, *OSWDF Surveillance and Maintenance* Section 6.3, *IMTA Surveillance and Maintenance*

Media/Location/Action	Requirements[a]	Prerequisite	Citation	Compliance Approach
Facility and equipment inspection, testing, and maintenance	Must inspect facility for malfunctions and deterioration, operator errors, and discharges to identify any problems and remedy any deterioration or malfunction of equipment or structures on a schedule and in a manner that ensures that the problem does not lead to an environmental or human health hazard, as detailed in 40 *CFR* 264.15 [*OAC* 3745-54-15].	Operation of a RCRA hazardous waste facility—**applicable**	40 *CFR* 264.15 (a) – (d) *OAC* 3745-54-15 (A) – (D)	Section 6, *Surveillance and Maintenance*
	All facility communications or alarm systems, fire protection equipment, spill control equipment, and decontamination equipment, where required, shall be tested and maintained as necessary to assure its proper operation in time of emergency.		40 *CFR* 264.33 *OAC* 3745-54-33	Section 9.4.2, *Emergency Response Equipment*
Required emergency equipment	All facilities shall be equipped with the following:		40 *CFR* 264.32 *OAC* 3745-54-32	Section 9.4.1, *Emergency Communications* Section 9.4.2, *Emergency Response Equipment*
	• An internal communications or alarm system capable of providing immediate emergency instruction to facility personnel		40 *CFR* 264.32(A) *OAC* 3745-54-32(A)	See above.
	• A device capable of summoning emergency assistance from local police departments, fire departments, or Ohio EPA or local emergency response teams		40 *CFR* 264.32(B) *OAC* 3745-54-32(B)	See above.

Media/Location/Action	Requirements[a]	Prerequisite	Citation	Compliance Approach
Required emergency equipment (continued)	• Portable fire extinguishers, fire control equipment, including but not limited to, special extinguishing equipment, such as that using foam, inert gas, or dry chemicals, spill control equipment, and decontamination equipment		40 *CFR* 264.32(C) *OAC* 3745-54-32(C)	Section 9.4.2, *Emergency Response Equipment*
	• Water at adequate volume and pressure to supply water hose streams, or foam producing equipment, or automatic sprinklers, or water spray systems		40 *CFR* 264.32(D) *OAC* 3745-54-32(D)	See above.
Access to communications or alarm system	Whenever hazardous waste is being poured, mixed, spread, or otherwise handled, all personnel involved in the operation shall have immediate access to an internal alarm or emergency communication device, either directly or through visual or voice contact with another employee, unless such a device is not required under 40 *CFR* 264.32 [*OAC* 3745-54-32].	Operation of a RCRA hazardous waste facility—**applicable**	40 *CFR* 264.34(a) *OAC* 3745-54-34(A)	Section 9.4.1, *Emergency Communications*
	If there is only one employee on the premises while the facility is operating, such employee shall have immediate access to a device capable of summoning external emergency assistance, unless such a device is not required under 40 *CFR* 264.32 [*OAC* 3745-54-32].		40 *CFR* 264.34(b) *OAC* 3745-54-34(B)	See above.

Media/Location/Action	Requirements[a]	Prerequisite	Citation	Compliance Approach
Required aisle space	Shall maintain aisle space to allow the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment to any area of facility operation in an emergency, unless it can be satisfactorily demonstrated that aisle space is not needed for any of these purposes.	Operation of a RCRA hazardous waste facility—**applicable**	40 *CFR* 264.35 *OAC* 3745-54-35	The OSWDF Project Area does not plan to have any hazardous waste container storage areas.
Purpose and implementation of a contingency plan	Substantive requirements will be met to minimize hazards to human health or the environment from fires, explosions or any unplanned sudden or nonsudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water.	Operation of a RCRA hazardous waste facility—**applicable**	40 *CFR* 264.51(a) *OAC* 3745-54-51(A)	Section 9.4, *Emergency Management Program*
	Substantive requirements shall be implemented immediately whenever there is a fire, explosion or release of hazardous waste or hazardous waste constituents which could threaten human health or the environment.		40 *CFR* 264.51(b) *OAC* 3745-54-51(B)	See above.
Content of contingency plan	Comply with the substantive requirements of §§264.51 and 264.56 [rules 3745-54-51 and 3745-54-56 of the Administrative Code] in response to fires, explosions, or any unplanned sudden or nonsudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water at the facility. 40 *CFR* 264.52(a) through (f) [*OAC* 3745-54-52(A) through (F)] describes what must be included in the Plan.	Operation of a RCRA hazardous waste facility—**applicable**	40 *CFR* 264.52 *OAC* 3745-54-52	Section 9.4, *Emergency Management Program*

Media/Location/Action	Requirements[a]	Prerequisite	Citation	Compliance Approach
Emergency coordinator	At all times, there shall be at least one employee either on the facility premises or on call with responsibility for coordinating all internal emergency response measures. This coordinator shall be thoroughly familiar with all aspects of the facility's contingency plan, all operations and activities at the facility, the locations and characteristics of waste handled, the location of all records within the facility, and the facility layout. In addition, this person shall have the authority to commit the resources needed to implement the contingency plan.	Operation of a RCRA hazardous waste facility—**applicable**	40 *CFR* 264.55 *OAC* 3745-54-55	Section 9.4.1, *Emergency Communication*
Emergency procedures	Whenever there is an imminent or actual emergency situation, the emergency coordinator, or his designee when the emergency coordinator is on call, must immediately implement the substantive requirements detailed in 40 *CFR* 264.56 [*OAC* 3745-54-56].	Operation of a RCRA hazardous waste facility—**applicable**	40 *CFR* 264.56 *OAC* 3745-54-56	Section 8.7, *Spill Response* Section 9.4.3, *Emergency Response Protocols*
Training requirements	Facility personnel must successfully complete a program of classroom instruction or on-the-job training in accordance with the program outlined in 40 *CFR* 264.16 [*OAC* 3745-54-16] and take part in an annual review of this initial training.	Operation of a RCRA hazardous waste facility**—applicable**	40 *CFR* 264.16 *OAC* 3745-54-16	Section 12.4, *Training*
Inventory requirements	Record on a map the exact location and dimensions, including depth, of each cell in reference to permanently surveyed benchmarks and document the contents of each cell and the approximate location of each hazardous waste type within each cell.	Operation of a RCRA hazardous waste facility—**applicable**	40 *CFR* 264.309 *OAC* 3745-57-09	Section 11.1.1, *Operating and Disposal Records*

Media/Location/Action	Requirements[a]	Prerequisite	Citation	Compliance Approach
Management of wastes in a CAMU				
Designation, design, operation, and closure of a CAMU used for storage and/or treatment only	• Such CAMUs that operate in accordance with time limits established for hazardous waste staging piles are subject to requirements for staging piles in lieu of performance standards and requirements for CAMUs.		40 *CFR* 264.552 (f)(1) *OAC* 3745-57-72 (F)(1)	The IMTA is operating under 40 *CFR* 263.552(f)(2) and *OAC* 3745-57-72 (F)(2) because it exceeds the 2-year operating time frame.
	• Such CAMUs that do not operate in accordance with time limits established for hazardous waste staging piles are subject to a time limit, as established by the Director, that is no longer than necessary to achieve a timely remedy selected for the waste, and are subject to requirements for staging piles in lieu of performance standards and requirements for CAMUs.		40 *CFR* 264.552 (f)(2) *OAC* 3745-57-72 (F)(2)	Section 3.5, *IMTA Operations* The IMTA CAMU is approved by the Waste Disposition ROD to operate until OSWDF operations are complete, which is no longer than necessary to complete remediation.
	The designation of a CAMU does not change Ohio EPA's existing authority to address clean-up levels, media-specific points of compliance to be applied to remediation at a facility, or other remedy selection decisions.		*OAC* 3745-57-72(K)	The plans for design, operation, and closure of the IMTA are subject to Ohio EPA review and concurrence.
Hazardous waste generation, characterization, and segregation				
Characterization of solid waste (*all primary and secondary wastes*)	Must determine if solid waste is hazardous or is excluded under 40 *CFR* 261.4 [*OAC* 3745-51-04]; and	Generation of solid waste as defined in 40 *CFR* 261.2—**applicable**	40 *CFR* 262.11(a) *OAC* 3745-52-11(A)	Section 10, *Management of Secondary Waste*
	Must determine if waste is listed as a hazardous waste in 40 *CFR* 261 [*OAC* 3745-51-30 to 3745-51-35], or	Generation of solid waste, which is not excluded under 40 *CFR* 261.4—**applicable**	40 *CFR* 262.11(b) *OAC* 3745-52-11(B)	See above.

Media/Location/Action	Requirements[a]	Prerequisite	Citation	Compliance Approach
Characterization of solid waste (*all primary and secondary wastes*) (continued)	Must determine whether the waste is identified in Subpart C of 40 *CFR* 261 [*OAC* 3745-51-20 through 3745-51-24], characterizing the waste by using prescribed testing methods or applying generator knowledge based on information regarding material or processes used.	Generation of solid waste that is not listed in Subpart D of 40 *CFR* 261 and not excluded under 40 *CFR* 261.4—**applicable**	40 *CFR* 262.11(c) *OAC* 3745-52-11(C)	See above.
	Must refer to 40 *CFR* 261, 262, 264, 265, 266, 268, and 273 [*OAC* 3745-51, 3745-54 to 3745-57, 3745-65 to 3745-69, 3745-205, 3745-256, 3745-266, 3745-270, and 3745-273] for possible exclusions or restrictions pertaining to management of the specific waste.	Generation of solid waste that is determined to be hazardous—**applicable**	40 *CFR* 262.11(d) *OAC* 3745-52-11(D)	See above.
Characterization of hazardous waste	Must obtain a detailed chemical and physical analysis of a representative sample of the waste(s) that, at a minimum, contains all the information which must be known to treat, store, or dispose of the waste in accordance with 40 *CFR* 264 and 268 [*OAC* 3745-54 to 3745-57, 3745-205, and 3745-270].	Generation of RCRA hazardous waste for storage, treatment, or disposal—**applicable**	40 *CFR* 264.13 (a)(1) and (2) *OAC* 3745-54-13 (A)(1) and (2)	Section 10, *Management of Secondary Waste* Information for the characterization of waste destined for on-site or off-site disposal will be based on process knowledge and/or available historic data first. Additional characterization of waste will be performed as needed to meet WAC and transportation needs. Hazardous waste determinations will be made for all waste targeted for off-site disposal. LDR status will be determined for hazardous waste shipped off site for treatment or disposal.

Media/Location/Action	Requirements[a]	Prerequisite	Citation	Compliance Approach
Determinations for land disposal of hazardous waste	Must determine if the waste meets the treatment standards in 40 *CFR* 268.40, 268.45, or 268.49 [*OAC* 3745-270-40, 3745-270-45, and 3745-270-49] by testing in accordance with prescribed methods or use of generator knowledge of waste.	Generation of RCRA hazardous waste for storage, treatment, or disposal**—applicable**	40 *CFR* 268.7(a) *OAC* 3745-270-07 (A)	Section 10, *Management of Secondary Waste* Information for the characterization of waste destined for on-site or off-site disposal will be based on process knowledge and/or available historic data first. Additional characterization of waste will be performed as needed to meet WAC and transportation needs. Hazardous waste determinations will be made for all waste targeted for off-site disposal. LDR status will be determined for hazardous waste shipped off site for treatment or disposal.
	Treatment facilities must test their wastes according to the frequency specified in their waste analysis plans to determine if the waste meets the treatment standards in 40 *CFR* 268.40, 268.45, or 268.49 [*OAC* 3745-270-40, 3745-270-45, and 3745-270-49] prior to disposal.	Treatment of RCRA hazardous waste prior to disposal—**applicable**	40 *CFR* 268.7(b) *OAC* 3745-270-07 (B)	Section 3.5, *IMTA Operations* Treatment of waste is not included in the OSWDF project plan at this time. Waste is sent off site for treatment.
	Must determine each EPA Hazardous Waste Number (waste code) to determine the applicable treatment standards under 40 *CFR* 268.40 et seq. [*OAC* 3745-270-40 et seq.].	Generation of RCRA hazardous waste for storage, treatment, or disposal**—applicable**	40 *CFR* 268.9(a) *OAC* 3745-270-09 (A)	Section 10, *Management of Secondary Waste*

Media/Location/Action	Requirements[a]	Prerequisite	Citation	Compliance Approach
Determinations for land disposal of hazardous waste (continued)	Must determine the underlying hazardous constituents [as defined in 40 *CFR* 268.2(i) and *OAC* 3745-270-02] in the waste.	Generation of RCRA characteristically hazardous waste (and is not D001 nonwastewaters treated by CMBST, RORGS, or POLYM of Section 268.42, Table 1) for storage, treatment, or disposal—**applicable**	40 *CFR* 268.9(a) *OAC* 3745-270-09 (A)	See above.
	Must determine whether the waste meets other applicable treatment standards under 40 *CFR* 268.9 [*OAC* 3745-270-09] for characteristic wastes.	Generation of RCRA characteristically hazardous waste—**applicable**	40 *CFR* 268.9 (b) to (d) *OAC* 3745-270-09 (B) to (C)	See above.
		Hazardous waste storage		
Storage of hazardous wastes restricted from land disposal	Prohibits storage of hazardous waste restricted from land disposal unless the generator stores such waste in tanks, containers, or containment buildings on site solely for the purpose of accumulating such quantities as necessary to facilitate proper recovery, treatment, or disposal.	Accumulation of hazardous wastes restricted from land disposal solely for purpose of accumulation of quantities as necessary to facilitate proper recovery, treatment, or disposal—**applicable**	40 *CFR* 268.50 *OAC* 3745-270-50	Section 10, *Management of Secondary Waste*
Temporary storage and accumulation of hazardous waste in containers on site	A generator may accumulate hazardous waste at the facility provided that: • The waste is placed in containers that comply with 40 *CFR* 265.171-173 (Subpart I) [*OAC* 3745-66-70 to -73]	Accumulation of RCRA hazardous waste on site as defined in 40 *CFR* 260.10—**applicable**	40 *CFR* 262.34 (a)(1)(i) *OAC* 3745-52-34 (A)(1)(a)	Section 10, *Management of Secondary Waste*

Media/Location/Action	Requirements[a]	Prerequisite	Citation	Compliance Approach
Temporary storage and accumulation of hazardous waste in containers on site (continued)	• Container is marked with the date upon which each period of accumulation begins		40 *CFR* 262.34 (a)(2) *OAC* 3745-52-34 (A)(2)	See above.
	• Container is marked with the words "hazardous waste"		40 *CFR* 262.34 (a)(3) *OAC* 3745-52-34 (A)(3)	See above.
	The generator complies with the requirements in Subparts C and D in 40 *CFR* Part 265, with §265.16, and with 40 *CFR* 268.7(a)(5) [*OAC* 3745-270-07(A)(5); *OAC* 3745-65-16; *OAC* 3745-65-30 to *OAC* 3745-65-37; and *OAC* 3745-65-50 to *OAC* 3745-65-56].	Accumulation of RCRA hazardous waste on site as defined in 40 *CFR* 260.10—**applicable**	40 *CFR* 262.34 (a)(4) *OAC* 3745-52-34 (A)(4)	See above.
	Generator is exempt from all requirements in Subparts G and H of 40 *CFR* Part 265, except for §265.111 and §265.114 [*OAC* 3745- 66-10 to *OAC* 3745-66-21 and *OAC* 3745-66-40 to *OAC* 3745-66-48 except for paragraphs (A) and (B) of *OAC* 3745-66-11 and *OAC* 3745-66-14].		40 *CFR* 262.34 (a)(1) *OAC* 3745-52-34 (A)(1)(e)	See above.
	Container must be marked with either the words "Hazardous Wastes" or with other words that identify the contents.	Accumulation of 55 gal or less of RCRA hazardous waste or 1 qt or less of acutely hazardous waste at or near any point of generation—**applicable**	40 *CFR* 262.34 (c)(1)(ii) *OAC* 3745-52-34 (C)(1)(b)	See above.

Media/Location/Action	Requirements[a]	Prerequisite	Citation	Compliance Approach
Temporary storage and accumulation of hazardous waste in containers on site (continued)	For the excess waste, must comply within 3 days with the requirements of *OAC* 3745-52-34(A) or other applicable provisions of Chapter 3745-52 of the Administrative Code. During the 3-day period, comply with *OAC* 3745-52-34(C)(1)(a) and (b). Must mark container holding excess accumulation with the date the excess accumulation began.	Accumulation of more than 55 gal of hazardous waste or more than 1 qt of acutely hazardous waste at or near any point of generation—**applicable**	40 *CFR* 262.34 (c)(2) *OAC* 3745-52-34 (C)(2)	Section 10, *Management of Secondary Waste* Hazardous waste will be accumulated and managed in appropriate containers that are appropriately labeled. Any such hazardous waste will be accumulated and stored in accordance with ARARs and will be disposed of as soon as practicable, given the need to coordinate efficient transportation and disposal management.
Accumulation of rejected shipments of hazardous waste	A generator who receives a shipment of hazardous waste back as a rejected load or residue from a facility in accordance with a manifest discrepancy may accumulate the waste on site in accordance with paragraphs (a) and (b) or (d), (e) and (f) of 40 *CFR* 262.34 [(A) and (B) or (D), (E), and (F) of *OAC* 3745-52-34] depending on the amount of hazardous waste on site in that calendar month.	Accumulation of RCRA hazardous waste on site as defined in 40 *CFR* 260.10—**applicable**	40 *CFR* 262.34(m) *OAC* 3745-52-34(M)	Hazardous waste resulting from a rejected shipment will be placed in storage areas within the Limited Area at PORTS that meet hazardous waste storage ARARs.
Management of hazardous waste stored in containers	If container is not in good condition (e.g., severe rusting, structural defects) or if it begins to leak, must transfer waste into container in good condition.	Storage of RCRA hazardous waste in containers—**applicable**	40 *CFR* 264.171 *OAC* 3745-55-71	Section 10, *Management of Secondary Waste*
	Use container made or lined with materials compatible with waste to be stored so that the ability of the container is not impaired.		40 *CFR* 264.172 *OAC* 3745-55-72	See above.
	Keep containers closed during storage, except to add/remove waste.		40 *CFR* 264.173(a) *OAC* 3745-55-73(A)	See above.

Media/Location/Action	Requirements[a]	Prerequisite	Citation	Compliance Approach
Management of hazardous waste stored in containers (continued)	Open, handle, and store containers in a manner that will not cause containers to rupture or leak.		40 *CFR* 264.173(b) *OAC* 3745-55-73(B)	See above.
Inspection of RCRA container storage area	At least weekly, must inspect areas where containers are stored, looking for leaking containers and for deterioration of containers and the containment system caused by corrosion or other factors.	Storage of RCRA hazardous waste in containers—**applicable**	40 *CFR* 264.174 *OAC* 3745-55-74	Section 10, *Management of Secondary Waste* Filled containers requiring storage prior to transportation and disposal will be moved to storage areas within the Limited Area at PORTS that meet hazardous waste storage ARARs.
Operation of a RCRA container storage area	Area must be sloped or otherwise designed and operated to drain liquid from precipitation, or containers must be elevated or otherwise protected from contact with accumulated liquid.	Storage in containers of RCRA hazardous waste that do not contain free liquids—**applicable**	40 *CFR* 264.175(c) *OAC* 3745-55-75(C)	Section 10, *Management of Secondary Waste* Filled containers of secondary waste from OSWDF requiring storage prior to transportation and disposal will be moved to storage areas within the Limited Area at PORTS that meet hazardous waste storage ARARs.
Storage of RCRA hazardous waste with free liquids in containers	Area must have a containment system designed and operated in accordance with 40 *CFR* 264.175(b) [*OAC* 3745-55-75(B)] as follows:	Storage of RCRA hazardous waste with free liquids or F020 to F023, F026, and F027 in containers—**applicable**	40 *CFR* 264.175 (a) and (d) *OAC* 3745-55-75 (A) and (D)	Section 10, *Management of* Secondary *Waste* Filled containers of secondary waste from OSWDF requiring storage prior to transportation and disposal will be moved to storage areas within the Limited Area at PORTS that meet hazardous waste storage ARARs.

Media/Location/Action	Requirements[a]	Prerequisite	Citation	Compliance Approach
Storage of RCRA hazardous waste with free liquids in containers (continued)	• A base must underlie the containers which is free of cracks or gaps and is sufficiently impervious to contain leaks, spills, and accumulated precipitation until the collected material is detected and removed.		40 *CFR* 264.175 (b)(1) *OAC* 3745-55-75 (B)(1)	See above.
	• A base must be sloped or the containment system must be otherwise designed and operated to drain and remove liquids resulting from leaks, spills, or precipitation, unless the containers are elevated or are otherwise protected from contact with accumulated liquids.		40 *CFR* 264.175 (b)(2) *OAC* 3745-55-75 (B)(2)	See above.
	• The system must have sufficient capacity to contain 10% of the volume of containers or volume of largest container, whichever is greater.		40 *CFR* 264.175 (b)(3) *OAC* 3745-55-75 (B)(3)	See above.
	• Run-on into the system must be prevented unless the collection system has sufficient capacity to contain along with volume required for containers.		40 *CFR* 264.175 (b)(4) *OAC* 3745-55-75 (B)(4)	See above.
	• Spilled or leaked waste and accumulated precipitation must be removed from the sump or collection area in as timely a manner as is necessary to prevent overflow.		40 *CFR* 264.175 (b)(5) *OAC* 3745-55-75 (B)(5)	See above.
Storage of incompatible waste in containers	Containers holding ignitable or reactive waste must be located at least 15 m (50 ft) from the facility's property line.	Storage of ignitable or reactive RCRA hazardous waste in containers—**applicable**	40 *CFR* 264.176 *OAC* 3745-55-76	Section 3.5, *IMTA Operations* Section 10, *Management of Secondary Waste*

Media/Location/Action	Requirements[a]	Prerequisite	Citation	Compliance Approach
Storage of incompatible waste in containers (continued)	Must not place incompatible wastes in same container unless comply with 40 *CFR* 264.17(b) [*OAC* 3745-54-17(B)].	Storage of "incompatible" RCRA hazardous wastes in containers—**applicable**	40 *CFR* 264.177(a) *OAC* 3745-55-77(A)	Section 10, *Management of Secondary Waste*
	Waste shall not be placed in an unwashed container that previously held an incompatible waste or material.		40 *CFR* 264.177(b) *OAC* 3745-55-77(B)	See above.
	A container holding incompatible wastes must be separated from any waste or nearby materials or must protect them from one another by using a dike, berm, wall, or other device.		40 *CFR* 264.177(c) *OAC* 3745-55-77(C)	Section 3.5, *IMTA Operations* Section 10, *Management of Secondary Waste*
Storage of ignitable or reactive waste in a staging pile	Must not place ignitable or reactive remediation waste in a staging pile unless:	Storage of ignitable or reactive remediation waste in staging pile—**applicable**	40 *CFR* 264.554(e) *OAC* 3745-57-74(E)	Section 3.5, *IMTA Operations*
	Waste has been treated, rendered, or mixed before it was placed in the staging pile so that the waste is no longer ignitable or reactive under §261.21 or §261.31 (*OAC* 3745-52-21 or 52-31), and 40 *CFR* 264.17(b) [*OAC* 3745-54-17(B)] has been complied with; or		40 *CFR* 264.554 (e)(i) *OAC* 3745-57-74 (E)(1)	Ignitable and reactive waste is not accepted for disposal at OSWDF or storage in IMTA.
	Remediation waste is managed to protect it from exposure to any material or condition that may cause it to ignite or react.		40 *CFR* 264.554 (e)(ii) *OAC* 3745-57-74 (E)(2)	See above.

Media/Location/Action	Requirements[a]	Prerequisite	Citation	Compliance Approach
Storage of incompatible waste in a staging pile	Must not place incompatible wastes in same pile unless comply with 40 *CFR* 264.17(b) [*OAC* 3745-54-17(B)].	Storage of "incompatible" remediation waste in staging pile—**applicable**	40 *CFR* 264.554 (f)(1) *OAC* 3745-57-74 (F)(1)	Section 3.5, *IMTA Operations*
	Incompatible wastes must be separated from any waste or nearby materials or must protect them from one another by using a dike, berm, wall, or other device.		40 *CFR* 264.554 (f)(2) *OAC* 3745-57-74 (F)(2)	See above.
	Must not pile remediation waste on the same base where incompatible wastes or materials were previously piled, unless the base has been decontaminated sufficiently to comply with 40 *CFR* 274.17(b) [*OAC* 3745-54-17(B)].		40 *CFR* 264.554 (f)(3) *OAC* 3745-57-74 (F)(3)	See above.
Hazardous waste treatment/disposal				
Disposal of RCRA-prohibited hazardous waste in a land-based unit	May be land disposed if the wastes no longer exhibit a characteristic at the point of land disposal, unless the wastes are subject to a specified method of treatment other than DEACT in 40 *CFR* 628.40 (*OAC* 3745-270-48), or are D003 reactive cyanide.	Land disposal of RCRA-restricted characteristic wastes—**applicable**	40 *CFR* 268.1 (c)(4)(iv) *OAC* 3745-270-01 (C)(4)	Section 10, *Management of Secondary Waste*

Media/Location/Action	Requirements[a]	Prerequisite	Citation	Compliance Approach
		Transportation[b]		
Transportation of hazardous materials on site	Must meet the substantive requirements of 49 *CFR* Parts 171–174, 177, and 178 or the site- or facility-specific Transportation Safety Document (i.e., *Transportation Safety Document for the On-Site Transfer of Hazardous Material at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio*).	Transport of hazardous materials on the PORTS facility—**TBC**	DOE Order 460.1C (4)(b)	Transportation requirements or equivalent safety standards will be met for hazardous materials traveling on site. (DOE Order 460.1C is now DOE Order 460.1D).
Transportation of hazardous waste off site	Must comply with the generator requirements of 40 *CFR* 262.20 to 262.23 [*OAC* 3745-52-20 to 3745-52-23] for manifesting, Section 262.30 [*OAC* 3745-52-30] for packaging, Section 262.31 [*OAC* 3745-52-31] for labeling, Sect. 262.32 [*OAC* 3745-52-32] for marking, Section 262.33 [*OAC* 3745-52-33] for placarding, Sections 262.40 and 262.41(a) [*OAC* 3745-52-40 and 3745-52-41] for record keeping requirements, and Section 262.12 [*OAC* 3745-52-12] to obtain EPA ID number.	Preparation of RCRA hazardous waste for off-site transport—**applicable**	40 *CFR* 262.10(h) *OAC* 3745-52-10(H) 40 *CFR* 262.20 to .23 *OAC* 3745-52-20 to -23 40 *CFR* 262.30 to .33 *OAC* 3745-52-30 to -33	Section 4.1, *Program Description.* Transportation of wastes off site will comply with all applicable DOE and DOT requirements.

[b]As noted in the DFF&O, Paragraph 9.a, the NCP at 40 *CFR* 300.400(e)(1) defines "on-site" as meaning "the areal extent of contamination and all suitable areas in very close proximity to the contamination necessary for the implementation of the response action." Off-site transportation, by definition, is not an on-site response action and is subject to all substantive, procedural, and administrative requirements of all legally applicable laws, but not to any requirements that might normally be labeled relevant and appropriate under the ARARs process.

Media/Location/Action	Requirements[a]	Prerequisite	Citation	Compliance Approach
SOLID WASTE				
Design, construction, operation, and closure of a solid waste landfill				
Activities causing dust, noise, or odors	Shall operate the facility in such a manner that noise, dust, and odors are strictly controlled so as to not cause a nuisance or health hazard.	Operation of a sanitary landfill—**applicable**	*OAC* 3745-27-19 (B)(3)	Section 2.3, *OSWDF Operations* (Initial Operations Phase) Section 2.6.2, *Operational Limits for Air Emissions Control During Waste Placement* Section 3.3, *OSWDF Operations* (Full-scale Operations Phase) Section 3.5, *IMTA Operations*
Conditions that cause the presence of insects, rodents, and vectors	Shall operate the facility in such a manner that conditions are controlled for insects, rodent, and vectors and they do not cause a nuisance or health hazard. Supplemental vector control measures may be implemented if deemed necessary.	Operation of a sanitary landfill—**applicable**	*OAC* 3745-27-19 (B)(4)	Appendix B, IMPP
Activities causing release of pollutants, nuisances, or health hazards	Shall operate the facility in such a manner that operation does not create a nuisance or a health hazard or cause water pollution.	Operation of a sanitary landfill—**applicable**	*OAC* 3745-27-19 (B)(5)	Section 2.6.2, *Operational Limits for Air Emissions Control During Waste Placement* Section 3.7, *IMTA Impacted Surface Water Management System Operations*

Media/Location/Action	Requirements[a]	Prerequisite	Citation	Compliance Approach
Placement of waste in first layer ("select waste layer")	Shall place select waste as the first layer of waste in all areas within the limits of waste placement adjacent to or in contact with the leachate collection system to protect the composite liner from the intrusion of objects during operation of the facility. The select waste layer shall:	Operation of a sanitary landfill—**applicable**	*OAC* 3745-27-19 (D)(1)	Section 3.1, *Start-up for Full-scale Operations* Appendix B, IMPP
	• Be spread but not compacted.		*OAC* 3745-27-19 (D)(1)(a)	See above.
	• Not contain items over 2 ft in length that are capable of puncturing the liner.		*OAC* 3745-27-19 (D)(1)(b)	See above.
	• Not restrict the flow of liquid to the leachate collection and management system.		*OAC* 3745-27-19 (D)(1)(c)	See above.
	• Not contain fines or small particles which can clog the leachate collection system		*OAC* 3745-27-19 (D)(1)(d)	See above.
	• Be placed as a single lift above the leachate collection layer so a minimum distance of 5 ft is created between the liner and general waste.		*OAC* 3745-27-19 (D)(1)(e)	See above.
Facility maintenance and repair	Maintain integrity of the engineered components of the facility and repair any damage to or failure of the components.	Operation of a sanitary landfill—**applicable**	*OAC* 3745-27-19 (E)(1)(c)	Section 6.1, *OSWDF Surveillance and Maintenance*
Support facilities for a sanitary landfill	Construct and maintain all-weather access roads within facility boundary in such a manner as to withstand the anticipated degree of use and allow passage of loaded refuse vehicles at all times, with minimum of erosion and dust generation.	Construction and operation of a sanitary landfill—**applicable**	*OAC* 3745-27-19 (E)(2)(a)	Section 6.5, *Roads Surveillance and Maintenance* Roads into the OSWDF are not maintained for waste placement during OSWDF shutdown.

Media/Location/Action	Requirements[a]	Prerequisite	Citation	Compliance Approach
Security system for a sanitary landfill	Limit access to the facility by nonemployees except during operating hours when operating personnel are present. Exclude live domestic and farm animals from the operating areas of the facility except for animals used for security purposes.	Construction and operation of a sanitary landfill—**applicable**	*OAC* 3745-27-19 (E)(2)(a), (b) and (d)	Section 5.3, *Security System*
Content of contingency plan	Shall ensure that operable equipment of adequate size and quantity for facility operations are available at all times, or that an appropriate contingency plan is prepared to properly handle and dispose of waste materials in the event of equipment failure.	Operation of a sanitary landfill—**applicable**	*OAC* 3745-27-19 (E)(3)(a)(b)	Section 8.2, *Truck or Heavy Equipment Issues*
General operating criteria for sanitary landfills	Shall only conduct salvaging in a manner approved by the director. Scavenging is prohibited.	Operation of a sanitary landfill—**applicable**	*OAC* 3745-27-19 (E)(4)	Salvaging will not occur at the OSWDF.
	Ensure preparations have been made such that during inclement weather the facility is able to receive, compact, and cover incoming waste. Preparations include, but are not limited to, designation and preparation of areas where waste will be deposited, compacted, and covered during inclement weather, construction and maintenance of all-weather roads, and stockpiling of cover material.	Operation of a sanitary landfill—**applicable**	*OAC* 3745-27-19 (E)(6)	Section 6.5, *Roads Surveillance and Maintenance* Section 9.4.3.1, *Inclement and severe weather* Appendix B, IMPP

Media/Location/Action	Requirements[a]	Prerequisite	Citation	Compliance Approach
General operating criteria for sanitary landfills (continued)	Prior to accepting waste comply with all leachate requirements, discharge and emission requirements. Do not begin filling a new phase without completing the previous phase, except as necessary for proper operation. Confine unloading to the smallest area possible and provide knowledge supervision at the working face. Do not deposit waste that is burning or may cause fire at the working face. Except as provided in paragraphs (D)(1) and (E)(7)(d), deposit waste at the working face, spread in layers not more than 2 ft thick, and compact to smallest practical volume. Bulky material shall be compacted or otherwise managed in a way to ensure proper daily cover and dusty materials are handled in such a way to minimize dust generation.	Waste acceptance and placement—**applicable**	*OAC* 3745-27-19 (E)(7)(a-f)	Section 2.1, *Start-up for Initial Operations* Section 2.2, *Waste Load-out and Transfer* (Initial Operations Phase) Section 3.1, *Start-up for Full-scale Operations* Section 3.2, *Waste Load-out and Transfer*, (Full-scale Operations Phase) Appendix B, IMPP, for waste placement.
Litter	Collect, properly contain, and dispose of scattered litter	Operation of a sanitary landfill**—applicable**	*OAC* 3745-27-19 (E)(9)	Appendix B, IMPP
Inspections	Inspect facility at least daily for ponding, erosion, and leachate outbreaks and record results on daily log forms.	Operation of a sanitary landfill**—applicable**	*OAC* 3745-27-19 (E)(11)(a)	Section 6.1, *OSWDF Surveillance and Maintenance*
	Inspect sedimentation ponds and pond discharge structures, includes pipes, ditches, and culverts at least weekly for erosion, clogging, or failure and take prompt correction, if necessary and record results on daily log forms.		*OAC* 3745-27-19 (E)(11)(b)	Section 6.6, *Surface Water Management System Maintenance*

Media/Location/Action	Requirements[a]	Prerequisite	Citation	Compliance Approach
Daily cover	Daily cover shall be applied to all exposed solid waste by the end of the working day and in no event should the waste be exposed more than 24 hours after unloading. Daily cover shall be nonputrescible, not contain large objects, and shall not be a solid waste without prior authorization. Implementation requirements include the following:	Operation of a sanitary landfill—**applicable**	*OAC* 3745-27-19(F)	Appendix B, IMPP
	• Where there is no leachate management system, a soil layer of at least 6 in. shall be used.		*OAC* 3745-27-19 (F)(2)	See above.
	• An alternative daily cover (including solid waste) can be used with director approval if it provides comparable level of protection of human health and the environment.		*OAC* 3745-27-19 (F)(3)	See above.
	• Less frequent than daily application may be approved by the director if the alternate frequency provides comparable and adequate protection.		*OAC* 3745-27-19 (F)(4)	See above.
	• Where there is a leachate management system, a soil layer a minimum of 6 in. thick shall be applied and maintained. The daily cover shall be removed prior to next waste placement so as not to impede the flow of leachate.		*OAC* 3745-27-19 (F)(1)	See above.
Intermediate cover	To minimize infiltration, apply intermediate cover to all filled areas where additional waste is not to be deposited for 30 days. An alternate time period can be approved by the Director.	Operation of a sanitary landfill—**applicable**	*OAC* 3745-27-19 (G)(1)	Section 3.3, *OSWDF Operations* (Full-scale Operations Phase) Appendix B, IMPP

Media/Location/Action	Requirements[a]	Prerequisite	Citation	Compliance Approach
Intermediate cover (continued)	Intermediate cover material shall be nonputrescible, have low permeability, good compaction, cohesiveness, relatively uniform texture, and not contain large objects. A minimum of 12-in. soil layer shall be used unless other materials are demonstrated to the director to be comparable and as protective.		*OAC* 3745-27-19 (G)(2)	Section 6.1, *OSWDF Surveillance and Maintenance* The surface conditions of the OSWDF described in the IMPP are maintained throughout the year, including periods of inactivity.
	Prior to next waste placement, the intermediate cover in an area shall be removed or otherwise prepared to not impede flow of leachate to a leachate management system.		*OAC* 3745-27-19 (G)(3)	See above.
	Protect the intermediate cover from erosion.		*OAC* 3745-27-19 (G)(4)	See above.
Leachate management at a solid waste landfill	If a leachate outbreak occurs at the facility, must repair all outbreaks and contain, properly manage, collect, and dispose of the leachate in accordance with *OAC* 3745-27-19(K)(5) and (K)(6) and take action to minimize, control, or eliminate the conditions which contribute to the production of leachate.	Construction and operation of a sanitary landfill—**applicable**	*OAC* 3745-27-19 (K)(1)	Appendix C, LISWSP Addresses response to leachate outbreaks.
	Maintain at least one lift station back-up pump at facility at all times.		*OAC* 3745-27-19 (K)(2)	Appendix C, LISWSP
	Visually or physically inspect collection pipe network of leachate management system after placement of initial lift of waste to ensure that crushing has not occurred and inspect network annually thereafter to ensure that clogging has not occurred.		*OAC* 3745-27-19 (K)(3)	See above.

Media/Location/Action	Requirements[a]	Prerequisite	Citation	Compliance Approach
Leachate management at a solid waste landfill (continued)	If approved, may temporarily store leachate within limits of waste placement until the leachate can be treated and disposed as outlined in the leachate contingency plan under *OAC* 3745-27-19(K)(6).		*OAC* 3745-27-19 (K)(4)	See above.
	Treat and dispose of collected leachate in accordance with *ORC* Chapter 6111 and with one of the following: • Treat and dispose of collected leachate on site at the disposal facility • Pretreat collected leachate on site and dispose of off site of facility • Treat and dispose of collected leachate off site of facility.	Operation of a sanitary landfill—**applicable**	*OAC* 3745-27-19 (K)(5)	See above.
	Must plan for storage and disposal of leachate to address immediate and long-term steps, including the setting aside of land for the construction and operation of an on-site treatment facility, to be taken for leachate management in the event that leachate cannot be managed in accordance with *OAC* 3745-27-19(K)(5).	Operation of a sanitary landfill—**applicable**	*OAC* 3745-27-19 (K)(6)	See above.
	If a substantial threat of water pollution exists from the leachate entering surface waters, the director or health commissioner may require the owner or operator to monitor the surface water.		*OAC* 3745-27-19 (K)(7)	See above.

Media/Location/Action	Requirements[a]	Prerequisite	Citation	Compliance Approach
		Solid waste disposal		
Prohibition on open dumping of solid wastes	Temporary storage of putrescible solid wastes in excess of 7 days, or temporary storage of any solid wastes where such storage causes a nuisance or health hazard shall be considered open dumping.	Temporary storage of solid waste prior to collection for disposal or transfer—**applicable**	*OAC* 3745-27-03 (A)(2)	Appendix B, IMPP
	No person shall conduct, permit, or allow open dumping. In the event that open dumping is or has occurred, person(s) responsible shall promptly remove and dispose of or otherwise manage the solid waste and shall submit verification that the waste has been properly managed.	Management and disposal of solid waste**—applicable**	*OAC* 3745-27-05(C)	See above.
Disposal of whole or shredded scrap tires	Whole or shredded scrap tires cannot be disposed at a sanitary landfill with the exception of the following:		*OAC* 3745-27-19 (E)(8)(g)	Appendix B, IMPP
	• Burned or partially burned scrap tires, pyrolytic oil, and contaminated soils provided those materials meet the definition of solid waste in *OAC* 3745-27-01.		*OAC* 3745-27-19 (E)(8)(g)(i)	See above.
	• Scrap tire pieces from a scrap tire recovery facility that are the byproduct of scrap tire processing.		*OAC* 3745-27-19 (E)(8)(g)(ii)	See above.
	• Authorized beneficial uses of scrap tires pursuant to *OAC* 3745-27-78.		*OAC* 3745-27-19 (E)(8)(g)(iii)	See above.

Media/Location/Action	Requirements[a]	Prerequisite	Citation	Compliance Approach
Disposal of whole or shredded scrap tires (continued)	• Whole scrap tires which could not be processed by a scrap tire recovery facility. The owner or operator of the scrap tire recovery facility shall complete a scrap tire shipping paper and record on the shipping paper why the scrap tires are not processable at the scrap tire recovery facility. This includes but is not limited to aircraft tires and forklift tires that are not processable due to their construction or scrap tires contaminated with mud or other materials that render the tires unsuitable for processing.		*OAC* 3745-27-19 (E)(8)(g)(iv)	See above.
TSCA/PCB WASTES				
Design, construction, operation and closure of a TSCA chemical waste landfill				
Leachate collection system monitoring and handling	Leachate collection systems shall be monitored monthly for quantity and physicochemical characteristics of leachate produced. The leachate should be either treated to acceptable limits for discharge in accordance with legally applicable discharge limits or disposed of by another legally appropriate method. Water analysis shall be conducted as provided in Paragraph (b)(6)(iii) of 40 *CFR* 761.75.	Construction of a TSCA chemical waste landfill—applicable	40 *CFR* 761.75 (b)(7)	Appendix C, LISWSP, for monitoring the quantity of liquids. OSWDF PSVP addresses physiochemical characterization.
Inventory requirements	Disposal records shall include information on the PCB concentration in the liquid wastes and the three dimensional burial coordinates for PCBs and PCB items.	Operation of a TSCA chemical waste landfill—applicable	40 *CFR* 761.75 (b)(8)(iv)	Section 11.1.1, *Operating and Disposal Records*

Media/Location/Action	Requirements[a]	Prerequisite	Citation	Compliance Approach
Security and support facilities for TSCA chemical waste landfill	Roads shall be maintained to and within the site that are adequate to support the operation and maintenance of the site without causing safety or nuisance problems or hazardous conditions.	Construction of a TSCA chemical waste landfill—applicable	40 *CFR* 761.75 (b)(9)(ii)	Section 6.5, *Roads Surveillance and Maintenance*
Operation of a TSCA chemical waste landfill	Site shall be operated and maintained to prevent hazardous conditions resulting from spilled liquids and windblown materials.	Operation of a TSCA chemical waste landfill—applicable	40 *CFR* 761.75 (b)(9)(iii)	Section 8.7, *Spill Response* Appendix B, IMPP
		PCB waste storage		
Temporary storage of PCB waste in a non-RCRA-regulated area	Except as provided in 40 *CFR* 761.65 (b)(2), (c)(1), (c)(7), (c)(9), and (c)(10), after July 1, 1978, facilities used for the storage of PCBs and PCB items designated for disposal shall comply with the storage unit requirements in 40 *CFR* 761.65(b)(1).	Storage of PCBs and PCB items at concentrations ≥ 50 ppm for disposal—applicable	40 *CFR* 761.65(b)	Section 3.5, *IMTA Operations* Storage at the IMTA conducted under risk-based disposal option of 40 .*CFR* 761.61(c)(9).
	The facilities shall meet the following criteria:		40 *CFR* 761.65 (b)(1)	See above.
	• Adequate roof and walls to prevent rain water from reaching the stored PCBs and PCB items		40 *CFR* 761.65 (b)(1)(i)	See above.
	• Adequate floor that has continuous curbing with a minimum 6-in.-high curb. Floor and curb must provide a containment volume equal to at least two times the internal volume of the largest PCB article or container or 25 percent of the internal volume of all articles or containers stored there, whichever is greater. Note: 6-in. minimum curbing not required for area storing PCB/radioactive waste.		40 *CFR* 761.65 (b)(1)(ii)	See above.

Media/Location/Action	Requirements[a]	Prerequisite	Citation	Compliance Approach
Temporary storage of PCB waste in a non-RCRA-regulated area (continued)	• No drain valves, floor drains, expansion joints, sewer lines, or openings that permit liquids to flow from curbed area		40 *CFR* 761.65 (b)(1)(iii)	See above.
	• Floors and curbing constructed of Portland cement, concrete, or a continuous, smooth, nonporous surface as defined at Section 761.3, which prevents or minimizes penetration of PCBs and		40 *CFR* 761.65 (b)(1)(iv)	See above.
	• Not located at site below 100-year flood water elevation.		40 *CFR* 761.65 (b)(1)(v)	See above.
Temporary storage of PCB waste in a RCRA-regulated area	Does not have to meet storage unit requirements in 40 *CFR* 761.65(b)(1) provided unit is stored in compliance with RCRA and PCB spills are cleaned up in accordance with Subpart G of 40 *CFR* 761.	Storage of PCBs and PCB items at concentrations ≥ 50 ppm for disposal—applicable	40 *CFR* 761.65 (b)(2)(i) through (iv)	Section 3.5, *IMTA Operations* Storage at the IMTA conducted under risk-based disposal option of 40 *CFR* 761.61(c)(9).
Temporary storage of PCB waste in containers	Container(s) shall be marked as illustrated in 40 *CFR* 761.45(a).	Storage of PCBs and PCB items at concentrations ≥ 50 ppm for disposal—applicable	40 *CFR* 761.40 (a)(1)	Section 3.5, *IMTA Operations* Section 7.2, *WAC Component 5: Waste Packaging Standards*
	Storage area must be properly marked as required by 40 *CFR* 761.40(a)(10).	Storage of PCBs and PCB items at concentrations ≥ 50 ppm for disposal—applicable	40 *CFR* 761.65 (c)(3)	PCB wastes will be stored in a manner to prevent the migration of PCB contamination and in compliance with obligations pursuant to the TSCA Compliance Agreement.
	Any leaking PCB items and their contents shall be transferred immediately to a properly marked nonleaking container(s).		40 *CFR* 761.65 (c)(5)	Section 3.5, *IMTA Operation*

Media/Location/Action	Requirements[a]	Prerequisite	Citation	Compliance Approach
Temporary storage of PCB waste in containers (continued)	Except as provided in 40 *CFR* 761.65 (c)(6)(i) and (ii), container(s) shall be in accordance with requirements set forth in DOT HMR at 49 *CFR* 171-180.		40 *CFR* 761.65 (c)(6)	Section 3.5, *IMTA Operations* All containers used to store PCBs will be nonleaking and chemically compatible with the material being stored and compliant with the on-site Transportation Safety Document.
	Items shall be dated when they are removed from service and the storage shall be managed so that PCB items can be located by this date. (Note: date should be marked on the container.)	PCB items (includes PCB wastes) removed from service for disposal—applicable	40 *CFR* 761.65 (c)(8)	PCB wastes will be stored in a manner to prevent the migration of PCB contamination and in compliance with obligations pursuant to the TSCA Compliance Agreement.
Temporary storage of PCB remediation waste or PCB bulk product waste in a TSCA waste pile	Waste must be placed and managed in accordance with the design and operation standards, including liner and cover requirements and runoff control systems, in 40 *CFR* 761.65(c)(9).	Storage of PCB remediation waste or PCB bulk product waste at cleanup site or site of generation—applicable	40 *CFR* 761.65 (c)(9)(i)	Section 3.5, *IMTA Operations* Storage at IMTA conducted under risk-based disposal option of 40 *CFR* 761.61(c)(9).
	Requirements of 40 *CFR* 761.65(c)(9) of this part may be modified under the risk-based disposal option of Section 761.61(c).		40 *CFR* 761.65 (c)(9)(iv)	See above.
Risk-based storage of PCB remediation waste or bulk product waste prior to disposal	May store in a manner other than prescribed in 40 *CFR* 761.65 if the method will not pose an unreasonable risk of injury to health or the environment.	Storage of PCB remediation waste or bulk product waste prior to disposal—applicable	40 *CFR* 761.61(c) 40 *CFR* 761.62(c)	Section 3.5, *IMTA Operations* Storage at IMTA conducted under risk-based disposal option of 40 *CFR* 761.61(c)(9).

Media/Location/Action	Requirements[a]	Prerequisite	Citation	Compliance Approach
Storage of PCB/radioactive waste in containers	For liquid wastes, containers must be nonleaking.	Storage of PCB/ radioactive waste in containers other than those meeting DOT HMR performance standards—applicable	40 *CFR* 761.65 (c)(6)(i)(A)	Section 3.5, *IMTA Operations*
	For nonliquid wastes, containers must be designed to prevent buildup of liquids if such containers are stored in an area meeting the containment requirements of 40 *CFR* 761.65(b)(1)(ii); and		40 *CFR* 761.65 (c)(6(i)(B)	
	For both liquid and nonliquid wastes, containers must meet all regulations and requirements pertaining to nuclear criticality safety.		40 *CFR* 761.65 (c)(6)(i)(C)	Section 3.9, *Operational Limits and Monitoring during Full-scale Operations*
		PCB waste treatment/disposal		
Disposal of TSCA PCB waste in a chemical waste landfill	Must be placed in manner that will prevent damage to containers or articles. Other wastes that are not chemically compatible with PCBs shall be segregated from the PCBs throughout the handling and disposal process.	Disposal of PCBs or PCB items in chemical waste landfill—applicable	40 *CFR* 761.75 (b)(8)(i)	Appendix B, IMPP
	May be disposed of if each container is surrounded by an amount of inert sorbent material capable of absorbing all of the liquid contents of the container.	Disposal of PCB container with liquid PCB between 50 and 500 ppm—applicable	40 *CFR* 761.75 (b)(8)(ii)	Containers of PCB liquids are prohibited for disposal by the OSWDF WAC

Media/Location/Action	Requirements[a]	Prerequisite	Citation	Compliance Approach
Disposal of PCB transformers	Shall be disposed of in one of the following: • An incinerator that complies with 40 *CFR* 761.70 • A chemical waste landfill that is compliant with 40 *CFR* 761.75 provided all free-flowing liquid is removed from the transformer, the transformer is filled with a solvent, the transformer is allowed to stand for at least 18-continuous hours, and then the solvent is thoroughly removed.	Disposal of PCB transformers that contain PCBs at concentrations of ≥ 500 ppm in the contaminating fluid as defined in 40 *CFR* 761.3—applicable	40 *CFR* 761.60 (b)(1) 40 *CFR* 761.60 (b)(1)(i)(A) 40 *CFR* 761.60 (b)(1)(i)(B)	Transformers received for disposal will have undergone the solvent rinse as described in the regulation.
RADIOACTIVE WASTE				
Design, construction, operation and closure of a low-level radioactive waste landfill				
Management, storage and disposal of LLW	Management, storage, and disposal must be conducted in a manner such that exposure to members of the public to radiation from radioactive waste complies with ALARA process requirements and does not exceed a TED of 25 mrem in a year from all exposure pathways and radiation sources associated with the waste, except for transportation and radon and its decay products.	Management, storage, and disposal of LLW—TBC	DOE Order 458.1 (h)(1)(c)	Section 9.3, *Radiation Protection Program* Monitoring for compliance is conducted under the OSWDF PSVP.
Siting, design, and operation of a DOE LLW disposal facility	Release of radon shall be less than an average flux of 20 pCi/m^2/s (0.74 Bq/m^2/s) at the surface of the disposal facility. Alternatively, a limit of 0.5 pCi/L (0.0185 Bq/L) of air may be applied at the boundary of the facility.	Operation of a LLW disposal facility at a DOE site—TBC	DOE M 435.1-1 (IV)(P)(1)(c)	The OSWDF Performance Assessment developed under DOE Order 435.1-1 projected radon flux would be less than 0.1 pCi/m^2/s above the cover of the filled OSWDF, which is well below the 20 pCi/m^2/s standard.

Media/Location/Action	Requirements[a]	Prerequisite	Citation	Compliance Approach
Siting, design, and operation of a DOE LLW disposal facility (continued)	Operating procedures must protect the public, workers, and the environment, ensure the security of the facility, minimize subsidence during and after waste placement, achieve long-term stability and minimize the need for long-term active maintenance, and meet the requirements of the closure/ postclosure plan.		DOE M 435.1-1 (IV)(P)(6)(a)	Section 2.3, *OSWDF Operations* (Initial Operations Phase) Appendix B, IMPP Monitoring is conducted under the OSWDF PSVP.
	Operations shall be conducted so that disposal operations do not have adverse effects on any other disposal unit low-level wastes.		DOE M 435.1-1 (IV)(P)(6)(d)	See above.
Facility requirements for land disposal of radioactive waste – performance objectives	Land disposal facilities shall be sited, designed, operated, closed, and controlled after closure to provide reasonable assurance that the following performance objectives will be met:	Siting, design, operation and closure of a licensed radioactive waste land disposal facility—relevant and appropriate	*OAC* 3701:1-54-08 (B)	Section 1, *Introduction* Section 2.2, *Waste Load-out and Transfer* (Initial Operations Phase) Section 2.3, *OSWDF Operations* (Initial Operations Phase) Section 3.2, *Waste Load-out and Transfer* (Full-scale Operations Phase) Section 3.3, *OSWDF Operations* (Full-scale Operations Phase) Appendix B, IMPP Monitoring is conducted under the OSWDF PSVP.

Media/Location/Action	Requirements[a]	Prerequisite	Citation	Compliance Approach
Facility requirements for land disposal of radioactive waste – performance objectives (continued)	• Concentrations of radioactive material which may be released to the general environment in ground water, surface water, air, soil, plants, or animals must not result in an annual dose exceeding the equivalent of 0.25 mSv (25 mrem) to the whole body, 0.75 mSv (75 mrem) to the thyroid, or 0.25 mSv (25 mrem) to any other organ to any member of the public. Reasonable effort should be made to maintain releases of radioactivity in effluents to the general environment as low as is reasonably achievable.		*OAC* 3701:1-54-08 (B)(1)	Section 2.6, *Operational Limits and Monitoring during Initial Operations* Section 3.9, *Operational Limits and Monitoring during Full-scale Operations* Monitoring is conducted under the OSWDF PSVP.
	• Disposal facility shall be sited, designed, used, operated, and closed to achieve long-term stability of the disposal site and to eliminate, to the extent practical, the need for ongoing active maintenance of the disposal site after closure so that only surveillance, monitoring, or minor custodial care are required.		*OAC* 3701:1-54-08 (B)(4)	Appendix B, IMPP

Media/Location/Action	Requirements[a]	Prerequisite	Citation	Compliance Approach
Facility requirements for land disposal of radioactive waste – performance objectives (continued)	• Shall develop and implement security measures to protect against and to detect unauthorized access to radioactive material or safety and security systems from external as well as internal threats. Shall perform periodic inspections to ensure all radioactive material is accounted for and that safety and security systems are operating as designed. Shall report any deficiency involving the radioactive material inventory or a safety and security system.		*OAC* 3701:1-54-08 (B)(5)	Section 5.3 *Security System* Section 11.2.5, *Radiological Inventory Security*
	• Radioactive waste and its containers shall be protected from adverse environmental conditions including, but not limited to, temperature changes that could compromise the isolation of the waste from the biosphere.		*OAC* 3701:1-54-08 (B)(6)	Appendix B, IMPP
Facility requirements for land disposal of radioactive waste – operational requirements	The operation of the disposal facility shall incorporate the following items:	Operation of a licensed radioactive waste land disposal facility—relevant and appropriate	*OAC* 3701:1-54-08 (C)	Appendix B, IMPP
	• Waste shall be packaged in appropriate containers for disposal when applicable. Wastes shall be emplaced in a manner that maintains the package integrity during emplacement, minimizes void spaces between packages, and permits the void spaces to be filled.		*OAC* 3701:1-54-08 (C)(4)	See above.
	• Void spaces between packages shall be filled as needed to reduce future subsidence within the fill.		*OAC* 3701:1-54-08 (C)(5)	See above.

Media/Location/Action	Requirements[a]	Prerequisite	Citation	Compliance Approach
Facility requirements for land disposal of radioactive waste – operational requirements (continued)	• Boundaries and locations of each disposal unit shall be accurately located and mapped by means of a land survey. Disposal units shall be marked in such a way that boundaries of each unit can be easily defined. Three permanent survey marker control points shall be established on the site to facilitate surveys.		*OAC* 3701:1-54-08 (C)(7)	Section 2.3, *OSWDF Initial Operations* Section 4.1, *Program Overview* Section 6.1, *OSWDF Surveillance and Maintenance* Section 11.1.1, *Operating and Disposal Records*
	• Closure and stabilization measures as set forth in the approved site closure plan shall be carried out as each disposal unit is filled and covered.		*OAC* 3701:1-54-08 (C)(9)	
	• Active waste disposal operations shall not have an adverse effect on completed closure and stabilization measures.		*OAC* 3701:1-54-08 (C)(10)	Appendix B, IMPP
	• Any other information which may be needed to prepare and maintain the disposal facility performance assessment, or demonstrate compliance with performance objectives.		DOE M 435.1-1 (IV)(I)(2)(g)	See above.
	Radioactive waste treatment/disposal			
Disposal of LLW in a landfill	Void spaces within the waste and, if containers are used, between the waste and its container shall be reduced to the extent practical.		DOE M 435.1-1 (IV)(G)(1)(d)(1)	Appendix B, IMPP

Media/Location/Action	Requirements[a]	Prerequisite	Citation	Compliance Approach
ASBESTOS-CONTAINING WASTE				
	Operation and closure of an asbestos-containing waste disposal site			
Operation of an active ACM waste disposal site	Shall cause or permit no visible emissions to the outside air; or shall comply with the requirements of *OAC* 3745-20-06(B) [as noted below].	Operation of an active waste disposal site that receives ACM—applicable	*OAC* 3745-20-06(A)	Section 2.2, *Waste Load-out and Transfer* (Initial Operations Phase) Section 2.3, *OSWDF Operations* (Initial Operations Phase) Section 3.2, *Waste Load-out and Transfer* (Full-scale Operations Phase) Section 3.3, *OSWDF Operations* (Full-scale Operations Phase) Appendix B, IMPP
	Shall be no visible emissions to the outside air from ACM during the on-site transportation, transfer, deposition, or compacting operations.		*OAC* 3745-20-06 (B)(1)	See above.
	Deposition and burial operations shall be conducted in a manner which prevents handling by equipment or persons that causes asbestos-containing waste materials to be broken up or dispersed before the materials are buried.		*OAC* 3745-20-06 (B)(2)	See above.

Media/Location/Action	Requirements[a]	Prerequisite	Citation	Compliance Approach
Operation of an active ACM waste disposal site (continued)	As soon as practicable after deposition of the ACM but no later than at the end of each operating day, the ACM deposited during the operating day shall be covered with at least 12 in. of compacted nonasbestos-containing material. Alternatively, may apply for approval to utilize alternative control methods to bind dust, control wind erosion or convert asbestos to nonfriable forms.		*OAC* 3745-20-06 (B)(3)	Section 2.3, *OSWDF Operations* (Initial Operations Phase) Section 3.3, *OSWDF Operations* (Full-scale Operations Phase) Appendix B, IMPP
	During the unloading, deposition, burial, and initial compaction of ACM, must establish a restricted area adequate to deter the unauthorized entry of the general public and any unauthorized personnel from any location within 100 ft of the operations; and		*OAC* 3745-20-06 (B)(4)	Section 5.3, *Security System*
	Shall display a sign not less than 20×14 in. so that it is visible at all entrances and at intervals of 300 ft or less along the property line or the fencing immediately surrounding the restricted area using wording, letter sizes, and styles in accordance with specifications listed in *OAC* 3745-20-06(B)(5).		*OAC* 3745-20-06 (B)(5)	Section 6.8, *Security System Surveillance and Maintenance*
Inventory requirements	Maintain until closure records of the location, depth and area, and quantity in cubic yards of asbestos-containing waste material within the disposal site on a map or diagram.	Operation of an active waste disposal site that receives ACM—applicable	40 *CFR* 61.154(f) *OAC* 3745-20-06 (C)(2)	Section 11.1.1, *Operation and Disposal Records*

Media/Location/Action	Requirements[a]	Prerequisite	Citation	Compliance Approach
		Asbestos-containing waste treatment and disposal		
Management of ACM prior to disposal	Discharge no visible emissions to the outside air, or use one of the emission control and waste treatment methods specified in Paragraphs (a)(1) through (a)(4) of 40 *CFR* 61.150 [Paragraphs (B)(1) through (B)(4) of *OAC* 3745-20-05].	Generation, collection, processing, packaging, and transporting of any ACM that is not Category I or II nonfriable ACM waste that did not become crumbled, pulverized, or reduced to powder [40 *CFR* 61.150 (a)(5)]—applicable	40 *CFR* 61.150(a) *OAC* 3745-20-05(B)	Appendix B, IMPP
Disposal of asbestos-containing waste material (e.g., transite siding, pipe lagging, insulation, ceiling tiles)	All asbestos-containing waste material must be adequately wetted, collected, sealed in leak-proof containers, and deposited as soon as practicable at an approved waste disposal site operated in accordance with Section 61.154 [*OAC* 3745-20-06] or a site that converts RACM and asbestos-containing waste material into nonasbestos (asbestos-free) material according to provisions of 40 *CFR* 61.155 [*OAC* 3745-20-13].	Removal and disposal of RACM, except Category I nonfriable asbestos-containing material—applicable	40 *CFR* 61.150 (b)(1) – (2) *OAC* 3745-20-05(A)	Section 7.2, *WAC Component 5: Waste Packaging Standards*
	The requirements of 40 *CFR* 61.150(b)(1) and (2) [*OAC* 3745-20-05(A)] do not apply to Category I nonfriable ACM that is not RACM.		40 *CFR* 61.150 (b)(3) *OAC* 3745-20-05 (A)(4)	See above.

Media/Location/Action	Requirements[a]	Prerequisite	Citation	Compliance Approach
Disposal of asbestos-containing waste material (e.g., transite siding, pipe lagging, insulation, ceiling tiles) (continued)	May use an alternative emission control and waste treatment method that will control asbestos emissions equivalent to currently required methods, if the alternative method is suitable for the intended application, and the alternative method will not violate other regulations and will not result in increased water or land pollution or occupational hazards.		40 *CFR* 61.150 (a)(4) *OAC* 3745-20-05 (B)(4)	See above.
UNIVERSAL WASTES				
	Characterization and management			
Characterization and management of universal waste	Must manage universal waste in accordance with 40 *CFR* 273 [*OAC* 3745-273-33] in a way that prevents releases of any universal waste or component of a universal waste to the environment.	Generation of universal waste [as defined in 40 *CFR* 273 and *OAC* 3745-273] for disposal—applicable	40 *CFR* 273.33 *OAC* 3745-273-33 (A)	Section 10, *Management of Secondary Waste*
	Must label or mark the universal waste to identify the type of universal waste.		40 *CFR* 273.34 *OAC* 3745-273-34	See above.
	May accumulate waste for no longer than 1 year from the date the waste is generated or received another handler unless the requirements of 40 *CFR* 273.35(b) [*OAC* 3745-273-35(B)] are met.		40 *CFR* 273.35(a) *OAC* 3745-273-35 (A)	See above.
	May accumulate universal waste for longer than 1 year from the date the waste is generated or received from another handler if such activity is solely for the purpose of accumulation of such quantities of universal waste as necessary to facilitate proper recovery, treatment, or disposal. However, the handler bears the burden of proving that such activity was solely for this purpose.		40 *CFR* 273.35(b) *OAC* 3745-273-35 (B)	See above.

Media/Location/Action	Requirements[a]	Prerequisite	Citation	Compliance Approach
Characterization and management of universal waste (continued)	Shall ensure that all employees are thoroughly familiar with proper waste handling and emergency procedures relative to their responsibilities during normal facility operations and emergencies.		40 *CFR* 273.36 *OAC* 3745-273-36	Section 12.4, *Training*
	Must immediately contain all releases of universal wastes and other residues from universal wastes, and must determine whether any material resulting from the release is hazardous waste, and if so, must manage the hazardous waste in compliance with all applicable requirements.		40 *CFR* 273.37 *OAC* 3745-273-37	Section 10, *Management of Secondary Waste*
		Batteries		
Management of universal waste batteries	A large quantity handler of universal waste must contain any universal waste battery that shows evidence of leakage, spillage, or damage that could cause leakage under reasonably foreseeable conditions in a container.	Generation of universal waste batteries [as defined in 40 *CFR* 273.9 and *OAC* 3745-273-02]—applicable	40 *CFR* 273.33 (a)(1) *OAC* 3745-273-33 (A)(1)	Section 10, *Management of Secondary Waste*
	Container must be closed, structurally sound, compatible with the contents of the battery, and lack evidence of leakage, spillage, or damage that could cause leakage under reasonably foreseeable conditions.			See above.
	Batteries, or container or tank in which the batteries are contained, must be labeled or marked clearly with any one of the following phrases: "Universal Waste – Battery(ies)" or "Waste Battery(ies)" or "Used Battery(ies)."		40 *CFR* 273.34(a) *OAC* 3745-273-34 (A)	See above.

Media/Location/Action	Requirements[a]	Prerequisite	Citation	Compliance Approach
		Pesticides		
Management of universal waste pesticides	A container, tank, transport vehicle or vessel in which recalled or unused pesticides are contained must be labeled or marked clearly with the label that was on or accompanied the product and the word "Universal Waste – Pesticide(s)" or "Waste – Pesticide(s)."		40 *CFR* 273.34 (b) and (c) *OAC* 3745-273-34 (B) and (C)	Section 10, *Management of Secondary Waste*
		Thermostats and other mercury-containing equipment		
Management of universal waste thermostats or other mercury-containing equipment	A large quantity handler of universal waste must contain any mercury-containing equipment that shows evidence of leakage, spillage, or damage that could cause leakage under reasonably foreseeable conditions in a container.	Generation of universal waste mercury-containing equipment [as defined in 40 *CFR* 273.9 and *OAC* 3745-273-04]—applicable	40 *CFR* 273.33 (c)(1) *OAC* 3745-273-33 (C)(1)	Section 10, *Management of Secondary Waste*
	Container must be closed, structurally sound, compatible with the contents of the thermostat, and lack evidence of leakage, spillage, or damage that could cause leakage under reasonably foreseeable conditions, and be reasonably designed to prevent the escape of mercury into the environment by volatilization or any other means.			See above.
	May remove the mercury-containing ampule or the open original housing holding the mercury from mercury-containing equipment and manage and dispose of it in accordance with regulations.		40 *CFR* 273.33 (c)(2) – (4) *OAC* 3745-273-33 (C)(2) – (4)	See above.

Media/Location/Action	Requirements[a]	Prerequisite	Citation	Compliance Approach
Management of universal waste thermostats or other mercury-containing equipment (continued)	Mercury-containing equipment or a container in which the equipment is contained must be labeled or marked clearly with any of the following phrases: “Universal Waste – Mercury-Containing Equipment” or “Waste Mercury-Containing Equipment” or “Used Mercury-Containing Equipment.”		40 *CFR* 273.34 (d)(1) *OAC* 3745-273-34 (D)(1)	See above.
	Mercury-containing thermostats or containers containing only these thermostats must be labeled or marked clearly with any of the following phrases: “Universal Waste – Mercury Thermostat(s)” or “Waste Mercury Thermostat(s)” or “Used Mercury Thermostat(s).”		40 *CFR* 273.34 (d)(2) *OAC* 3745-273-34 (D)(2)	See above.
Fluorescent and mercury vapor lamps				
Management of universal waste lamps (fluorescent, mercury vapor)	A large quantity handler of universal waste lamps must contain any lamp in containers or packages that are structurally sound, adequate to prevent breakage, and compatible with the contents of the lamps.	Generation of universal waste lamps [as defined in 40 *CFR* 273.9 and *OAC* 3745-273-05] — applicable	40 *CFR* 273.33 (d)(1) *OAC* 3745-273-33 (D)(1)	Section 10, *Management of Secondary Waste*
	Such containers and packages must remain closed and must lack evidence of leakage, spillage, or damage that could cause leakage of hazardous constituents under reasonably foreseeable conditions.			See above.

Media/Location/Action	Requirements[a]	Prerequisite	Citation	Compliance Approach
Management of universal waste lamps (fluorescent, mercury vapor) (continued)	A large quantity handler of universal waste lamps must immediately clean up and place in a container any lamp that is broken and must place in a container any lamp that shows evidence of breakage, leakage, or damage that could cause the release of mercury or other hazardous constituents to the environment.		40 *CFR* 273.33 (d)(2) *OAC* 3745-273-33 (D)(2)	Broken lamps will be containerized.
	Each lamp or container or package in which such lamps are contained must be labeled or marked clearly with one of the following phrases: “Universal Waste-Lamp(s),” or “Waste Lamps,” or “Used Lamps.”		40 *CFR* 273.34(e) *OAC* 3745-273-34 (E)	Section 10, *Management of Secondary Waste*
	Mark or label the individual item with the date the lamp(s) became a waste, or mark or label the container or package with the date the wastes were received.		40 *CFR* 273.35(c) *OAC* 3745-273-35 (C)	See above.
MISCELLANEOUS WASTES				
		Beryllium wastes		
Disposal of beryllium-containing waste or beryllium-contaminated equipment and other items	Dispose of in sealed, impermeable bags, containers, or enclosures to prevent the release of beryllium dust during handling and transportation. Bags, containers, and enclosures must be labeled according to 10 *CFR* 850.38.	Generation of beryllium-containing waste or beryllium-contaminated equipment and other items—applicable	10 *CFR* 850.32(b)	Section 7.2, *WAC Component 5, Waste Packaging Standards*

Media/Location/Action	Requirements[a]	Prerequisite	Citation	Compliance Approach
		Used oil		
Management of used oil	Used oil shall not be stored in a unit other than a tank, container, or RCRA regulated unit.	Generation and storage of used oil, as defined in 40 *CFR* 279.1 [*OAC* 3745-279-01 (A)(12)], that meets the applicability requirements of 40 *CFR* 279.10—applicable	40 *CFR* 279.22(a) *OAC* 3745-279-22 (A)	Section 10, *Management of Secondary Waste*
	Containers and aboveground tanks used to store used oil must be in good condition (no severe rusting, apparent structural defects, or deterioration); and not leaking (no visible leaks).		40 *CFR* 279.22 (b)(1) and (2) *OAC* 3745-279-22 (B)(1) and (2)	See above.
	Containers and aboveground tanks used to store used oil and fill pipes used to transfer used oil into USTs must be labeled or marked clearly with the words "Used Oil."		40 *CFR* 279.22 (c)(1) and (2) *OAC* 3745-279-22 (C)(1)	See above.
	Upon detection of a release of used oil to the environment, a generator must stop the release; contain, clean up, and properly manage the released used oil; and, if necessary, repair or replace any leaking used oil storage containers or tanks prior to returning them to service.	Release of used oil to the environment—applicable	40 *CFR* 279.22(d) *OAC* 3745-279-22 (D)	See above.
Disposal of hazardous used oil	Used oils that are identified as a hazardous waste and cannot be recycled in accordance with *OAC* 3745-279 must be managed in accordance with the hazardous waste management requirements of *OAC* 3745-50 to 3745-69, 3745-205, 3745-256, 3745-266, and 3745-270.	Generation of used oil—applicable	40 *CFR* 279.81(a) *OAC* 3745-279-81 (A)	Section 10, *Management of Secondary Waste*

Media/Location/Action	Requirements[a]	Prerequisite	Citation	Compliance Approach
Disposal of nonhazardous used oils	Used oils that are not hazardous wastes and cannot be recycled under *OAC* 3745-279 must be disposed in accordance with the applicable requirements of *OAC* 3745-27, 3745-28, 3745-29, and 3745-30.		40 *CFR* 279.81(b) *OAC* 3745-279-81 (B)	Used oils that are determined to be hazardous and cannot be recycled will be managed in accordance with the hazardous waste management requirements.
Transportation of used oil off site	Except as provided in paragraphs (a) to (c) of 40 *CFR* 279.24 [*OAC* 3745-279-24(A) to (C)], generators must ensure that their used oil is transported by transporters who have obtained EPA ID numbers.	Preparation of used oil for off-site transport—applicable	40 *CFR* 279.24 *OAC* 3745-279-24	Section 10, *Management of Secondary Waste* Transportation of wastes off site will comply with all applicable DOE and DOT requirements.
AIR EMISSIONS				
		Fugitive air emissions		
Activities causing fugitive dust (particulate) emissions	Shall take reasonable achievable control measures to prevent particulate matter from becoming airborne. Reasonable achievable control measures shall include, but are not limited to, the following:	Fugitive emissions from transportation, land-disturbing, or building alteration activities located in areas identified in Appendix A to *OAC* 3745-17-08, except as exempted under *OAC* 3745-17-08 (A)(3)—relevant and appropriate	*OAC* 3745-17-08(B)	Section 2.2, *Waste Load-out and Transfer* (Initial Operations Phase) Section 2.3, *OSWDF Operations* (Initial Operations Phase) Section 3.2, *Waste Load-out and Transfer* (Full-scale Operations Phase) Section 3.3, *OSWDF Operations* (Full-scale Operations Phase) Section 5.2, *Access Roads*

Media/Location/Action	Requirements[a]	Prerequisite	Citation	Compliance Approach
Activities causing fugitive dust (particulate) emissions (continued)	• Use, where possible, of water or chemicals for control of dust and in demolition of existing buildings or structures, construction operations, grading of roads, or the clearing of land		*OAC* 3745-17-08 (B)(1)	See above.
	• Periodic application of asphalt, oil (excluding used oil), water, or other suitable chemicals on dirt or gravel roads and parking lots, materials stock piles, and other surfaces which can create airborne dusts, or the use of canvas or other suitable coverings for all materials stockpiles and stockpiling operations except temporary stockpiles		*OAC* 3745-17-08 (B)(2) and (6)	See above.
	• Pave and maintain roadways in a clean condition		*OAC* 3745-17-08 (B)(8)	Section 6.3 See above.
	• Promptly remove, in such a manner as to minimize or prevent resuspension, earth or other material from paved streets onto which this material has been deposited by trucking or earth moving equipment or erosion by water or other means.		*OAC* 3745-17-08 (B)(9)	Section 2.2, *Waste Load-out and Transfer* (Initial Operations Phase) Section 2.3, *OSWDF Operations* (Initial Operations Phase) Section 3.2, *Waste Load-out and Transfer* (Full-scale Operations Phase) Section 3.3, *OSWDF Operations* (Full-scale Operations Phase) Section 5.2, *Access Roads*

Media/Location/Action	Requirements[a]	Prerequisite	Citation	Compliance Approach
Air emissions from a stationary source				
Activities causing release of air pollutants	Shall not cause the emission or escape into the open air from any source or sources whatsoever, of smoke, ashes, dust, dirt, grime, acids, fumes, gases, vapors, odors, or any other substances or combinations of substances, in such manner or in such amounts as to endanger the health, safety, or welfare of the public, or cause unreasonable injury or damage to property	Activities causing the release of air pollution nuisances as defined in *OAC* 3745-15-07(A)—applicable	*OAC* 3745-15-07	Section 2.6.2, *Operational Limits for Air Emissions Control During Waste Placement* Section 2.6.3, *Operational Limits for Air Emissions Control During Waste Transport* Section 3.9.2, *Operational Limits for Air Emissions*

ACM = asbestos-containing material
ALARA = as low as reasonably achievable
ARAR = applicable or relevant and appropriate requirement
CAMU = corrective action management unit
CFR = *Code of Federal Regulations*
CMBST = combustion
DEACT = deactivation
DFF&O = *The April 13, 2010 Director's Final Findings and Orders for Removal Action and Remedial Investigation and Feasibility Study and Remedial Design and Remedial Action, including the July 16, 2012 Modification thereto*
DOE = U.S. Department of Energy
DOE M = DOE Manual
DOT = U.S. Department of Transportation
EPA = U.S. Environmental Protection Agency
HMR = Hazardous Materials Regulations
ID = identification number
IMPP = Impacted Material Placement Plan
IMTA = Impacted Material Transfer Area
LDR = land disposal restriction
LISWSP = Leachate and Impacted Surface Water Systems Plan
LLW = low-level (radioactive) waste
NCP = National Oil and Hazardous Substances Pollution Contingency Plan
O&M = operation and maintenance
OAC = *Ohio Administrative Code*
Ohio EPA = Ohio Environmental Protection Agency
ORC = *Ohio Revised Code*
OSWDF = On-site Waste Disposal Facility
PCB = polychlorinated biphenyl
POLYM = polymerization
PORTS = Portsmouth Gaseous Diffusion Plant
PSVP = Performance Standards Verification Plan
RACM = regulated asbestos-containing material
RCRA = Resource Conservation and Recovery Act of 1976, as amended
ROD = Record of Decision
RORGS = recovery of organics
SWMESC = Surface Water Management, Erosion, and Sediment Control
TBC = to-be-considered (guidance)
TED = total effective dose
TSCA = Toxic Substances Control Act of 1976
UST = underground storage tank
WAC = waste acceptance criteria

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APPENDIX B: IMPACTED MATERIAL PLACEMENT PLAN

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ON-SITE WASTE DISPOSAL FACILITY (OSWDF) IMPACTED MATERIAL PLACEMENT PLAN (IMPP)

FINAL DESIGN

Portsmouth Gaseous Diffusion Plant,
Decontamination & Decommissioning Project
Piketon, Ohio

U.S. Department of Energy
DOE/PPPO/03-0344&D4

April 2023

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ON-SITE WASTE DISPOSAL FACILITY (OSWDF) IMPACTED MATERIAL PLACEMENT PLAN (IMPP)

PRE-FINAL DESIGN

Portsmouth Gaseous Diffusion Plant,
Decontamination & Decommissioning Project
Piketon, Ohio

U.S. Department of Energy
DOE/PPPO/03-0344&D4

April 2023

Prepared for
U.S. Department of Energy

Prepared by
Geosyntec Consultants
0001346

Under Contract to
Fluor-BWXT Portsmouth LLC, Under Contract DE-AC30-10CC40017
FBP-ER-OSDC-WD-ENG-0015, Revision N

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CONTENTS

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FIGURES

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ACRONYMS

A-E	Architect-Engineer
ACM	asbestos-containing material
ALARA	as low as reasonably achievable
ARAR	applicable or relevant and appropriate requirement
ASTM	American Society of Testing and Materials
CQA	Construction Quality Assurance
CQC	Construction Quality Control
D&D	decontamination and decommissioning
DCP	Design Criteria Package
DOE	U.S. Department of Energy
ECR	engineering change request
IMPP	Impacted Material Placement Plan
IMTA	Impacted Material Transfer Area
LCS	Leachate Collection System
LLW	low-level (radioactive) waste
O&M	operation and maintenance
OSWDF	On-site Waste Disposal Facility
PCB	polychlorinated biphenyl
PGE	process gas equipment
PORTS	Portsmouth Gaseous Diffusion Plant
PPE	personal protective equipment
QA	quality assurance
RD/RA	Remedial Design/Remedial Action
ROD	Record of Decision
SWMESC	Surface Water Management and Erosion and Sediment Control
TBC	to-be-considered (guidance)
TSCA	Toxic Substances Control Act of 1976
WAC	waste acceptance criteria
WAO	Waste Acceptance Organization

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1. INTRODUCTION

1.1 OVERVIEW

This Impacted Material Placement Plan (IMPP) presents the plan to be used for impacted material acceptance, placement, and compaction during the filling of the On-site Waste Disposal Facility (OSWDF) at the U.S. Department of Energy's (DOE's) Portsmouth Gaseous Diffusion Plant (PORTS) Decontamination and Decommissioning (D&D) Project in Piketon, Ohio. Impacted material is defined as PORTS-generated demolition debris, contaminated soils, contaminated equipment, personal protective equipment (PPE), and waste by-products (e.g., sludge, carbon, resin) to be disposed of in the OSWDF. The OSWDF Design Package, which includes this document, has been prepared in accordance with the waste disposition applicable or relevant and appropriate requirements (ARARs) as presented in *Record of Decision for the Site-wide Waste Disposition Evaluation Project at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (Waste Disposition Record of Decision [ROD]) (DOE 2015).

1.2 PROJECT DESCRIPTION

The *Comprehensive On-Site Waste Disposal Facility Remedial Design/Remedial Action Work Plan for the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (Comprehensive OSWDF Remedial Design/Remedial Action [RD/RA] Work Plan) (DOE 2018a) presents the strategy for completing remedial design and remedial action tasks for the on-site disposal remedy. The work plan identifies the design deliverables or compliance approaches needed to satisfy the ARARs associated with the on-site disposal component of the selected remedy and outlines the overall strategy for performing the design, construction, waste placement operations, closure, long-term operation and maintenance (O&M), and monitoring of on-site waste disposal at the OSWDF. This IMPP is a component of the OSWDF Design Package identified in the Comprehensive OSWDF RD/RA Work Plan.

The OSWDF is constructed for impacted material disposition of low-level (radioactive) waste (LLW), hazardous waste, Toxic Substances Control Act of 1976 (TSCA) waste, mixed waste (combinations of LLW, hazardous waste, and/or TSCA waste), and solid waste that will be generated as a result of the PORTS D&D Project. Examples of impacted materials identified for disposal in the OSWDF and considered during development of this IMPP include the following:

Debris Component:

- Concrete including concrete pads, floors, pillars, basements, and concrete building construction materials

- Structural steel, scrap metal, and other demolition and building waste including building materials (waste demolition material from razing buildings including rubber, concrete that could not be separated from the rubble, metallic items other than process equipment, siding, gypsum, roofing material, flooring, and brick), asbestos (such as insulation that contains asbestos fibers, transite siding, building pipe, floor tile, and cable insulation), and size-reduced, empty DUF_6 cylinders

- Process gas equipment (PGE) consisting of large PGE (i.e., compressors), segmented converters (this does not include converters, compressors, and coolers from the X-326 Process Building), and other equipment and associated appurtenances directly used for uranium enrichment such as motors, valves, and process piping

- Landfill debris including materials excavated from on-site landfills for disposal in the OSWDF
- Secondary waste generated by D&D and excavation activities.

Soil Component:

- D&D residual soil (soil that adheres to the concrete foundations or otherwise must be excavated as part of D&D activities)
- Corrective action soil (from deferred units)
- Landfill soil
- X-114A soil
- Contaminated subsurface soil from groundwater contamination plumes.

These impacted materials are classified as Types 1, 2, 3, 4, and 5 and are defined in Section 4 of this IMPP.

The construction, operation, and closure of the OSWDF are currently scheduled to occur simultaneously. However, this schedule is subject to change based on a number of constraints. Therefore, the OSWDF has been designed to be constructed, operated, and closed in phases.

1.3 PURPOSE AND SCOPE OF IMPP

This IMPP establishes the operational requirements for receiving, placing, and compacting impacted material in the OSWDF in a manner that protects the underlying liner system and also maintains the overall stability of the OSWDF with negligible impact to the performance of the final cover (cap) system. The scope of the IMPP includes:

- Presenting physical waste acceptance criteria (WAC) applicable to the OSWDF impacted materials
- Classifying impacted material types based on handling, placement, and compaction requirements
- Developing acceptable proportions of the various impacted material types to be placed within any area of the OSWDF to achieve satisfactory OSWDF performance
- Developing requirements for placing and compacting impacted materials in the OSWDF
- Implementing quality assurance (QA) and quality control requirements for impacted material placement in accordance with the Construction Quality Assurance (CQA) Project Plan.

1.4 TERMINOLOGY

This IMPP uses several key phrases, which are critical to the development of a complete understanding of the plan. The terms and their usage within this plan are briefly explained as follows:

- lift – A common earthwork term used to describe the different material layers placed in the cell

- grid – A 100-ft by 100-ft grid system for each cell that provides the control for management of impacted material placement

- berm – A small embankment or dike constructed around or within a cell to isolate placement of impacted material

- grid column – The interval between the top of the protective layer and bottom of the contouring layer within a 100-ft by 100-ft grid

- horizon – A horizontal stratum limited horizontally to a 100-ft by 100-ft grid element, and limited vertically by either the maximum thickness of the item(s) therein or by the total thickness of the maximum number of lifts therein

- clean soils – Clean soil materials from OSWDF excavation, trenching, general site excavations, on-site stockpiles, or on-site borrow areas

1.5 PLAN RESPONSIBILITIES

This IMPP describes the work to be performed by separate entities with responsibilities as described below:

OSWDF Operations Manager – Responsibilities include providing overall coordination between all parties regarding impacted material placement within the OSWDF; directing the operational management team, including delegation of responsibilities; technical contractual management responsibility; coordinating with the Waste Acceptance Organization (WAO); providing coordination with security for the OSWDF operations; implementing operational safety; coordinating with emergency health and safety and radiological response teams; and coordination of the Construction Quality Control (CQC) Contractor activities. The OSWDF Operations Manager has similar responsibilities for the Impacted Material Transfer Area (IMTA) to include management of and accountability for impacted materials stored in the IMTA for final disposal in the OSWDF.

OSWDF Field Engineering Manager – The OSWDF Field Engineering Manager is the authorized representative for the OSWDF Project for field engineering services. The Field Engineering Manager has overall responsibility for evaluating field conditions requiring engineering guidance and developing Engineering Change Requests (ECRs) as required.

OSWDF Design Engineering Manager – The OSWDF Design Engineering Manager is the authorized representative for the OSWDF Project for engineering design services. The Design Engineering Manager provides day-to-day engineering support to the entire OSWDF Project including oversight of the Engineer of Record, development of design packages for regulatory review and certified for construction documents, reviewing ECRs, support plan development, management of Title III engineering services, and responding to client and stakeholder concerns.

Engineer of Record – The Engineer of Record reports to the Design Engineering Manager and has overall authority for design, including preparation of certified for construction drawings, and overall authority for clarification and interpretation of construction drawings and technical specifications. The Engineer of Record is also referred to as the Architect-Engineer (A-E).

OSWDF Operations Personnel – OSWDF Operations Personnel are the personnel responsible for placing impacted material. Responsibilities include compliance with this IMPP; receiving and unloading impacted material delivered to the OSWDF cell or to the IMTA; loading and hauling impacted material from the IMTA to the OSWDF; placing impacted material in the OSWDF; establishing a grid system (not more than 100 ft on a side) to track and manage impacted material placement; achieving final grade lines as shown on the Construction Drawings; compacting (or compacting around and over) impacted material in the OSWDF; verifying impacted material to be placed as protective and select impacted material layers; controlling the generation of fugitive dust; and managing potentially impacted surface water runoff.

Transportation Manager – The Transportation Manager is the designated contractor official responsible to DOE for the safe and compliant implementation of DOE Order 460.1D, *Hazardous Materials Packing and Transportation Safety* and the approved PORTS-specific transportation requirements, including establishing and approving transportation requirements specific to discrete projects such as OSWDF within the federal reservation. The Transportation Manager is also responsible for establishing and approving any waste-stream-specific transportation requirements, to the extent they align with DOE approved requirements, and overseeing their compliant implementation.

WAO – Responsibilities of the WAO per the WAC Implementation Plan include providing independent verification of WAC compliance prior to transfer of waste to the OSWDF or IMTA; observing waste transport to OSWDF; visually inspecting field operations and waste for prohibited items; verifying waste placement within the designated cell at the OSWDF; monitoring, tracking, and trending anomalous conditions; and verifying documentation is compliant with the WAC Implementation Plan.

Project QA Manager – The QA Manager is the authorized representative of the OSWDF Project with overall responsibility for QA activities during filling of the OSWDF.

CQC Contractor – Responsibilities include checking the impacted material type as material is placed in the designated OSWDF cell grid; spot-checking impacted material shipments for conformance with the OSWDF WAC as verified by the WAO; verifying the choice of location for impacted material placement; documenting that placement and compaction methods required by this IMPP were followed; and conducting performance tests on material placed in the OSWDF.

Surveyor – The surveyor is the entity responsible for surveying and documenting or verifying locations (coordinates and elevations) related to impacted material placement.

1.6 RELATED PLANS

Several support plans, drawings, or related requirements prepared as part of the OSWDF Design Package should be used in conjunction with this IMPP. The support plans containing information relevant to this plan are described below. Design drawings show the phasing plan for OSWDF liner system construction, filling, and construction of the final cover (cap) system. See Figure 1-1 for typical liner system and cover (cap) system detail.

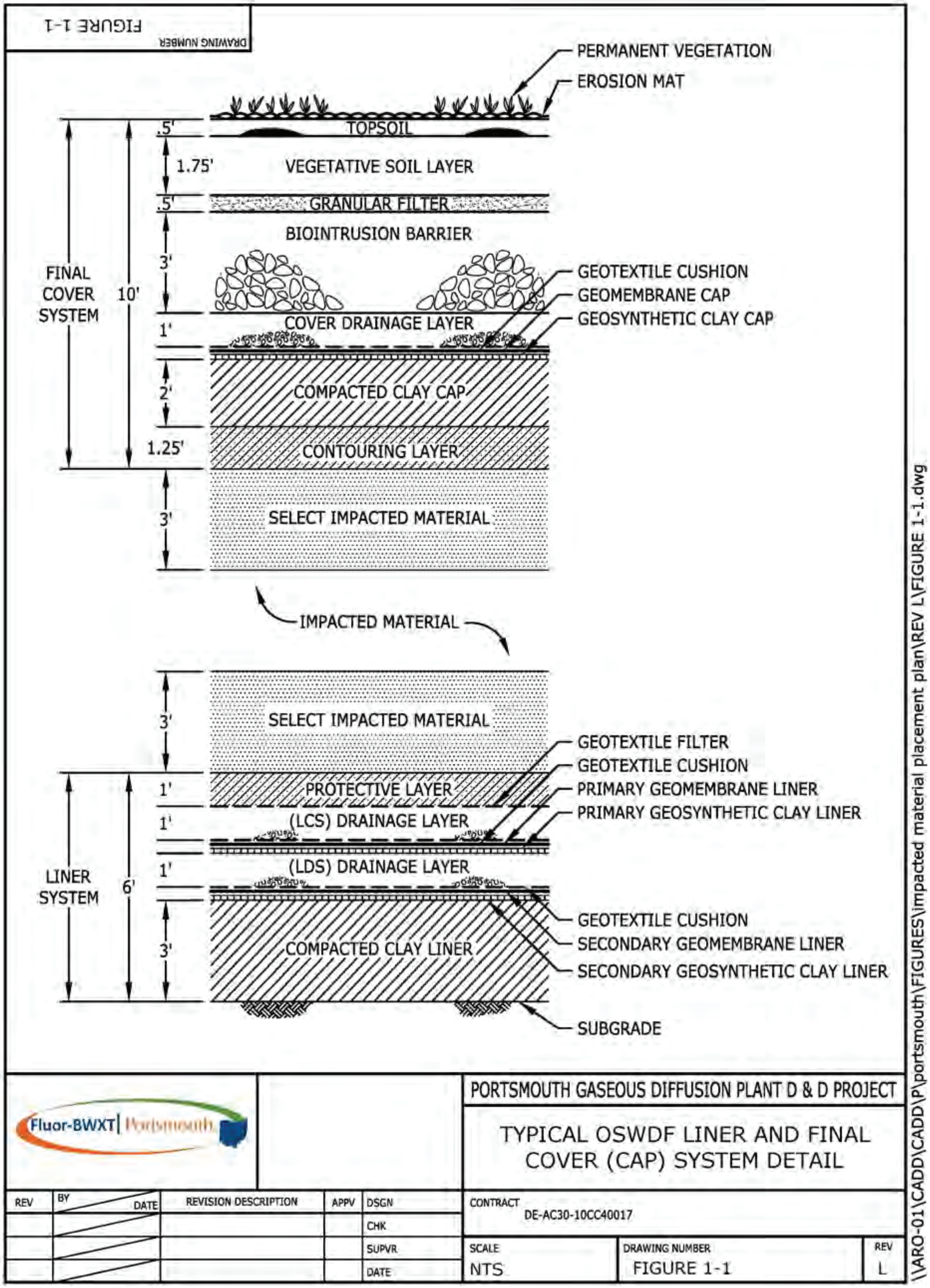

Figure 1-1. Liner and Final Cover (Cap) Systems Detail for OSWDF

OSWDF Construction Quality Assurance Project Plan – Describes the quality control monitoring, testing, documentation, and verification or compliance requirements during construction, impacted material placement, and closure of the OSWDF and associated remedy components. Organization and responsibilities of the CQC Contractor along with CQC personnel qualifications, nonconformance and issue reporting, documents and records, and inspections and testing are contained in the CQA Project Plan.

OSWDF Surface Water Management and Erosion and Sediment Control (SWMESC) Plan – Describes the surface water management and erosion and sediment control practices to be implemented during construction of the OSWDF, infrastructure support area, and support facilities, including liner construction, infrastructure construction, and final cover construction.

OSWDF Leachate and Impacted Surface Water Systems Plan (OSWDF O&M Plan Appendix C) – Guides the inspection, monitoring, maintenance, and operation of the leachate and impacted surface water management systems associated with construction, operation, and closure of the OSWDF, IMTA, and IMTA support systems.

Waste Acceptance Criteria Implementation Plan – Establishes the processes used to determine that waste intended for disposal in the OSWDF meets the approved WAC. Defines the roles and responsibilities of waste generators, the WAO, and OSWDF Organization, and specifies the documentation requirements. Also establishes the following components of the OSWDF: WAC Component 3, Waste Characterization and Evaluation Standards, and WAC Component 6, Waste Safe Handling Standards.

Other pertinent documents – The OSWDF security plan describes security requirements for construction of the OSWDF prior to the start of Operations. A full, comprehensive security plan will be developed and approved by DOE prior to the start of OSWDF Operations.

1.7 ORGANIZATION OF THE IMPP

The remainder of the IMPP is organized as follows:

Section 2 – Pertinent Requirements
This section describes the criteria used in establishing the requirements of this IMPP.

Section 3 – OSWDF Features
This section presents the design features of the OSWDF applicable to this IMPP.

Section 4 – Impacted Material Descriptions
This section provides descriptions of impacted material types to be placed in the OSWDF.

Section 5 – General Placement Requirements
This section presents general requirements for handling, placement, and compaction of impacted material in the OSWDF.

Section 6 – Type 1 Impacted Material Placement
This section presents specific requirements for handling, placement, and compaction of soil and soil-like materials (Type 1 materials) in the OSWDF.

Section 7 – Type 2 Impacted Material Placement
This section presents specific requirements for handling and placement of impacted debris (Type 2 impacted materials) in the OSWDF.

Section 8 – Type 3 Impacted Material Placement
This section presents specific requirements for placement of large impacted materials that must be handled individually (e.g., bundled transite, coolers, block valves, construction equipment parts [Type 3 impacted materials]) in the OSWDF.

Section 9 – Type 4 Impacted Material Placement
This section presents specific requirements for handling, placement, and compaction of impacted materials that are subject to decomposition (Type 4 impacted materials) in the OSWDF.

Section 10 – Type 5 Impacted Material Placement
This section presents specific requirements for handling and placement of special impacted materials that require special handling (Type 5 impacted materials) such as asbestos-containing material (ACM), double-bagged asbestos and asbestos-covered piping, broken transite panels, and large PGE (compressors) in the OSWDF.

Section 11 – References
This section provides a list of references cited in this IMPP.

Appendix A – ARARs and to-be-considered (guidance) criteria
Appendix A presents a summary of ARARs and to-be-considered (guidance) (TBC) criteria that are relevant to the development of this IMPP and identifies the section in this plan that explains or references the compliance approach needed to satisfy the ARARs.

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2. PERTINENT REQUIREMENTS

2.1 OVERVIEW

The OSWDF refers to all of the cells where waste will be dispositioned; individual cells are referred to as an OSWDF cell. The OSWDF Project Area refers to the OSWDF, IMTA, and supporting infrastructure (see Figure 2-1 for the OSWDF Site Layout Plan). The OSWDF is designed to meet regulatory, functional, and other requirements as well as general design criteria in accordance with the OSWDF Design Criteria Package (DCP). Impacted material placement activities for the OSWDF will (i) be protective of the OSWDF liner system, leachate management system, and final cover system; (ii) result in an OSWDF waste mass that is stable and does not undergo unacceptable levels of differential settlement; (iii) result in the disposal of impacted material in a manner that prevents unacceptable worker exposure to health and safety hazards; and (iv) achieve the long-term performance goals of the OSWDF.

2.2 ARARS AND TBCS

As stated in Section 1.1, the OSWDF design package has been prepared in accordance with ARARs presented in the Waste Disposition ROD. ARARs and TBCs that are relevant to this IMPP are summarized in Appendix A. Appendix A also provides a crosswalk to the section of this IMPP that addresses the ARAR.

2.3 GENERAL DESIGN CONSIDERATIONS

A number of general design criteria have also been identified for the OSWDF. The general design criteria applicable to this IMPP are:

- Manage and temporarily store impacted material within the OSWDF cells/IMTA, as necessary to facilitate placement and compaction in the OSWDF.

- Develop requirements that minimize the need for on-site workers to use respirators.

- Implement material transfer methods that cause minimal disturbance to the site and work area and are coordinated with D&D and other approved cleanup and placement activities.

- Develop requirements for the placement of the first layer of waste, which shall comply with the requirements of *OAC* 3745-27-19(D)(1)(a) through (e).

- Control the release of fugitive emissions (including dust, radiological, chemical, and asbestos material) to acceptable levels. The following are acceptable methods for controlling fugitive dust emissions during transfer and placement operations:

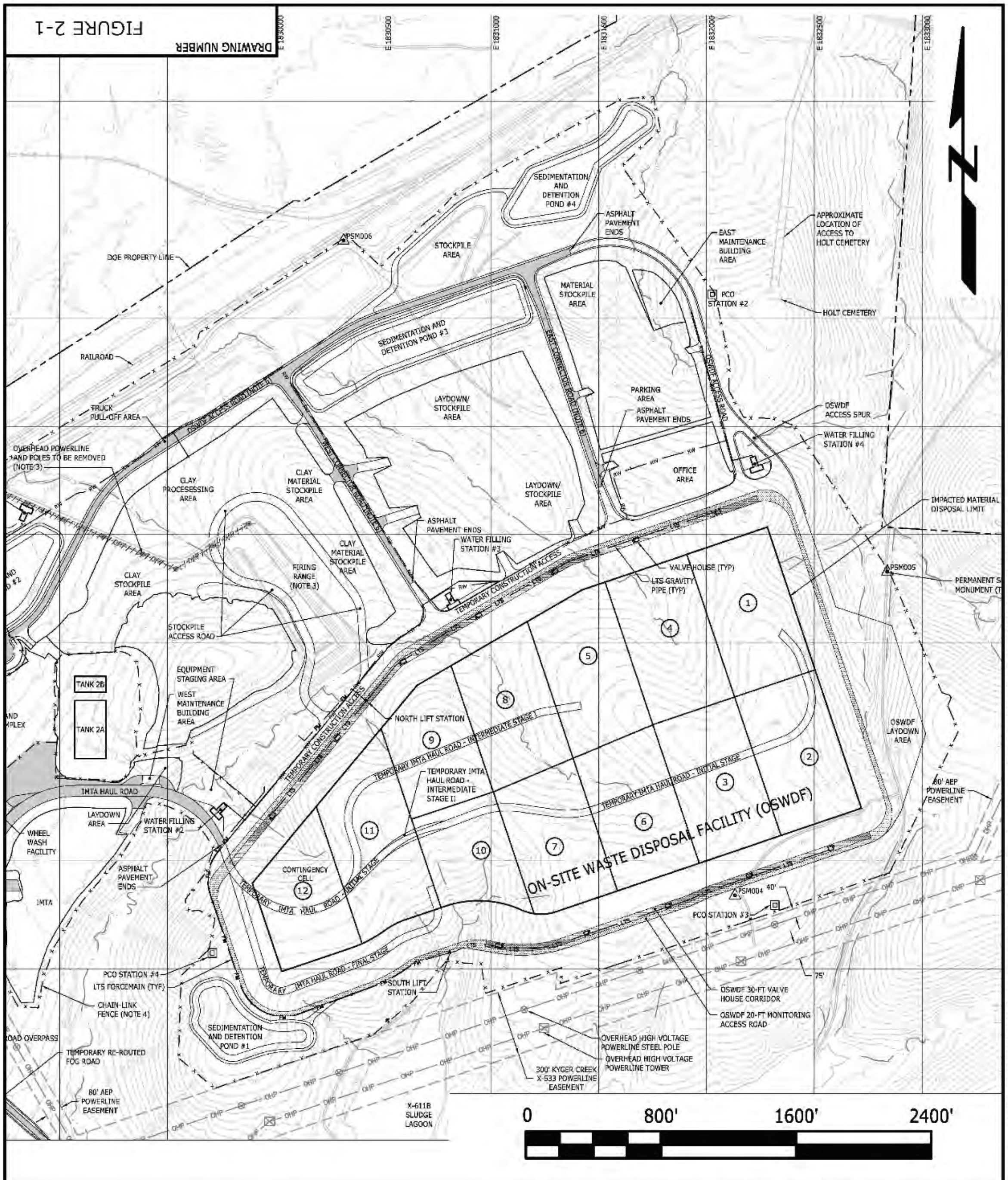
    - Assure that impacted materials are sufficiently misted with water during loading to reduce the possibility of fugitive dust emissions during transit.

    - If trucks are loaded and the impacted material is dry to a point that it may cause fugitive dust emissions, then misting of impacted material in the trucks with water is acceptable.

    - Use closed containers or cover materials with lids or tarps.

    - Spray impacted materials, especially friable ACM, with water during placement and compaction.

    - Apply surfactant to impacted material prior to transferring.



Fluor-BWXT Portsmouth		PORTSMOUTH GASEOUS DIFFUSION PLANT D & D PROJECT		
		OSWDF SITE LAYOUT PLAN		
REV	BY / DATE	REVISION DESCRIPTION	APPV	DSGN
				CHK
				SUPVR
				DATE

CONTRACT DE-AC30-10CC40017		
SCALE AS SHOWN	DRAWING NUMBER FIGURE 2-1	REV L

Figure 2-1. OSWDF Site Layout Plan

- Impacted material placement requirements are to take into account:
  - The rate and time at which impacted material will be available for placement in the OSWDF
  - The types of impacted material (e.g., D&D debris, landfill debris, PGE, concrete debris, landfill soils, or D&D residual soils) available for disposal
  - The availability of soil or soil-like material (engineered fill) for use in placing, filling voids, and compacting impacted material to minimize the potential for differential settlements within the OSWDF
  - The potential for bulking or shrinkage of impacted material during placement
  - The availability of temporary stored materials
  - The extent to which the disposal cell is available to receive impacted material.
- Impacted material placement activities are to be organized to achieve the following design goals and objectives specified in the OSWDF DCP:
  - Impacted material is to be placed in the OSWDF in such a manner that the OSWDF will meet the DOE Order 435.1-1 performance standards for protection of the public and environment for a minimum of 1,000 years.
  - Impacted material is to be placed in a manner that is protective of the liner system and final cover system.
  - Impacted material is to be placed to minimize differential settlement to the extent reasonably achievable.
  - Impacted material is to be placed so that it will remain stable under both static and earthquake loading conditions.
  - A minimum 3-ft thickness of select impacted material is to be placed directly over the protective layer component of the liner system, and below the contouring layer component of the final cover system, to protect these systems from damage by impacted materials. The thickness of the select impacted material over the protective layer may be decreased to 2 ft if the first lift of material to be placed over the select impacted material consists of Type 1 material.
  - Large material is to be placed in a manner that does not cause adverse impacts on the liner system due to concentrated loads, or an adverse impact on the geotechnical slope stability of the OSWDF.
  - To limit air emissions, generation of wastewaters, and erosion of impacted material, the sequence of placement is to be designed to minimize the area of exposed impacted material.
  - At the end of each work day, as reasonably achievable, the impacted material surface is to be graded and prepared to control precipitation runoff and impacted material erosion.

- Placement of impacted material in the OSWDF shall be performed such that the cell can store runoff from active and open portions of the cell resulting from the 25-year, 24-hour storm event (40 *Code of Federal Regulations* 264.301(h) and *Ohio Administrative Code* 3745-57-03(H)).

3. OSWDF FEATURES

3.1 GENERAL

The primary elements of the OSWDF related to the placement of impacted material are the liner and final cover systems and certain support elements. These features are briefly described in this section. OSWDF Operations Personnel shall be responsible for implementing the requirements of this section and for the protection and safety of the systems described in this section during impacted material placement.

3.2 IMPACTED MATERIAL PLACEMENT ZONES

Per the OSWDF DCP, control of the placement of impacted material in the OSWDF is required in order to (i) protect the OSWDF liner system, final cover system, and leachate management system from damage; (ii) maintain the impacted material in a stable configuration; (iii) limit fugitive dust using reasonable, achievable, proactive control measures; (iv) allow containment of leachate within the active OSWDF cell; and (v) limit differential settlement of the OSWDF final cover system to an acceptable level. Details of the liner system and final cover system proposed for the OSWDF are shown on Figure 1-1.

Each OSWDF cell has three zones in which impacted material may be placed. These zones and their locations relative to the OSWDF liner and final cover systems are shown on Figure 3-1. The three zones are as follows:

Protective Layer – A 1-ft-thick protective layer of soil material, according to the Technical Specifications (Section 02240, Protective and Contouring Layers), shall be placed directly over the geotextile filter overlying the 1-ft-thick leachate collection system (LCS) drainage layer on the bottom of each OSWDF cell. The soil used for the protective layer shall be either on-site soil material with a maximum particle size not exceeding 4 in. (per American Society of Testing and Materials [ASTM] C136 or D6913), or (ii) granular drainage material meeting the material requirements of the Technical Specifications (Section 02240) and placed in specified areas of each cell to facilitate vertical percolation of impacted surface water runoff or leachate into the underlying LCS.

Select Impacted Material Layer – A 3-ft-thick select soil layer shall be placed both on top of the protective layer and beneath the contouring layer of the final cover system to provide a physical barrier between debris and other large-size impacted material and the OSWDF liner and final cover systems. The select impacted material shall consist of soil or soil-like material with a maximum particle size not exceeding 6 in. (per ASTM C136 or D6913).

Impacted Material Layers – A variety of impacted material types can be placed on top of the select impacted material layer in the central portions of an OSWDF cell. The impacted material in this zone shall meet the requirements of WAC Component 1 (Prohibited Items), WAC Component 2 (Activity and Chemical Concentration Criteria), WAC Component 3 (Waste Evaluation and Characterization Standards), WAC Component 4 (Waste Physical Characteristic Standards), WAC Component 5 (Waste Packaging Standards), WAC Component 6 (Waste Safe Handling Standards) and the placement and compaction criteria established in this IMPP.

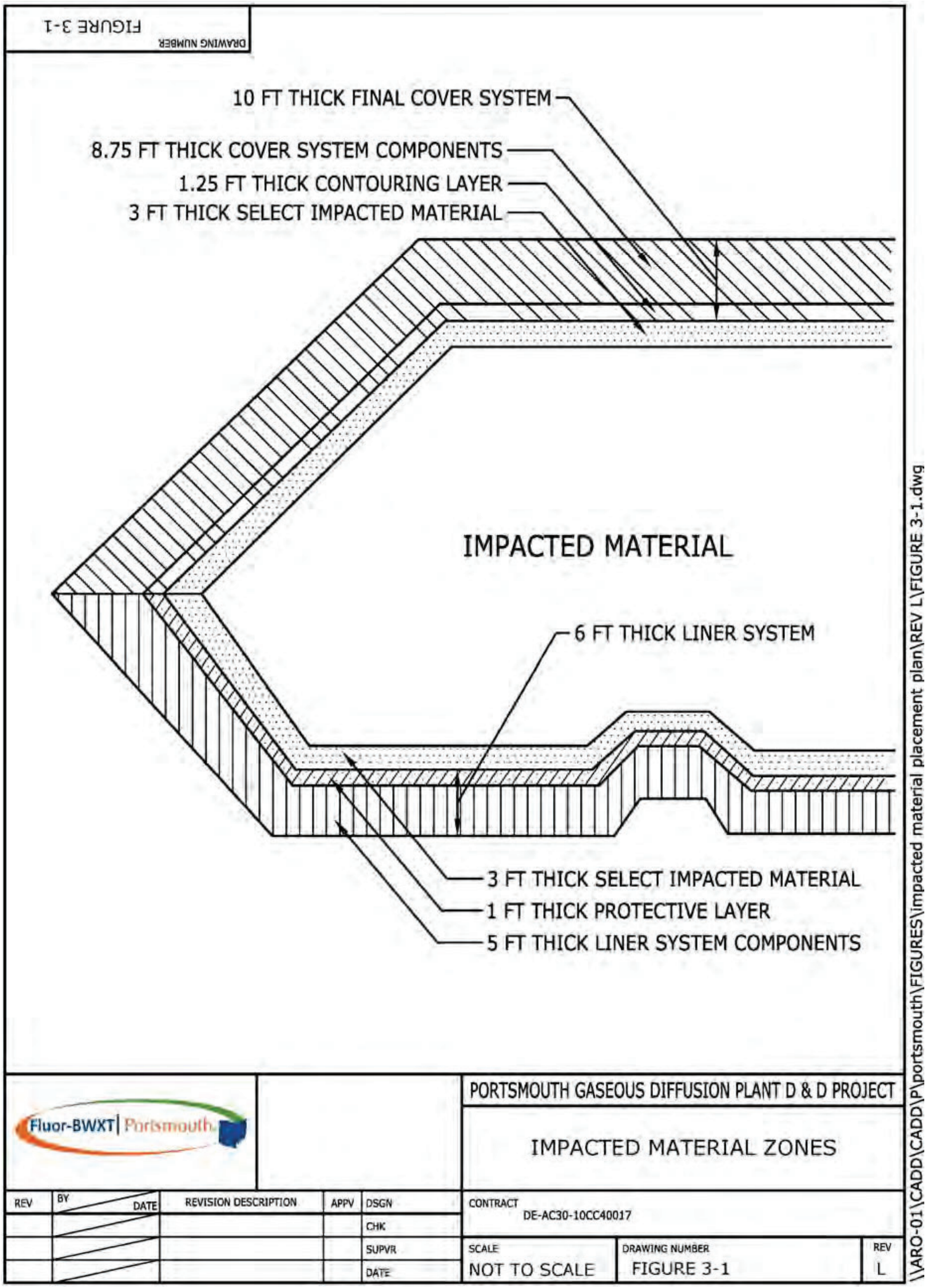


Figure 3-1. Impacted Material Zones Cross Section (North-South)

4. IMPACTED MATERIAL DESCRIPTIONS

4.1 GENERAL

The OSWDF will be the final repository for a majority of the impacted material generated from D&D of the three large gaseous diffusion process buildings, numerous smaller buildings and/or facilities, and man-made structures at PORTS. The majority of the impacted material will originate from the three large gaseous diffusion buildings (X-326, X-330, and X-333). The waste volumes from these process buildings include the structure of each facility, process and industrial equipment within each facility, and facility slabs and foundations. However, large PGE (i.e., converters, compressors, and coolers) from Building X-326 has been shipped off site for disposal and is not included in this IMPP. The impacted materials are expected to vary considerably in their composition, handling, placement, and compaction characteristics.

This IMPP establishes the requirements used to place and compact impacted material in the OSWDF in a manner that meets the objectives outlined in Section 2 of this plan. To do this, the IMPP divides waste into five impacted material types for disposal. This section of the IMPP describes each of these five types of impacted materials, as well as the physical characteristics of each type.

The *Waste Acceptance Criteria Implementation Plan for the On-site Waste Disposal Facility at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (WAC Implementation Plan) provides the processes that must be followed in order to accept waste for placement in the OSWDF. Discrete project-level documentation is created to serve as both a communication tool to individual project organizations of waste acceptance requirements and as a basis in documentation for internal and external reviewers attesting to full compliance with the requirements of the WAC and the WAC IP. This documentation process includes identification of each anticipated waste stream, identification of available process knowledge and quantitative data, and identification of the methods that will be used to meet WAC requirements (e.g., segregation and off-site disposal of prohibited items, size reduction of waste, uranium-235 activity limits), as well as any special requirements unique to the waste stream (e.g., health and safety, security).

Materials from waste generating organizations at PORTS shall be segregated by the impacted material types defined in this section prior to delivery to the IMTA or OSWDF. The impacted material type is determined for each anticipated waste stream during the waste generation project planning process. This allows the necessary processing of waste (e.g., size reduction, segregation) to be incorporated in D&D or excavation field activity plans.

Special requirements for waste handling or disposal, if any, will be addressed with the OSWDF Operations Manager during the development of waste generating project planning documentation. Examples of special requirements include, but are not limited to the following:

- Materials that may require special radiological controls to prevent release of contamination
- Polychlorinated biphenyl (PCB) concentrations affecting handling or disposal
- Wastes that are not chemically compatible with PCBs and therefore must be segregated from the PCBs throughout the handling and disposal process
- Security requirements

- Others as may be identified by the generator, WAO, or the OSWDF Operations Manager, including specific authorizations associated with the impacted material type.

4.2 TYPE 1

Type 1 materials are soils and soil-like materials that do not contain hard agglomerations greater than 12 in. in greatest dimension. An example of a soil-like material which may be placed as Type 1 material is crushed concrete, because crushed concrete would behave like gravel. Type 1 materials may also contain a mixture of soil and non-soil-like material as long as the mixture is compactable using standard construction equipment. The Type 1 impacted materials may be supplemented with clean soil and soil-like materials, obtained from OSWDF excavations, trenching, on-site stockpiles, on-site borrow area excavations for use in placing other impacted materials such as D&D debris or PGE as described below. The physical characteristic requirements of Type 1 material are as follows:

- Type 1 impacted materials shall contain no hard agglomerations greater than 12 in. in the greatest dimension. All Type 1 material must be graded so as to permit compaction with standard construction equipment and measurement using the Standard Proctor test in accordance with the IMPP.

- Type 1 material used in the Select Materials layers of the OSWDF (a special Type 1 material) shall have a maximum particle size not exceeding 6 in. (per ASTM C136 or D6913); for material other than impacted soil, at least 80 percent of the material shall be finer than a 1-in. particle size.

- Type 1 materials used in the Protective Layer of the OSWDF (a special Type 1 material) shall be either on-site soil material with a maximum particle size not exceeding 4 in. (per ASTM C136 or D6913) or granular drainage material meeting the material requirements of the Technical Specifications (Section 02240).

4.3 TYPE 2

Type 2 impacted materials are materials that can be transferred, placed, spread, and compacted en masse. These materials can be spread in loose lifts of 21 in. ±3 in. thick and are compactable using a Caterpillar 826 landfill compactor or approved similar equipment. Type 2 impacted materials include concrete, metal, debris, and other miscellaneous waste resulting from D&D activities at the PORTS site. Examples include broken-up concrete foundations, bagged PPE, impacted soil mixed with broken-up concrete, crushed or size-reduced containers, and size-reduced piping and equipment. Type 2 impacted materials also include general building rubble and debris consisting of irregularly shaped metals and other components of the superstructure or substructure with a maximum length of 10 ft and a maximum width and/or thickness of 18 in. The physical characteristic requirements of Type 2 impacted material are as follows:

- Materials including, but not limited to general building rubble consisting of drywall; heating, ventilation, and air conditioning systems; electrical and plumbing systems; size-reduced compressors from X-330 and X-333; and minor equipment, shall be sufficiently reduced in size to be gradable into a 21 in. ±3 in. lift by a Caterpillar D-8 bulldozer or equivalent.

- The maximum length and width of irregularly shaped metals or other components of a building superstructure or finish component shall be 10 ft, with a maximum thickness of 18 in. While this is not the intent of Type 2 material, it is acceptable as maximum dimensions for occasional individual pieces. These large pieces of debris would require careful manipulation during placement to be placed such that they minimize voids (i.e., lying flat on the grid subgrade). The Type 3 placement methodology is preferred for these larger items.

- Piping and cylinders with a nominal diameter larger than 12 in., except piping containing asbestos (Type 5), shall be split in half lengthwise or crushed to reduce void space and have a maximum length of 10 ft. Cylinders shall be visibly identifiable as empty and free of pressure (e.g., breached and clearly marked empty).

- Whole, shredded, or sheared scrap tires that meet one of the following conditions specified in *OAC* 3745-27-19 (E)(8)(g): (i) burned and partially burned scrap tires, pyrolytic oil, and contaminated soils provided that those materials meet the definition of solid waste in *OAC* 3745-27-01; (ii) scrap tire pieces from a scrap tire recovery facility that are the byproduct of the processing of scrap tires; (iii) authorized beneficial uses of scrap tires pursuant to *OAC* 3745-27-78; or (iv) whole scrap tires which could not be processed by a scrap tire recovery facility. In the latter instance, the owner or operator of the scrap tire recovery facility shall complete a scrap tire shipping paper and record on the shipping paper why the scrap tires are not processable at the scrap tire recovery facility. This includes but is not limited to aircraft tires and forklift tires that are not processable due to their construction or scrap tires contaminated with mud or other materials that render the tires unsuitable for processing. Whole, shredded, or sheared scrap tires that meet one of these requirements but do not meet the size and void space limits for Type 2 material shall be classified according to Type 3 or Type 5 physical standards.

4.4 TYPE 3

Type 3 impacted materials are large impacted materials that must be individually handled and placed in the OSWDF, and are suitable for having Type 1 material placed around and against them. These impacted materials are essentially incompressible using standard compaction equipment. Type 3 materials may include equipment or material such as block valves, bundles of transite panels, construction equipment parts, and broken concrete foundation members that can be placed no more than 4 ft high. Type 3 materials exclude equipment or material requiring specialized placement; such equipment or material will be classified as Type 5 impacted material, as indicated below. The physical requirements of Type 3 impacted material are as follows:

- Items must be suitable for having Type 1 material placed around and against them. The specific configuration of an item may make this difficult; in such cases, fill used around and against these items may be augmented with flowable, cohesionless materials, grout, or similar materials as approved by Nuclear Safety to assure no excessive voids will exist. While these items are acceptable to be placed as Type 3 impacted material, they should not be sent to the OSWDF without authorization from the OSWDF Operations Manager.

- The maximum cross-sectional dimension of an individual concrete member or other component of a building slab or substructure shall be 4 ft when the item is handled individually and is a regular rectangular shape having no concrete protrusions greater than 18 in.

- Transite panels should be bundled with like sizes. For instance, one bundle would contain transite panels that are 4 ft wide by 4 ft long and stacked up to 4 ft high, while another bundle might consist of transite panels that are 4 ft wide by 12 ft long stacked up to 4 ft high.

- In accordance with *OAC* 3745-54-14, containerized waste shall have no more than 10 percent internal voids (i.e., at least 90 percent full) or shall be very small containers (e.g., ampules).

- Intact (i.e., not split) tanks and cylinders with a maximum cross-sectional dimension of 4 ft may be placed as Type 3 if the internal void space is reduced in accordance with Section 8.2.1.

- PCB containers and PCB articles that must be placed in a manner that prevents damage to either the container or the article shall be clearly identified.

- Containers holding free liquids cannot be placed in the OSWDF unless freestanding liquid has been removed, mixed with sorbent, solidified, or otherwise eliminated, or the container otherwise complies with *OAC* 3745-57-14. Sorbents used to treat free liquids must be nonbiodegradable.

4.5 TYPE 4

Type 4 impacted materials are those that are subject to decomposition. Examples are vegetative waste from clearing and grubbing operations that has been determined to be contaminated as well as large quantities of wooden debris such as bulk paper products, pallets, utility poles, tree root structures, sewage plant waste, and railroad ties. Vegetative waste that is not contaminated shall not be placed in the OSWDF to the extent practicable. The total quantity of Type 4 impacted material acceptable for placement in the OSWDF shall be limited to 5,744 cy, and 479 cy per cell under a 12-cell configuration. The physical requirement of Type 4 impacted material is as follows:

- Materials shall be sized such that they can be placed within a 1-ft-thick lift with minimal voids.

Diligence should be exercised in excluding Type 4 materials from entering the OSWDF. The OSWDF design includes an 80-mil high-density polyethylene geomembrane as a component of the capping system. As Type 4 materials decay they generate gases, primarily methane, with a specific gravity less than that of air. These lighter-than-air gases have the potential to migrate upward through the waste column and create an uplift pressure on this confining geomembrane. The design of the OSWDF does not include a gas venting system, thereby minimizing penetrations through the cap and potential points of water infiltration.

The WAC Implementation Plan establishes the roles and responsibilities of involved organizations in the characterization, segregation, classification, tracking, and acceptance of waste for the OSWDF. These responsibilities include the need to conservatively identify and segregate Type 4 materials from the bulk waste materials destined for placement in the OSWDF and to exercise care in tracking the quantity of Type 4 materials purposefully released for placement in the OSWDF. Generators and the WAO are to exercise diligence during demolition, excavation, and waste loading processes to exclude Type 4 materials from entering other waste types destined for OSWDF placement.

Prior to open air facility demolition, effort shall be expended by the waste generators with WAO oversight to identify and mark any Type 4 materials remaining in a facility to enable proper segregation prior to bulk debris waste loading and transportation to the OSWDF. Similarly, during landfill and foundation excavation, care shall be exercised by the waste generators and the WAO in a best efforts approach to segregate Type 4 materials from entering the waste materials loaded for transportation to the OSWDF. Excavation efforts shall include safely setting aside suspect Type 4 materials during bulk excavation for closer examination by field personnel.

OSWDF personnel and the WAO shall exercise similar best efforts within the footprint of the OSWDF in identifying and segregating for removal (and/or quantifying the amount) of incidental Type 4 waste materials present within loads of other waste types (i.e., Types 1, 2, 3, or 5) received in the OSWDF. Examples of Type 4 materials known to be present at the site and potentially within the site landfills include bulk paper products, wood framing, railroad ties, wood pallets, utility poles, tree root structures, sewage plant wastes, and other potential methane-generating materials.

Finally, the OSWDF Project Organization and the WAO shall exercise diligence and conservatism in the tracking of any compliant Type 4 waste purposefully released for placement within the OSWDF to ensure the established, albeit conservative, limits of 479 cy per cell under a 12 cell configuration, and total of 5,744 cy for the entire OSWDF are not exceeded.

4.6 TYPE 5

Type 5 impacted materials are materials that require special handling, placement, and compaction. Examples include large PGE such as compressors, containerized waste, ACM, broken pieces of transite panels, double-bagged asbestos, and asbestos-covered piping. Each item identified as Type 5 impacted material has special requirements related to size and placement methodology as identified in Section 10 of this IMPP. This section of the IMPP will not attempt to capture all possible Type 5 materials, as the Type 5 materials category is a catch-all for items that need special handling or do not fit another impacted material type. Additional clarification of sizing and specific Type 5 impacted materials follows:

- Whole compressors are included in this type. However, this plan does not currently provide placement requirements for whole compressors (either unfilled or partially filled) as they are not expected to be placed in this manner. If, however, placement of whole compressors is expected, then the placement methodology will be developed and detailed through the ECR process. The placement requirements for whole compressors will then be incorporated into this IMPP as Type 5 Impacted Material. This change will then be submitted to Ohio EPA for concurrence as described in Section 10.

- Converters will be segmented. Each segmented converter shell shall be appropriately size-reduced to meet the WAC as Type 5, Type 3, or Type 2 waste, balancing the costs to the project, the risks to workers, and the efficiency of final waste placement.

- Asbestos-containing pipe with a nominal diameter of 18 in. or less does not need to be split lengthwise. Asbestos-containing pipes 18 in. and less in diameter are encouraged to be nested (i.e., smaller diameter pipes placed inside larger diameter pipes). (Note: nesting of uranium-bearing pipe must be approved by Nuclear Safety).

- Asbestos-containing pipe with a nominal diameter of greater than 18 in. must be split lengthwise or internal void spaces must be filled prior to placement in the OSWDF. If asbestos is removed from the pipe and the pipe can be determined to be non-ACM pipe, it can be split lengthwise and placed as Type 2 impacted material.

The impacted material types described in this section shall be used to classify each load of impacted material brought to the OSWDF for placement. The OSWDF Operations Manager shall use this classification in establishing placement limitations and instructions for each truckload of material destined for the OSWDF.

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5. GENERAL PLACEMENT REQUIREMENTS

5.1 INTRODUCTION

This section of the IMPP describes the general requirements that shall be followed for placement of impacted material in the OSWDF. Specific placement requirements for Types 1 through 5 impacted materials are presented in Sections 6 through 10 of this IMPP.

5.2 PROTECTION OF FACILITIES

Impacted material placement activities shall be conducted in a manner that protects and maintains the integrity of the OSWDF liner system, leachate management system, final cover system, and OSWDF support facilities and equipment. Impacted material placement activities shall not commence in a cell until liner system construction has been completed in accordance with the design and construction contract documents and readiness to operate has been attained.

5.3 PLACEMENT OVERSIGHT AND QUALITY ASSURANCE

Impacted material placement for all types of material shall be conducted under the direct oversight of Contractor personnel versed in all aspects of this plan whose qualifications meet the requirements of the CQA Project Plan. OSWDF Operations personnel, located on the ground, shall observe each load that is placed to monitor that the work is performed in compliance with the requirements of this plan. Monitoring of the placement and performance testing of impacted material for specified compaction in the OSWDF will be performed by the CQC Contractor in accordance with requirements of the contract documents. The CQC Contractor will also perform required testing prior to placement of additional lifts above the area being tested.

5.4 LOCATION RECORDING AND SURVEYING

The locations of placement for each lift of impacted material (i.e., Types 2, 3, 4, and 5) as placed in the OSWDF will be identified and recorded by surveying. The horizontal location shall be established within 100-ft gridlines and the vertical location by lift. The impacted material shall be surveyed in accordance with the Technical Specifications (Section 02100, Surveying). Where appropriate, sketches indicating the placement of Types 3 and 5 materials will be completed to show the general orientation and layout for individual and items requiring special handling and placement (i.e., Types 3 and 5).

The grid markers shall be maintained outside the active impacted material placement areas along the OSWDF perimeter berms of the cell grids receiving impacted material and in visible locations in other areas to facilitate impacted material placement. Markers shall be visible from the working face. These grid markers shall be placed within a 1-ft horizontal tolerance.

5.5 CONFORMANCE WITH TECHNICAL SPECIFICATIONS

Technical Specifications (Section 13010, Impacted Material Placement) shall be complied with and used in conjunction with this plan. Section 13010 provides general specifications associated with impacted material placement such as materials and equipment, quality control requirements, survey interfaces, measurement tolerances, and daily activity tracking.

5.6 STANDARD OPERATIONS REQUIREMENTS

5.6.1 General

The OSWDF Operations Manager will have the authority to halt impacted material placement operations if placement methods are not in accordance with this IMPP. Placement of impacted materials shall only occur during daylight hours unless specifically approved by the OSWDF Operations Manager or a designated representative. The last load of impacted material typically will not be accepted less than 45 minutes prior to sundown unless otherwise approved by the OSWDF Operations Manager or a designated representative.

Impacted material placement activities are expected to cease during part of the winter months when the OSWDF Operations Manager determines that efficient and compliant compaction of impacted material and/or safe working conditions are no longer achievable due to weather conditions. The OSWDF Operations Manager will consult with the CQC Officer, radiological protection, and safety personnel as needed to make this determination. The CQC Officer is the responsible authority for accepting or rejecting impacted material compaction results. The OSWDF Operations Manager may also request development of a winter placement plan to allow alternate placement approaches for specific impacted materials in order to achieve compliant compaction results in the winter.

Surface conditions of the OSWDF described in this plan are maintained throughout the year, including periods of inactivity. Type 1 material is placed and compacted prior to periods of prolonged inactivity, which satisfies the requirement for intermediate cover. The compacted Type 1 material, serving as the intermediate cover, may be removed prior to placing additional impacted layers.

In accordance with the OSWDF O&M Plan, impacted material placement shall cease during adverse weather conditions such as high winds. Waste placement activities shall not resume after inclement weather shutdown until approval is provided by the OSWDF Operations Manager based on weather forecasts. A decision to resume placement activities shall consider temperature and chance for precipitation, potential for erosion of waste or release of contaminants, the nature of waste to be placed, and conditions within the OSWDF. The OSWDF O&M Plan provides a complete description of inclement and severe weather operational requirements.

Deposition and burial operations shall be conducted in a manner which prevents handling by equipment or persons that causes asbestos-containing waste materials to be broken up or dispersed before the materials are buried. There shall be no visible emissions to the outside air from ACM during the on-site transportation, transfer, deposition, or compacting operations.

All waste placement shall be in accordance with the IMPP. Open dumping is strictly prohibited. In the event that open dumping is occurring or has occurred, the OSWDF Operations manager shall direct prompt removal and disposal of the waste and shall document the corrective action in accordance with the CQA Project Plan.

5.6.2 As-Placed Documentation

The CQC Contractor and/or the OSWDF Operations Manager shall maintain documentation showing the placement locations of all types of impacted materials. The documentation will provide locations of the impacted material placement in the cell by grid, lift, and type. The OSWDF Operations Manager will use the documentation to decide where subsequent loads of Types 2 through 5 impacted materials can be placed. Daily tracking of impacted material placement (e.g., daily truck counts for each type of impacted material and daily impacted material placement volumes for each waste type) must be provided as indicated in the Technical Specifications (Section 13010).

5.7 MATERIAL STORAGE IN THE OSWDF

Impacted material may be stored in the OSWDF prior to placement as described in this section.

Type 1 impacted material (e.g., gravel, asphalt, concrete, rock, and similar aggregate materials) may be stored in OSWDF cells to be readily available for building interior cell roads and ramps.

Cell grids used to store this material shall be identified and inspected weekly to assure the storage configuration has remained the same. Type 1 material may also be stored in the active cells to optimize and facilitate impacted material placement. Fugitive dust from stored Type 1 material shall be controlled using methods specified in Sections 2.3 and 5.10 (e.g., misting, crusting agents).

Other impacted material (Types 2, 3, 4, and 5) may be stored in the OSWDF in preparation for placement if approved by the OSWDF Operations Manager. Fixatives or other measures such as misting will be used during storage to control release of fugitive emissions (including dust, radiological, chemical, and asbestos material) to acceptable levels.

Waste requiring daily cover as described in Section 5.11 will not be stored at the OSWDF unless unforeseen conditions (e.g., sudden severe weather, emergency response in cell) require waste placement operations to cease before the waste can be covered. In this case, measures will be taken, to the extent they are safe and practical, to mitigate potential nuisance or health hazards (i.e., due to wind dispersion; insects, rodents, and vectors; litter; and fire) until waste placement operations can safely resume.

Storage areas within a cell shall be surveyed prior to beginning storage activities. No lifts of impacted material shall be placed in a storage area until a survey showing depletion of the stored material is completed. Areas that may be disturbed by storage shall require recompaction and retesting.

5.8 SPREADING AND GRADING

The objective of this IMPP is to achieve uniform consolidation of the impacted materials placed within the OSWDF and to limit the total magnitude of such settlement. Homogeneity of the physical characteristics of the impacted materials placed across lifts of the OSWDF shall be maintained to the extent achievable. Materials subject to decomposition (such as contaminated vegetative wastes and organic wastes) shall be distributed laterally within the OSWDF. Incompressible materials shall not be placed directly above other incompressible items without an intervening layer of Type 1 material. Materials of higher permeability (such as demolition debris) shall not be placed directly above other high permeability materials without an intervening layer of lower permeability, Type 1 material.

Impacted material placement shall proceed in a manner that promotes positive drainage toward the catchment area within each OSWDF cell. Vertical slope of an existing grid shall be benched prior to placement of impacted material in an adjacent grid. Maximum compacted lift thickness for soil, soil-like materials, and other impacted materials shall be 1 ft, except as provided in Sections 7 through 10 of this IMPP. Each lift of the topmost select impacted material layer shall be controlled to line and grade such that cell perimeter contours are within 0.2 ft of the design grade for the bottom of the contouring layer.

Figure 5-1 illustrates the sequencing of impacted material placement and slope development within the first OSWDF cell, looking north to south. Select impacted material layers on the cell base and side slopes shall be advanced at least 2 ft ahead of general impacted material layers. Similarly, Figures 5-2 and 5-3 illustrate the sequencing of impacted material placement and slope development in subsequent cells. Impacted material unloaded and spread in the active placement grids will be compacted using the same equipment and methods, as described in Sections 6 through 10 of this IMPP.

5.9 COMPACTION

Each lift of Type 1 impacted material placed in the OSWDF shall be compacted to the minimum criteria in Sections 6 through 10 of this IMPP. Monitoring and testing activities are described in the CQA Project Plan.

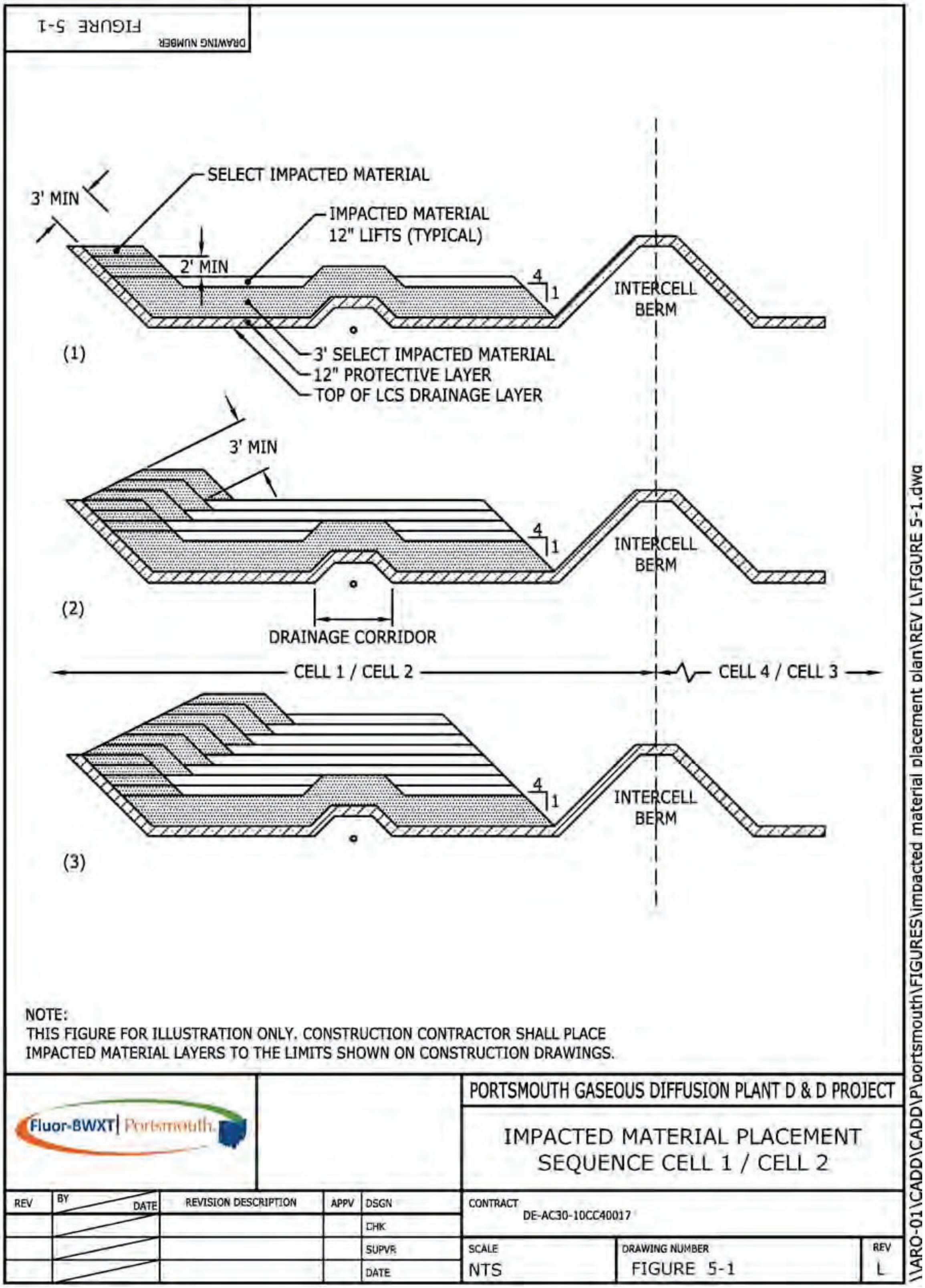

Figure 5-1. Impacted Material Placement Sequence Cell 1/Cell 2

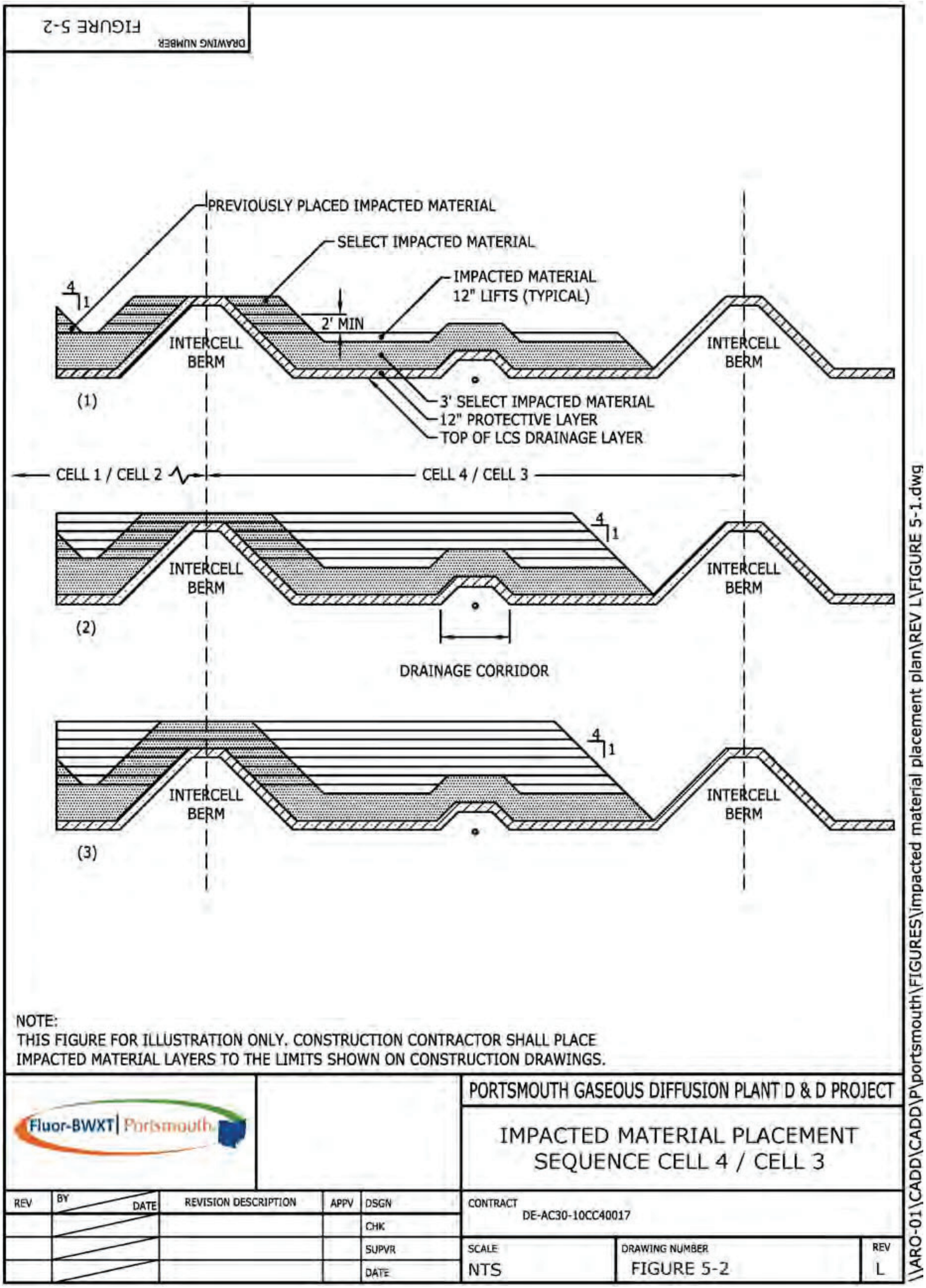

Figure 5-2. Impacted Material Placement Sequence Cell 4/Cell 3

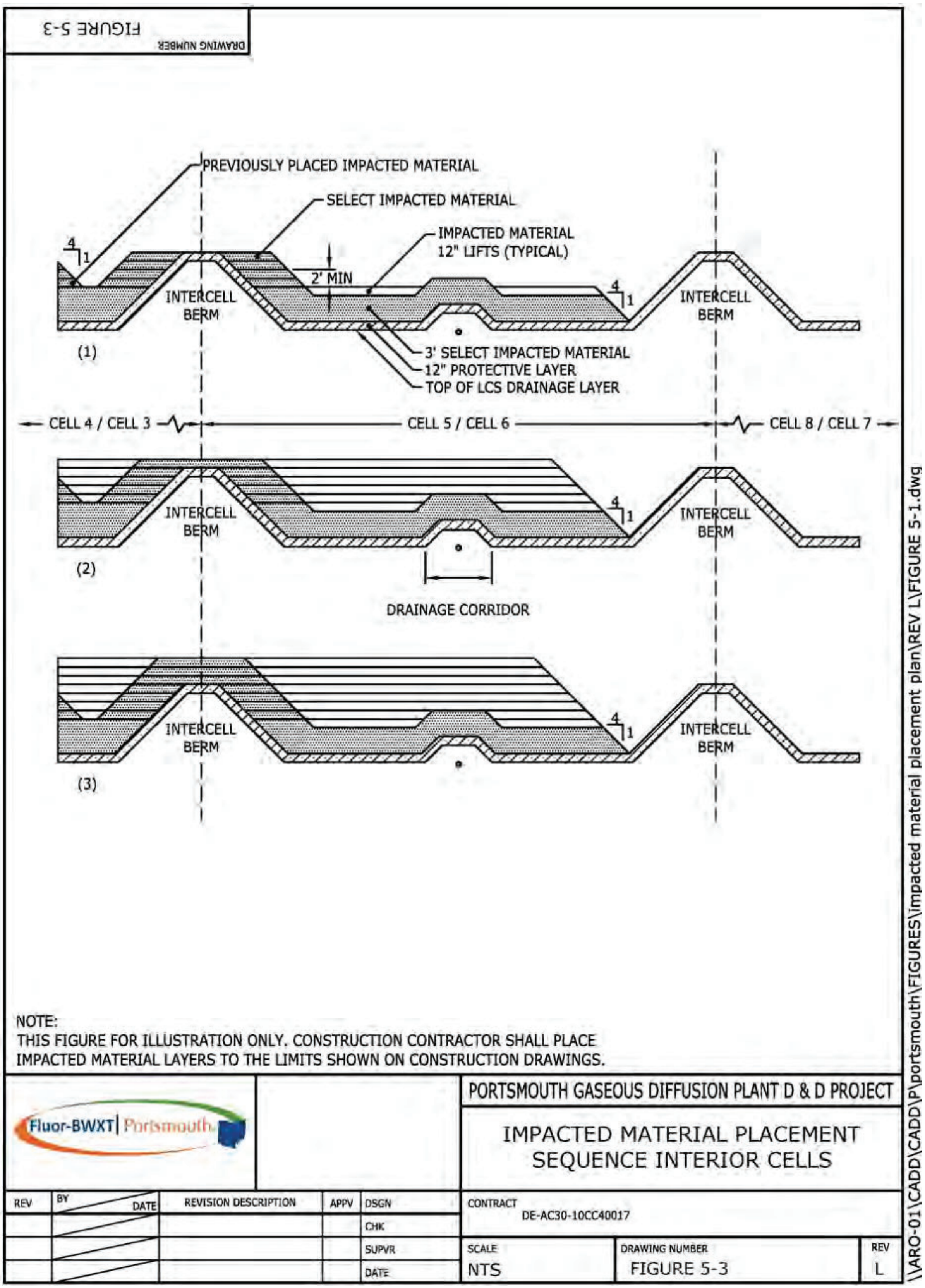

Figure 5-3. Impacted Material Placement Sequence for Interior Cells

5.10 SURFACE CONDITIONS AND RUNOFF CONTROLS

Impacted material surfaces in the OSWDF cells and IMTA shall be maintained to control fugitive dust and manage runoff, termed as leachate, as well as erosion and sediment. Surface conditions of the OSWDF shall be maintained throughout the year, including periods of inactivity.

As specified in Section 6 of this IMPP, Type 1 material used as engineered fill will be rolled with a smooth-drum roller or tracked in with heavy equipment following completion of a required lift to minimize both erosion during rainfall events and wind dispersal of particulate matter. If smooth rolling or tracking cannot be completed by the end of the work day, alternate controls such as crusting agents may be selected by the OSWDF Operations Manager to protect exposed particulate matter from wind dispersal. Additionally, some erosion control measures (e.g., temporary rolled erosion control products) can also provide dust control.

Runoff control measures, consisting of temporary or permanent drainage channels and/or culverts, shall be installed to convey runoff from the active cells and the IMTA. Check dams shall typically be installed within the channels, and outlet protection shall be installed at the culvert outlets to reduce the runoff velocity and promote settling of sediments. These runoff control measures shall convey the runoff either to the leachate catchment area established within each active cell (for runoff generated within the active cells) or to the leachate modular tank (for runoff generated within the IMTA) prior to treatment at the Interim Leachate Treatment System. Maintenance of runoff control measures is addressed in the OSWDF O&M Plan.

Excessive erosion and sedimentation from impacted material surfaces shall be reduced through the implementation of temporary erosion and sediment control measures, such as crusting agents and temporary rolled erosion control products on Type 1 soil and soil-like materials, and sediment control measures such as filter socks, and silt fence. Criteria for the design, installation, and maintenance of runoff, erosion, and sediment control measures are described in the *On-site Waste Disposal Facility (OSWDF) Surface Water Management and Erosion and Sediment Control Plan* (SWMESC Plan). The SWMESC does not explicitly cover the management of runoff considered leachate; however, similar principles for runoff, erosion, and sediment control practices are applicable in areas generating leachate and the SWMESC Plan can be used as a resource to develop these measures in the IMTA and active cells of the OSWDF.

Specific measures apply to the surface and drainage of the active cells of the OSWDF. To protect the surface of placed impacted materials from inclement weather, use a smooth-drum roller or track the material with heavy equipment to seal the surface, covers, and other means. At the end of each working day, as reasonably achievable, the uppermost layer of impacted material shall be sloped such that leachate will flow to the leachate catchment area. The impacted material faces adjacent to the leachate catchment area shall be constructed to a slope not steeper than 3.5H:1V (horizontal:vertical).

The leachate catchment area in a current cell shall be fully maintained until the adjacent cell becomes operational and runoff from the current cell is routed to the leachate catchment area of the adjacent cell through temporary drainage channels. Each leachate catchment area is designed to collect leachate from a maximum of three cells. Leachate in the leachate catchment area may be allowed to percolate through the granular protective layer into the underlying cell LCS or pumped into an adjacent cell or to the Leachate Transmission System. Maintenance of the leachate catchment area is addressed in the OSWDF O&M Plan.

5.11 DAILY COVER

Two of DOE's objectives are to minimize both the footprint of waste placement at the OSWDF and the acceptance of any noncontaminated materials into the disposal facility. To meet these objectives, DOE does not intend to utilize clean fill as cover material and limit the use of daily covers to only where necessary to eliminate the potential for unacceptable concentrations of airborne contaminants, such as asbestos. When a daily covered is applied, contaminated Type 1 soil or soil-like materials are intended to be used.

OAC 3745-27-19(F) provides that a daily cover be applied to all exposed solid waste by the end of the working day for purposes of controlling fire hazards, blowing litter, odors, insects, vectors, and rodents. *OAC* 3745-27-19 (F)(4) permits an alternate frequency of cover if approved by Ohio EPA. In general, the waste to be placed in the OSWDF will be comprised of general building demolition rubble and debris including concrete, steel, and other metals that are typically outside the definition of solid waste and generally void of waste forms commonly received at municipal sanitary landfills. Therefore, the wastes planned for bulk placement in the OSWDF, generally Type 2 and 3 wastes, have limited capacity to create fire hazards, blowing litter, odors, or to attract insects, vectors, or rodents. Contaminated Type 1 soil and soil-like material exhumed from former landfills, oil biodegradation plots, and groundwater plume areas will be placed in and around the bulk contaminated debris and rubble to fill void spaces to help ensure the long-term integrity of the capping system. As this engineered fill is placed in accordance with the requirements of this plan, it will be rolled with a smooth-drum roller or tracked in with heavy equipment following completion of a required lift to minimize both erosion during rainfall events and dust generation. The OSWDF Performance Standards Verification Plan establishes the required air monitoring network that will be implemented to evaluate the effectiveness of the controls used to minimize air emissions during OSWDF operations. Should this monitoring network detect unacceptable conditions, OSWDF operations will be adjusted to reduce air emissions as necessary.

Daily cover will be applied selectively where the specific waste being placed has the potential to create the unacceptable conditions contemplated by the referenced *OAC* citation above, or where required to minimize airborne concentrations of hazardous air contaminants. When daily cover is applied, contaminated Type 1 soil or soil-like materials will be used. Specifically, daily cover will be applied to the following:

- Bulk placement of Type 4 materials capable of creating blowing litter, fire hazards, or odors or with the potential to attract insects, vectors, or rodents. Type 4 materials are being severely limited from placement in the OSWDF so as to preclude any possible buildup of uplift pressure on the geomembrane layer in the capping system. Significant efforts will be applied by the waste generators and the WAO to limit Type 4 materials from arriving at the OSWDF for placement; therefore, the use of such daily covers to address Type 4 material placement is expected to be minimal.

- Bagged friable asbestos will be subject to daily cover requirements. Bagged friable asbestos is designated as a Type 5 material requiring special placement requirements, as described in Section 10. Nonfriable asbestos, such as asbestos-containing transite panels, will not be subject to daily cover but will be placed in a manner consistent with the requirements of this plan; with care taken to not impact the materials in a manner to generate airborne contaminants. While not addressed by this plan, encapsulating agents will typically be applied to the interior of the transite panels prior to hand removal and stacking of the transite panels in anticipation of open air building demolition.

- Other waste streams identified during the predemolition or excavation characterization and design/planning processes (including air modeling) that have the potential, during waste placement, to generate hazardous airborne pollutants at concentrations potentially unacceptable to workers or the public.

Impacted materials requiring daily cover will not be received at the OSWDF unless there is an adequate supply of cover material.

Controls such as fixative will be used to mitigate release of contamination from impacted materials that have been placed, but not covered, at the end of the working day and to control the release of fugitive emissions (including dust, radiological, chemical and asbestos material) to acceptable levels.

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6. TYPE 1 IMPACTED MATERIAL PLACEMENT

6.1 GENERAL

Type 1 soil and soil-like materials will be used to place and compact around Types 2 through 5 impacted materials. Type 1 materials are further divided into (i) protective layer soils, (ii) select impacted material, and (iii) general soil and soil-like material. The placement of this material is expected to be accomplished using similar methods for spreading, grading, and compaction associated with earthwork for OSWDF construction. This section of the IMPP addresses those activities associated with the placement and compaction of these Type 1 soils and soil-like materials within the OSWDF.

6.2 PROTECTIVE LAYER

6.2.1 Placement Requirements

As indicated in Section 3.2 of this IMPP, the protective layer shall consist of soil having a maximum particle size not exceeding 4 in. (ASTM C136 or D6913). The protective layer soil shall also meet the requirements of the Technical Specifications (Section 02240). Topsoil shall not be used for the protective layer. The protective layer shall be placed in a 12- to 15-in.-thick loose lift in accordance with the Technical Specifications (Section 02240).

6.2.2 Compaction Requirements

To protect the underlying liner system from construction-induced damage, the protective layer shall not be compacted with conventional compaction equipment; but rather shall be tracked with a bulldozer with ground pressure of 5 psi or less. The protective layer shall be constructed in conformance with the Technical Specifications (Section 02240).

6.3 SELECT IMPACTED MATERIAL LAYERS

6.3.1 Placement Requirements

As indicated in Section 3.2 of this IMPP, select impacted material shall have a maximum particle size not exceeding 6 in. (ASTM C136 or D6913); for material other than impacted soil, at least 80 percent of the material shall be finer than a 1-in. particle size. Impacted topsoil may be included in the select impacted material layer but it should not be placed in quantities that deleteriously affect compaction.

The select impacted material layer at the base of the landfill shall be placed in 12- to 15-in.-thick loose lifts and each lift compacted to a minimum total thickness of 3 ft (e.g., three lifts of roughly equal thickness). The thickness of select impacted material layer directly over the protective layer may be decreased to 2 ft upon approval by the OSWDF Operations Manager, or a designated representative, if the first lift to be placed over the select impacted material is Type 1 soil and soil-like material. The select impacted material layer below the final cover system shall be placed in a similar manner to a minimum total thickness of 3 ft, measured perpendicular to the exterior slope (see Figure 5-1).

6.3.2 Compaction Requirements

A standard Proctor compaction (ASTM D698) maximum dry density and optimum moisture content will be established for impacted material used in the select impacted material layers. These parameters will be obtained by the CQC Contractor in an on-site geotechnical laboratory established for OSWDF operations prior to placement of these materials. Each lift of select impacted material shall be compacted to 85 percent of the standard Proctor maximum dry density if adjacent to the protective layer of the liner system, and to 90 percent of the standard Proctor maximum dry density if adjacent to the contouring layer in the final cover system. It is anticipated that the compaction moisture content will be within 3 percentage points of the optimum moisture content. Specific requirements for compaction moisture content will be established by the OSWDF Operations Manager during placement.

6.4 TYPE 1 SOIL AND SOIL-LIKE MATERIAL

6.4.1 Placement Requirements

Type 1 soil and soil-like material shall be placed in 12- to 15-in.-thick loose lifts and then compacted as indicated below. Prior to placement of a new lift of Type 1 material, the previous lift shall be tracked to leave the surface in a rough condition. The purpose of this preparation is to promote bonding of the previous and new lifts and to mitigate preferential seepage pathways forming between adjacent lifts.

6.4.2 Compaction Requirements

Each lift of Type 1 soil and soil-like material shall be compacted to at least 85 percent of the maximum dry density based on the standard Proctor compaction test, with a running average of at least 90 percent based on the previous 10 tests. The CQC Contractor will establish the standard Proctor compaction (ASTM D698) maximum dry density and optimum moisture content for Type 1 material requiring compaction prior to placement of these materials. These parameters will be obtained by the CQC Contractor in an on-site geotechnical laboratory established for OSWDF operations. It is anticipated that the compaction moisture content of the Type 1 material will be within 3 percentage points of the material's optimum moisture content. The development of moisture content requirements will take into account the workability of the material, the required shear strength to obtain adequate levels of OSWDF stability, moisture contents needed to achieve dust and other fugitive dust control, and material trafficability.

If a material does not meet the Type 1 impacted material compaction requirements described above, one or a combination of the following may be implemented: (i) increase moisture content by adding water; (ii) dry the material; (iii) amend with granular material; and (iv) another method approved by the OSWDF Operations Manager.

7. TYPE 2 IMPACTED MATERIAL PLACEMENT

7.1 GENERAL DESCRIPTION

Type 2 impacted materials are materials that can be transferred, placed, spread, and compacted en masse. These materials can be spread in loose lifts of 21 in. ±3 in. thick and are compactable using a Caterpillar 826 landfill compactor or approved equipment with equal or better compactive effort. Type 2 impacted materials include concrete, metal, debris, and other miscellaneous waste resulting from D&D activities at the PORTS site. Examples of these materials include broken-up concrete foundations, bagged PPE, and impacted soil mixed with broken-up concrete. This type also includes general building rubble and debris of irregularly shaped metals and other components of the superstructure or substructure with a maximum length of 10 ft, where length is defined as the greater lateral dimension, and a maximum thickness of 18 in. Type 2 impacted materials from D&D activities shall be size-reduced prior to transferring to the OSWDF to meet the maximum dimensions specified in this IMPP.

7.2 STANDARD GRID PLACEMENT REQUIREMENTS

7.2.1 Placement Requirements

Materials conforming to the Type 2 (en masse placement) definition shall be placed in the OSWDF in loose lifts not exceeding 21 in. ±3 in. in thickness. The ±3 in. tolerance is to allow for the occasional piece of rebar, structural steel, or other material that may protrude from the material placed and material that cannot be readily removed or placed within the 21-in. limit.

Prior to placement of a lift of Type 2 impacted material, the placement grid shall be designated such that the grid can be isolated horizontally on all sides with a 2-ft-high and 5-ft-wide (top width minimum) compacted berm of Type 1 material. The Type 1 material shall be placed in 12- to 15-in.-thick loose lifts as described in Section 6.4.1 of this IMPP.

The Type 2 impacted material shall then be placed within the designated placement grid to a loose thickness of not more than 21 in. ±3 in. Initial compaction shall be accomplished as the material is spread by tracking with a bulldozer of a minimum total weight of 25 tons producing a ground pressure of at least 10 psi, or with a landfill compactor. Both pieces of equipment are acceptable and can be used based on operational needs.

After spreading and initial compaction, Type 1 material (of a granular nature when available) shall be spread over the Type 2 impacted material to bring the layer thickness to approximately 24 in. For Type 2 lifts less than 24 in., the berm height shall be at least as high as the Type 2 material lift thickness to provide containment of the material. Prior to placement of a second lift of Type 2 impacted material, Type 1 material shall be utilized to construct a placement grid as described above.

Type 2 impacted material is expected to be less compressible than the majority of the materials contained in the OSWDF. However, as it is also expected to be more permeable than other OSWDF material, Type 2 impacted material shall not be spread laterally more than 100 ft. The exceptions being, in the bottom of the cell (on top of select impacted material layer) and beneath the area of the OSWDF where the final cover slopes will be 10H:1V and 20H:1V, the option is available to spread Type 2 impacted material in an area as large as 200 ft by 200 ft square. In all cases, Type 2 impacted material is to be surrounded in the horizontal directions by at least 5 ft of less permeable compacted Type 1 material. This will reduce the potential for significant lateral migration of leachate. Type 1 berms at perimeter slopes are not needed if select impacted material is placed, or is already in place, at the same time of impacted material placement within a grid. This operational decision must be approved by the

OSWDF Operations Manager as it relates to management of leachate runoff within the cells. No more than two lifts of Type 2 impacted material shall be placed on top of another lift of Type 2 impacted material without at least the required minimum 2-ft thickness of the intervening layer of Type 1 soil and soil-like material. However, within 20 vertical ft of the bottom of the select layer to be placed beneath the final cover system, no more than one lift of Type 2 impacted material shall be placed on top of another lift of Type 2 impacted material without at least the required minimum 2-ft thickness of the intervening layer of Type 1 soil and soil-like material.

Type 1 material shall be mixed as much as practicable with the Type 2 impacted material during placement activities. The objective of this mixing is to fill voids within the Type 2 impacted material, increase the density of the material placed in the OSWDF, and aid in the homogenizing of building rubble, demolition debris, and soils.

7.2.2 Compaction Requirements

Type 1 material for the 5-ft-wide berms surrounding the Type 2 impacted material shall be compacted to at least 90 percent of the standard Proctor maximum dry density, determined as described in Section 6.4.2. Within the vertical grid columns, the intervening layer of Type 1 material shall be placed and compacted in accordance with Section 6.4 of this IMPP.

After each lift of Type 2 impacted material is placed in accordance with Section 7.2.1, the material shall be compacted by a minimum four passes of a self-propelled, static pad/blade-foot landfill compactor (e.g., Caterpillar 826 landfill compactor or approved equal).

After compacting the Type 1 material over the compacted Type 2 impacted material, the Type 1 material shall be performance tested using one of the alternatives described below. The OSWDF Operations Manager will select which performance test to use based on the characteristics of the Type 1 material.

- *Alternate 1 – Proof-rolling*
  After compacting the Type 1 material over the Type 2 impacted material, the Type 1 material shall be proof-rolled. Soft spots indicated by tire ruts more than 3 in. in depth or visible deflection under the moving proof-rolling equipment shall be stabilized through additional passes of the compactor. The proof-rolling equipment shall have a minimum gross vehicle weight of 20 tons and exert a ground pressure of at least 65 psi. The proof-rolling passes shall be overlapped such that one set of tires on each pass runs between the two sets of tire tracks from the previous pass. Any soft spot that cannot be stabilized with further compactive effort shall be repaired. The repair shall consist of removal, replacement, and recompaction of the Type 1 material and, if needed, infilling soft spots/areas in the Type 2 impacted material with other material approved by the OSWDF Operations Manager.

- *Alternate 2 – Placement and compaction of a second lift of Type 1 material*
  Place second 12- to 15-in.-thick loose lift of Type 1 material and compact in accordance with Section 6.4.2 of this IMPP. The second lift of Type 1 material placed and compacted shall pass the performance testing requirements of Section 6.4.2 and the CQA Project Plan. Any failing areas shall be reworked and retested in accordance with Section 6.4.2.

  If a material does not meet the above alternatives for Type 1 impacted material compaction requirements, one or a combination of the following may be implemented: (i) add water to increase to an acceptable moisture content; (ii) dry the material; (iii) amend with granular material; and/or (iv) other method approved by the OSWDF Operations Manager.

7.3 ALTERNATIVE TRENCHING PLACEMENT REQUIREMENTS

7.3.1 General Requirements

These alternative trenching requirements may be used for nonroutine placement of Type 2 impacted material when:

- A specific Type 2 impacted material requires lateral confinement for spreading and placement activities (e.g., structural steel, pipes)

or

- A specific Type 2 impacted material is conducive to alternate placement methods (such as large structural members that meet the Type 2 impacted material size criteria).

Before commencing Type 2 impacted material placement by the alternative trenching method, the OSWDF Operations Manager will select and approve a grid with at least 4 ft of Type 1 material that was previously placed, overlying 2-ft thick intervening layer of Type 1 material. The trench for placement of Type 2 impacted material by this method shall meet the following requirements:

- A trench shall not be excavated in previously placed Types 2 through 5 impacted material, protective layer, or select impacted material layer.

- A trench shall not be excavated within 6 ft under the select impacted material layer for the final cover system.

- Minimum thickness of Type 1 material under trench excavation shall be as thick as the intervening layer of Type 1 impacted material, as described in this IMPP.

Type 2 impacted material placement in a trench shall be in accordance with the requirements and general steps presented herein and as shown on Figure 7-1.

General steps include

- Trench Excavation
- Type 2 Impacted Material Placement
- Lift(s) of Type 1 Material.

Requirements for each step are as follows.

7.3.2 Trench Excavation

After a grid(s) is selected, a trench (or trenches) shall be excavated as shown on Figure 7-1. Each trench shall be a minimum of 3 ft deep and a maximum of 4 ft deep as long as there is a minimum of 2 ft of Type 1 material above previously placed lift, and between 15 ft and 18 ft wide. A minimum 6-ft distance shall be maintained between top of the side slopes of the adjacent trenches. One end of the trench shall be graded to a minimum 5H:1V (subject to approval by PORTS Excavation Competent Person) ramp for truck access into the trench. The maximum trench length shall be approximately 70 ft and shall be limited by the maximum length that can be excavated in one grid and still provide adequate access to enter and exit the trench. The Type 1 material excavated from the trench shall be stockpiled a minimum of 6 ft from the top of the side slopes of the trench and shall be used later for lift(s) of Type 1 material over the Type 2 impacted material.

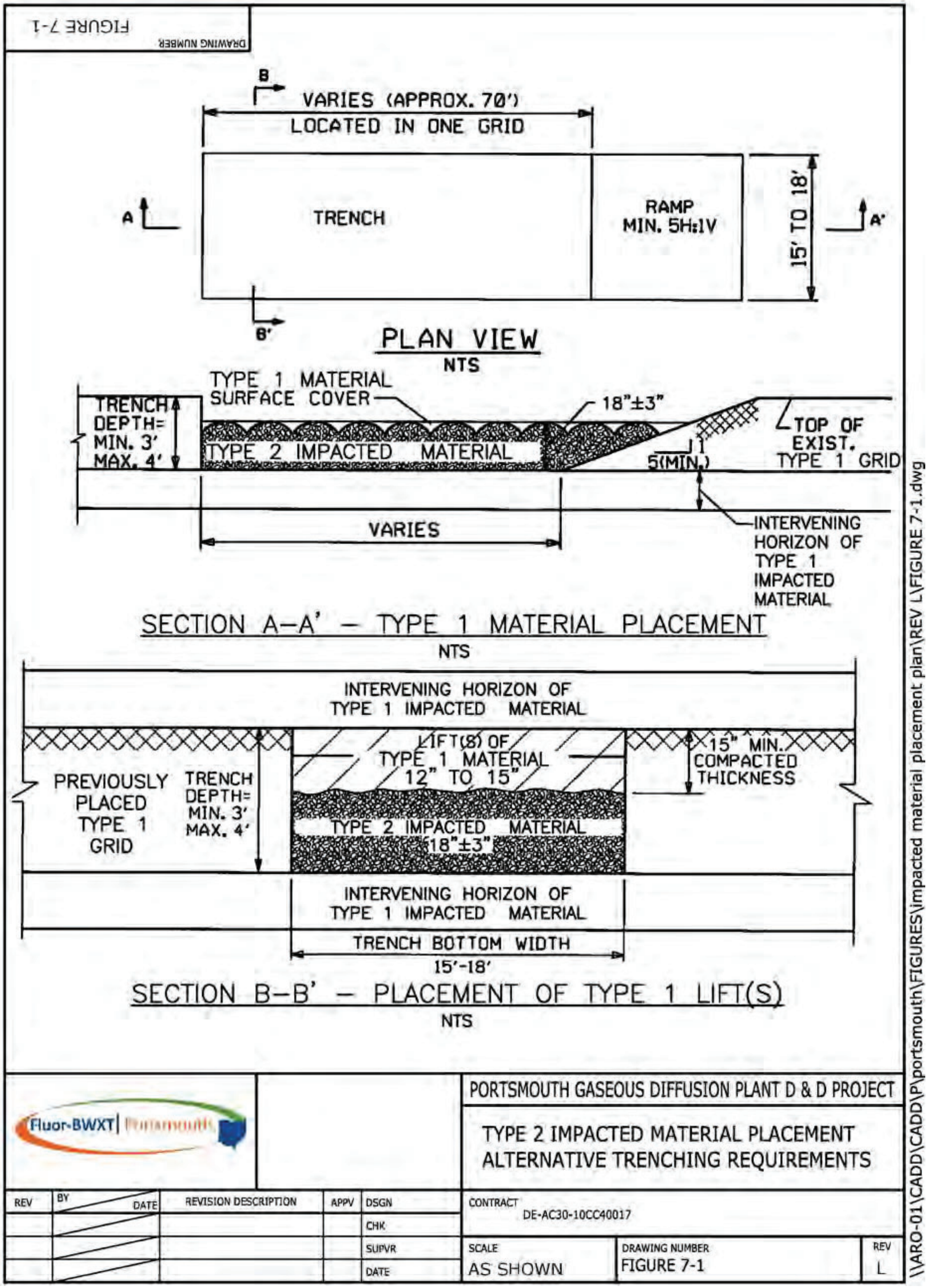

Figure 7-1. Alternative Trenching Requirements for Placement of Type 2 Impacted Material

7.3.3 Type 2 Impacted Material Placement

After the trench is excavated, trucks transferring the Type 2 impacted material shall back down the ramp and begin dumping material at the farthest end of the trench. The Type 2 impacted material shall be spread by construction equipment, such as a trackhoe or dozer, to achieve a maximum loose lift thickness of 18 in. ± 3 in. Type 1 material shall be spread and mixed as much as practicable with Type 2 impacted material during placement in the trench. The objective of this mixing is to fill voids in the Type 2 impacted material, increase the density, and aid in homogenizing the debris. Initial compaction shall be accomplished using a Caterpillar 826 landfill compactor or equivalent in the trench. Fugitive dust and storm water runoff controls shall be in accordance with the IMPP. Water trucks and/or water hoses shall be available at the location of placement activities.

7.3.4 Lift(s) of Type 1 Material

The compacted Type 2 impacted material shall be covered with a 12- to 15- in.-thick loose lift of Type 1 material. The lift shall be compacted with a minimum of four one-way passes of a self-propelled drum roller compactor, a smooth drum vibratory roller, or other compaction equipment approved by the OSWDF Operations Manager or a designated representative. Additional 12- to 15- in.-thick loose lifts of Type 1 material shall be placed, if necessary, to the top of trench elevation. Total compacted thickness of Type 1 material placed above the Type 2 impacted material, shall be a minimum of 15 in. as shown on Figure 7-1. The lifts of Type 1 material shall be compacted to at least 90 percent of the standard Proctor maximum dry density (ASTM D698) as described in Section 6.4.2. Compaction shall be tested in accordance with this IMPP. As shown on Figure 7-1, the trench will subsequently be covered with an intervening layer of Type 1 material.

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8. TYPE 3 IMPACTED MATERIAL PLACEMENT

8.1 GENERAL DESCRIPTION

Type 3 impacted materials are large impacted materials that must be handled as individual members or groups and are suitable for having Type 1 material placed around them. These include equipment or material such as coolers, block valves, construction equipment parts, as well as groups of individual members or bundles of transite panels, which are expected to be generated from the D&D of gaseous diffusion process buildings and are essentially incompressible using standard compaction equipment.

8.2 PLACEMENT REQUIREMENTS

8.2.1 Individual Placement Requirements

Type 3 impacted materials shall be placed as individual members, bundles, or packages in the OSWDF. As much as possible, groups of individual members or packages shall be similarly and regularly sized to enable their placement in the OSWDF in regular patterns. Items shall be placed at least 8 ft apart. Figure 8-1, Part A and Figure 8-2 illustrate the placement of individual or bundles of Type 3 material. No more than four (4) layers of Type 3 impacted material may be placed in a single grid column and, furthermore, no more than four (4) layers of combined Type 3 and Type 5 (large PGE) impacted materials shall be placed in a single grid column. Layers of Type 3 impacted materials shall be separated by at least the required minimum 2-ft thickness of the intervening layer of Type 1 material.

Type 3 impacted materials shall be placed to minimize voids and subsidence, and voids shall be reduced to the extent practical. Voids shall be sufficiently filled to not affect overall stability of the OSWDF through slumping, collapse, or other failure of the disposal unit. If needed, voids shall be filled with a quickset grout, flowable cohesionless material, or other materials approved by the OSWDF Operations Manager unless a separate analysis has demonstrated acceptability to the satisfaction of OSWDF Engineering and the A-E. Nonsoil materials such as grout used for filling voids shall be such that long term performance is similar to a soil materials (i.e., material shall not be subject to decomposition and shall behave in consolidation similar to soils). If a grout is used in this manner, it shall be applied in accordance with the supplier’s recommendations. All materials used to fill voids at the OSWDF shall be approved for use by Nuclear Safety. Containers having more than 10 percent internal voids (i.e., at less than 90 percent full) shall be filled by waste generators unless they are very small (e.g., ampules), or it can be demonstrated the voids will not affect overall stability of the OSWDF.

Prior to placement of the Type 3 items, the surface of the in-place Type 1 impacted material shall be prepared by rolling with a smooth-drum roller in the area of item placement. The Type 3 items or packages shall be placed on the surface in a regular pattern with an adequate spacing between individual members or packages to allow Type 1 material placement and compaction with available equipment. The space between each member or package shall be filled with Type 1 material placed in 12- to 15-in.-thick loose lifts. A final 12- to 15-in.-thick loose lift of Type 1 material shall be placed over each grouping of Type 3 items. The Type 1 material shall be placed in 12- to 15-in.-thick loose lifts as described in Section 6.4 of this IMPP.

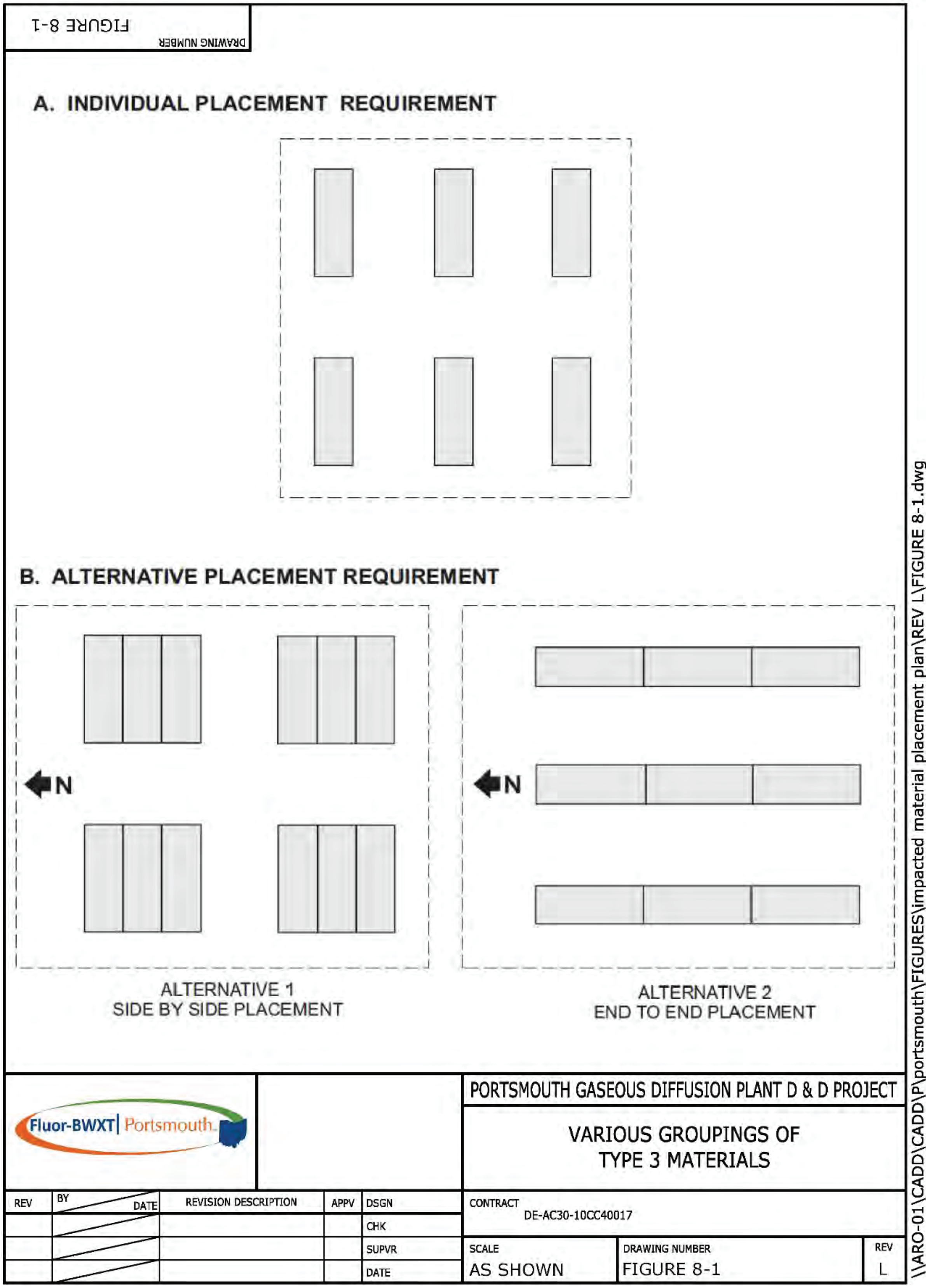


Figure 8-1. Various Groupings of Type 3 Impacted Material

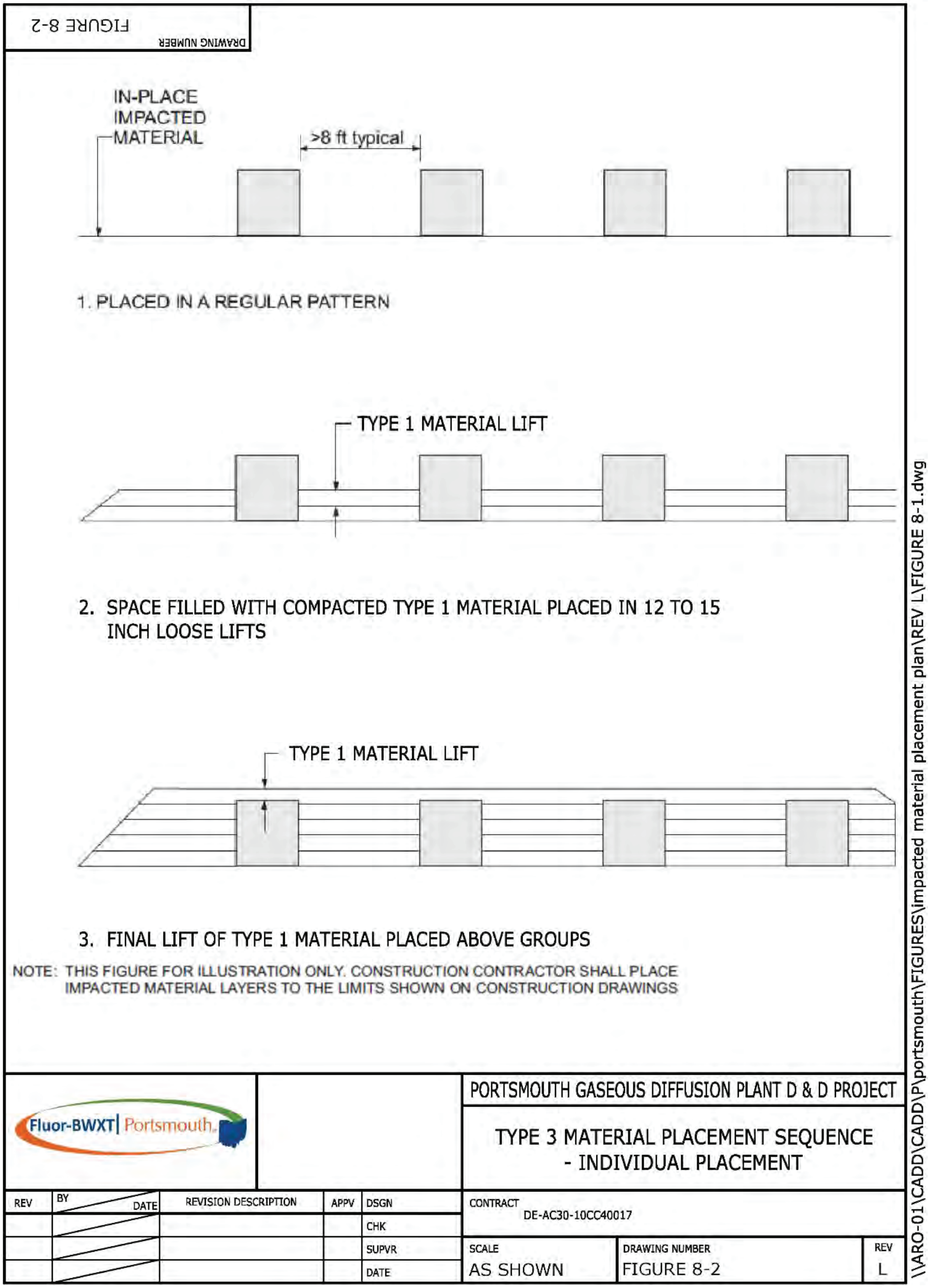


Figure 8-2. Type 3 Impacted Material Placement Sequence – Individual Placement

As the Type 3 impacted materials are expected to be less compressible than the majority of the impacted materials placed in the OSWDF, the Type 3 items should be placed toward the center of the cell, at least 50 ft horizontally from the bottom of the select impacted material layer in the final cover system, and not in the same horizontal elevation within 100 ft laterally of more compressible materials (e.g., Type 4 impacted materials). The 100 ft laterally means a 100 ft separation distance from all directions (e.g., north-south, east-west, diagonally) of placed Type 3 impacted material. Layers of Type 3 impacted materials shall be separated by at least the required minimum 2-ft thickness of the intervening layer of Type 1 material (see Figure 8-3).

8.2.2 Alternate Placement Requirements

8.2.2.1 General requirements

The alternate placement methods described allow bundles of Type 3 impacted material (e.g., packaged transite panels) to be placed in side-by-side and end-to-end configurations. The placement of Type 3 impacted material using alternative methods specified herein shall adhere to the same lateral and vertical separation distances described in Section 8.2.1. The alternate placement methods shall not be used in grids where material subject to decomposition (e.g., Type 4 impacted material) has been placed in a lower horizon.

Groups or bundles of Type 3 impacted material shall be placed on the surface of a previously placed horizon of Type 1 intervening layer or 3-ft-thick select impacted material layer. This surface shall be prepared by rolling with a smooth-drum roller in the area of Type 3 impacted material placement. The groups or bundles of Type 3 material shall be placed on the surface in the prescribed pattern illustrated on Figure 8-1, Part B. Groups or bundles of Type 3 material may be placed adjacent to existing 2-ft-high berms constructed for Type 2 grids. Minimum spacing between groups or bundles of Type 3 material shown on Figures 8-4 and 8-5 shall be 8 ft to allow Type 1 material placement and compaction with suitable equipment. The space between groups or bundles of Type 3 impacted material shall be filled with Type 1 material placed in maximum 12-in.-thick compacted lifts. Lifts shall be brought up uniformly around the group or bundles of Type 3 impacted material. A final 12-in.-thick compacted lift of Type 1 material shall be placed over each grouping or bundles of Type 3 impacted material. Placement of Type 1 material is illustrated on Figures 8-4 and 8-5.

Whenever possible, place similar size of Type 3 impacted material within a group. When more than one size is to be placed in a group, the Type 3 impacted material shall be placed in a manner which does not hamper the placement of Type 1 material. Examples for placing Type 3 impacted material of varying sizes in a group are shown on Figure 8-6. Lifts of Type 1 material shall be brought up uniformly around the group of Type 3 material. If the Type 3 materials are of varying heights, Type 1 material shall be first placed over the shorter Type 3 material to bring the common surface of the Type 3 impacted material up to the same elevation before the placement of the final overlying lift.

8.2.2.2 Requirements for Alternate 1 (Side-by-Side) Placement Method

The alternate requirements for this method allow placement of Type 3 impacted material in a side-by-side configuration. The side-by-side configuration is shown in Figure 8-4. The Type 3 impacted material shall be oriented relative to north and south or east and west as shown on Figure 8-4. The Type 3 impacted material of the same size shall be grouped together whenever possible. When Type 3 impacted material of varying dimensions are placed in a single group, their orientation shall be such that zones are not created which hamper the placement of Type 1 material. Examples of preferred groupings of different sizes of Type 3 impacted material are shown on Figure 8-6.

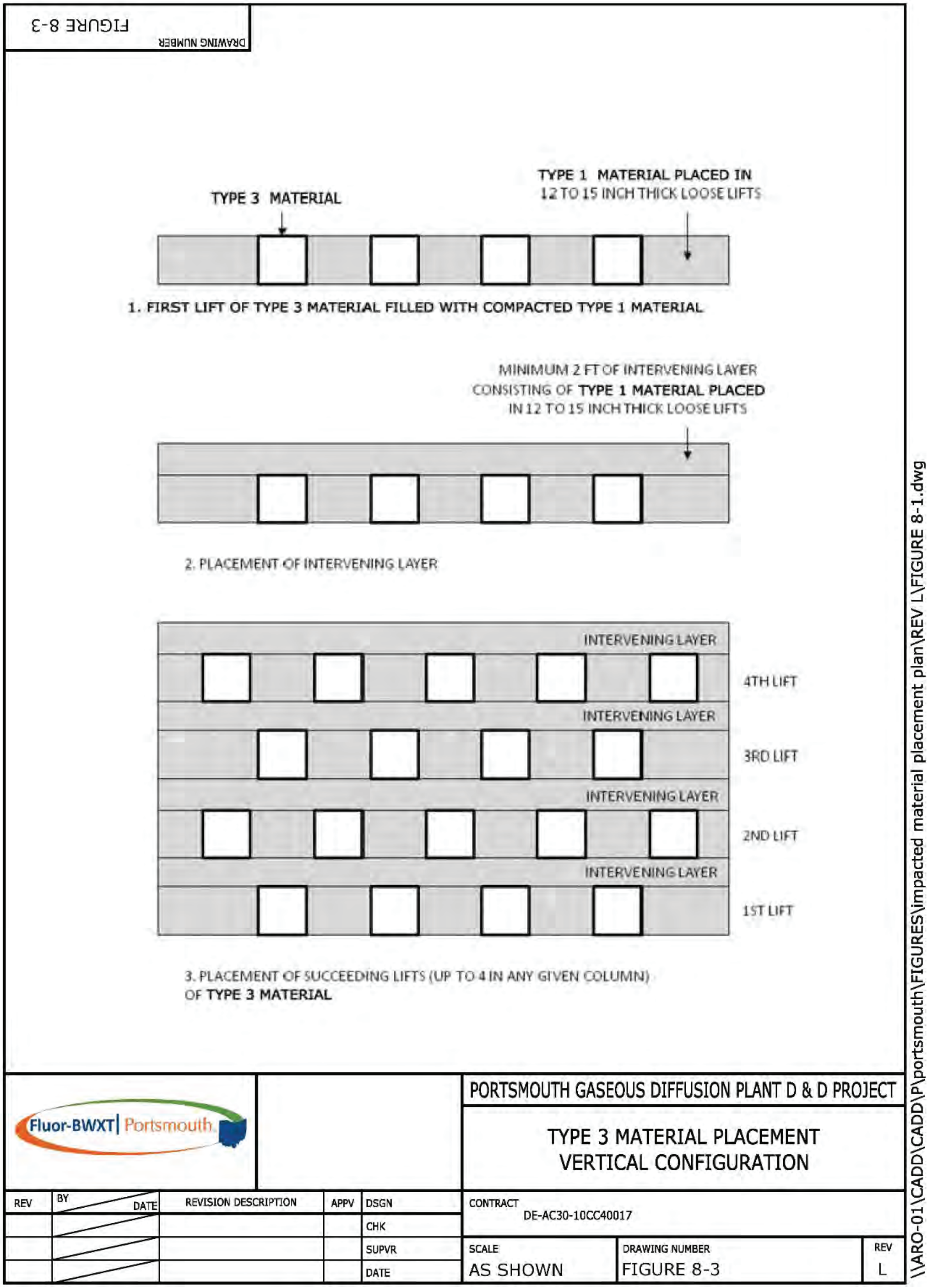


Figure 8-3. Type 3 Impacted Material Placement Vertical Configuration

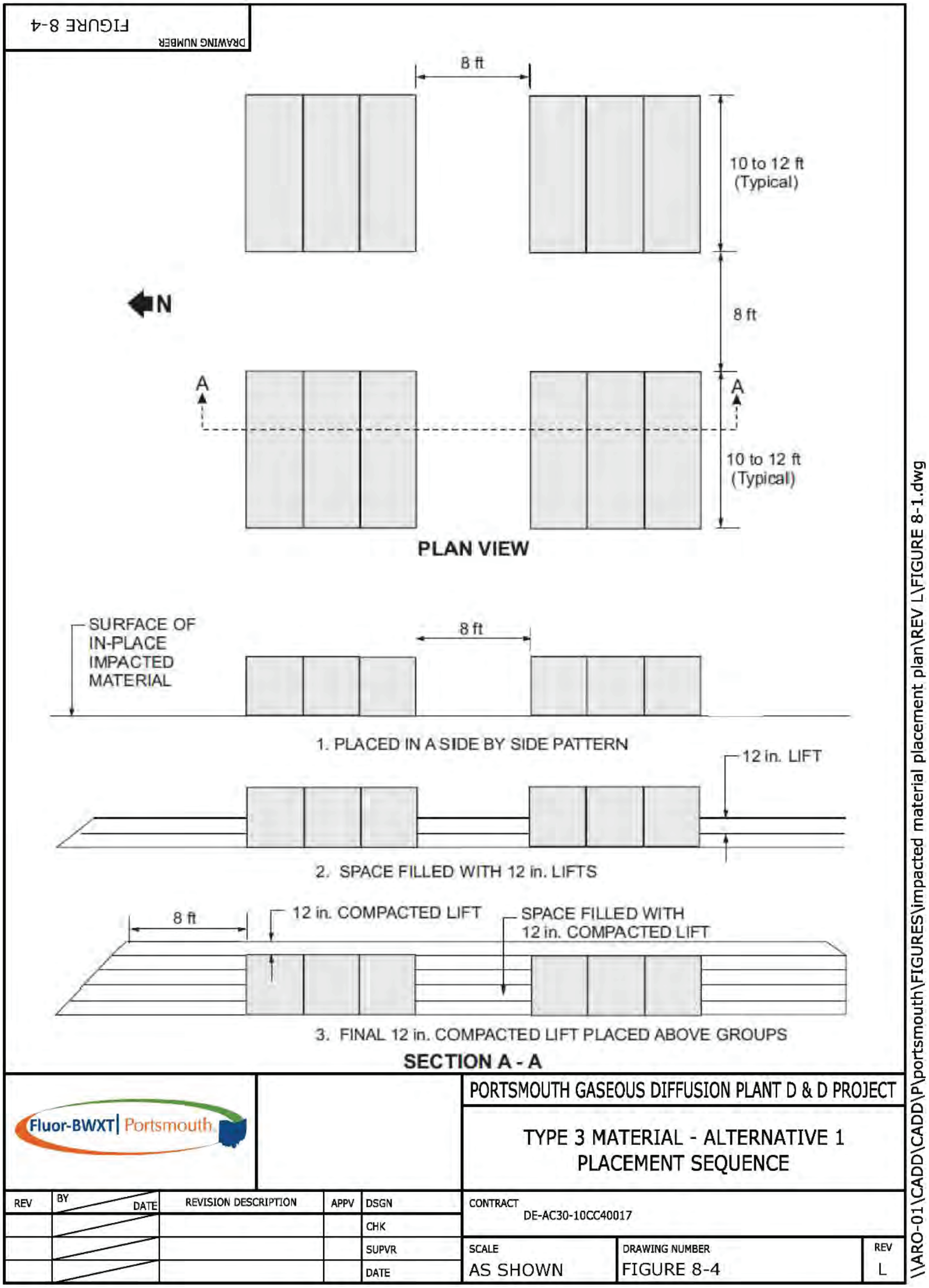


Figure 8-4. Type 3 Impacted Material – Alternative 1 Placement Sequence

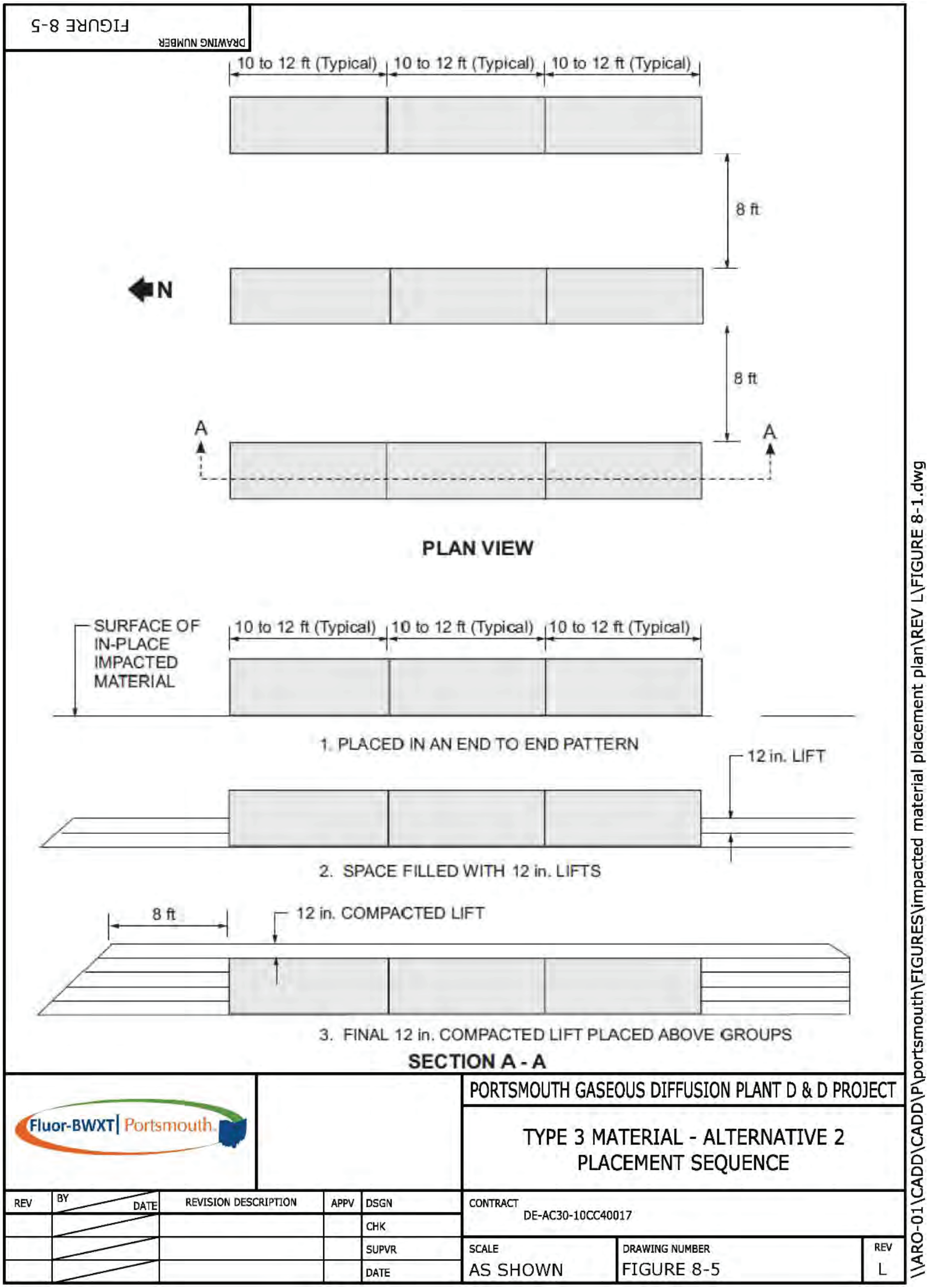


Figure 8-5. Type 3 Impacted Material – Alternative 2 Placement Sequence

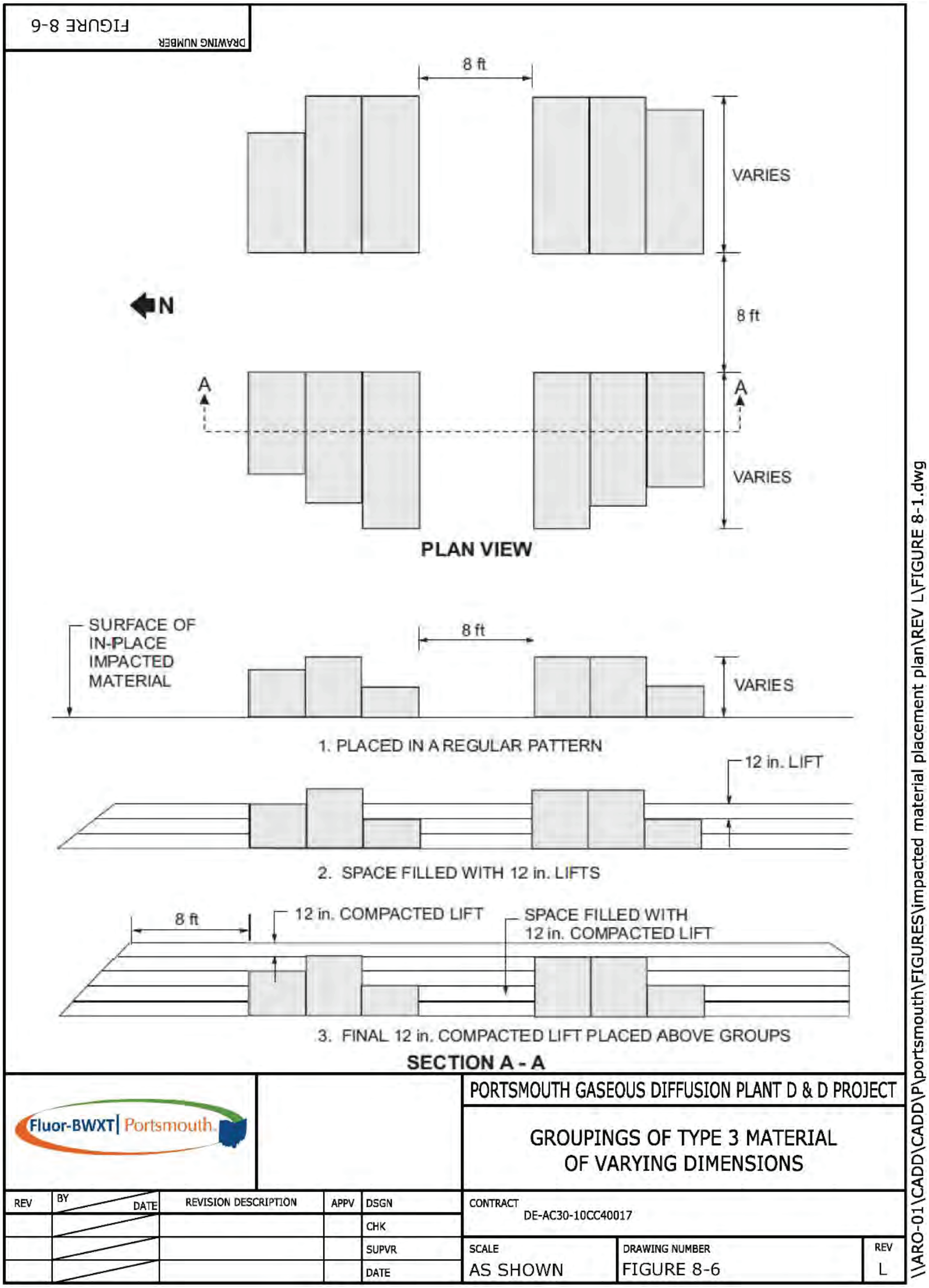


Figure 8-6. Groupings of Type 3 Material of Varying Dimensions

Place bundles or groups of Type 3 impacted material in contact with minimum space between each other. However, it is recognized that a space between bundles of Type 3 impacted material may occur. The space between the bundles shall not be more than 2 in. If space between bundles is wider than 2 in., spaces shall be filled with a quickset grout or flowable cohesionless material. All materials used to fill voids at the OSWDF shall be approved for use by Nuclear Safety. Filling of the space can be performed after Type 1 material is placed around bundles.

8.2.2.3 Requirements for Alternate 2 (End-to-End) Placement Method

The alternate requirements for this method allow for placement of Type 3 impacted material in an end-to-end configuration. The end-to-end placement configuration is shown on Figure 8-5. Bundles of Type 3 impacted material shall be oriented relative to north and south or east to west as shown on Figure 8-5. Type 3 materials of the same height shall be grouped together whenever possible. When Type 3 impacted materials of varying heights are placed in a single group, their orientation shall be such that zones are not created which hamper the placement of Type 1 material.

Place bundles of Type 3 impacted material in contact with minimum space between each other. However, it is recognized that a space between the bundles may occur. The space between the bundles shall not be more 2 in. If space between the bundles is wider than 2 in., spaces shall be filled with a quickset grout or flowable, cohesionless material. All materials used to fill voids at the OSWDF shall be approved for use by Nuclear Safety. Filling of the space can be performed after Type 1 material is placed around the bundles of Type 3 impacted material.

8.3 COMPACTION REQUIREMENTS

Each lift of soil (Type 1 material) between and above the Type 3 items shall be compacted using equipment capable of achieving compaction to at least 85 percent with rolling average of 90 percent of the standard Proctor maximum dry density, determined as described in Section 6.4.2 of this IMPP. It is anticipated that the compaction moisture content for this Type 1 material will be within 3 percentage points of the material's optimum moisture content. The development of moisture content requirements will take into account the workability of the Type 1 material, the required shear strength to obtain adequate levels of OSWDF stability, moisture content needed to achieve dust and other fugitive dust control, and material trafficability.

A final 12- to 15-in.-thick loose lift of soil (Type 1 material) shall be placed above the Type 3 impacted material. This final compacted lift shall be performance-tested using one of the methods described below. The OSWDF Operations Manager will select which performance test to use based on the characteristics of the Type 1 material.

- *Alternate 1 – Proof-rolling*
  The compacted lift of the Type 1 material shall be proof-rolled using equipment with a minimum gross vehicle weight of 20 tons and exert a ground pressure of at least 65 psi. Soft spots indicated by tire ruts more than 3 in. in depth or visible deflection under the moving proof-rolling equipment shall be stabilized through additional passes of the compactor. Any soft spot that cannot be stabilized with further compactive effort shall be repaired. The repair shall consist of removal, replacement, and recompaction of the Type 1 material and, if needed, infilling soft spots/areas around the Type 3 impacted material with other material approved by the OSWDF Operations Manager.

- *Alternate 2 – Placement and compaction of second lift of Type 1 material*
  Place a second 12- to 15-in.-thick loose lift of Type 1 material and compact in accordance with Section 6.4.2 of this IMPP. The second lift of Type 1 material placed and compacted shall pass the performance testing requirements of Section 6.4.2 and Appendix A of the IMPP. Any failing areas shall be reworked and retested in accordance with Section 6.4.2.

If a material does not meet the Type 1 impacted material compaction requirements described above, one or a combination of the following may be implemented: (i) increase moisture content by adding water; (ii) dry the material; (iii) amend with granular material; and/or (iv) other method approved by the OSWDF Operations Manager.

9. TYPE 4 IMPACTED MATERIAL PLACEMENT

9.1 GENERAL

This IMPP describes special requirements for placement of Type 4 impacted materials generated from the PORTS D&D activities. Examples of Type 4 impacted material include vegetative waste from clearing and grubbing operations that have been determined to be contaminated, as well as large quantities of wooden debris such as bulk paper products, pallets, telephone phones, tree root structures, sewage plant waste, and railroad ties. Vegetative waste that is not contaminated shall not be placed in the OSWDF to the extent practicable. Putrescible waste will not be stored in the OSWDF for placement long enough to create a decomposable nuisance, in compliance with *OAC* 3745-27-03(A)(2).

9.2 PLACEMENT REQUIREMENTS

Type 1 material berms, which are a minimum of 12 in. high and 5 ft wide (top width), shall be placed around Type 4 impacted material and placed as described in Section 6.4 of this IMPP. The lateral extent of each Type 4 impacted material placement shall not exceed 100 ft. Type 4 material shall be placed adjacent to the berms to a loose thickness of approximately 18 in. Vegetative waste shall be reduced in size, as necessary, to enable placement in the lift. Wind dispersal of loose material shall be prevented by using water sprays, the initial compaction process, or other suitable methods. Fire hazards will also be prevented by wetting the material appropriately prior to and during placement activities. Initial compaction shall be accomplished as the material is spread by tracking with a bulldozer with a minimum total weight of 25 tons, producing a ground pressure of at least 10 psi, or with a landfill compactor (e.g., Caterpillar 826 landfill compactor or approved equal). Prior to placement of the succeeding lifts of Type 4 impacted material, a minimum 12-in.-thick loose lift of Type 1 material shall be placed over the Type 4 impacted material and compacted as indicated below. Placement and compaction of the second lift of Type 4 impacted material shall be identical to the first lift. No more than two lifts of Type 4 impacted material shall be placed in a grid column.

The OSWDF design does not include a gas collection or venting system. To avoid pressure build-up that could affect performance of the OSWDF final cover system, maximum allowable landfill gas generation was calculated based on the composition of Type 4 impacted material expected to be included for disposal in the OSWDF. Based on landfill gas generation and maximum allowable landfill gas pressure calculations, the maximum volume of Type 4 impacted material that may be placed in the OSWDF has been calculated at 5,744 cy (i.e., 2,644 cy of wood plus 3,100 cy of landfill debris) for the entire OSWDF (i.e., 479 cy per OSWDF cell for a 12 cell configuration), as detailed in the OSWDF landfill gas generation calculation package. This calculation conservatively assumed that all the material in the southern landfills (i.e., X-749, X-749A, and X-749B) will generate landfill gas at a rate similar to municipal solid waste because actual decomposition rates for waste in the closed landfill are not currently available. After landfill material is excavated, a detailed waste composition evaluation may be performed to quantify the organic content and decomposition parameters of its waste compared to the rates used in the landfill gas generation calculation package. This IMPP (and associated WAC limits for Type 4 materials) shall be modified if the organic content and decomposition parameters of the actual landfill waste cause a reduction in the Type 4 material volume acceptable for OSWDF disposal. Revision of the Type 4 volume limits requires Ohio EPA review and approval via the design change process specified in the Comprehensive OSWDF RD/RA Work Plan.

The calculated maximum quantity (5,744 cy) of Type 4 impacted material acceptable for placement in the OSWDF and the 479 cy per cell maximum assumed no disposal of hay bales or other decomposable materials used for erosion and sediment control in the OSWDF. Therefore, hay bales and other decomposable erosion and sediment control materials should not be used in the OSWDF. If hay bales or other decomposable materials must be used inside the OSWDF for erosion and sediment control and will remain in the cell for disposal as contaminated vegetative waste, the OSWDF landfill gas generation calculation package must first be revised to account for the organic content and decomposition parameters of these unplanned Type 4 materials. The maximum volume of Type 4 material per cell and the maximum volume of Type 4 material for the entire OSWDF will change as a result of this recalculation.

The OSWDF Project Organization and the WAO shall exercise diligence and conservatism in the tracking of any Type 4 waste placed in the OSWDF to ensure the established maximum volume per cell and the maximum volume for the entire OSWDF are not exceeded.

9.3 COMPACTION REQUIREMENTS

After spreading and initial compaction, the Type 4 impacted material shall be compacted by a minimum of four passes of a self-propelled, static pad/blade-foot landfill compactor (e.g., Caterpillar 826 landfill compactor or approved equivalent). After each sequence of Type 4 material compaction and Type 1 cover material placement, the Type 1 cover material shall be compacted as required according to Section 6.4.2 of this IMPP. This final compacted lift of the Type 1 cover material shall be performance-tested using one of the alternatives described below. The OSWDF Operations Manager will select which of the performance tests to use based on the characteristics of the Type 1 cover material:

- *Alternate 1 – Proof-rolling*
  The compacted lift of the Type 1 cover material shall then be proof-rolled using equipment with a minimum gross vehicle weight of 20 tons and exert a ground pressure of at least 65 psi. Soft spots indicated by tire ruts more than 3 in. in depth or visible deflection under the moving proof-rolling equipment shall be stabilized through additional passes of the landfill compactor. Any soft spot that cannot be stabilized with further compactive effort shall be repaired. The repair shall consist of removal, replacement, and recompaction of the Type 1 material and, if needed, infilling soft spots/areas in the Type 4 impacted material with other material approved by the OSWDF Operations Manager.

- *Alternate 2 – Placement and compaction of second lift of Type 1 material*
  Place a second 12- to 15-in.-thick loose lift of Type 1 material and compact in accordance with Section 6.4.2 of this IMPP. The second lift of Type 1 material placed and compacted shall pass the performance testing requirements of Section 6.4.2 and Appendix A of the IMPP. Any failing areas shall be reworked and retested in accordance with Section 6.4.2.

  If a material does not meet the Type 1 impacted material compaction requirements described above, one or a combination of the following may be implemented: (i) increase moisture content by adding water; (ii) dry the material; (iii) amend with granular material; and/or (iv) other method approved by the OSWDF Operations Manager.

10. TYPE 5 IMPACTED MATERIAL PLACEMENT

10.1 GENERAL

Type 5 impacted materials are those that require special handling, placement, and compaction. They include large PGE such as compressors, containerized waste, ACM, broken pieces of transite panels, double-bagged asbestos, piping insulated with ACM, and other bagged or nonbagged ACMs. Other Type 5 impacted materials will be identified and designated in accordance with the approved ROD and the WAC. This section of the IMPP establishes general requirements for placement and compaction of the following Type 5 impacted materials that require special handling: (i) compressors placed whole with internal void space completely filled (i.e., 95 percent of voids filled); (ii) segmented converters; and (iii) bagged or nonbagged ACMs.

Specific requirements for placement and compaction (i.e., special placement plans) for other specific or unique Type 5 impacted material generated during PORTS D&D activities will be developed when the waste is identified during D&D and excavation project planning. These special placement plans will be prepared by the A-E and submitted as design changes to Ohio EPA for review and concurrence in accordance with the Comprehensive OSWDF RD/RA Work Plan.

10.2 COMPRESSORS PLACED WHOLE WITH INTERNAL VOID SPACE COMPLETELY FILLED

10.2.1 General Requirements

Large PGE (i.e., compressors) from PORTS D&D activities may be placed whole with the internal void space completely filled (i.e., at least 95 percent of voids filled). Filling of voids shall be conducted prior to delivery to the OSWDF or IMTA. It should be noted that compressors placed whole must be evaluated/modeled by the A-E if at least 95 percent of the voids cannot be filled.

The internal void space shall be filled using flowable fill, granular (cohesionless) soil, or other approved methods. The type of material used to fill the void space shall be approved by Nuclear Safety with concurrence of the A-E. Non-soil materials such as grout used for filling voids shall be such that long term performance is similar to a soil materials (i.e., material shall not be subject to decomposition and shall consolidate similar to soils). Placement and compaction requirements for compressors placed whole with the internal void space completely filled are presented in this section of the IMPP.

Prior to delivery to OSWDF, suitable working surfaces or access ramps shall be prepared for the low-boy trailers and cranes for unloading and placement of the large PGE. Crane mats may be used to create temporary roadways/ramps if approved by the OSWDF Operations Manager. Equipment used to transport large PGE should not drive directly on the select impacted material layer or intervening layer of previously placed large PGE unless approved otherwise by the OSWDF Operations Manager based on evaluation of equipment and conditions. Crane capacities and operation conditions should also be considered for unloading and placing the large PGE in the OSWDF.

10.2.2 Placement Requirements

The large PGE shall be placed at least 40 ft from the toe of the side slopes of the OSWDF. Large PGE shall be placed at 2-ft minimum spacing. The 2-ft minimum spacing between large PGE shall be filled with cohesionless material (e.g., coarse sand, gravel, crushed concrete, or equivalent). A minimum 1-ft soil cover (i.e., Type 1 soil or soil-like material) shall be placed over each large PGE.

The first layer of large PGE should be placed directly over the select impacted material layer or as approved by the OSWDF Operations Manager. The select impacted material layer shall consist of an 18-in.-thick layer of Type 1 select impacted material (±3 in.) overlain by a minimum 18-in.-thick layer of crushed gravel approved by the OSWDF Operations Manager. The second and third layers of large PGE with the internal void space completely filled shall each be separated by at least a 2-ft-thick intervening layer of soil. A minimum 2-ft-thick intervening layer of soil shall be placed between two layers of large PGE or between large PGE and other Types 2, 3, 4, and 5 impacted material layers within the same grid column. No more than three layers of large PGE shall be placed in a given grid column.

Specific placement scenarios can be developed by the Field Engineer Manager, in consultation with the OSWDF Operations Manager and with the concurrence of the A-E, based on the schedule for delivery of large PGE to the OSWDF.

10.2.3 Compaction Requirements

The cohesionless fill material placed within the 2-ft spacing between each large PGE placed whole with the internal void space completely filled shall be compacted using vibration and/or tamping techniques. The OSWDF Operations Manager will ensure that the fill material is adequately vibrated and additional fill material is placed to fill in the void space resulting from the vibration/tamping efforts. This additional material shall also be compacted using the same techniques. The CQC Contractor will monitor and document the compaction operations. Fill material must be approved by Nuclear Safety.

The 1-ft-thick soil cover and 2-ft-thick intervening layer of soil (Type 1 material) shall be placed above the Type 5 impacted material in 12- to 15-in.-thick loose lifts. Each lift of Type 1 material above the Type 5 material shall be compacted using equipment capable of achieving compaction to at least 85 percent with a rolling average of 90 percent of the standard Proctor maximum dry density, determined as described in Section 6.4.2 of this IMPP. It is anticipated that the compaction moisture content for this Type 1 material will be within 3 percentage points of the material's optimum moisture content. The development of moisture content requirements will take into account the workability of the Type 1 material, the required shear strength to obtain adequate levels of OSWDF stability, the moisture content needed to achieve dust and other fugitive dust control, and material trafficability.

If a material does not meet the Type 1 impacted material compaction requirements described above, one or a combination of the following may be implemented: (i) increase moisture content by adding water; (ii) dry the material; (iii) amend with granular material; and/or (iv) other method approved by the OSWDF Operations Manager.

10.3 SEGMENTED CONVERTERS

10.3.1 General Requirements

Converters may be segmented into quarters for placement in the OSWDF. Segmenting of converters shall be performed before hauling to the OSWDF. In general, segmenting of converters will require cutting off the ends, removing the internal components, and splitting the remaining shell in four parts lengthwise (i.e., quarters). The segmented quarters and ends may then be placed in the OSWDF as Type 5 impacted material requiring special handling.

10.3.2 Placement Requirements

Converters when segmented shall be placed in the OSWDF as individual members or bundles, as outlined below. The cylindrical quarters and ends shall be placed with the open face upwards (see Figure 10-1) or downwards (see Figure 10-2) to facilitate placement of Type 1 soil and soil-like material to fill the void spaces and spaces between individual pieces or bundles of the segmented converters.

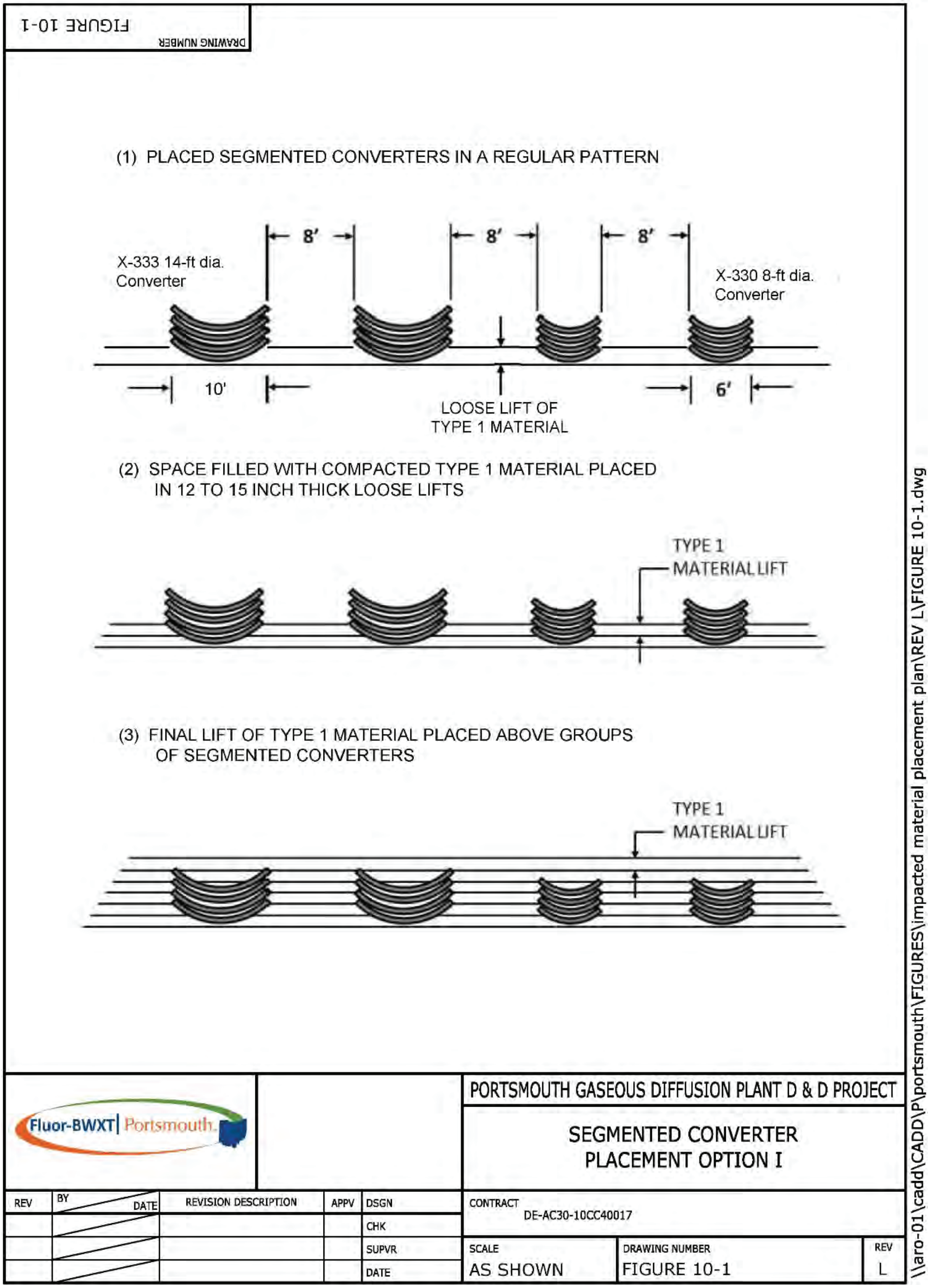


Figure 10-1. Segmented Converter Placement Option 1

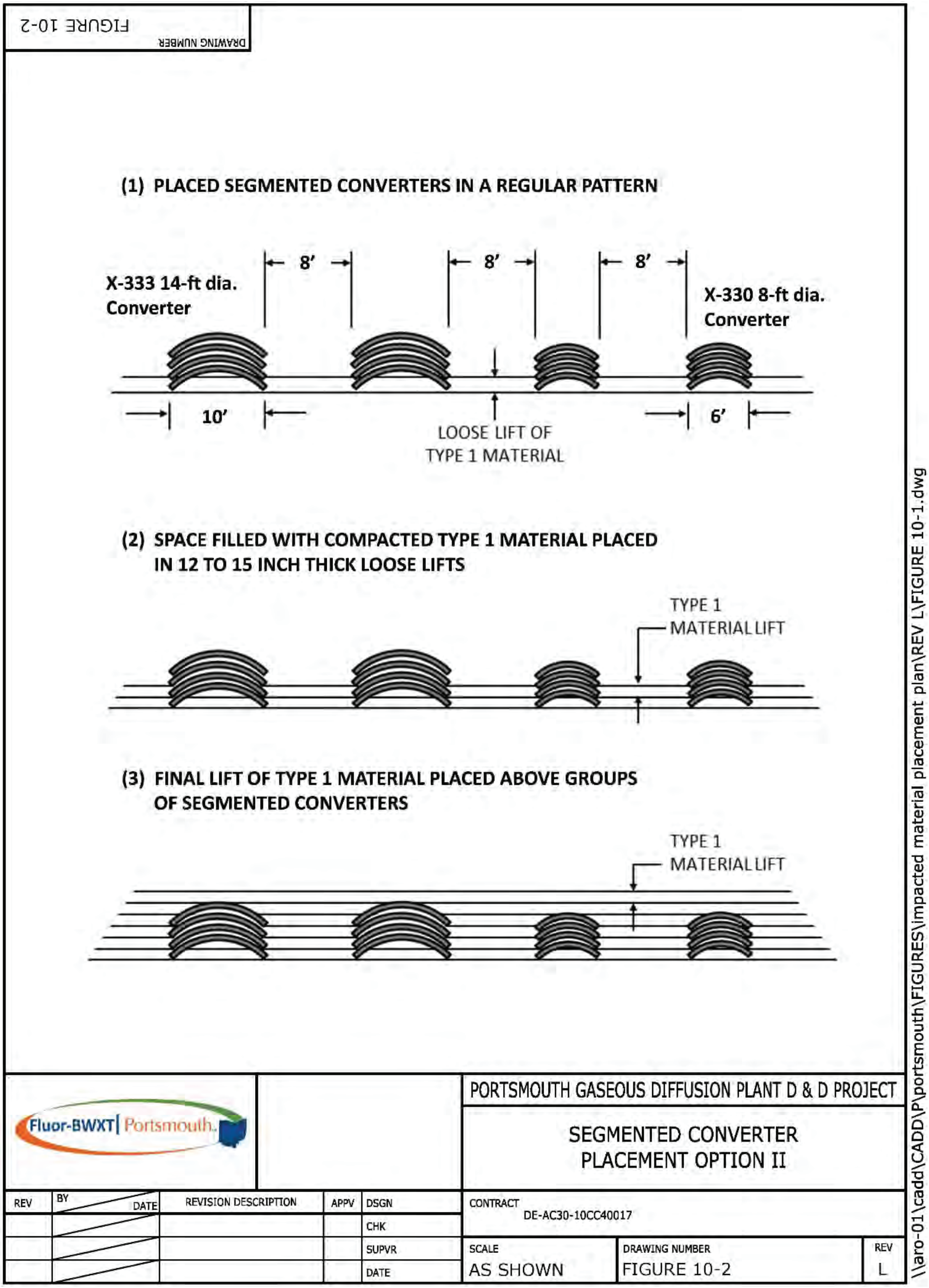


Figure 10-2. Segmented Converter Placement Option 2

Up to four units of segmented converters from the same converter and dimension shall be stacked for placement as bundles of converters as shown on Figures 10-1 and 10-2. The soil and soil-like material shall be placed in lifts and compacted using a portable compactor or approved equivalent in accordance with Section 6.4 of this IMPP.

Before placing the segmented quarters of the converters, the surface of the in-place Type 1 material shall be prepared by rolling with a smooth-drum roller in the area of placement. The segmented converters shall be placed in the surface in a regular pattern with an adequate spacing between each individual item to allow Type 1 material placement and compaction with available equipment. An initial loose lift of Type 1 material shall be placed (without compaction) prior to placing segmented converters with the open face downwards (see Figure 10-2) to facilitate filling the void space during placement and compaction of overlying soils. The space between segmented converters shall be filled with Type 1 material placed in 12- to 15-in.-thick loose lifts. A final 12- to 15-in.-thick loose lift of Type 1 material shall be placed over each segmented converter. The Type 1 material shall be placed in 12- to 15-in.-thick loose lifts as described in Section 6.4 of this IMPP.

As the Type 5 segmented converters are expected to be less compressible than the majority of the impacted materials placed in the OSWDF, these Type 5 items should be placed toward the center of the cell, at least 40 ft vertically from the bottom of the select impacted material layer in the final cover system, and not in the same horizontal elevation within 100 ft laterally of more compressible materials (e.g., Type 4 materials). The 100 ft laterally means a 100 ft separation distance from all directions (e.g., north-south, east-west, diagonally) of placed Type 5 segmented converters. Horizons of Type 5 segmented converters shall be separated by at least the required minimum 2-ft thickness of the intervening horizon of Type 1 material as required for large PGE placed whole in the OSWDF.

10.3.3 Compaction Requirements

The final 12- to 15-in.-thick loose lift of soil (Type 1 material) placed above the layer of segmented converters shall be compacted and performance-tested using one of the alternatives described below. The OSWDF Operations Manager will select which performance test to use based on the characteristics of the Type 1 material.

- *Alternate 1 – Proof-rolling*
  The Type 1 material shall be proof-rolled using equipment with a minimum gross vehicle weight of 20 tons and exert a ground pressure of at least 65 psi. Soft spots indicated by tire ruts more than 3 in. in depth or visible deflection under the moving proof-rolling equipment shall be stabilized through additional passes of the compactor. The proof-rolling passes shall be overlapped such that one set of tires on each pass runs between the two sets of tire tracks from the previous pass. Any soft spot that cannot be stabilized with further compactive effort shall be repaired. The repair shall consist of removal, replacement, and recompaction of the Type 1 material, and if needed, infilling soft spots/areas in the Type 5 segmented converters with other material approved by the OSWDF Operations Manager.

- *Alternate 2 – Placement and compaction of second lift of Type 1 material*
  Place a second 12- to 15-in.-thick loose lift of Type 1 material and compact in accordance with Section 6.4.2 of this IMPP. The second lift of Type 1 material placed and compacted shall pass the performance testing requirements of Section 6.4.2 and Appendix A of the IMPP. Any failing areas shall be reworked and retested in accordance with Section 6.4.2.

If a material does not meet the Type 1 impacted material compaction requirements described above, one or a combination of the following may be implemented: (i) increase moisture content by adding water; (ii) dry the material; (iii) amend with granular material; and/or (iv) other method approved by the OSWDF Operations Manager.

10.4 BAGGED OR NONBAGGED ACM

Bagged or nonbagged ACM (e.g., piping containing ACM insulation, broken transite panels, soil containing friable asbestos, and bagged asbestos) is expected to be generated as buildings are demolished. Additionally, some bagged or nonbagged ACM may be generated in small quantities as other remediation activities are performed. To provide flexibility, two options are specified herein for placement of bagged or nonbagged ACM. These options are specified to minimize potential radiological exposure to personnel and equipment, prevent discharge of visible emissions and dispersion of ACM, control storm water runoff, and place bagged or nonbagged ACMs in a safe manner. The two placement options are:

- Option 1 – Placement by grid method
- Option 2 – Placement by trenching method.

The OSWDF Operations Manager will select the placement option based on the quantity of bagged or nonbagged ACM available for placement and the availability of a required grid.

10.4.1 Option 1 – Placement by Grid Method

10.4.1.1 Placement requirements

Bagged or nonbagged ACM may be placed by the grid method when an estimated quantity of debris for placement is equal to or more than the amount required to fill half a grid, or when a previously placed minimum 3-ft-thick Type 1 grid is not available for placement by the Option 2 trenching method. The approved selected grid(s) shall meet the following requirements:

- Grids with bagged or nonbagged ACM placed by the grid method shall not be laterally adjacent to each other within the same horizontal plane. However, the grids may be placed in a checkerboard pattern (i.e., diagonally from one another) and separated by a minimum 5-ft-wide Type 1 berm if the bagged or nonbagged ACM is placed within the 14-ft (± 2 ft) nominal zone above the top of the 3-ft-thick select impacted material layer above the liner system. See Figure 10-3 for the typical checkerboard pattern configuration and Figure 10-4 for a cross section.

- A grid with bagged or nonbagged ACM placed by the grid method and a grid with bagged or nonbagged ACM placed by the trenching method shall not be adjacent to one other in the same horizontal plane. However, the grids may be placed in a checkerboard pattern (i.e., diagonally from one another) and separated by a minimum 5-ft-wide Type 1 berm, if the bagged or nonbagged ACM is placed within the nominal zone above the top of the 3-ft-thick select impacted material layer above the liner system. See Figure 10-3 for the typical checkerboard pattern configuration. The thickness of the nominal zone (see Figure 10-4) will vary from 12 ft to 18 ft, depending on the number of additional lifts of Type 1 impacted material placed on each lift of Type 2 or Type 5 impacted material to facilitate performance testing.

- Bagged or nonbagged ACM shall be placed above an intervening horizon of Type 1 impacted material.

- Bagged or nonbagged ACM shall not be placed directly on previously placed Type 2 through 5 impacted material or a protective layer.

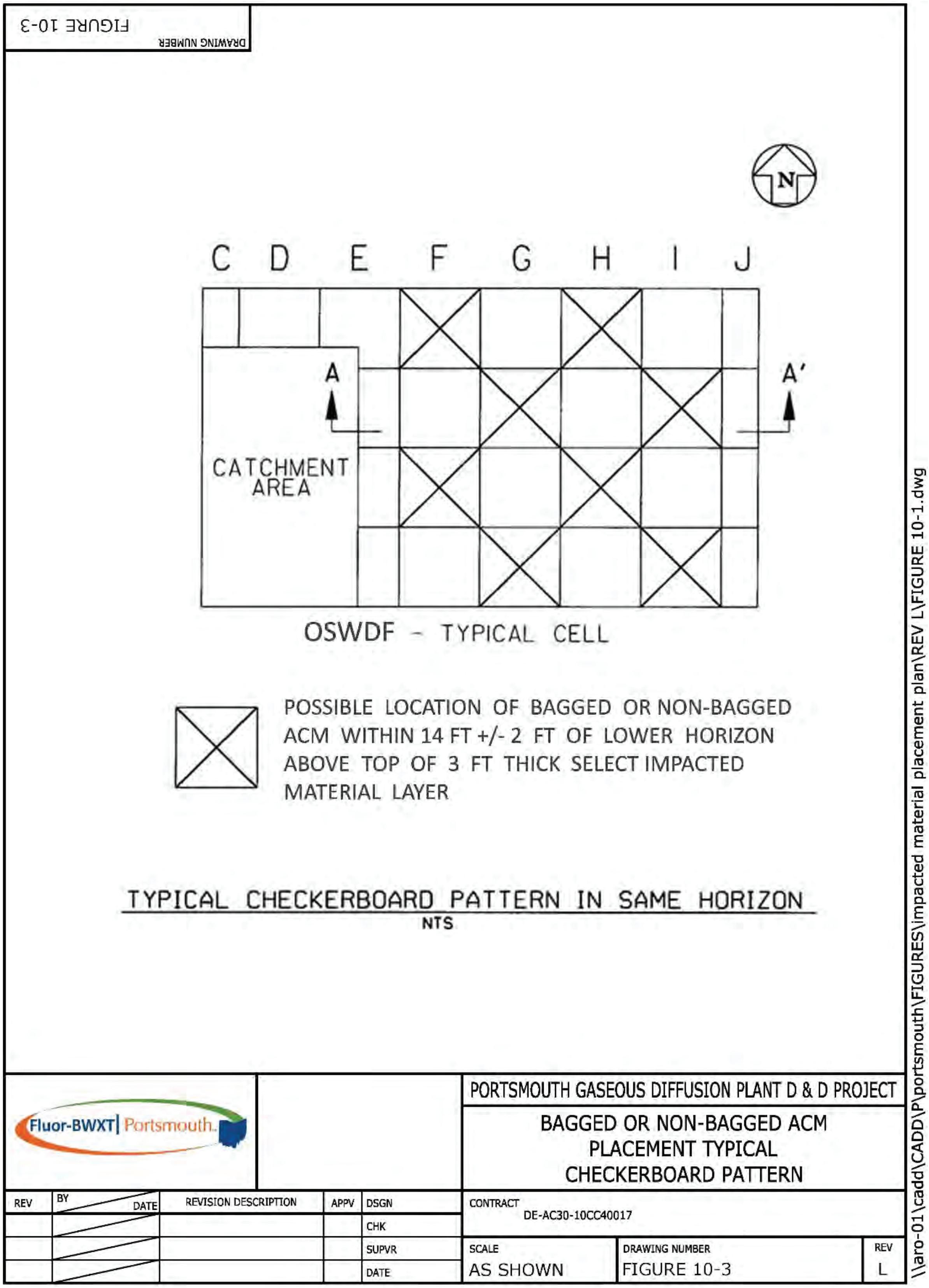
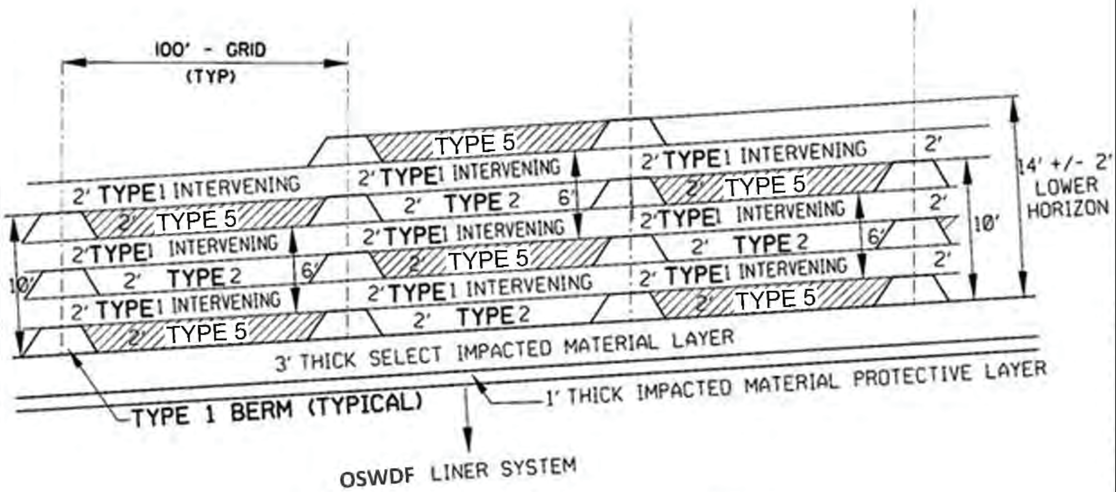


Figure 10-3. Bagged or Nonbagged ACM Placement Typical Checkerboard Pattern

DRAWING NUMBER
FIGURE 10-4



NOTE: TYPE 5 DENOTES PLACEMENT OF BAGGED OR NON-BAGGED ACM

SECTION A-A'
NTS

Fluor-BWXT | Portsmouth

PORTSMOUTH GASEOUS DIFFUSION PLANT D & D PROJECT

BAGGED OR NON-BAGGED ACM PLACEMENT WITH CHECKERBOARD PATTERN IN ADJACENT GRIDS AND 2 LIFTS PER GRID

REV	BY / DATE	REVISION DESCRIPTION	APPV	
				DSGN
				CHK
				SUPVR
				DATE

CONTRACT DE-AC30-10CC40017

SCALE	DRAWING NUMBER	REV
AS SHOWN	FIGURE 10-4	L

\\aro-01\cadd\CADD\P\portsmouth\FIGURES\impacted material placement plan\REV L\FIGURE 10-1.dwg

Figure 10-4. Bagged or Nonbagged ACM Placement with Checkerboard Pattern in Adjacent Grids and 2 Lifts per Grid

- Bagged or nonbagged ACM shall not be placed within 6 ft under the select impacted material for the final cover system.

- A maximum of two lifts of bagged or nonbagged ACM may be placed in each grid column, provided both lifts of bagged or nonbagged ACM can be placed within the nominal zone above the top of the 3-ft-thick select impacted material layer above the liner system, and a minimum 6 ft of Type 1 and/or Type 2 material is placed to separate the two lifts of bagged or nonbagged ACM. Where this requirement cannot be met, only one lift of bagged or nonbagged ACM may be placed within a grid column. See Figure 10-4 for a typical cross section of adjacent grids with two lifts per grid placement.

After a grid is selected and approved, perimeter berms shall be constructed on three sides of the grid as shown on Figure 10-5. These berms shall be constructed from Type 1 material, and shall be 24 in. high and have minimum top width of 10 ft. The berms shall be placed and compacted in 12- to 15-in.-thick loose lifts in accordance with this IMPP. An additional berm shall be constructed (with the same requirements of the perimeter berms) in the middle of the grid to provide access for a trackhoe (or other equipment) to spread and compact material. This additional berm is not necessary if equipment access for spreading or tamping the impacted material, such as bagged asbestos, is not required. Until bagged or nonbagged ACM placement in the grid is complete, the fourth side shall be left open for trucks to enter and exit the grid.

The fourth side of the perimeter berm shall be constructed after completion of bagged or nonbagged ACM as shown on Figures 10-6 and 10-7. These berms shall be compacted to meet at least 90 percent of the standard Proctor maximum dry density as described in Section 6.4.2. Compaction shall be tested in accordance with this IMPP. The surface of Type 1 material on which the bagged or nonbagged ACM will be placed shall be graded at an approximately 1 percent downward slope, away from the truck entrance and exit side of the grid. A temporary diversion berm (approximately 18 in. high) shall be constructed as needed approximately 30 ft in front of the grid entrance to limit runoff entering the grid. The grid shall be oriented so that the open side (fourth perimeter berm) is at the upgradient side of the grid. The required radiological controls for the placement area will be established before commencing bagged or nonbagged ACM placement.

After the grid has been prepared, trucks transferring bagged or nonbagged ACM shall unload material at the downgradient end of the grid. Nonbagged ACM shall be spread and tamped by the bucket of a trackhoe to achieve a maximum loose lift thickness of 18 in. Bagged ACM shall be evenly spread. The trackhoe shall be of sufficient size and reach and be situated so that only the bucket shall contact the bagged or nonbagged ACM. Compaction, other than tamping from a trackhoe bucket, shall not be performed directly on the bagged or nonbagged ACM. In accordance with the ALARA concept, equipment operators and other personnel shall avoid contact with ACM. Fugitive dust and storm water runoff controls shall be in accordance with this IMPP. Water trucks and/or water hoses shall be available at the location of placement activities.

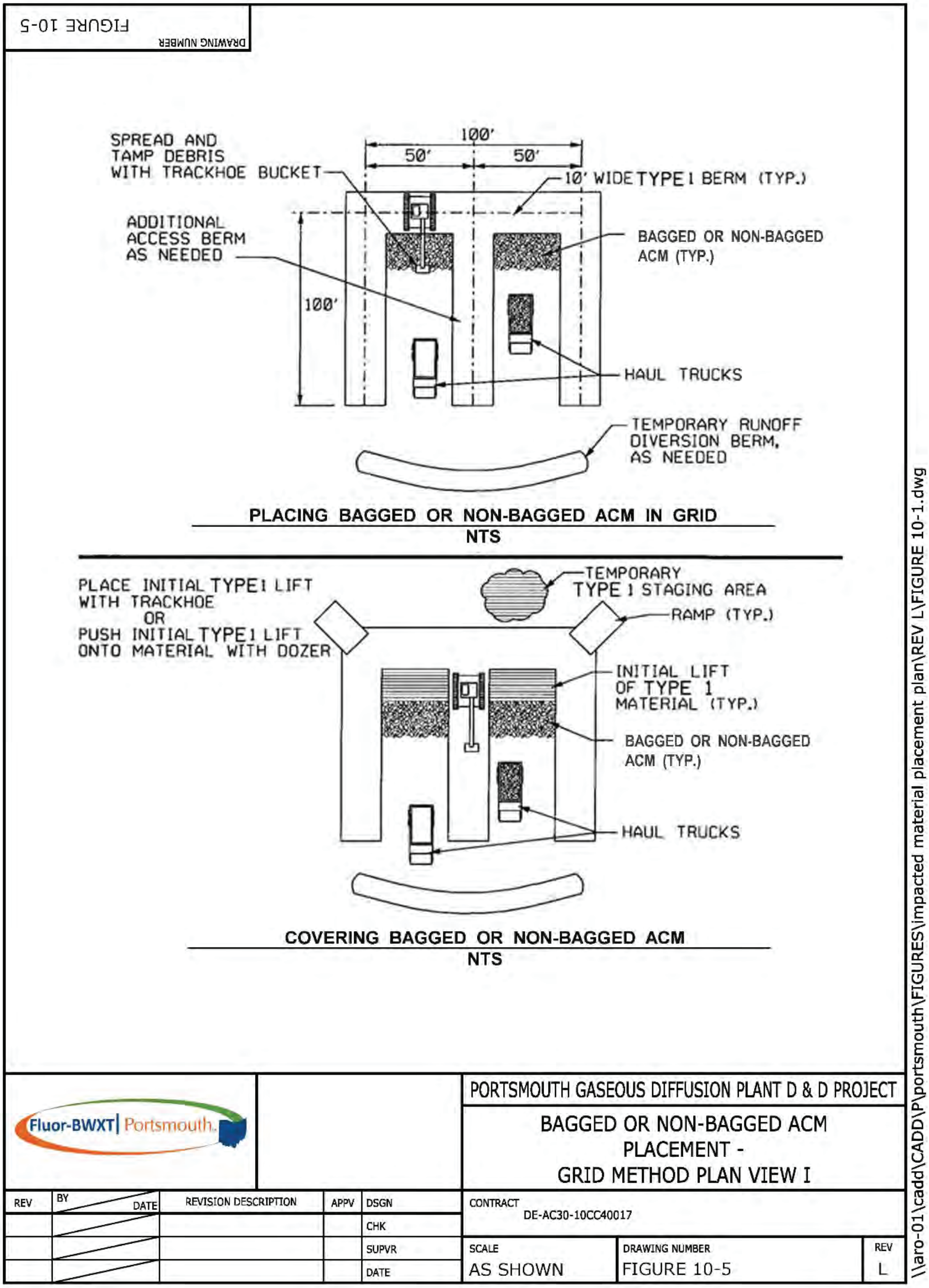


Figure 10-5. Bagged or Nonbagged ACM Placement – Grid Method Plan View I

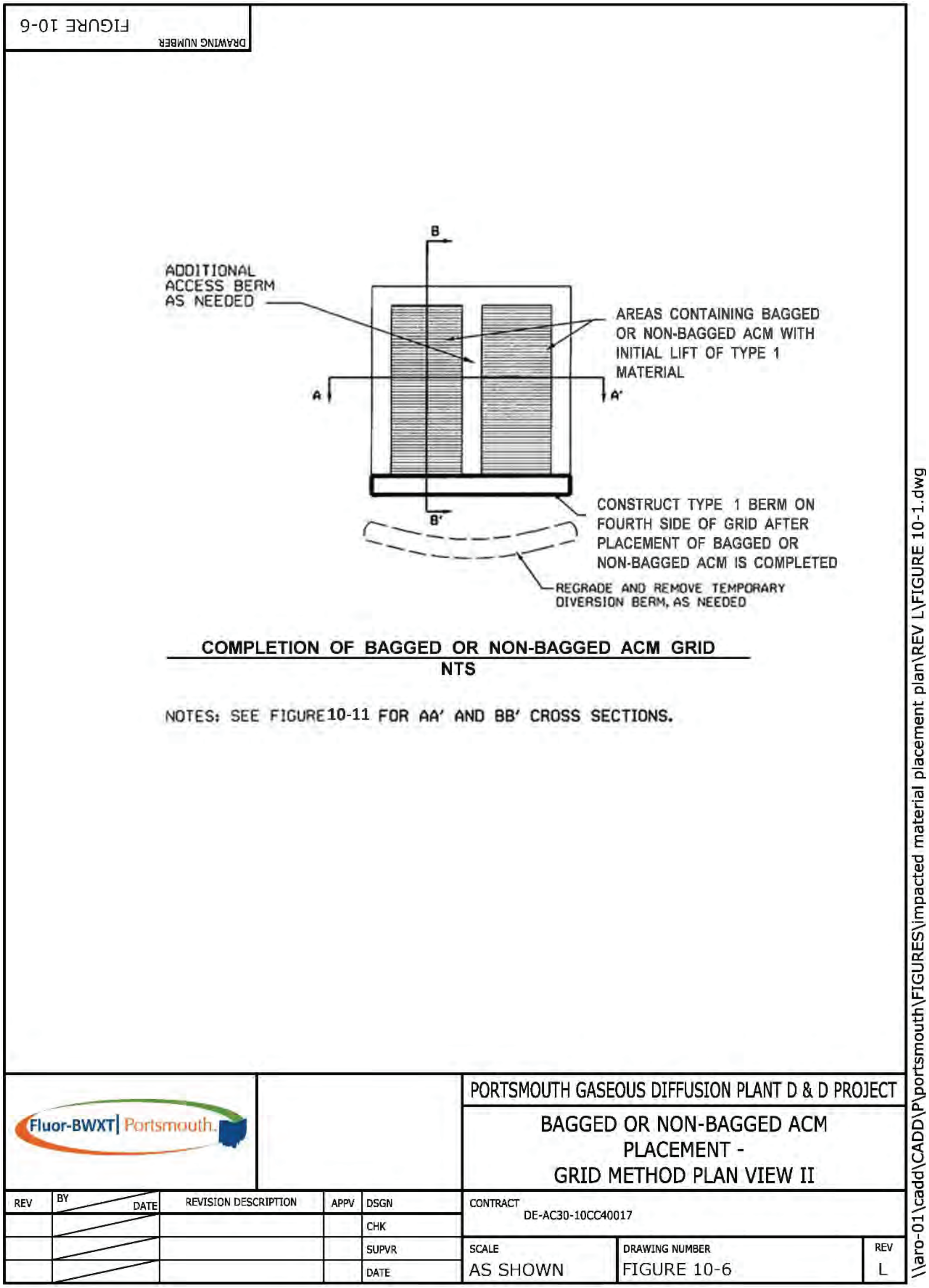


Figure 10-6. Bagged or Nonbagged ACM Placement – Grid Method Plan View II

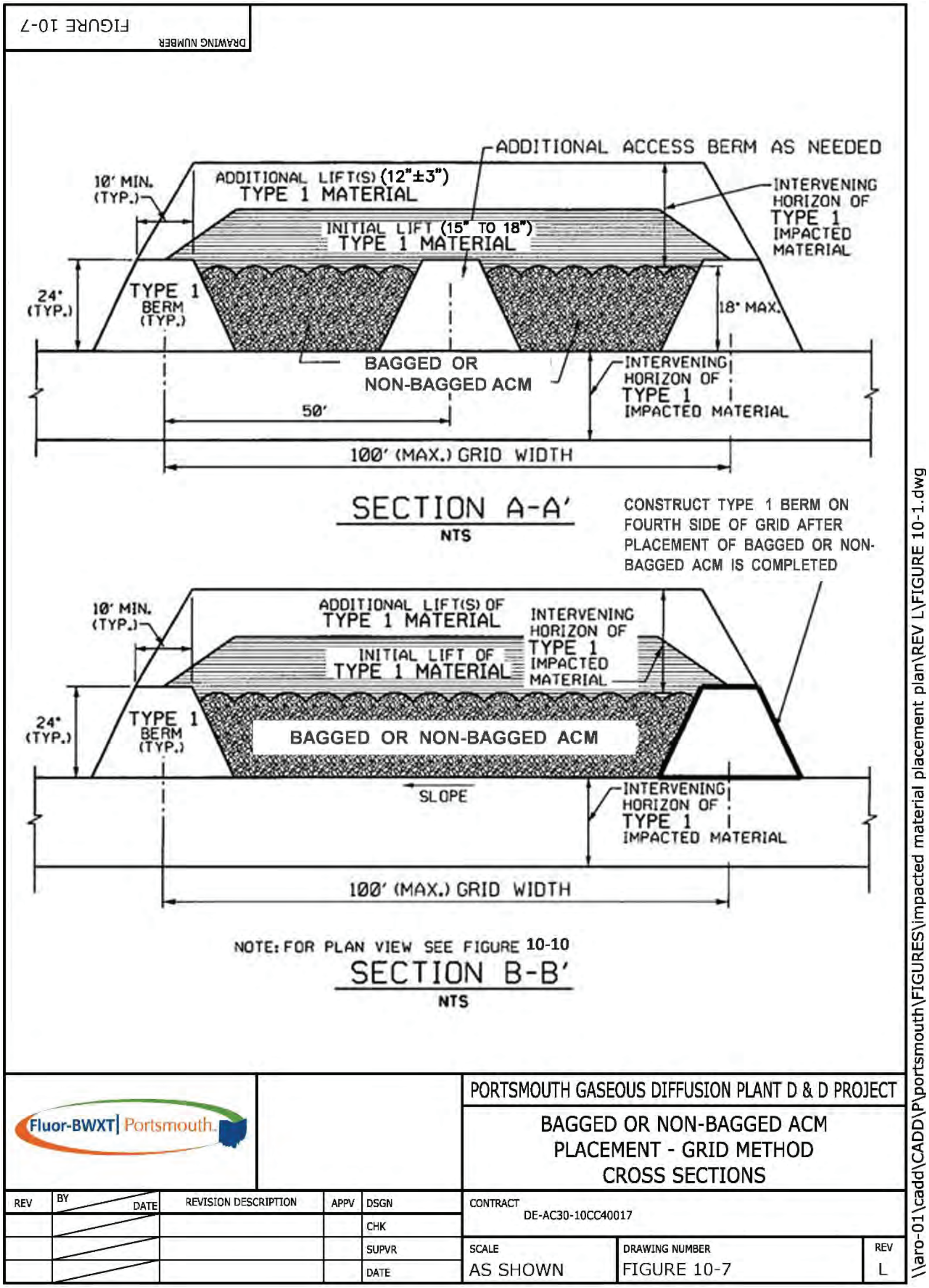


Figure 10-7. Bagged or Nonbagged ACM Placement – Grid Method Cross Sections

10.4.1.2 Compaction requirements

As material placement progresses, an initial 15-in. minimum, 18-in. maximum loose lift of Type 1 material (soil and soil-like material) shall be placed on top of the bagged or nonbagged ACM by the end of each working day. No bagged or nonbagged ACM shall remain uncovered with Type 1 material by the end of the workday. The initial lift shall be compacted with a minimum of four one-way passes of a self-propelled double drum roller compactor, a smooth drum vibratory roller, or other compaction equipment approved by the OSWDF Operations Manager. No compaction testing will be performed on the initial lift above the bagged or nonbagged ACM. The top of bagged or nonbagged ACM shall then be surveyed for horizontal location and elevation, subtracting the approximate thickness of the initial lift of Type 1 material, and the information shall be submitted to the OSWDF Operations Manager. As shown on Figures 10-6 and 10-7, the fourth side of the perimeter berm will be constructed after bagged or nonbagged ACM placement is complete. After the fourth side of the perimeter berm has been placed and the initial lift is placed over the bagged or nonbagged ACM, the temporary diversion berm to control storm water runoff (if needed) shall be removed. An additional 12-in. ±3 in.-thick loose lift(s) of Type 1 material shall be placed above the initial lift. Total compacted thickness of Type 1 material placed above the nonbagged ACM, including the initial lift, shall be at least as thick as the intervening horizon described in this IMPP (see Figure 10-7). The Type 1 material lift(s) above the initial lift shall be compacted to meet at least 90 percent of the standard Proctor maximum dry density (ASTM D698). Appropriate compaction equipment, including the Caterpillar 826 landfill compactor or approved equivalent, shall be used on lifts above the initial lift to meet the specified compaction requirements. Compaction of the additional lift(s) shall be tested in accordance with this IMPP.

After compacting the final lift of Type 1 material over the bagged or nonbagged impacted material, the Type 1 material shall be performance-tested using one of the alternatives described below. The OSWDF Operations Manager will select which performance test to use based on the characteristics of the Type 1 material:

- *Alternate 1 – Proof-rolling*
  After compacting the final lift of Type 1 material over the bagged or nonbagged impacted material, the Type 1 material shall be proof-rolled. The proof-rolling equipment shall have a minimum gross vehicle weight of 20 tons and exert a ground pressure of at least 65 psi. Soft spots indicated by the tire ruts more than 3 in. in depth or visible deflection under the moving proof-rolling equipment shall be stabilized through additional passes of the compactor. Any soft spot that cannot be stabilized with further compactive effort shall be repaired. The repair shall consist of removal, replacement, and recompaction of the Type 1 material, and if needed, infilling soft spots/areas in the bagged or nonbagged impacted material with other material approved by the OSWDF Operations Manager.

- *Alternate 2 – Placement and compaction of second lift of Type 1 material*
  Place a second 12- to 15-in.-thick loose lift of Type 1 material and compact in accordance with Section 6.4.2 of this IMPP. The second lift of Type 1 material placed and compacted shall pass the performance testing requirements of Section 6.4.2 and Appendix A of the IMPP. Any failing areas shall be reworked and retested in accordance with Section 6.4.2.

If a material does not meet the Type 1 impacted material compaction requirements described above, one or a combination of the following may be implemented: (i) increase moisture content by adding water; (ii) dry the material; (iii) amend with granular material; and/or (iv) other method approved by the OSWDF Operations Manager.

10.4.2 Option 2 – Placement by Trenching Method

10.4.2.1 Placement requirements

Bagged or nonbagged impacted material shall be placed by the trenching method when the estimated quantity of debris will be less than the quantity required to fill a half grid, and a previously placed minimum 3-ft-thick Type 1 grid is available for placement of bagged or nonbagged ACM as shown on Figure 10-8. The OSWDF Operations Manager will select and approve a grid with a previously placed minimum 3-ft-thick Type 1 layer overlying an intervening horizon of Type 1 material. The trench for placement of impacted material by this method shall meet the following requirements:

- The width of the trench shall be approximately the width of the transferring container for the bagged or nonbagged ACM plus 2 ft, but generally between 8 ft to 12 ft.

- Grids with bagged or nonbagged ACM trenches shall not be laterally adjacent to each other within the same horizontal plane. The grids may be placed in a checkerboard pattern that is diagonally from one another, when the bagged or nonbagged ACM is placed within the 14-ft (±2 ft) nominal zone above the top of the 3-ft-thick select impacted material layer above the liner system. See Figure 10-3 for typical checkerboard pattern configuration.

- A grid with bagged or nonbagged ACM placed by the grid method and a grid with bagged or nonbagged ACM placed by the trenching method shall not be adjacent to each other in the same horizontal plane. The grids may be placed in a checkerboard pattern that is diagonally from one another, when the bagged or nonbagged ACM is placed within the 14-ft (±2 ft) nominal zone above the top of the 3-ft-thick select impacted material layer above the liner system. See Figure 10-3 for typical checkerboard pattern configuration.

- A trench for bagged or nonbagged ACM shall not be excavated in previously placed Types 2 through 5 impacted material, protective layer, or 3-ft-thick select impacted material layer.

- A trench for bagged or nonbagged ACM shall not be excavated within 6 ft under the select impacted material for the final cover system.

- A maximum of two lifts of bagged or nonbagged ACM may be placed in each grid column, provided both lifts of bagged or nonbagged ACM can be placed within the nominal zone above the top of the 3-ft-thick select impacted material layer above the liner system, and a minimum 6 ft of Type 1 and/or Type 2 impacted material is placed to separate the two lifts of bagged or nonbagged ACM. Where this requirement cannot be met, only one lift of bagged or nonbagged ACM may be placed within a grid column.

- The minimum thickness of Type 1 material under a bagged or nonbagged ACM trench excavation shall be the thickness of the intervening horizon of Type 1 impacted material, as described in this IMPP.

Bagged or nonbagged ACM placement in a trench shall be in accordance with the following requirements and general methods, and as shown on Figure 10-8.

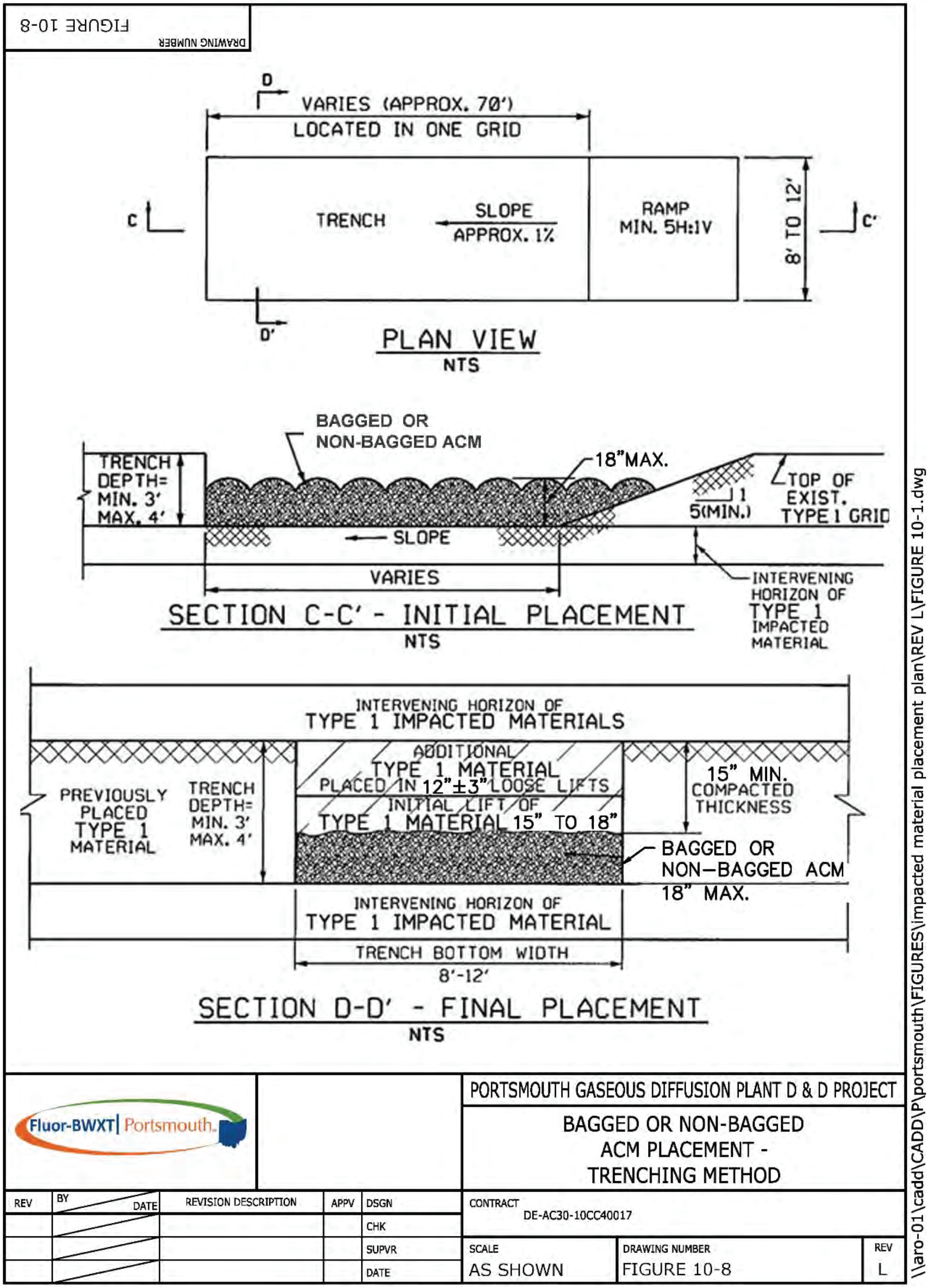


Figure 10-8. Bagged or Nonbagged ACM Placement – Trenching Method

After a grid is selected and approved, a trench (or trenches) shall be excavated as shown on Figure 10-8. Each trench shall be a minimum of 3 ft deep and a maximum of 4 ft deep, and between 8 ft and 12 ft wide. A minimum 6-ft distance shall be maintained between top of the side slopes of the adjacent trench. One end of the trench shall be graded for truck access into the trench. The trench bottom shall be graded at an approximately 1 percent downward slope, away from the truck access ramp. The maximum trench length shall be approximately 70 ft and shall be limited by the maximum length that can be excavated in one grid and still provide adequate access to enter and exit the trench. The Type 1 material excavated from the trench shall be stockpiled a minimum of 6 ft from the top of the side slopes of the trench and shall be used later for initial and additional lifts thickness over bagged or nonbagged impacted material.

After the trench is excavated, trucks transporting bagged or nonbagged ACM shall back down the ramp and begin dumping material at the farthest end of the trench.

Bagged or nonbagged ACM shall be spread and tamped by the bucket of a trackhoe to achieve a maximum loose lift thickness of 18 in. The trackhoe shall be situated so that only the bucket shall contact the bagged or nonbagged ACM. Compaction, other than tamping from a trackhoe bucket, shall not be performed directly on bagged or nonbagged ACM. Equipment operators and other personnel shall avoid contact with asbestos impacted material in accordance with the ALARA concept. Fugitive dust and storm water runoff controls shall be used in accordance with this IMPP. Water trucks and/or water hoses will be available at the location of placement activities. The bottom of the trench and the top of the bagged or nonbagged ACM shall be surveyed for location and elevation and the information shall be submitted to the OSWDF Operations Manager.

10.4.2.2 Compaction requirements

After bagged or nonbagged ACM is placed in the trench and compacted, it shall be covered with an initial 15-in. minimum, 18-in. maximum loose lift of Type 1 material by the end of each working day. The initial lift shall be compacted with a minimum of four one-way passes of a self-propelled double drum roller compactor, a smooth drum vibratory roller, or other compaction equipment approved by the OSWDF Operations Manager. No compaction testing will be performed on the initial lift above bagged or nonbagged ACM. An additional 12-in. 3 in. loose lift(s) of Type 1 material shall be placed above the initial lift. Total compacted thickness of Type 1 material placed above bagged or nonbagged ACM, including the initial lift, shall be a minimum 15 in. as shown on Figure 10-8. The Type 1 material lift(s) above the initial lift shall be compacted to meet at least 90 percent of the standard Proctor maximum dry density (ASTM D698). Appropriate compaction equipment shall be used on lifts above the initial lift to meet the specified compaction requirements. Compaction of the additional lift(s) shall be tested in accordance with this IMPP.

After compacting the final lift of Type 1 material over bagged or nonbagged ACM, the Type 1 material shall be performance-tested using one of the alternatives described below. The OSWDF Operations Manager will select which performance test to use based on the characteristics of the Type 1 material:

- *Proof-rolling*
  The compacted lift of the Type 1 material shall be proof-rolled. The proof-rolling equipment shall have a minimum gross vehicle weight of 20 tons and exert a ground pressure of at least 65 psi. Soft spots indicated by tire ruts more than 3 in. in depth or visible deflection under the moving proof-rolling equipment shall be stabilized through additional passes of the compactor. Any soft spot that cannot be stabilized with further compactive effort shall be repaired to the satisfaction of the OSWDF Operations Manager. As shown on Figure 10-8, the trench will subsequently be covered with an intervening layer of Type 1 material.

- *Placement and compaction of second lift of Type 1 material*
  Alternatively, if approved in writing by the OSWDF Operations Manager or designated representative, place a second 12- to 15-in.-thick loose lift of Type 1 material and compact in accordance with Section 6.4.2 of this IMPP. The second lift of Type 1 material placed and compacted shall pass the performance testing requirements of Section 6.4.2 and Appendix A of the IMPP. Any failing areas shall be reworked and retested in accordance with Section 6.4.2.

If a material does not meet the Type 1 impacted material compaction requirements described above, one or a combination of the following may be implemented: (i) increase moisture content by adding water; (ii) dry the material; (iii) amend with granular material; and/or (iv) other method approved by the OSWDF Operations Manager.

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11. REFERENCES

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DOE 2014, *Remedial Investigation and Feasibility Study Report for the Site-wide Waste Disposition Evaluation Project at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio (RI/FS)*, DOE/PPPO/03-0246&D3, U.S. Department of Energy, Piketon, OH, February.

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APPENDIX A: ARARS AND TO-BE-CONSIDERED (GUIDANCE) CRITERIA

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ARARs and To-Be-Considered Criteria

Media/Location/Action	Requirements[a]	Prerequisite	Citation	IMPP Section Addressing ARAR
HAZARDOUS WASTE				
	Hazardous waste treatment/disposal			
Wind dispersal control system	If the landfill contains any particulate matter which may be subject to wind dispersal, must cover or manage the landfill to control wind dispersal of particulate matter.	Operation of a RCRA hazardous waste landfill—applicable	40 *CFR* 264.301(j) *OAC* 3745-57-03(J)	Section 5.10, *Surface Conditions and Runoff Controls*. By the end of each working day, exposed surfaces of Type 1 impacted materials will be prepared to control wind dispersal of particulate matter.
Disposal of bulk or containerized hazardous liquids	Unless they are very small, containers must be either at least 90% full when placed in the landfill, or crushed, shredded, or similarly reduced in volume to the maximum practical extent before burial in the landfill.	Placement of bulk or containerized hazardous waste liquids in a landfill—applicable	40 *CFR* 264.315 *OAC* 3745-57-15	Section 4.4, *Type 3*. Requires containerized waste to be at least 90% full unless they are very small. Crushed, shredded, or size reduced containers are placed as Type 2 materials.
SOLID WASTE				
	Design, construction, operation, and closure of a solid waste landfill			
Conditions that cause the presence of insects, rodents, and vectors	Shall operate the facility in such a manner that conditions are controlled for insects, rodent, and vectors and they do not cause a nuisance or health hazard. Supplemental vector control measures may be implemented if deemed necessary.	Operation of a sanitary landfill—applicable	*OAC* 3745-27-19 (B)(4)	Section 5.11 *Daily Cover*. Daily cover will be applied selectively where the specific waste being placed has the potential to create the unacceptable conditions contemplated by the referenced *OAC* citation above or where required to minimize airborne concentrations of hazardous air contaminants.

[a]The requirements portion of the ARARs table is intended to provide a summary of the cited ARAR. The omission of any particular requirement does not limit the scope of the cited ARARs.

Media/Location/Action	Requirements[a]	Prerequisite	Citation	IMPP Section Addressing ARAR
Placement of waste in first layer ("select waste layer")	Shall place select waste as the first layer of waste in all areas within the limits of waste placement adjacent to or in contact with the leachate collection system to protect the composite liner from the intrusion of objects during operation of the facility. The select waste layer shall:	Operation of a sanitary landfill—applicable	*OAC* 3745-27-19 (D)(1)	Strict requirements are included in the design to protect the geomembrane liner from intrusion of objects. As shown on Figure 1-1, 5 ft of protective material above the geomembrane consists of the leachate collection layer, the protective layer, and the select impacted material.
	• Be spread but not compacted.		*OAC* 3745-27-19 (D)(1)(a)	Sections 3.2 and 6.2 state that the Protective Layer shall be constructed in accordance with Technical Specification Section 02240, which in turn references Section 02714 which provides construction equipment ground pressure restrictions within 3 ft of the geomembrane liner. The ground pressure restriction was designed to maintain the integrity of the geomembrane liner.
	• Not contain items over 2 ft in length that are capable of puncturing the liner.		*OAC* 3745-27-19 (D)(1)(b)	Sections 3.2 and 6 state that the maximum particle size is 6 in.

Media/Location/Action	Requirements[a]	Prerequisite	Citation	IMPP Section Addressing ARAR
Placement of waste in first layer ("select waste layer") (continued)	• Not restrict the flow of liquid to the leachate collection and management system.		*OAC* 3745-27-19 (D)(1)(c)	The 5 ft of protective material above the geomembrane is as permeable, or more permeable, than the soil matrix (Type 1 Impacted Materials) of the OSWDF. Therefore, it will not restrict leachate flow to the leachate collection system.
	• Not contain fines or small particles which can clog the leachate collection system		*OAC* 3745-27-19 (D)(1)(d)	Geotextile filters have been designed (Calculation G7) to retain fine soil particles to prevent clogging of the leachate collection system while maintaining adequate flow of leachate into the leachate collection system.
	• Be placed as a single lift above the leachate collection layer so a minimum distance of 5 ft is created between the liner and general waste.		*OAC* 3745-27-19 (D)(1)(e)	Figure 1-1, *Liner and Final Cover (Cap) Systems Detail for OSWDF*. Five ft of Type 1 material is provided by the granular leachate collection system drainage layer, the protective layer, and select impacted material layer.

Media/Location/Action	Requirements[a]	Prerequisite	Citation	IMPP Section Addressing ARAR
General operating criteria for sanitary landfills	Ensure preparations have been made such that during inclement weather the facility is able to receive, compact, and cover incoming waste. Preparations include, but are not limited to designation and preparation of areas where waste will be deposited, compacted, and covered during inclement weather; construction and maintenance of all-weather roads: and stockpiling of cover material.	Operation of a sanitary landfill—applicable	*OAC* 3745-27-19 (E)(6)	Section 5.11 *Daily Cover*. Impacted materials requiring daily cover will not be received at the OSWDF unless there is an adequate supply of material to meet the daily cover requirement. The OSWDF O&M Plan, Section 6.5, *Roads Surveillance and Maintenance*, addresses maintenance of roads; OSWDF O&M Plan, Section 9.4.3.1, *Inclement and Severe Weather*, addresses inclement weather operations for this ARAR.

Media/Location/Action	Requirements[a]	Prerequisite	Citation	IMPP Section Addressing ARAR
General operating criteria for sanitary landfills (continued)	Prior to accepting waste, comply with all leachate requirements, discharge, and emission requirements. Do not begin filling a new phase without completing the previous phase, except as necessary for proper operation. Confine unloading to the smallest area possible and provide knowledge supervision at the working face. Do not deposit waste that is burning or may cause fire at the working face. Except as provided in paragraphs (D)(1) and (E)(7)(d), deposit waste at the working face, spread in layers not more than 2 ft thick, and compact to the smallest practical volume. Bulky material shall be compacted or otherwise managed in a way to ensure proper daily cover and ensure dusty materials are handled in such a way to minimize dust generation.	Waste acceptance and placement—applicable	*OAC* 3745-27-19 (E)(7)(a-f)	Section 5.2, *Protection of Facilities.* Impacted material placement activities shall not commence in a cell until liner system construction has been completed in accordance with the design and construction contract documents and readiness to operate has been obtained. Section 9.2, *Placement Requirements.* Type 4 waste is placed in 18-in. loose lifts and compacted. Fire hazards are prevented by wetting the material prior to and during placement.
Litter	Collect, properly contain, and dispose of scattered litter	Operation of a sanitary landfill—applicable	*OAC* 3745-27-19 (E)(9)	Section 9.2, *Placement Requirements.* Wind dispersal of loose material shall be prevented by using water sprays, the initial compaction process, or other suitable methods.

Media/Location/Action	Requirements[a]	Prerequisite	Citation	IMPP Section Addressing ARAR
Daily cover	Daily cover shall be applied to all exposed solid waste by the end of the working day to control fire hazards, blowing litter, odors, insects, vectors, and rodents. In no event should solid waste be exposed more than 24 hrs after unloading. Daily cover shall be nonputrescible, shall not contain large objects, and shall not be a solid waste without prior authorization. Implementation requirements include the following:	Operation of a sanitary landfill—applicable	*OAC* 3745-27-19(F)	Section 5.11, *Daily Cover*. Daily cover will be applied to solid waste capable of creating blowing litter, fire hazards, or odors or with potential to attract insects, vectors, and rodents.
	Where there is a leachate management system, a soil layer a minimum of 6 in. thick shall be applied and maintained. The daily cover shall be removed prior to next waste placement so as not to impede the flow of leachate.		*OAC* 3745-27-19 (F)(1)	Section 5.11, *Daily Cover*. Contaminated fill is used as daily cover and therefore will not be removed prior to placing additional impacted material layers.
	• Where there is no leachate management system, a soil layer of at least 6 in. shall be used.		*OAC* 3745-27-19 (F)(2)	The OSWDF has a leachate management system.
	• An alternative daily cover (including solid waste) can be used with director approval if it provides comparable level of protection of human health and the environment.		*OAC* 3745-27-19 (F)(3)	Alternative daily cover is provided in this plan for Ohio EPA approval.
	• Less frequent than daily application may be approved by the director if the alternate frequency provides comparable and adequate protection.		*OAC* 3745-27-19 (F)(4)	See above.

Media/Location/Action	Requirements[a]	Prerequisite	Citation	IMPP Section Addressing ARAR
Intermediate cover	To minimize infiltration, apply intermediate cover to all filled areas where additional waste is not to be deposited for 30 days. An alternate time period can be approved by the director.	Operation of a sanitary landfill—applicable	*OAC* 3745-27-19 (G)(1)	Section 5.6.1, *General.* Alternative intermediate cover is provided in this plan for Ohio EPA approval.
	Intermediate cover material shall be nonputrescible: shall have low permeability, good compaction, cohesiveness, and relatively uniform texture; and shall not contain large objects. A minimum 12-in. soil layer shall be used unless other materials are demonstrated to the director to be comparable and as protective.		*OAC* 3745-27-19 (G)(2)	See above.
	Prior to next waste placement, the intermediate cover in an area shall be removed or otherwise prepared to avoid impeding flow of leachate to a leachate management system.		*OAC* 3745-27-19 (G)(3)	See above.
	Protect the intermediate cover from erosion.		*OAC* 3745-27-19 (G)(4)	Section 5.10, *Surface Protection and Runoff Controls.* Surface conditions of the OSWDF are maintained throughout the year, including periods of inactivity.
		Solid waste disposal		
Prohibition on open dumping of solid wastes	Temporary storage of putrescible solid wastes in excess of 7 days, or temporary storage of any solid wastes where such storage causes a nuisance or health hazard, shall be considered open dumping.	Temporary storage of solid waste prior to collection for disposal or transfer—applicable	*OAC* 3745-27-03 (A)(2)	Section 5.6.1, *General* prohibits open dumping and requires corrective action if violated.

Media/Location/Action	Requirements[a]	Prerequisite	Citation	IMPP Section Addressing ARAR
Prohibition on open dumping of solid wastes (continued)	No person shall conduct, permit, or allow open dumping. In the event that open dumping is or has occurred, person(s) responsible shall promptly remove and dispose of or otherwise manage the solid waste and shall submit verification that the waste has been properly managed.	Management and disposal of solid waste—applicable	*OAC* 3745-27-05(C)	See above.
Disposal of whole or shredded scrap tires	Whole or shredded scrap tires cannot be disposed of at a sanitary landfill with the exception of the following:		*OAC* 3745-27-19 (E)(8)(g)	Section 4.3, *Type 2*. Whole, shredded, or sheared scrap tires must meet these exception requirements for disposal in the OSWDF.
	• Burned or partially burned scrap tires, pyrolytic oil, and contaminated soils provided those materials meet the definition of solid waste in *OAC* 3745-27-01.		*OAC* 3745-27-19 (E)(8)(g)(i)	See above.
	• Scrap tire pieces from a scrap tire recovery facility that are the byproduct of scrap tire processing.		*OAC* 3745-27-19 (E)(8)(g)(ii)	See above.
	• Authorized beneficial uses of scrap tires pursuant to *OAC* 3745-27-78.		*OAC* 3745-27-19 (E)(8)(g)(iii)	See above.

Media/Location/Action	Requirements[a]	Prerequisite	Citation	IMPP Section Addressing ARAR
Disposal of whole or shredded scrap tires (continued)	• Whole scrap tires which could not be processed by a scrap tire recovery facility. The owner or operator of the scrap tire recovery facility shall complete a scrap tire shipping paper and record on the shipping paper why the scrap tires are not processable at the scrap tire recovery facility. This includes, but is not limited to aircraft tires and forklift tires that are not processable due to their construction, or scrap tires contaminated with mud or other materials that render the tires unsuitable for processing.		*OAC* 3745-27-19 (E)(8)(g)(iv)	See above.
TSCA/PCB WASTES				
Design, construction, operation and closure of a TSCA chemical waste landfill				
Operation of a TSCA chemical waste landfill	Site shall be operated and maintained to prevent hazardous conditions resulting from spilled liquids and windblown materials.	Operation of a TSCA chemical waste landfill—applicable	40 *CFR* 761.75 (b)(9)(iii)	PCB liquids are not accepted for disposal per OSWDF WAC which eliminates the risk of spills during OSWDF operations. Section 5.7, *Material Storage in the OSWDF* and Section 5.11, *Daily Cover*. Controls are used to mitigate release of contamination from impacted materials to prevent hazardous conditions resulting from dispersion of contaminants.

Media/Location/Action	Requirements[a]	Prerequisite	Citation	IMPP Section Addressing ARAR
		PCB waste treatment/disposal		
Disposal of TSCA PCB waste in a chemical waste landfill	Must be placed in a manner that will prevent damage to containers or articles. Other wastes that are not chemically compatible with PCBs shall be segregated from the PCBs throughout the handling and disposal process.	Disposal of PCBs or PCB Items in chemical waste landfill—applicable	40 *CFR* 761.75 (b)(8)(i)	Section 4.4, *Type 3.* PCB containers and PCB articles that must be placed in a manner that prevents damage shall be clearly identified. Section 4.1, *General.* Wastes that are not chemically compatible with PCBs and must be segregated from the PCBs throughout the handling and disposal process will be identified by waste generators.
RADIOACTIVE WASTE				
		Design, construction, operation and closure of a low-level radioactive waste landfill		
Facility requirements for land disposal of radioactive waste –performance objectives	Radioactive waste and its containers shall be protected from adverse environmental conditions including, but not limited to temperature changes that could compromise the isolation of the waste from the biosphere.	Siting, design, operation, and closure of a licensed radioactive waste land disposal facility—relevant and appropriate	*OAC* 3701:1-54-08 (B)(6)	Section 5.6.1, *General*. Waste transfer and placement cease during adverse weather conditions. Section 5.7, *Material Storage in the OSWDF* and Section 5.11, *Daily Cover* require controls, such as fixative, to mitigate release of contamination.
Facility requirements for land disposal of radioactive waste –operational requirements	The operation of the disposal facility shall incorporate the following items:	Operation of a licensed radioactive waste land disposal facility—relevant and appropriate	*OAC* 3701:1-54-08 (C)	Section 8 *Type 3 Impacted Material Placement* and Section 10, *Type 5 Impacted Material Placement*

Media/Location/Action	Requirements[a]	Prerequisite	Citation	IMPP Section Addressing ARAR
Facility requirements for land disposal of radioactive waste –operational requirements (continued)	• Waste shall be packaged in appropriate containers for disposal when applicable. Wastes shall be emplaced in a manner that maintains the package integrity during emplacement, minimizes void spaces between packages, and permits the void spaces to be filled.		*OAC* 3701:1-54-08 (C)(4)	Requirements for Type 3 and Type 5 waste receipt and placement address the filling of void spaces.
	• Void spaces between packages shall be filled as needed to reduce future subsidence within the fill.		*OAC* 3701:1-54-08 (C)(5)	See above.
	• Closure and stabilization measures as set forth in the approved site closure plan shall be carried out as each disposal unit is filled and covered.		*OAC* 3701:1-54-08 (C)(9)	Inspection and maintenance of the cover system will commence under the OSWDF PCCIP after the first cell cover system is installed.
	• Active waste disposal operations shall not have an adverse effect on completed closure and stabilization measures.		*OAC* 3701:1-54-08 (C)(10)	Section 2.1 *Overview*. Impacted material placement is designed to provide a stable waste mass and achieve the long-term performance goals of the OSWDF.

Media/Location/Action	Requirements[a]	Prerequisite	Citation	IMPP Section Addressing ARAR
Siting, design, and operation of a DOE LLW disposal facility	Operating procedures must protect the public, workers, and the environment, ensure the security of the facility, minimize subsidence during and after waste placement, achieve long-term stability and minimize the need for long-term active maintenance, and meet the requirements of the closure/postclosure plan.		DOE Manual 435.1-1 (IV)(P)(6)(a)	Section 2.1 *Overview*. Impacted material placement is designed to provide a stable waste mass and achieve the long-term performance goals of the OSWDF and to control release of fugitive emissions (including dust, radiological, chemical and asbestos material) to acceptable levels.
Facility requirements for land disposal of radioactive waste –performance objectives	Land disposal facilities shall be sited, designed, operated, closed, and controlled after closure to provide reasonable assurance that the following performance objectives will be met:	Siting, design, operation and closure of a licensed radioactive waste land disposal facility—relevant and appropriate	*OAC* 3701:1-54-08 (B)	Section 2.1 *Overview*. Impacted material placement is designed to provide a stable waste mass and achieve the long-term performance goals of the OSWDF.
	Disposal facility shall be sited, designed, used, operated, and closed to achieve long-term stability of the disposal site and to eliminate, to the extent practical, the need for ongoing active maintenance of the disposal site after closure so that only surveillance, monitoring, or minor custodial care is required.		*OAC* 3701:1-54-08 (B)(4)	See above.

Media/Location/Action	Requirements[a]	Prerequisite	Citation	IMPP Section Addressing ARAR
		Radioactive waste treatment/disposal		
Disposal of LLW in a landfill	Waste placement into disposal units shall minimize voids between containers with the voids filled to the extent practicable. Uncontainerized bulk waste shall be placed to minimize voids and subsidence.	Operation of a LLW disposal facility at a DOE site—TBC	DOE Manual 435.1-1 (IV)(P)(6)(c)	Section 8, *Type 3 Impacted Material Placement* and Section 10, *Type 5 Impacted Material Placement* address placement of containerized waste. Section 7, *Type 2 Impacted Material Placement* addresses bulk waste placement.
	Void spaces within the waste and, if containers are used, between the waste and its container shall be reduced to the extent practical.		DOE Manual 435.1-1 (IV)(G)(1)(d)(1)	See above.
ASBESTOS-CONTAINING WASTE				
		Operation and closure of an asbestos-containing waste disposal site		
Operation of an active ACM waste disposal site	Shall cause or permit no visible emissions to the outside air; or shall comply with the requirements of *OAC* 3745-20-06(B) [as noted below].	Operation of an active waste disposal site that receives ACM—applicable	*OAC* 3745-20-06(A)	Section 5.6.1, *General* Section 10.5, *Bagged or Nonbagged ACM* provides placement options designed to prevent discharge of visible emissions and dispersion of ACM.
	Shall be no visible emissions to the outside air from ACM during the on-site transportation, transfer, deposition, or compacting operations.		*OAC* 3745-20-06 (B)(1)	Section 5.6.1, *General* Transportation of ACM and all waste is addressed in the OSWDF O&M Plan, Section 4, *Transportation Plan*.

Media/Location/Action	Requirements[a]	Prerequisite	Citation	IMPP Section Addressing ARAR
Operation of an active ACM waste disposal site (continued)	Deposition and burial operations shall be conducted in a manner which prevents handling by equipment or persons that causes asbestos-containing waste materials to be broken up or dispersed before the materials are buried.		*OAC* 3745-20-06 (B)(2)	See above.
	As soon as practicable after deposition of the ACM but no later than at the end of each operating day, the ACM deposited during the operating day shall be covered with at least 12 in. of compacted nonasbestos-containing material. Alternatively, may apply for approval to utilize alternative control methods to bind dust, control wind erosion or convert asbestos to nonfriable forms.		*OAC* 3745-20-06 (B)(3)	Section 5.11, *Daily Cover*.
Asbestos-containing waste treatment and disposal				
Management of ACM prior to disposal	Discharge no visible emissions to the outside air, or use one of the emission control and waste treatment methods specified in Paragraphs (a)(1) through (a)(4) of 40 *CFR* 61.150 [Paragraphs (B)(1) through (B)(4) of *OAC* 3745-20-05].	Generation, collection, processing, packaging, and transporting of any ACM that is not Category I or II nonfriable ACM waste that did not become crumbled, pulverized, or reduced to powder [40 *CFR* 61.150 (a)(5)]—applicable	40 *CFR* 61.150(a) *OAC* 3745-20-05(B)	Section 5.6.1, *General*

ACM = asbestos-containing material
ARAR = applicable or relevant and appropriate requirement
CFR = Code of Federal Regulations
DOE = U.S. Department of Energy
IMPP = Impacted Material Placement Plan
LLW = low-level (radioactive) waste
O&M = operation and maintenance
OAC = Ohio Administrative Code
Ohio EPA = Ohio Environmental Protection Agency
OSWDF = On-site Waste Disposal Facility
PCB = polychlorinated biphenyl
PCCIP = Post-Closure Care and Inspection Plan
RCRA = Resource Conservation and Recovery Act of 1976, as amended
TBC = to-be-considered (guidance)
TSCA = Toxic Substances Control Act of 1976
WAC = waste acceptance criteria

APPENDIX C: LEACHATE AND IMPACTED SURFACE WATER SYSTEMS PLAN

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ON-SITE WASTE DISPOSAL FACILITY (OSWDF) LEACHATE AND IMPACTED SURFACE WATER SYSTEMS PLAN

FINAL DESIGN

Portsmouth Gaseous Diffusion Plant, Decontamination & Decommissioning Project Piketon, Ohio

U.S. Department of Energy
DOE/PPPO/03-0441&D5

April 2022

This document is approved for public release per review by:

Samuel Eldridge/signature on file	7-11-2019
PORTS Classification Office/Export Controlled Information Officer	Date

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ON-SITE WASTE DISPOSAL FACILITY (OSWDF) LEACHATE AND IMPACTED SURFACE WATER SYSTEMS PLAN

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Prepared for
U.S. Department of Energy

Prepared by
Geosyntec Consultants
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Under Contract to
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CONTENTS

FIGURES

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TABLES

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ACRONYMS

ARAR	applicable or relevant and appropriate requirement
ARV	air release valve
BS	basket strainer
CFR	*Code of Federal Regulations*
CM	control manhole
D&D	decontamination and decommissioning
DCP	Design Criteria Package
DOE	U.S. Department of Energy
FAL	flow alarm low
FCO	forcemain cleanout
FE	flow meter
FIT	flow indicating transmitter
FT	flow transmitter
FQI	flow totalizer/indicator
HDPE	high-density polyethylene
HOA	hand-off/automatic
IDR	inside dimension ratio
ILTS	Interim Leachate Treatment System
IMTA	Impacted Material Transfer Area
ISWMS	Impacted Surface Water Management System
LAH	level alarm high
LAHH	level alarm high high
LAL	level alarm low
LALL	level alarm low low
LCA	Leachate Catchment Area
LCS	Leachate Collection System
LDS	Leak Detection System
LEL	lower explosive limit
LISWMS	Leachate and Impacted Surface Water Management System
LISWSP	Leachate and Impacted Surface Water Systems Plan
LMS	Leachate Management System
LS	level switch
LT	level transmitter
LTS	Leachate Transmission System
MLTS	Modular Leachate Treatment System
MPZ	mini power zone
O&M	operations and maintenance
OAC	*Ohio Administrative Code*
Ohio EPA	Ohio Environmental Protection Agency
OSWDF	On-site Waste Disposal Facility
P&ID	piping and instrumentation diagram
PAH	pressure alarm high
PAL	pressure alarm low
PI	pressure indicator
PIT	pressure indicating transmitter
PLC	programmable logic controller
PMP	pump

PORTS	Portsmouth Gaseous Diffusion Plant
PSVP	Performance Standards Verification Plan
PVC	polyvinyl chloride
RLCS	Redundant Leachate Collection System
ROD	record of decision
SAP	sampling and analysis plan
SDR	standard dimension ratio
SWMESC	Surface Water Management and Erosion and Sediment Control
TBC	to-be-considered (guidance)
VH	valve house
VM	valve manhole

1. INTRODUCTION

This Draft On-site Waste Disposal Facility (OSWDF) Leachate and Impacted Surface Water Systems Plan (LISWSP) will guide inspection, monitoring, maintenance, and operation of the leachate and impacted surface water management systems (LISWMSs) associated with construction, operation, and closure of the OSWDF, Impacted Material Transfer Area (IMTA), and IMTA support systems at the U.S. Department of Energy's (DOE's) Portsmouth Gaseous Diffusion Plant (PORTS) Decontamination and Decommissioning (D&D) Project in Piketon, Ohio. This plan covers management of leachate and potentially impacted surface water. Leachate is managed by two systems: the OSWDF Leachate Management System (LMS) and the IMTA LMS. Potentially impacted surface water is managed by the IMTA Impacted Surface Water Management System (ISWMS).

The OSWDF design is prepared in accordance with the waste disposition applicable or relevant and appropriate requirements (ARARs) provided in the *Record of Decision for the Site-wide Waste Disposition Evaluation Project at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (Waste Disposition Record of Decision [ROD]) (DOE 2015). ARARs specifically applicable to this plan are included in Appendix A.

Leachate generated as a result of OSWDF operations (waste placement) must be conveyed to a leachate treatment system for removal of contaminants prior to discharge per the *Ohio Administrative Code (OAC)* – Operational Criteria for a Sanitary Landfill Facility (*OAC* 3745-27-19[K][5]).

This LISWSP is an appendix to the OSWDF Operations and Maintenance (O&M) Plan. Consistent with *The April 13, 2010 Director's Findings and Orders for Removal Action and Remedial Investigation and Feasibility Study and Remedial Design and Remedial Action, including the July 16, 2012 Modification thereto* (Ohio Environmental Protection Agency [Ohio EPA] 2012), Attachment B – Remedial Design/Remedial Action Statement of Work, Section 4.6, a Final Design version of the OSWDF O&M Plan (including this LISWSP) will be submitted to Ohio EPA for concurrence prior to the start of initial operations.

Per the OSWDF Design Criteria Package (DCP), this plan has been prepared to augment the OSWDF drawings and specifications. This plan describes operations, maintenance, and monitoring of these systems, including the associated electrical and mechanical equipment and ancillary facilities.

1.1 PURPOSE AND SCOPE OF LISWSP

The purpose of this draft LISWSP is to describe the start-up, operation, inspection, maintenance, and monitoring activities associated with management of leachate by the OSWDF LMS and IMTA LMS and the management of potentially impacted surface water by the IMTA ISWMS. The components of these systems are defined as follows:

- **OSWDF Leachate Management System –** The systems, structures, and components designed to capture, contain, and convey leachate generated within the OSWDF and to detect leaks in the liner system. The systems that perform these functions are the Leachate Collection System (LCS), Leachate Transmission System (LTS), and Leak Detection System (LDS), respectively. Figure 1-1 shows the components of the fully constructed LTS used to convey leachate from the OSWDF to the Interim Leachate Treatment System (ILTS) for treatment.

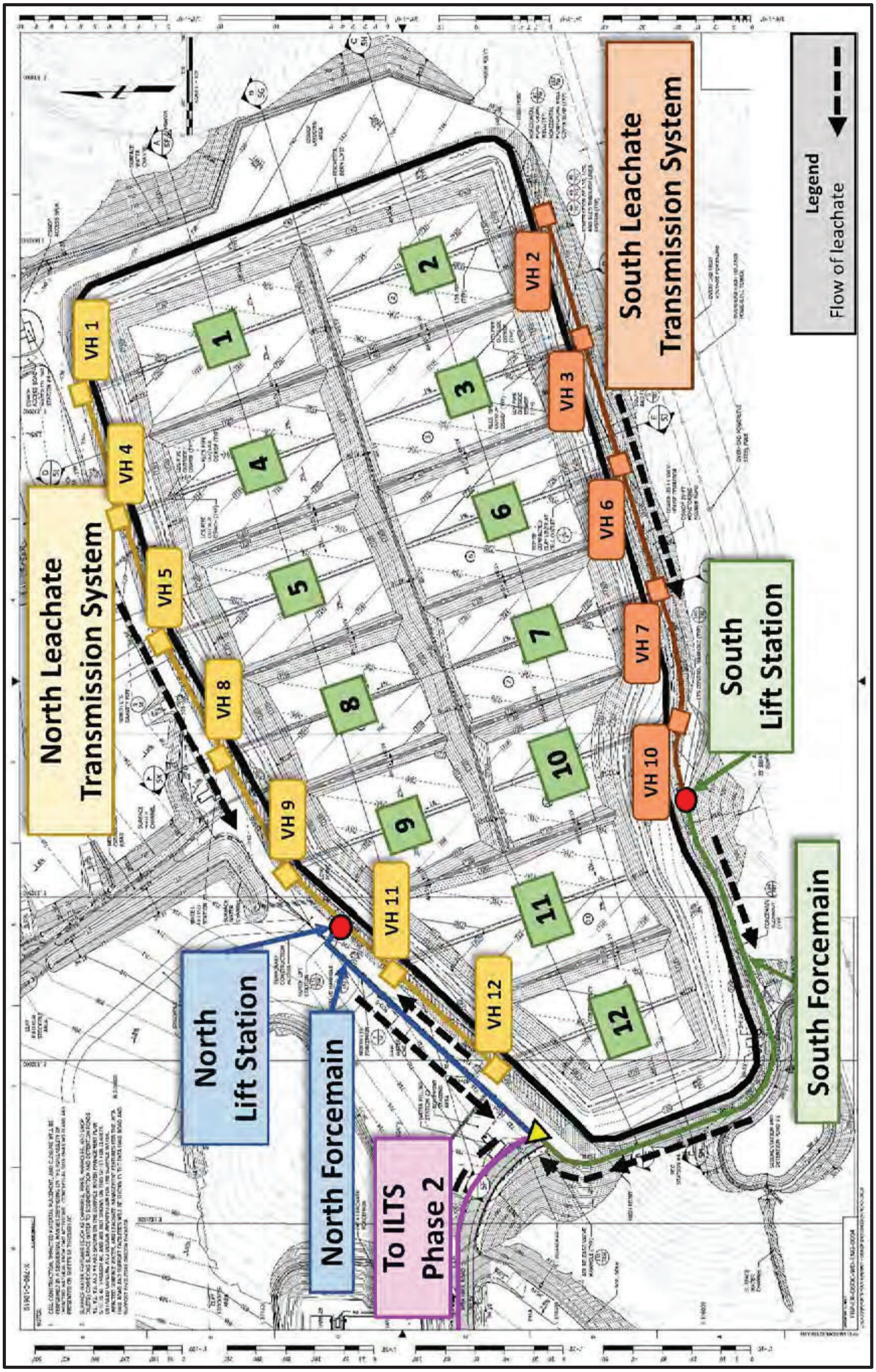


Figure 1-1. OSWDF Leachate Transmission System

- **IMTA Leachate Management System –** The systems, structures, and components designed to capture and convey leachate from the IMTA to Tank 1 and liquids from the Wheel Wash Facility to Tank 1. Figure 1-2 delineates the areas from which liquids are captured and collected in Tank 1 during full-scale operations.

- **IMTA Impacted Surface Water Management System –** The systems, structures, and components designed to collect and convey potentially impacted surface water from the potentially impacted section of the IMTA Haul Road (the section between the OSWDF and the Wheel Wash Facility) to Tank 2A. Figure 1-2 delineates the areas from which liquids are captured and collected in Tank 2A during full-scale operations.

This LISWSP does not address the following components:

- The systems, structures, and piping that convey surface water that is not impacted to the OSWDF sedimentation basins. These components are addressed in the OSWDF Surface Water Management and Erosion and Sediment Control (SWMESC) Plan.

The following components are addressed in the ILTS Design Package and procedures:

- The systems, structures, and piping associated with the influent conveyance pipeline that conveys leachate to the ILTS (ILTS Phase 1 – MLTS or ILTS Phase 2). The influent conveyance pipeline begins near the northwest corner of future Cell 12 and terminates at the ILTS Influent Valve Vault at the ILTS location.

- The systems, structures, and components associated with treatment of leachate or impacted surface water (ILTS Phase 1 – MLTS or ILTS Phase 2).

- The systems, structures and piping associated with the effluent conveyance pipeline that conveys treated effluent from the ILTS to the existing outfall line for Outfall 4.

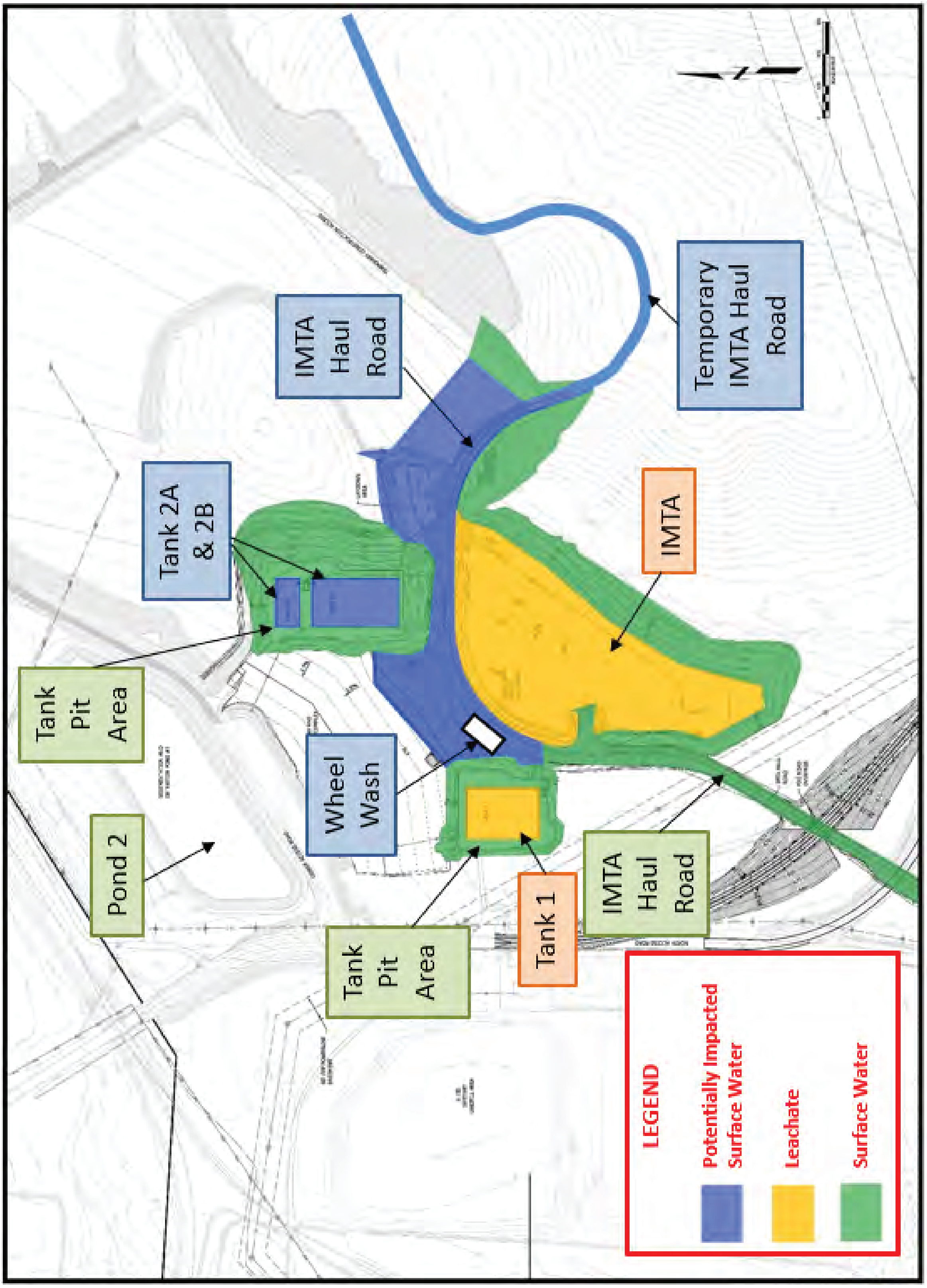


Figure 1-2. Delineation of Surface Water, Potentially Impacted Surface Water, and Leachate Generation for the IMTA, the IMTA Haul Road, Tanks 1 and 2A/2B, and Surrounding Areas during Full-scale Operations

1.2 PROJECT OVERVIEW

On-site waste disposal is part of a single remedial action per the Waste Disposition ROD. Based on the size of the remedial action and potential variability of funding, OSWDF operations (waste placement) are to be implemented in two distinct phases: (1) initial operations, and (2) full-scale operations. To coincide with the two phases of waste placement operations, leachate treatment operations will also be implemented in two distinct phases: (1) ILTS Phase 1 – MLTS; and, (2) ILTS Phase 2. A summary of these phases is provided in the following sections. Detailed descriptions of these phases are provided in the OSWDF O&M Plan.

1.2.1 Initial Operations Overview

Initial operations involve placement of waste in the OSWDF before the IMTA, IMTA Haul Road, Temporary IMTA Haul Road, IMTA ISWMS, Wheel Wash Facility, and the ILTS Phase 2 are constructed. During initial operations, leachate is treated by the ILTS Phase 1 – MLTS, which is constructed at the location of the future ILTS Phase 2. During initial operations, waste can be placed in a maximum of three active cells (Cells 1, 4, and 5). Placement of waste in these cells will continue during full-scale operations. The initial operations phase is described in detail in the OSWDF O&M Plan and is summarized as follows:

- Vehicles transfer waste to the OSWDF using existing site roads, including the North Access Road and portions of Perimeter Road.

- Vehicles offload waste into the OSWDF using transfer ramps located at the edge of the waste placement area.

- Waste is moved inside the cell footprint to a designated grid location.

- ILTS Phase 1 – MLTS treats leachate from OSWDF initial operations.

The ILTS Phase 1 – MLTS consists of a treatment system that has the capacity to treat leachate from up to three active cells within the OSWDF. The treatment capacity of the ILTS Phase 1 – MLTS is approximately 400 gpm. Unlike the ILTS Phase 2, the ILTS Phase 1 – MLTS does not have the capacity to treat impacted water from the IMTA, IMTA Support Systems, more than three active cells, or other site operations.

Because of the methods for transferring waste to the OSWDF during initial operations (refer to the OSWDF O&M Plan for a detailed description of OSWDF initial operations), potentially impacted surface water is not generated during initial operations and is therefore not a source of liquid for treatment at the ILTS Phase 1 – MLTS.

1.2.2 Full-scale Operations Phase Overview

As OSWDF construction and operations progress and infrastructure is added, the volume and the sources of leachate and potentially impacted surface water to be managed will increase. Waste placement in additional cells will increase the volume of leachate. Operation of the IMTA and portions of the IMTA Haul Road will increase the volume and sources of leachate and potentially impacted surface water will be introduced. The IMTA, IMTA Haul Road, IMTA LMS, ISWMS, and a fourth cell can be constructed, but cannot be operated until the ILTS Phase 2 is constructed and operational. When the remaining OSWDF support infrastructure and the ILTS Phase 2 are constructed and operational, the OSWDF will begin full-scale operations.

Full-scale operations begin when the IMTA, IMTA Haul Road, IMTA ISWMS, Wheel Wash Facility, and ILTS Phase 2 are constructed and operational. As cells are filled to capacity, cell cover systems are constructed and maintained while newer cells are being filled. The full-scale operations phase is described in detail in the OSWDF O&M Plan and is summarized as follows:

- Vehicles transfer waste from project generators on dedicated roads, which includes the IMTA Haul Road.

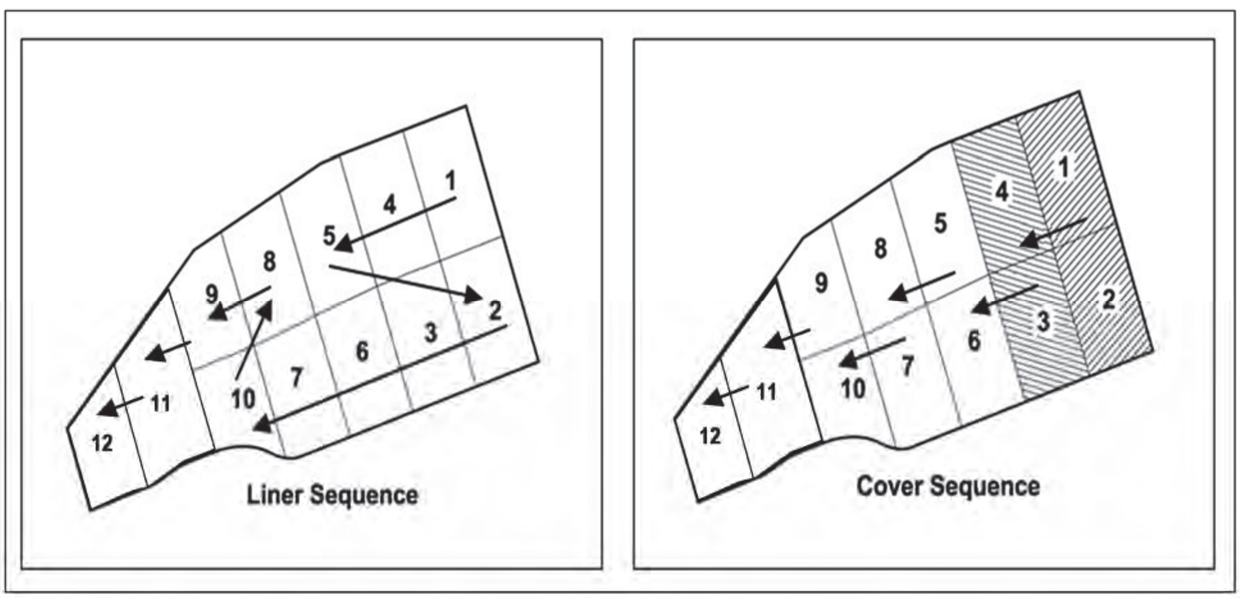
- Waste can be staged in the IMTA before it is moved to the OSWDF.

- Vehicles move waste from the IMTA directly into the OSWDF active waste placement area, and undergo wheel washing and release prior to returning to waste-generating areas.

- ILTS Phase 2 can treat the maximum anticipated flow of leachate and impacted surface water from OSWDF full-scale operations (multiple cells, IMTA, IMTA Haul Road segment between Wheel Wash Facility and OSWDF).

The ILTS Phase 2 consists of a leachate treatment system that has the capacity to treat leachate from multiple active cells within the OSWDF. The treatment capacity of the ILTS Phase 2 is approximately 1,600 gpm. The ILTS Phase 2 also has the capacity to treat liquids from the IMTA operations and other site operations.

The planned overall cell liner and cover construction sequence for the OSWDF is illustrated by Figure 1-3.



Note: Cells 11 and 12 are contingency cells.

Figure 1-3. OSWDF Construction Sequence

1.3 TERMINOLOGY

Terminology used throughout this LISWSP is defined below:

- OSWDF − Refers to all of the cells where waste will be dispositioned; individual cells are referred to as a "cell."

- OSWDF Project Area − Refers to the area constructed under the OSWDF Design Package (OSWDF, IMTA, and supporting infrastructure).

- IMTA − Refers to a lined gravel pad, with an integral leachate collection system, used to temporarily store waste in the OSWDF Project Area.

- IMTA Support Systems − Refers to the systems constructed with the IMTA (IMTA LMS, IMTA ISWMS, and the Wheel Wash Facility).

- Operations − Operation activities include transportation, waste placement, waste tracking, and compaction of waste; environmental and operational monitoring; and support activities such as erosion and sediment control, dust control, surveying, decontamination, equipment and materials management, haul roads management, and liquids management. Operation of the OSWDF is divided into two phases:

    - Initial Operations − Placement of waste in the OSWDF prior to construction of the ILTS Phase 2, IMTA, the IMTA Haul Road, the equipment maintenance areas, the Impacted Surface Water Management System (ISWMS), and the Wheel Wash Facility. Initial operations utilizes the ILTS Phase 1 – MLTS for treatment of leachate.

    - Full-scale Operations − Placement of waste in the OSWDF after construction of the ILTS Phase 2, IMTA, the IMTA Haul Road, the equipment maintenance areas, the ISWMS, and the Wheel Wash Facility. Full-scale operations utilize the ILTS Phase 2 for treatment of leachate.

- Construction − Construction of support infrastructure, as well as the liner and cover systems, occurs during the operations phase. As discussed in the OSWDF O&M Plan, one or more cell liners may be in the construction phase while an adjacent cell is operating (receiving waste). A physical barrier will delineate the boundary between operating cells and liner construction.

- Waste − Waste generated during D&D of PORTS facilities and other environmental media cleanup activities at PORTS is referred to as D&D waste, engineered fill, and impacted material in other regulatory and design documents. All soil and debris that meets the OSWDF waste acceptance criteria and is intended for disposition in the OSWDF will hereafter be referred to as "waste" in this LISWSP.

- ILTS Phase 1 – MLTS − The ILTS Phase 1 – MLTS consists of a modular leachate treatment system that has the capacity to treat leachate from a portion of the OSWDF, but not the entire OSWDF. Unlike the ILTS Phase 2, the ILTS Phase 1 – MLTS does not have the capacity to treat impacted water from the IMTA, IMTA support systems, the entire OSWDF, or other site operations.

- ILTS Phase 2 − The ILTS Phase 2 utilizes larger-scale equipment to treat leachate and wastewater to remove contaminants of concern to allow safe discharge of the liquids. The ILTS Phase 2 replaces the ILTS Phase 1 – MLTS and has the capacity to treat leachate from multiple active cells within the OSWDF. The ILTS Phase 2 also has the capacity to treat liquids from the IMTA operations and other site operations.

- Liquids − The OSWDF design categorizes liquids generated during operations in three categories, based on the source materials from which the liquids are generated and the corresponding likelihood the liquid will come in contact with waste. A detailed description of liquid categories and sources is provided in Section 2 of this plan. The three general categories are summarized below:

    - Leachate − Precipitation or water from dust control originating from active OSWDF cells, inside closed OSWDF cells, and the IMTA. (Note: Wheel washing at the Wheel Wash Facility at the IMTA occurs only during full-scale operations. By regulatory definition, liquid from wheel washing is considered wastewater, not leachate. However, the wastewater from the Wheel Wash Facility is collected and managed with the IMTA leachate prior to treatment.)

    - Potentially impacted surface water − Precipitation or water from dust control that falls in areas adjacent to waste handling areas or on haul roads inside the OSWDF radiologically controlled area prior to wheel washing.

    - Surface water − Precipitation or water from dust control that falls in areas that are maintained to be free of contamination, such as the construction areas and nonimpacted haul roads.

1.4 RELATED PLANS

Several support plans, which are elements of the OSWDF and ILTS Design Packages, are to be used in conjunction with this plan. The support plans that contain information relevant to this plan include the following:

Construction Quality Assurance Project Plan − Describes the quality control monitoring, testing, documentation, and nonconformance resolution activities during construction, waste placement, and closure of the OSWDF. It establishes both material and construction method conformance with the requirements of the Technical Specifications, appropriate regulatory requirements and guidance, and good construction practices.

Surface Water Management and Erosion and Sediment Control Plan − Describes the surface water management and erosion and sediment control practices to be implemented during construction of the OSWDF, infrastructure support area, and support facilities, including liner construction, infrastructure construction, and final cover construction.

OSWDF Performance Standards Verification Plan − Consolidates the testing, sampling, and analysis required to verify that waste placement operations are being conducted in a manner that is protective of human health and the environment, and that remedy components are functioning as designed. It includes the sampling and analysis plan (SAP) and data quality objectives for monitoring leachate, groundwater, seeps, surface water, air, and external radiation. (Note: Routine operational monitoring such as inspections for leaks, measurements of flow rates, and characterization of potentially impacted surface water are addressed in this LISWSP. Monitoring activities included in the OSWDF Performance Standards Verification Plan [PSVP] [currently under development] are not duplicated in this LISWSP.)

1.5 ORGANIZATION OF THE LISWSP

The remainder of this plan is divided into the following sections:

Section 2 – Liquids Management
This section provides an overview of liquids management for leachate and potentially impacted surface water.

Section 3 – Regulatory and Other Applicable Requirements
This section provides an overview of regulatory and other criteria applicable to this plan.

Section 4 – Functional Descriptions and System Overviews
This section provides an overview and functional description of the components that comprise the LMS and the IMTA ISWMS.

Section 5 – LMS and ISWMS Functional Checkout
This section describes the functional checkout and initial start-up process for the LMS and the ISWMS.

Section 6 – Operating Procedure Development
This section provides the operational procedures for the LMS and the ISWMS, including routine system start-ups and shutdowns, valve adjustments, and others.

Section 7 – Inspection and Maintenance
This section describes the required inspection, maintenance, and monitoring procedures for the LMS and the IMTA ISWMS.

Section 8 – References
This section provides a list of references cited in this LISWSP.

Appendix A – ARARs and to-be-considered (guidance) criteria
Appendix A presents the subset of the ARARs list from the Waste Disposition ROD that are applicable to implementation of this scope of work, and identifies the section in this LISWSP that explains or references the compliance approach needed to satisfy the ARARs.

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2. LIQUIDS MANAGEMENT

2.1 LIQUIDS MANAGEMENT OVERVIEW

Liquids managed during the operation of the OSWDF and OSWDF Project Area are classified in three general categories based on the source materials from which the liquids are generated. The three general categories are as follows:

Leachate – Leachate includes liquids originating from active OSWDF cells, the IMTA, wheel washing activities, and closed OSWDF cells (e.g., precipitation, water from dust control, water from compaction of fill). Leachate is generated during both initial and full-scale operations. All leachate will require treatment prior to its discharge to the environment. (Note: Wheel washing occurs only during full-scale operations. By regulatory definition, liquid from wheel washing is not considered leachate. However, the wheel wash collection system is designed such that water generated from wheel washing will be pumped to IMTA Tank 1. Once water from wheel washing enters Tank 1, it is considered leachate.)

Potentially Impacted Surface Water – Potentially impacted surface water includes liquids generated from the portion of the IMTA Haul Road adjacent to the IMTA, prior to the Wheel Wash Facility; the area surrounding the Wheel Wash Facility; the West Maintenance Building Area; and Water Filling Station #2. Potentially impacted surface water will be generated only during full-scale operations.

Surface Water – Surface water includes liquids originating from areas that are maintained to be free of contamination. These areas are OSWDF Access Roads, the section of the IMTA Haul Road between Perimeter Road and the Wheel Wash Facility, the OSWDF Final Cover System, Tank 1 and Tank 2A/2B tank pit areas, construction laydown and stockpile areas, other support areas (e.g., parking and trailer areas, contractor areas, water filling stations, and equipment maintenance areas), and pond surface areas. Based on the source materials from which surface water is generated, surface water will not require treatment at the ILTS. As defined, surface water is generated during both initial and full-scale operations. Surface water management is addressed in the SWMESC Plan.

Table 2-1 describes the sources of the three types of liquids and whether the liquids are present during initial operations, full-scale operations, or both.

Table 2-1. Liquid Types Present during Initial Operations and Full-scale Operations

	Liquid Source Present during Initial Operations?	Liquid Source Present during Full-scale Operations?
	Leachate Source[1]	
Active OSWDF Cells	Yes Maximum 3 active cells (1, 4, 5)	Yes Active cells including Cells 1, 4, 5
Wheel Wash Facility[2], IMTA (See Figure 1-2)	No – Not operational during initial operations	Yes
Closed OSWDF cells (leachate collected in the LCS of closed cells after final cover)	No – Sufficient quantity of waste cannot be placed during initial operations to allow installation of final cover on any cells	Yes
	Potentially Impacted Surface Water Source	
The IMTA Haul Road adjacent to IMTA, Temporary IMTA Haul Road (See Figure 1-2)	No – Not operational during initial operations	Yes
The area surrounding the Wheel Wash Facility, West Maintenance Building Area, Water Filling Station #2	No – Not operational during initial operations	Yes
	Surface Water	
OSWDF Access Roads	Addressed by SWMESC Plan	Addressed by SWMESC Plan
OSWDF Final Cover System	No – Not operational during initial operations	Addressed by SWMESC Plan
Tanks 1, 2A, and 2B pit areas	No – Not operational during initial operations	Addressed by SWMESC Plan
IMTA Haul Road (from Wheel Wash Facility to Perimeter Road	No – Not operational during initial operations	Addressed by SWMESC Plan
Construction laydown and stockpile areas	Addressed by SWMESC Plan	Addressed by SWMESC Plan
Parking and trailer areas, contractor areas	Addressed by SWMESC Plan	Addressed by SWMESC Plan
Water filling stations, equipment maintenance areas, pond surface areas	Addressed by SWMESC Plan	Addressed by SWMESC Plan
Tanks 1, 2A, and 2B pit areas	Not operational during initial operations	Addressed by SWMESC Plan

Notes:
[1]During initial operations, leachate is treated by the ILTS Phase 1 – Modular Leachate Treatment System; During full-scale operations leachate is treated by the ILTS Phase 2.
[2]Wheel washing occurs only during full-scale operations. By regulatory definition, liquid from wheel washing is not considered leachate. However, the wheel wash collection system is designed such that water generated from wheel washing will be pumped to IMTA Tank 1. Once water from wheel washing enters Tank 1 it is considered leachate.

ILTS = Interim Leachate Treatment System
IMTA = Impacted Material Transfer Area
LCS = Leachate Collection System
OSWDF = On-site Waste Disposal Facility
SWMESC = Surface Water Management and Erosion and Sediment Control

2.2 LIQUIDS MANAGEMENT – INITIAL OPERATIONS PHASE

A general flow diagram of liquids management for the OSWDF during the initial operations phase is shown on Figure 2-1. An overview of the liquids management system for leachate during the initial operations phase is shown on Figure 2-2. Liquid generated from each source will be collected, conveyed, managed, and treated as appropriate.

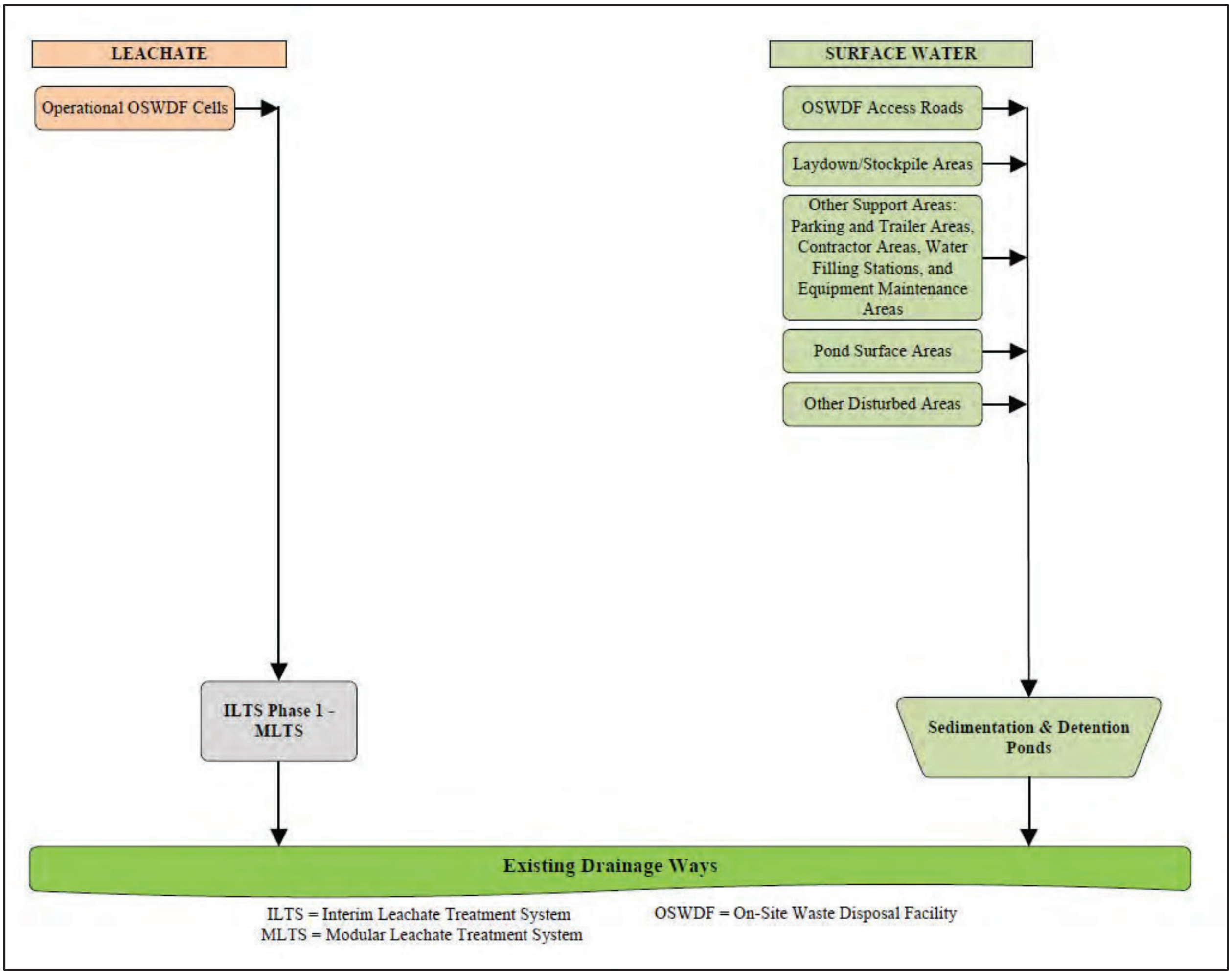


Figure 2-1. General Flow Diagram for Liquids Management during Initial Operations Phase

The approaches for management of each liquid category are as follows:

Leachate Management – During initial operations, leachate is generated only from OSWDF operations (placement of waste in active cells). This includes leachate from the cell liner systems as well as leachate that accumulates in a Leachate Catchment Area (LCA), an open area within an active OSWDF cell. Leachate will be conveyed directly to the ILTS Phase 1 – MLTS for treatment in accordance with the operational strategy described in Section 2.2.1. The infrastructure required to manage leachate is described in Section 4.1.

Potentially Impacted Surface Water Management – Potentially impacted surface water will not be generated during initial operations.

Surface Water Management – During initial operations, surface water will be diverted and conveyed to sedimentation ponds (designed in accordance with ARARs) and discharged to existing drainage ways. As noted previously, the management of surface water is addressed in the SWMESC Plan.

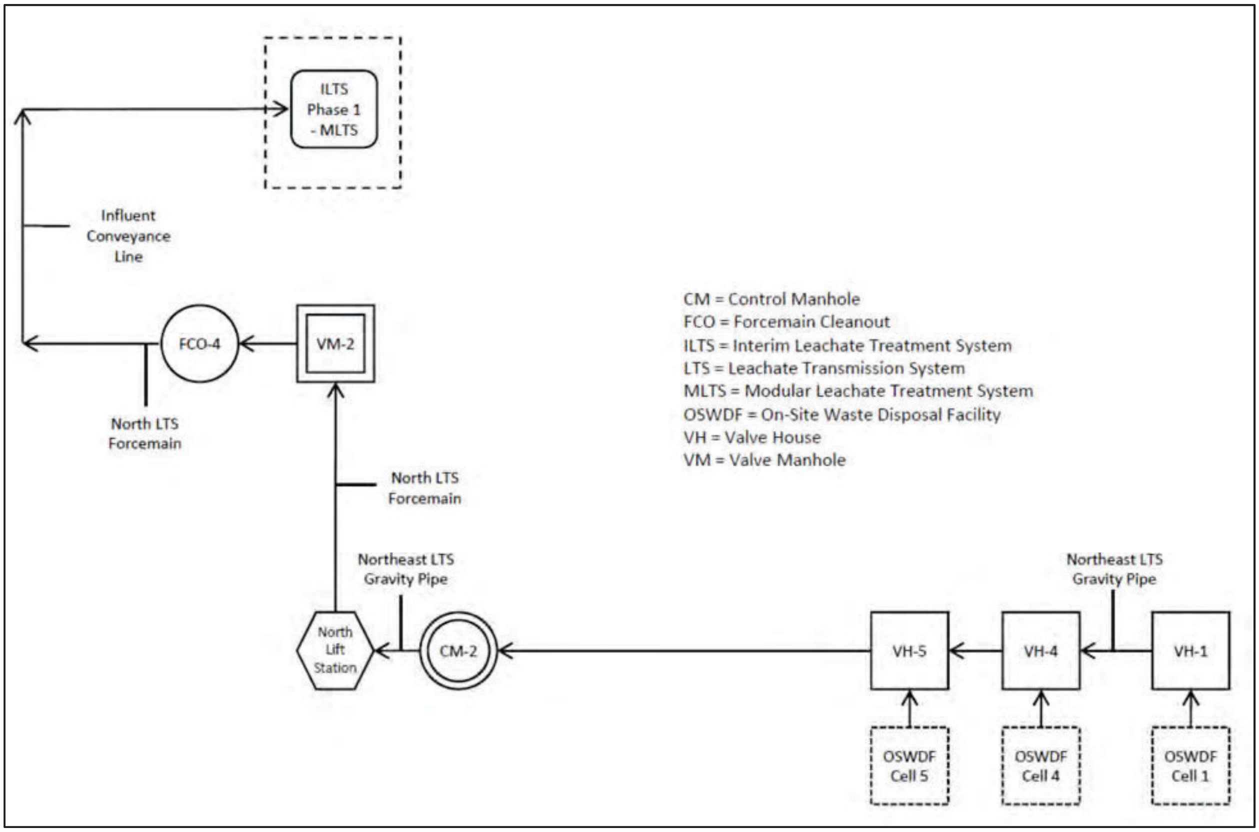


Figure 2-2. Overview of Leachate Management during Initial Operations Phase

2.2.1 Liquids Management Strategy during Initial Operations

The OSWDF LMS is designed to manage leachate generated during OSWDF initial operations and during and after storm events. During OSWDF initial operations, the only liquid to be managed will be liquid that accumulates in the operational LCA and it will, therefore, be the treatment priority. The liquids management strategy example presented in Figure 2-3 assumes that Cells 1, 4, and 5 are operational.

During the initial operations phase, the treatment capacity of the ILTS Phase 1 – MLTS will be approximately 400 gpm. The ILTS Phase 1 – MLTS infrastructure will include an influent one-million-gallon storage tank that will provide operational flexibility to handle significant storm events (e.g., 25-year, 24-hour rainfall event). The flow capacity of the northeast portion of the North LTS gravity line was calculated to be approximately 235 gpm, as documented in the OSWDF Calculation Package, calculation titled *LTS Gravity Line Flow Capacity (North and South)*. The northeast portion of the North LTS gravity line conveys water from the LCA to the North Lift Station, where it is then pumped to the ILTS Phase 1 – MLTS.

The time required to empty the LCA following a storm event is controlled by the 235 gpm flow capacity of the northeast LTS gravity line. The calculation estimates ,the time required to empty a single LCA under gravity flow conditions would be 5.8 days for a volume of liquid generated from a 25-year, 24-hour rainfall event.

Under certain circumstances, and if there is excess flow equalization capacity at the ILTS, it may benefit operations to increase the rate of liquid removal from the LCA by using the LCS Bypass System. The LCS Bypass System is designed to pump up to 500 gpm of leachate directly from the LCA, bypassing the LCS and redundant leachate collection system (RLCS) pipes, over the perimeter berm to the cell's valve house, and then to the LTS gravity pipe system and on to the treatment location. The LCS Bypass System is described in detail in Section 4.1.2.3 of this LISWSP. The anticipated time required to empty a single LCA after a 25-year, 24-hour storm is 2.7 days if pumped at 500 gpm using the LCS Bypass System, and if there are no ILTS Phase 1 – MLTS capacity rate or inflow storage limitations. Although not an ARAR, as currently designed, the OSWDF water/waste water management system can collect, convey, and detain flow from a 100-year, 24-hour design storm event without overtopping.

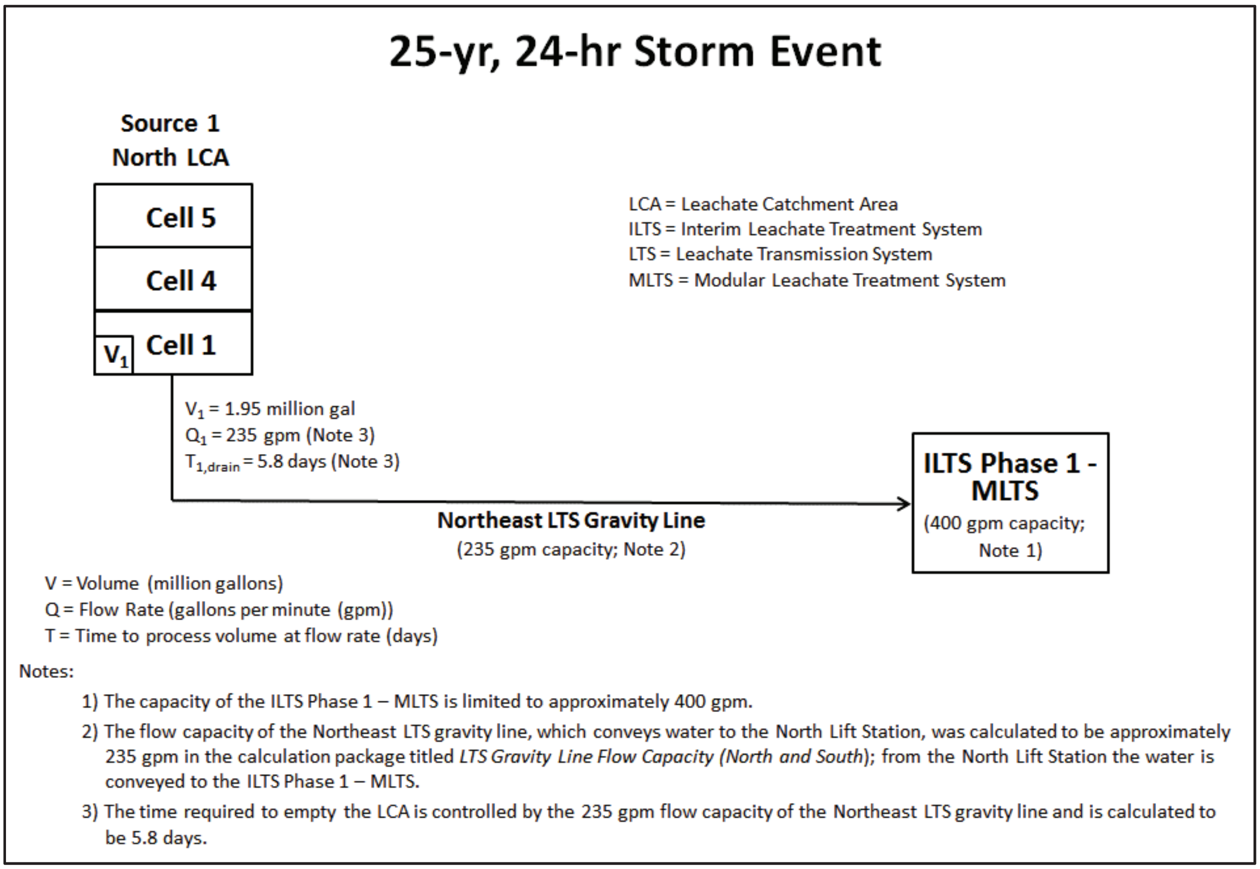


Figure 2-3. Liquids Management Strategy during Initial Operations

2.3 LIQUIDS MANAGEMENT – FULL-SCALE OPERATIONS PHASE

A general flow diagram for liquids management for the OSWDF, IMTA, and IMTA support systems during the full-scale operations phase is shown in Figure 2-4. An overview of the liquids management system for leachate and potentially impacted surface water for the full-scale operations phase is shown in Figure 2-5. Liquids generated from each source will be collected, conveyed, managed, and treated as appropriate.

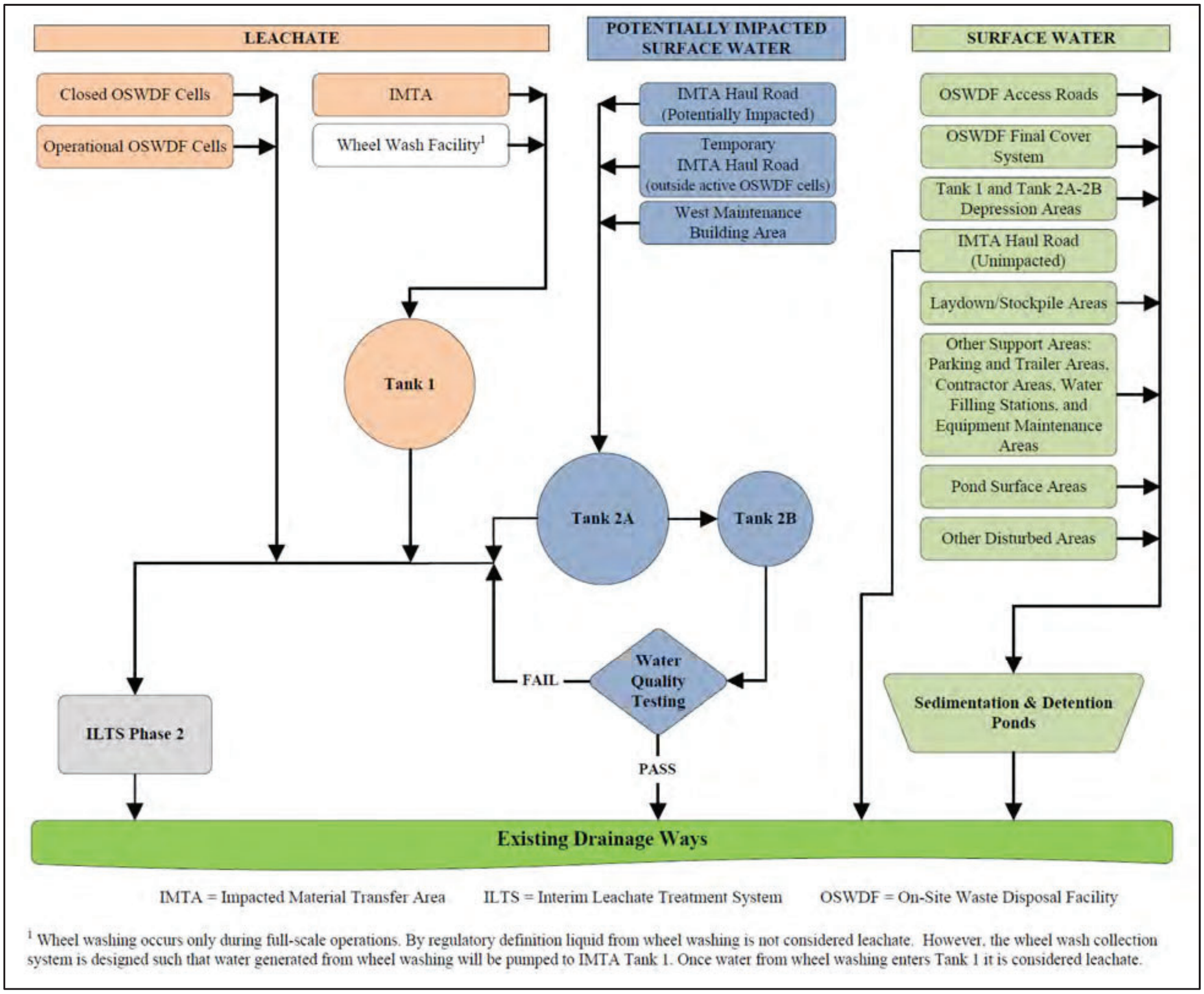


Figure 2-4. General Flow Diagram for Liquids Management during Full-scale Operations Phase

The approaches for management of each liquid category (leachate, potentially impacted surface water, and surface water) are described as follows:

Leachate Management − Leachate, depending upon its source, will accumulate in either an LCA in an active OSWDF cell or in Tank 1. Leachate that accumulates in an LCA will be conveyed directly to the ILTS Phase 2 for treatment. Leachate that accumulates in Tank 1 also will be conveyed directly to the ILTS Phase 2 for treatment in accordance with the operational strategy described in Section 2.3.1. The infrastructure required to process the leachate in the OSWDF and Tank 1 is described in Section 4.1.

Potentially Impacted Surface Water Management − Potentially impacted surface water will be conveyed to and temporarily stored in Tank 2A. Tank 2A is the larger of two aboveground, modular storage tanks that comprise the Tank 2A/2B storage system. Tank 2B is the second tank in the system and is smaller than Tank 2A.

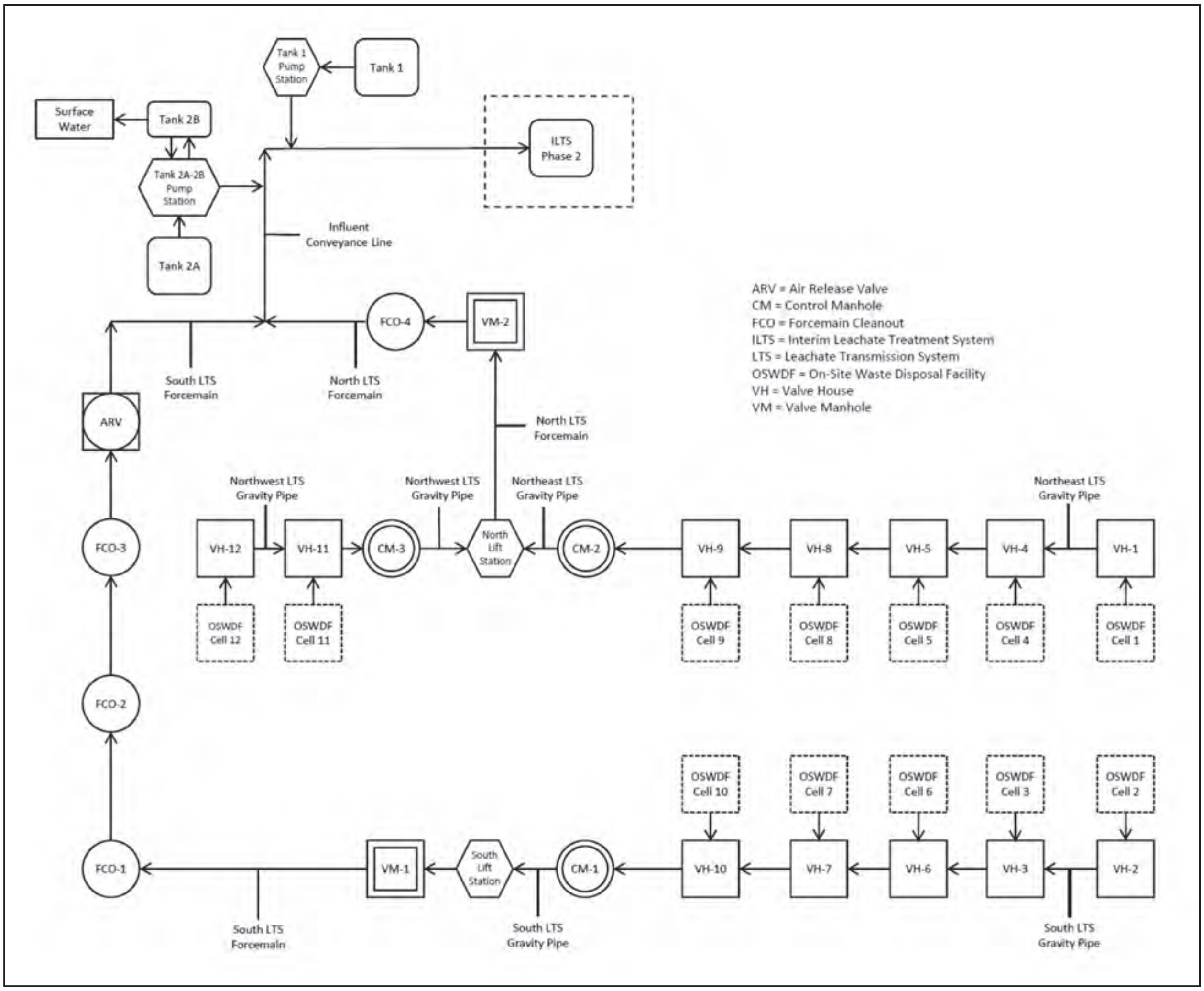


Figure 2-5. Overview of Leachate and Impacted Surface Water Management Systems during Full-scale Operations Phase

Potentially impacted surface water conveyed to Tank 2A is pumped to Tank 2B as operational conditions dictate. Per the concurred with OSWDF Final (100%) Design plans and specifications, the Tank 2A/2B storage system is designed to allow potentially impacted surface water to be stored, sampled, and released to Sedimentation and Detention Pond 2 without treatment if the water meets Ohio EPA approved criteria. The design plans and specifications for the Tank 2A/2B storage system have received Ohio EPA concurrence as part of the OSWDF Final (100%) design. This LISWP describes the configuration, operation and maintenance of the concurred design, but does not include the sampling and analysis plan and discharge levels required to release water to Sedimentation and Detention Pond 2 without treatment. Discharge of water from Tank 2B to Sedimentation and Detention Pond 2 will not be implemented unless the complete operational approach has been explicitly authorized by Ohio EPA. Until such time as a sampling and analysis plan and discharge levels have been developed by the DOE and concurred upon by Ohio EPA, all waters collected in Tanks 2A/2B will be pumped to the ILTS for treatment prior to discharge. The SAP will include parameters listed in the Priority Pollutant List, 40 *CFR* Part 423, Appendix A, that may be present in potentially impacted surface water. To prevent inadvertent discharge without treatment, the valves or piping designed to allow discharge of water from

Tanks 2A/ 2B to Sedimentation or Detention Pond 2 will be secured by the use of a blind flange, welded cap or other positive means. The Tank 2A/2B system provides the capability to minimize the volume of potentially impacted surface water that is treated unnecessarily. The infrastructure required to process potentially impacted surface water at Tank 2A/2B is described in Section 4.2.

Surface Water Management − During full-scale operations, surface water will be diverted and conveyed to sedimentation ponds (designed in accordance with ARARs) and discharged to existing drainage ways. As noted previously, the management of surface water is described in the SWMESC Plan.

2.3.1 Operational Objectives and Treatment Prioritization during Full-scale Operations

The OSWDF LMS and IMTA LMS are designed to manage leachate generated from OSWDF full-scale operations and during and after storm events. The IMTA ISWMS is designed to manage potentially impacted surface water generated during and after storm events and is typically inoperative during dry weather. The timely and efficient management of leachate and potentially impacted surface water is critical to minimize the effects of storm-generated leachate and potentially impacted surface water on overall site operations. For example, placement of impacted material within an active OSWDF cell may be delayed until the leachate generated from a storm event is emptied from the associated LCA.

Appropriate treatment prioritization of leachate and potentially impacted surface water following a storm event allows for more efficient site operations, as well as meeting the water quality performance standards in the OSWDF PSVP. One of the design criteria for the LCAs, Tank 1, and Tank 2A is that each have the capacity to hold the volume of liquid generated from a 25-year, 24-hour rainfall event (i.e., 4.45 in. of rain in 24 hours). A 25-year, 24-hour rainfall event will generate approximately 1.95 million gal of leachate per each active LCA within the OSWDF, 1.1 million gal of leachate at Tank 1, and 1.3 million gal of potentially impacted surface water at Tank 2A.

During full-scale operations, the ILTS Phase 2 will have a treatment capacity that ranges from 800 gpm to 1,600 gpm. The ILTS Phase 2 infrastructure will also include two influent one-million-gallon storage tanks that will provide significant operational flexibility to handle a range of large storm event scenarios (e.g., 25-year, 24-hour rainfall event). The preceding information can be used to evaluate and select appropriate treatment priorities for the different leachate and potentially impacted surface water holding units (e.g., LCAs, Tank 1, and Tank 2A).

2.3.2 Liquids Management Strategy during Full-scale Operations

The treatment sequence for the LCAs, Tank 1, and Tanks 2A/2B is dependent on the weather forecast following the initial storm event. For example, if the weather forecast following a 25-year, 24-hour rainfall event predicts dry weather for the next 7 days, leachate would be treated according to the following priorities:

- Priority 1: Leachate in the LCAs
- Priority 2: Leachate in Tank 1
- Priority 3: Potentially impacted surface water in Tank 2B (if needed).

The rationale for the preceding priority ranking is as follows:

- The prediction of dry weather indicates no impending precipitation would cause an overflow of liquids stored in Tanks 1 and 2B; thus the leachate in the LCAs could be processed first to facilitate resumption of work within the cells.

- Tank 1 is prioritized ahead of Tank 2B because it contains liquid classified as leachate; Tank 2B contains liquid classified as potentially impacted surface water.

Table 2-2 lists estimated durations to drain individual liquid storage areas following a 25-year, 24-hour storm assuming no additional rain falls during the draining period. The estimated durations assume the LCS Bypass System is not used. During full-scale operations the ILTS Phase 2 will be operational. The ILTS Phase 2 infrastructure will include a minimum of two influent one-million-gallon storage tanks that will provide significant operational flexibility to handle a range of large storm event scenarios (e.g., 25-year, 24-hour rainfall event). The availability of the LCS Bypass system would greatly reduce the durations required to drain and add further operational flexibility. Given the capacity of the ILTS Phase 2 and the available influent storage, it is likely that the LCAs and Tank 1 could be processed simultaneously.

Table 2-2. Days to Drain Liquid Storage Areas

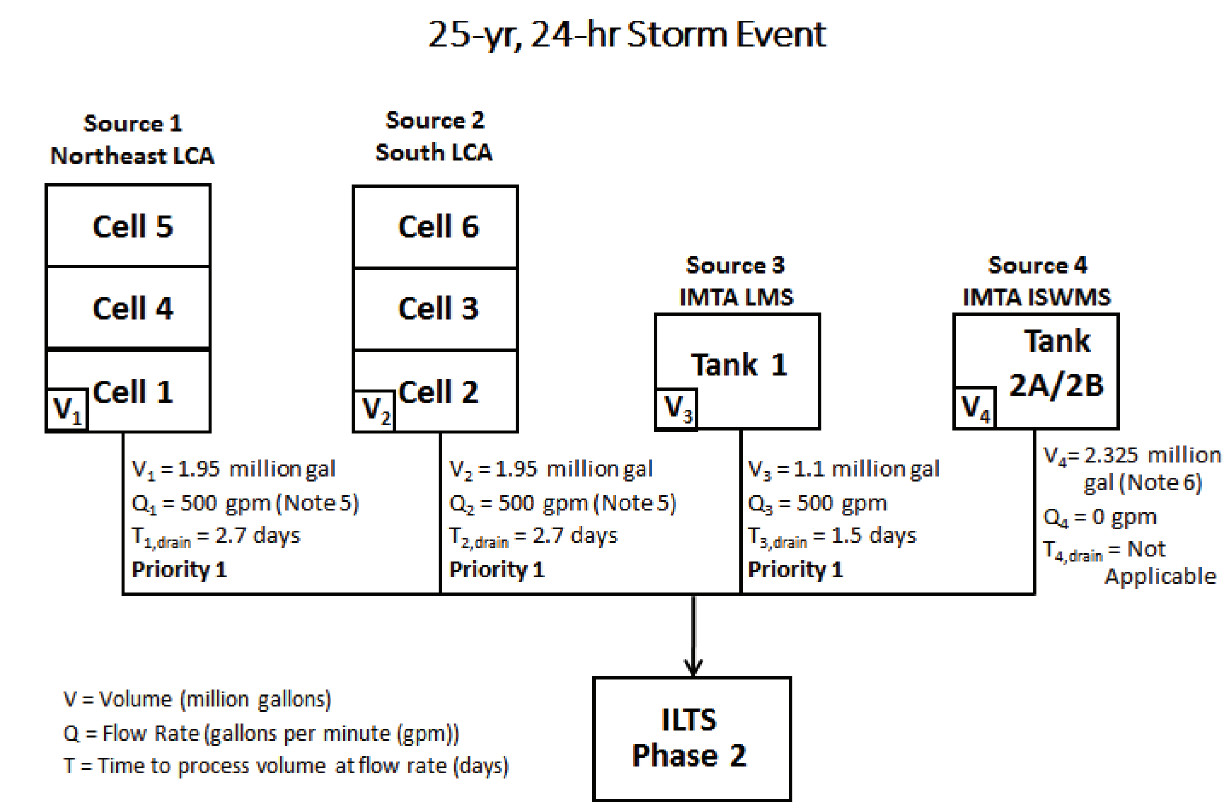
Liquid Storage Area (LCA or Tank)	Days to Drain
LCA in Cell 5, serving active cells 1, 4, 5	5.8 days
LCA in Cell 6, serving active cells 2, 3, 6	6.1 days
Tank 1	1.5 days
Tank 2A	1.6 days
Tank 2B	0.7 days

LCA = Leachate Catchment Area

Figure 2-6 presents one potential management scenario for liquids generated from the OSWDF and the IMTA when no additional rain is forecast for 7 days after the initial storm event. The assumptions for the scenario are also listed in Figure 2-6. For this scenario, the time required to manage the liquids generated from the 25-year, 24-hour rainfall event is 2.7 days.

For a scenario where additional rainfall is forecast following a 25-year, 24-hour design storm event, the treatment prioritization in the preceding scenario would be adjusted.

It is not possible to evaluate in this LISWSP the many operational scenarios that could arise during system operation. Operational procedures and operator training will provide the basis for managing liquids during routine operations and during and after storm events.



Time to Drain Sources 1 through 3 = 2.7 days (Note 5)

Notes:

1) There is no rain in the forecast for 7 days following the 25-yr, 24-hr storm event;
2) Two 1,000,000 gallon storage tanks at the ILTS Phase 2 are available to receive liquids from the OSWDF LMS, the IMTA LMS, and the IMTA ISWMS.
3) The ILTS Phase 2 is capable of treating 800 gpm.
4) Sources 1, 2, and 3 will be treated concurrently until the ILTS Phase 2 storage capacity is reached. Assuming an influent flow rate of 1,500 gpm, a treatment rate of 800 gpm, and 2,000,000 gallons of initial storage capacity, the ILTS Phase 2 can receive liquid at 800 gpm for 2 days before the storage capacity is consumed and the influent rate would need to be reduced to 800 gpm.
5) The processing times provided on Figure 2-6 assume that the LCS bypass system is used. If the LCS bypass is not employed, the estimated times to empty sources 1 and 2 will be approximately 5.7 to 6.0 days, respectively.
6) The liquid that accumulates in Tank 2A/2B will be managed as described in Section 2.3 of the LISWSP.

ILTS = Interim Leachate Treatment System
IMTA = Impacted Material Transfer Area
ISWMS = Impacted Surface Water Management System
LCS = Leachate Collection System
LMS = Leachate Management System

Figure 2-6. Liquids Management Strategy during Full-scale Operations

3. REGULATORY AND OTHER APPLICABLE REQUIREMENTS

3.1 OVERVIEW

Regulatory, DOE, and other requirements applicable to this LISWSP are contained in the OSWDF DCP. These requirements take the form of ARARs and to-be-considered (guidance) (TBC) criteria as determined by the Waste Disposition ROD, functional requirements, and general design criteria.

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4. FUNCTIONAL DESCRIPTIONS AND SYSTEM OVERVIEWS

4.1 LEACHATE MANAGEMENT SYSTEMS

4.1.1 Overview

Leachate is managed by two systems, the OSWDF LMS and the IMTA LMS. A conceptual illustration of the OSWDF LMS during initial operations is depicted on Figure 1-1 of this LISWSP. The OSWDF LMS is designed to address leachate generated within active cells of the OSWDF. The IMTA LMS is designed to address leachate generated within the IMTA.

4.1.2 OSWDF Leachate Management System (Initial Operations and Full-scale Operations) – Components and Functional Descriptions

The components and function of the OSWDF LMS are not affected by phasing of the project. These components function the same during initial operations and full-scale operations.

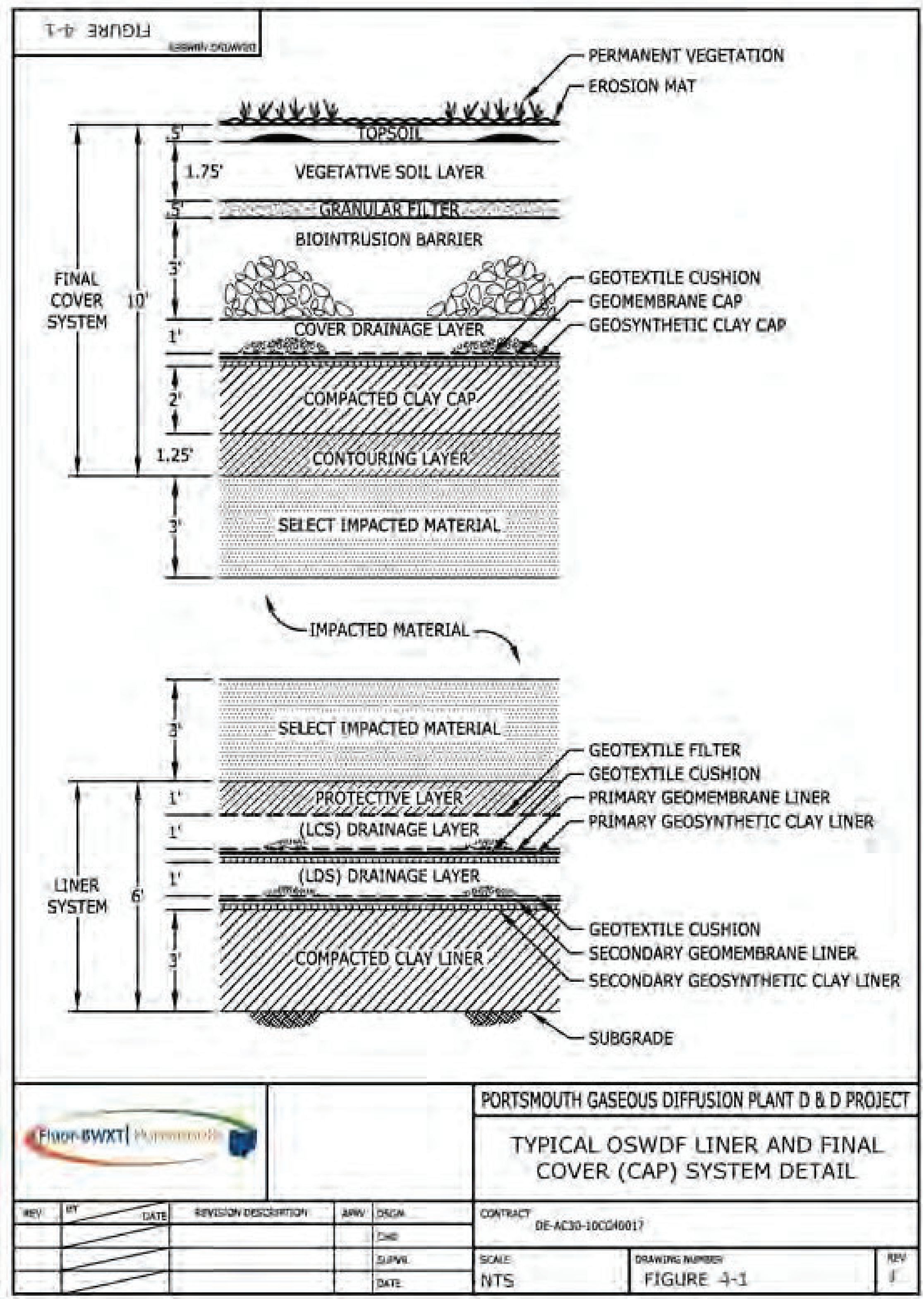
The objective of the OSWDF LMS is to capture, contain, and convey leachate generated within the active cells of the OSWDF. The OSWDF LMS includes the LCS and the LDS in the liner system, up to 12 valve houses, and the North and South LTS. Leachate from the OSWDF is collected in the LCS (and detected in the LDS if present), then conveyed to the valve houses that correspond to the cell. The valve houses are located outside the limits of waste placement. The LTS includes gravity drainage pipes, control manholes, lift stations, forcemains (including cleanouts), and air release valves and vaults. The LTS conveys leachate to the ILTS Phase 1 – MLTS or ILTS Phase 2 for treatment via the IMTA Conveyance Pipeline.

4.1.2.1 Leachate Collection System

The LCS is designed to remove leachate that accumulates on the OSWDF liner system and leachate that accumulates within the LCA of active cells during impacted material placement. LCAs are temporary leachate storage areas located along the inside perimeter of active cells. Typical details for the OSWDF liner system are shown on Figure 4-1.

The drainage capacity of the LCS is designed to exceed the anticipated leachate generation rates during active and postconstruction periods and thus prevent leachate head build-up across the liner system from exceeding 1 ft (30 cm), per *OAC* 3745-57-03(C)(2). Leachate that accumulates in the LCS Drainage Layer (see Figure 4-1) within each cell is conveyed along the slope of the OSWDF floor to a perforated section of 6-in.-diameter high-density polyethylene (HDPE) standard dimension ratio (SDR)-7 LCS pipe. Leachate that enters the perforated section of the LCS pipe is then conveyed by gravity toward the perimeter of the cell and on to the cell's designated valve house. Before penetrating the liner system, the LCS pipe is transitioned to solid 6-in.-diameter HDPE SDR-11 pipe and then to solid 6 in./10 in. double-wall HDPE SDR-11/SDR-17 pipes. The LCS pipe joints are butt fused to create one continuous pipeline that runs from the OSWDF cell to the cell's valve house. The 6-in./10-in. double-wall HDPE SDR-11/SDR-17 pipe penetrates the wall of the cell valve house. Inside the valve house wall penetration, the HDPE containment pipe is terminated and a fixed HDPE end seal is installed. The material of the carrier pipe is then transitioned to single-wall steel piping.

In addition to the LCS pipe, a RLCS pipe is installed to provide a redundant system to remove leachate from the cell floor if the LCS pipe becomes clogged or damaged and cannot achieve its design objectives. The RLCS pipe is constructed of the same materials as the LCS pipe.



LCS = Leachate Collection System
LDS = Leak Detection System

Figure 4-1. Typical OSWDF Liner and Final Cover (Cap) Systems Detail

During placement of impacted material in the OSWDF, storm events will generate runoff from active cells of the OSWDF and from the Temporary Haul Road inside active OSWDF cells. The runoff is considered leachate and is conveyed through temporary drainage channels to the active LCA.

Leachate that collects within the LCA infiltrates downward to the LCS Drainage Layer where it enters the LCS pipe and is conveyed to a valve house. The rate of liquid removal from the LCA is controlled by the gravity-based flow capacity of the LTS that conveys liquids collected in the valve houses to a pair of lift stations and ultimately to the ILTS. The estimated time to empty an active LCA after the design storm event is discussed in Sections 2.2 and 2.3 under gravity-based flow rates.

4.1.2.2 Leak Detection System

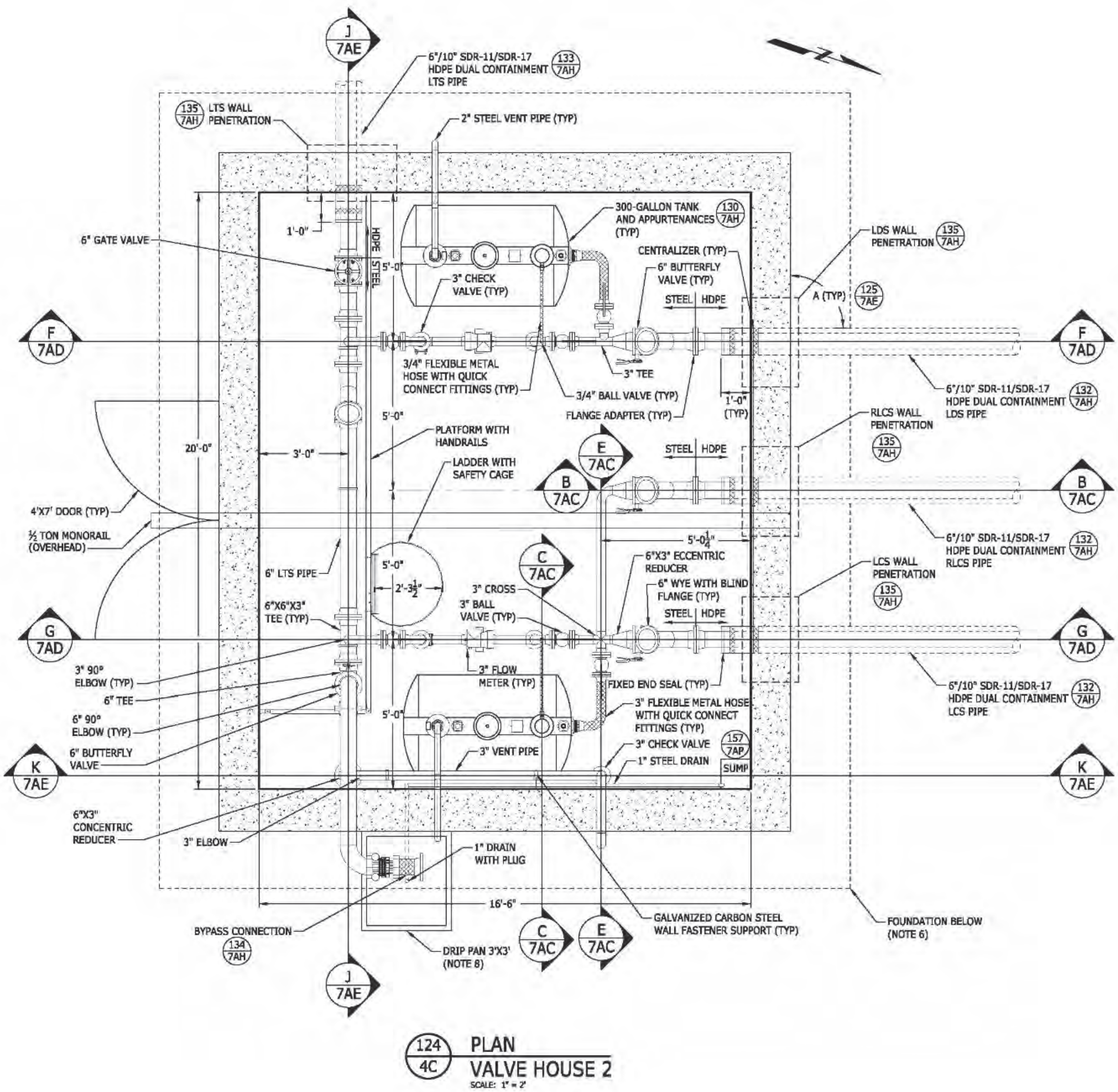
The LDS is designed to remove and quantify the volume of any leachate that may penetrate the primary geomembrane and geosynthetic clay liners and accumulate on the secondary geomembrane liner. Leachate that accumulates in the LDS Drainage Layer (shown on Figure 4-1) in each cell is conveyed along the slope of the OSWDF floor to a perforated section of 6-in.-diameter HDPE SDR-7 LDS pipe. Leachate that enters the perforated section of the LDS pipe is then conveyed by gravity toward the perimeter of the cell and to the cell's valve house. The LDS pipe is constructed of the same materials as the LCS and RLCS pipes installed in the LCS Drainage Layer.

4.1.2.3 Valve houses

Each cell has a dedicated valve house, which houses the points where the cell's LCS pipe, RLCS pipe, LDS pipe, and LCS Bypass System connect to the LTS. The valve houses provide access to the valves, piping, fittings, monitoring and sampling ports, postconstruction leachate storage tanks, and other ancillary equipment required to regulate, monitor, and maintain performance of the LCS and the LTS.

The mechanical components of the valve houses are shown on OSWDF Design Package Drawings X-780-M-10655, X-780-M-10656, X-780-M-10657, X-780-M-10689, X-780-M-10690, and X-780-M-10677. The piping and instrumentation diagram (P&ID) for the valve houses is shown on OSWDF Design Package Drawings X-780-M-10654 and X-780-M-10667. The following discussion of key valve house components references Valve House 2 [VH-2] equipment and tag numbers [where appropriate] for clarity. The layout of VH-2 is shown on Figure 4-2.

Basic Valve House Features. The valve houses are designed as closed systems. Liquids should not accumulate in these valve houses, and any liquids that do accumulate in these valve houses must be removed as soon as possible. Each valve house is equipped with a 7.5-gal sump in which a level switch (LS) (LS-0207) is installed. The level switch in the sump of each valve house shall be set to activate the alarm light ([level alarm high] LAH-0207) for a liquid level at a predetermined set point, anticipated to be approximately 6 in. (0.5 ft) above the base of the sump. If the alarm is activated, personnel shall respond immediately to evaluate whether a significant emergency condition exists (e.g., imminent filling of the valve house due to a burst pipe), immediately assess the problem, and inform the OSWDF Operations Manager who will take appropriate corrective actions.



Source: Design Drawing X780-M-10657, Rev K

Figure 4-2. Valve House 2 Layout

The valve houses serve as secondary containment structures for the single-contained pipes, tanks, valves, and other elements that are accessible within the valve houses. Each valve house fulfills the secondary containment requirement through the installation of a water-tight protective seal over the lower portion of interior surfaces. The floor of each valve house is sloped toward the liquid sump. As noted, if a liquid leaks from the single-contained plumbing elements, the liquid will flow to and accumulate within the sump and activate the valve house sump high alarm light (LAH-0207). The valve houses are periodically inspected for the presence of liquid, which could indicate a possible leak in the LTS carrier pipe, the LCS pipe, the RLCS pipe, the LDS pipe, or their associated valves or fittings.

Each valve house is provided with mechanical ventilation and has limited entry controlled by platforms. The ventilation fan is designed to exchange the air in the valve house at least six times per hour. The valve house also has a ceiling fan to mix the air in the building. The cross flow of air from right to left and top to bottom of the valve house, combined with the mixing of air by the ceiling fan, will reduce the potential for dead zones without air exchange.

Leachate Collection System/Redundant Leachate Collection System Piping, Valves and Ancillary Equipment. Design Drawing X-780-M-10657 shows the horizontal piping layout for the LCS in VH-2; the components (e.g., pipes, valves, instrumentation) are identical to the other valve houses although the layout may be slightly different based on geometric considerations related to the OSWDF and piping orientation to the valve house. The LCS and RLCS pipes are designed to allow direct discharge of flow from their carrier pipes to the LTS gravity pipe that passes through each valve house. The 6-in./10-in. double-wall HDPE SDR-11/SDR-17 LCS/RLCS pipes penetrate the wall of the cell valve house via a water-tight wall penetration (see Design Drawing X-780-M-10677).

Inside the valve house wall penetration, the HDPE containment pipes are terminated and a fixed HDPE end seal is installed; the LCS and RLCS containment pipes are monitored via monitoring ports equipped with ¾-in.-diameter ball valves (V-0231 and V-0221, respectively) as shown on Design Drawing X-780-M-10677. The monitoring ports allow for observation and quantification of any liquid that may accumulate in the annular spaces between the carrier pipes and containment pipes. The monitoring ports also enable any accumulated liquids to be removed from the containment piping.

Immediately after termination of the containment pipes, sampling ports equipped with ¾-in.-diameter ball valves (V-0232 and V-0222) are installed on the LCS and RLCS carrier pipes to collect leachate samples. The piping material of the 6-in.-diameter carrier pipes is then transitioned to 6-in.-diameter single-wall steel piping via a 6-in.-diameter flange adapter. A 6-in.-diameter wye with a blind flange is then attached to the 6-in.-diameter flange adapter on the LCS and RLCS carrier pipes. The 6-in.-diameter wyes serve as cleanouts and provide access to the LCS and RLCS pipes for inserting a video camera to inspect the integrity of the pipes. Six-in.-diameter butterfly valves (V-0223 or V-0233) installed after the wyes serve as isolation valves to facilitate maintenance of the downstream components, if necessary.

The LCS carrier pipe valve (i.e., V-0233) shall not be closed during the active life, closure period, or postconstruction period of the OSWDF, except for periods where the valve needs to be closed for systems maintenance and repair or in the event of an operational emergency. During normal operation, RLCS valve V-0223 is locked in the closed position so leachate flow from the cell to the LTS gravity line occurs through the LCS carrier pipe. RLCS valve V-0223 can be opened to allow flow to the LTS gravity line at any time if clogging occurs in the LCS carrier pipe. The valve on the RLCS carrier shall only be opened at the direction of the Operations Manager.

After their respective butterfly valves, the LCS and RLCS pipes are reduced from 6 in. to 3 in. using 6-in. × 3-in. eccentric reducers. The 3-in.-diameter LCS and RLCS pipes are joined at a 3-in. diameter cross. The straight run through the cross from the LCS pipe includes a short section of 3-in.-diameter steel pipe and then a 3-in.-diameter ball valve (V-0234). Immediately after the ball valve, a 90-degree elbow is installed to route the LCS pipe downward to the valve house floor, where a 3-in.-diameter tee changes the flow direction once again to horizontal. A ¾-in.-diameter threadolet fitting and ¾-in.-diameter ball valve (V-0236) are installed at the top of the 90-degree elbow. The horizontal run of 3-in.-diameter pipe at the base of VH-2 includes a 3-in.-diameter magnetic flow meter (FE-0206) and transmitter (FT-0206) with a display at the VH-2 Control Panel (see Design Drawing X-780-E-10650); the horizontal section of pipe also includes a low point drain consisting of ¾-in.-diameter pipe and a ¾-in.-diameter ball valve (V-0237). The purpose of the flow meter is to monitor the rate of flow from the LCS during the active life of a cell or when a cell is open. Downstream of the drain, the 3-in.-diameter pipe is routed vertically using a 90-degree elbow. A 3-in.-diameter check valve (V-0238) is installed on the vertical section of pipe prior to another 90-degree elbow that routes the pipe in the horizontal direction. A 3-in.-diameter ball valve (V-0239) is installed on the horizontal section of pipe before a final 90-degree elbow routes the pipe in the vertical direction to connect to the underlying 6-in.-diameter LTS pipe via a 6-in. × 6-in. × 3-in. reducing tee.

On the straight run through the cross from the RLCS, a 3-in.-diameter ball valve (V-0235) is connected to the cross to provide shutoff service. A section of 3-in.-diameter flexible metal hose with quick-connect fittings connects V-0235 to the 300-gal LCS Containment Tank. The LCS Containment Tank is placed into use once the rate of flow from the LCS decreases below approximately 0.1 gpm. As described below, use of the LCS Containment Tank improves the accuracy of quantifying leachate volume once flow rates decrease below 0.1 gpm. The LCS Containment Tank is equipped with a liquid level recorder (LR-0205) and a submersible liquid level sensor ([level transmitter] LT-0204) that transmits its data to a panel-mounted level indicator (LI-0204). The LCS Containment Tank is also equipped with a transfer pump with an intake tube strainer that extends to the bottom of the tank; transfer pump operation is controlled at the tank. A section of ¾-in.-diameter flexible metal hose with quick-connect fittings connects the discharge port of the transfer pump to V-0236, thus enabling the contents of the tank to be pumped from the tank to the 3-in.-diameter LCS pipe and then to the LTS. Other appurtenances installed on the LCS Containment Tank include a 2-in.-diameter air admittance valve, a 6-in.-diameter top access opening with threaded lid, and a tank venting assembly comprised of a 4-in.-diameter inline centrifugal duct fan and a 2-in.-diameter vent pipe routed to the exterior of the valve house. These appurtenances are shown on Design Drawing X-780-M-10677.

The leachate generation rate in the cell varies over time depending on the stage of system operation (e.g., cell construction, impacted material placement, post closure). Leachate generation rates in the LCS Drainage Layer were estimated in the OSWDF Calculation Package, calculation titled *Hydrologic Evaluation of Landfill Performance (Leachate Generation Rates)*. Three cases were evaluated for the LCS Drainage Layer:

- *Case I: Initial Period of Operation (i.e., 10 ft of impacted material)* – The average annual leachate generation rate in the LCS Drainage Layer was calculated to be approximately 948 gals per acre per day (gpad). The area of Cell 2 is 6.2 acres, thus the average annual leachate generation rate for the Cell 2 LCS Drainage Layer is approximately 5,877 gal per day (gpd) for Case I.

- *Case II: Intermediate Period of Operation (i.e., 50 ft of impacted material)* – The average annual leachate generation rate in the LCS Drainage Layer was calculated to be approximately 939 gpad. The average annual leachate generation rate for the Cell 2 LCS Drainage Layer is approximately 5,822 gpd for Case II.

- *Case III: Post-Construction Period (i.e., 90 ft of impacted material plus final cover system)* – The average annual leachate generation rate in the LCS Drainage Layer was calculated to be approximately 0.002 gpad. Thus, once the final cover system is in place and the cell enters the postclosure period, the average annual leachate generation rate for the Cell 2 LCS Drainage Layer will start to decline, eventually decreasing to approximately 0.0124 gpd for Case III or a total of 4.53 gal per year.

The rate of flow through the LCS pipe prior to the postconstruction period can be regulated via the 3-in.-diameter ball valves (V-0234 or V-0239) by partially closing the valve (i.e., increase the head loss across the valve). If necessary, the LCS valves can be manually adjusted during early phases of cell construction to prevent exceeding the lift station output capacity. When peak flows in the LCS system reduce to approximately 0.1 gpm, flow from the LCS carrier pipe (or RLCS carrier pipe if it is in use) will be diverted to the LCS Containment Tank by closing V-0234 and opening V-0235 and V-0236. At 0.1 gpm, the contents of the LCS Containment Tank will need to be emptied every 1 to 2 days to prevent overtopping the tank. The piping is configured so the volume of leachate transferred from the tank to the LCS is measured by FE-0206 and recorded by flow totalizer/indicator FQI-0206. At flow rates less than 0.1 gpm, the flow meter does not provide reliable estimates of flow rate; thus, the accuracy of the flow measurements are improved by processing and measuring the leachate in batches as they accumulate in the LCS Containment Tank.

Leak Detection System Piping, Valves, and Ancillary Equipment. Design Drawing X-780-M-10656 shows the horizontal piping layout for the LDS in VH-2; the components (e.g., pipes, valves, instrumentation) are identical to the other valve houses although the layout may be slightly different based on geometric considerations related to the OSWDF and piping orientation to the valve house. The LDS pipe is designed to allow direct discharge of flow from its carrier pipe to the LTS. The 6 in./10 in. double-wall HDPE SDR-11/SDR-17 LDS pipe penetrates the wall of the cell valve house via a water-tight wall penetration (see Design Drawing X-780-M-10677).

Inside the valve house wall penetration, the HDPE containment pipe is terminated and a fixed HDPE end seal is installed; the LDS containment pipe is monitored via a monitoring port equipped with a ¾-in.-diameter ball valve (V-0211) as shown on Design Drawing X-780-M-10677. The monitoring port allows for the observation and quantification of any liquid that may accumulate in the annular space between the carrier pipe and containment pipe. The monitoring port also provides the means of removing any accumulated liquids from the containment piping.

Immediately after termination of the containment pipe, a sampling port equipped with a ¾-in.-diameter ball valve (V-0212) is installed on the LDS carrier pipe to collect samples. The piping material of the 6-in.-diameter carrier pipe is then transitioned to 6-in.-diameter single-wall steel pipe via a 6-in.-diameter flange adapter. A 6-in.-diameter wye with a blind flange is then attached to the 6-in.-diameter flange adapter on the LDS carrier pipe. The 6-in.-diameter wye serves as a cleanout and provides access to the LDS pipe for inserting a video camera to inspect the integrity of the carrier pipe. A 6-in.-diameter butterfly valve (V-0213) is installed after the wye as an isolation valve to facilitate maintenance of the downstream components, if necessary. The LDS carrier pipe valve (i.e., V-0213) shall not be shut during the active life, closure period, or postconstruction period of the OSWDF, except for periods when the valve needs to be closed for systems maintenance and repair, or in the event of an operational emergency.

The LDS pipe is then reduced from 6 in. to 3 in. using a 6-in. × 3-in. eccentric reducer, which in turn is connected to a 3-in.-diameter tee. The straight run through the tee from the LDS pipe includes a short section of 3-in.-diameter steel pipe and then a 3-in.-diameter ball valve (V-0214). Immediately after the ball valve, a 90-degree elbow routes the LDS pipe downward to the valve house floor where a 3-in.-diameter tee changes the flow direction once again to horizontal. A ¾-in.-diameter threadolet fitting and ¾-in.-diameter ball valve (V-0216) are installed at the top of the 90-degree elbow. The horizontal run of 3-in.-diameter pipe at the base of VH-2 includes a 3-in.-diameter flow meter (FE-0203) and transmitter (FT-0203) with a display at the VH-2 Control Panel (see Design Drawing X-780-E-10650); the horizontal section of pipe also includes a low point drain consisting of ¾-in.-diameter pipe and a ¾-in.-diameter ball valve (V-0217). The purpose of the flow meter is to monitor the rate of flow, if any, from the LDS.

Downstream of the drain, the 3-in.-diameter pipe is routed vertically using a 90-degree elbow. A 3-in.-diameter check valve (V-0218) is installed on the vertical section of pipe prior to another 90° elbow that routes the pipe in the horizontal direction. A 3-in.-diameter ball valve (V-0219) is installed on the horizontal section of pipe before a final 90-degree elbow routes the pipe in the vertical direction to connect to the underlying 6-in.-diameter LTS pipe via a 6-in. × 6-in. × 3-in. reducing tee.

On the cross-branch run through the tee from the LDS, a 3-in.-diameter ball valve (V-0215) is connected to the tee to provide shutoff service. A section of 3-in.-diameter flexible metal hose with quick-connect fittings connects V-0215 to the 300-gal LDS Containment Tank. The LDS Containment Tank is equipped with a liquid level recorder (LR-0202) and a submersible liquid level transmitter (LT-0201) that transmits its data to a panel-mounted indicator (LI-0201). The LDS Containment Tank is also equipped with a transfer pump with an intake tube strainer that extends to the bottom of the tank; transfer pump operation is controlled at the tank. A section of ¾-in.-diameter flexible metal hose with quick-connect fittings connects the discharge port of the transfer pump to V-0216, thus enabling the contents of the tank to be pumped from the tank to the 3-in.-diameter LDS pipe and then to the LTS. Other appurtenances installed on the LDS Containment Tank include a 2-in.-diameter air admittance valve, a 6-in.-diameter top access opening with threaded lid, and a tank venting assembly comprised of a 4-in.-diameter inline centrifugal duct fan and a 2-in.-diameter vent pipe routed to the exterior of the valve house. These appurtenances are shown on Design Drawing X-780-M-10677.

During installation of the LDS in the OSWDF cells, precipitation is able to accumulate within the LDS Drainage Layer. The volume of precipitation that accumulates within the LDS Drainage Layer during installation is orders of magnitude greater than the volume of liquid that accumulates once a cell is placed in operation (i.e., during impacted material placement). During the period that precipitation drains from the LDS Drainage Layer, the precipitation flows directly through the LDS pipe to the LTS, bypassing the LDS Containment Tank. To bypass the tank, valve V-0214 is opened and valves V-0215 and V-0216 are closed. The flow of residual precipitation through the LDS is measured by FE-0203 until the flow decreases sufficiently to allow operation of the LDS Containment Tank.

The average annual leachate generation rate in the LDS Drainage Layer during placement of impacted material was calculated in the OSWDF Calculation Package, calculation titled *Hydrologic Evaluation of Landfill Performance (Leachate Generation Rates)*, to be approximately 0.001 gpad or less; the calculation assumes the primary geomembrane liner will have a limited number of imperfections from the installation process. The area of Cell 2 is 6.2 acres, thus the long-term average annual leachate generation rate for the Cell 2 LDS Drainage Layer is approximately 0.0062 gpd, or a total of 2.3 gal per year. When the total leachate generation rate of the LDS Drainage Layers decreases to approximately 0.1 gpm, flow through the LDS pipe will be diverted to the LDS Containment Tank to facilitate quantification of the generation rate. At this operational point, valves V-0215 and V-0216 will be opened and V-0214 will be replaced with a blank so all liquid collected in the LDS will be diverted to the LDS Containment Tank. At 0.1 gpm, the contents of the LDS Containment Tank will need to be emptied every 1 to 2 days to prevent overtopping the tank. The piping is configured so the volume of leachate transferred from the tank to the LDS is measured by FE-0203 and recorded by FQI-0203. At flow rates less than 0.1 gpm, the flow meter does not provide reliable estimates of flow rates; the accuracy of the flow measurements is improved by processing and measuring the liquid in batches as it accumulates in the LDS Containment Tank.

Leachate Collection System Bypass System. The LCS Bypass System is designed to pump leachate directly from the LCA, bypassing the LCS and RLCS pipes, over the perimeter berm to the cell's valve house, into the LTS gravity pipe system, and on to the ILTS for treatment. The LCS Bypass System meets the design requirements for dual containment of leachate. The bypass system has the capability to remove liquid from an LCA at a rate of 500 gpm, thus reducing the time required to empty an active LCA after a significant storm event as discussed in Sections 2.2 and 2.3. The LCS Bypass System will be used only at the direction of the OSWDF Operations Manager when it is necessary to rapidly lower the water level in a LCA.

The LCS Bypass System includes a flow control/throttling device on the pump so the flows to the LTS lift stations do not exceed the design capacity of the LTS lift station pumps. The LCS Bypass System pump skid includes a pump capable of pumping 500 gpm against an estimated 135 ft of hydraulic head. The bypass pump will be skid-mounted and located in the cell near the active LCA. Immediately downstream of the bypass pump discharge, a flow meter and throttle control valve will be installed to regulate flow so the 500 gpm limit of the LTS lift stations is not exceeded. The discharge pipe that will connect the bypass pump skid to the exterior bypass connection at the valve house is 6 in./10 in. dual-wall HDPE SDR-11/SDR-17 pipe.

Design Drawings X-780-M-10657 and X-780-M-10678 show the interior VH-2 bypass piping layout and the exterior bypass connection point; the components (e.g., pipes, valves, fittings) are identical to those in the other valve houses, although the layout of the bypass piping may be slightly different based on geometric considerations related to the OSWDF and piping orientation to the valve house.

The exterior bypass connection consists of a 6-in.-diameter steel pipe that penetrates the exterior wall of VH-2 and is attached to a 6-in.-diameter flexible metal hose with quick-connect fittings. The terminal quick-connect fitting connects a portable dual-contained bypass pipe that conveys pumped leachate from the LCS Bypass System pump skid, which is set up adjacent to the LCA. A 3-ft by 2-ft drip pan with curbs is installed beneath the connection assembly; the drip pan slopes to the valve house wall, where a 1-in.-diameter steel drain and plug is connected to 1-in.-diameter steel piping that runs to the interior valve house sump. The drip pan serves as dual containment for the pumped leachate from the point where the portable dual-contained bypass pipe transitions to the single-wall 6-in.-diameter flexible hose, to the point where the 6-in.-diameter steel pipe penetrates the valve house wall. Prior to using the LCS Bypass System, any water accumulated in the drip pan should be emptied before the drain plug is removed. Upon completion of bypass operations, the drain plug should be reinserted to prevent water entering the valve house sump.

Inside the valve house, the 6-in.-diameter steel pipe is routed to the LTS gravity pipe, where it connects via a 6-in. × 6-in. × 6-in. steel tee. Immediately prior to the steel tee, a 6-in.-diameter butterfly valve (V-0241) is installed on the 6-in.-diameter bypass piping. When the LCS Bypass System is not in use, V-0241 shall be in the closed position.

Leachate Transmission System Piping within Valve House. Design Drawings X-780-M-10657 and -780-M-10678 show the horizontal piping layout for the LTS pipe in VH-2; the components (e.g., pipes, valves, instrumentation) are similar to those in the other valve houses, although the layout may be slightly different based on geometric considerations related to the OSWDF and piping orientation to the valve house. Within the valve house, the LTS pipe conveys leachate from one end of the valve house to the other and provides connection points to receive additional leachate generated within the valve house's OSWDF cell. At the terminal end of the LTS pipe in valve houses VH-1, VH-2, and VH-12, the 6-in.-diameter steel pipe is routed vertically and transitions to
3-in.-diameter steel pipe via a 6-in. × 3-in. steel reducer. The 3-in.-diameter steel pipe is then routed through a sequence of horizontal and vertical runs along the interior wall of the valve house until the pipe

exits the side of the valve house approximately 5.75 ft above the ground. A 3-in.-diameter swing check valve (V-0242 for VH-2, V-0142 for VH-1, and V-1242 for VH-12) is installed in the direction of flow along a vertical section of pipe; the swing check valve allows air to enter or exit the LTS gravity pipe to prevent pressure or vacuum buildup in the system. The check valve closes shut if leachate backs up the vent pipe and engages the valve.

VH-2 is the first valve house on the South LTS Gravity Line; thus the LTS gravity pipe penetrates the wall of the cell valve house at only a single point, below grade, where the pipe exits the valve house on its path to VH-3. Similar to VH-2, VH-1 and V-12 are the first valve houses on their respective LTS gravity pipe lines and each has a single LTS gravity pipe penetration on the downstream side of the valve house. The remaining nine valve houses each have two LTS gravity pipe penetrations, where the pipe enters and exits the valve house. At each below-grade penetration, the 6 in./10 in. double-wall HDPE SDR-11/SDR-17 LTS gravity pipe passes through the wall of the cell valve house via a water-tight wall penetration (see Design Drawing X-780-M-10677).

Inside the valve house wall penetration, the HDPE containment pipe is terminated and a fixed HDPE end seal is installed. For valve houses VH-3 through VH-11 (i.e., not the first valve house on their respective LTS gravity pipe lines), the LTS gravity containment pipe can be monitored at the upstream penetration via a monitoring port equipped with a ¾-in.-diameter ball valve as shown on Design Drawing X-780-M-10677. The monitoring port allows for the observation and quantification of any liquid that may accumulate in the annular space between the carrier pipe and containment pipe. The monitoring port also provides the means of removing any accumulated liquids from the containment piping. Valve houses VH-1, VH-2, and VH-12 do not have monitoring ports because the downstream sections of pipe are monitored in the downstream valve houses VH-4, VH-3, and VH-11, respectively.

Following each HDPE containment pipe termination, the 6-in.-diameter HDPE SDR-11 carrier pipe is transitioned to 6-in.-diameter steel piping. At each transition (i.e., one location in VH-1, VH-2, and VH-12, and two locations in the remaining valve houses), a 6-in.-diameter gear-operated gate valve is installed for line isolation and maintenance purposes. In VH-2, the valve designation is V-0260. As described previously, the LCS pipe, the LDS pipe, and the LCS Bypass System pipe each tie into the 6-in.-diameter LTS steel pipe. In valve houses VH-1, VH-2 and VH-12, one 6-in.-diameter wye with a blind flange is installed on the LTS pipe; access to the downstream pipe is attainable via the wye's blind flange branch. For the remaining valve houses, two 6-in.-diameter wyes are installed on the LTS pipe, providing access to the downstream and upstream pipes via each wye's blind flange branch. Each wye serves as a clean-out for maintenance of the LTS carrier pipe installed between valve houses. The distance between valve houses is less than 400 ft, so each section of LTS gravity pipe is accessible for maintenance at intervals less than 400 ft.

4.1.2.4 Leachate Transmission System

The LTS consists of two gravity lines (North and South LTS Gravity Lines; the North LTS consists of a northeast and a northwest section), three control manholes (CMs) (CM-1, CM-2, and CM-3), two lift stations (North and South), two valve manholes (VM-1 and VM-2), and two forcemains (North and South LTS Forcemains) used to convey the leachate generated within the OSWDF to the influent conveyance pipeline, which conveys the leachate to the ILTS for treatment.

Leachate Transmission System Gravity Lines (North and South). The North and South LTS Gravity Lines are constructed of 6 in./10 in. double-wall HDPE SDR-11/SDR-17 pipe. The inner carrier pipes of the LTS gravity lines are continuous over their entire lengths (i.e., from their upgradient ends to their discharge points). As described in the preceding section, upon entering a valve house the carrier pipe transitions from HDPE to steel and then transitions back to HDPE prior to exiting the valve house. The outer containment pipe is continuous between the valve houses. Upon entering the valve houses, the containment pipe is terminated and a fixed end seal is installed; similarly, as the LTS exits the valve house, the pipe transitions back to dual-contained HDPE, with the containment pipe sealed at the end. The North LTS Gravity Line has two sections. The valve houses connected to the northeast section of the North LTS Gravity Line, in the direction of flow, are VH-1, VH-4, VH-5, VH-8, and VH-9. The valve houses connected to the northwest section of the North LTS Gravity Line, in the direction of flow, are VH-12 and VH-11. The valve houses connected to the South LTS Gravity Line, in the direction of flow, are VH-2, VH-3, VH-6, VH-7, and VH-10.

The LTS gravity lines are located outside the limit of impacted material disposal. To promote gravity flow, the LTS gravity lines are constructed with a minimum longitudinal slope of 0.5 percent. The LTS gravity lines are buried in trenches of sufficient depth below ground surface to prevent freezing of liquids in the line and damage due to traffic loads and other stresses.

Control Manholes (CM-1, CM-2 and CM-3). Immediately upstream of the two lift stations, each LTS gravity line is routed through a prefabricated inside dimension ratio (IDR)-44 HDPE manhole. The components of the control manholes are shown on Design Drawings X-780-M-10668 and X-780-M-10678. A level switch (LS-1301, LS-2101, and LS-2201 for CM-1, CM-2 and CM-3, respectively) is installed below the maintenance platform. If the liquid level rises above the level switch, an alarm is triggered and the alarm light on the Lift Station Manhole Control Panel is illuminated.

The 6 in./10 in. double-wall HDPE SDR-11/SDR-17 LTS gravity line penetrates the HDPE wall of the manhole. Inside the control manhole, the HDPE containment pipe is terminated using a 6 in./10 in. SDR-11 × SDR-17 force transfer dogbone end termination seal. A monitoring port with a ¾-in.-diameter ball valve (V-1301, V-2101, and V-2201 for CM-1, CM-2, and CM-3, respectively) is attached to the dogbone end seal to allow observation and quantification of any liquid that may accumulate in the annular space between the carrier pipe and containment pipe of the LTS gravity line. This port monitors the containment pipe that runs between the control manhole and the upgradient valve house. After the ¾-in.-diameter ball valve (normally opened), piping is routed up to the level of the maintenance platform where another ¾-in.-diameter ball valve (normally closed) is installed. To check for the presence of liquid, the valve at the maintenance platform is slowly opened. If no liquid is observed at the top of the pipe, a water level tape or sensor will be deployed down the section of vertical piping until the sensor either indicates the presence of liquid or reaches the bottom of the pipe. Using this approach, the presence of liquid in the containment pipe can be assessed at the maintenance platform.

The 6-in.-diameter HDPE SDR-11 carrier pipe is then transitioned to 6-in.-diameter single-wall steel piping using an HDPE flange adapter. A 6-in.-diameter butterfly valve (V-1302, V-2102, and V-2202 for CM-1, CM-2, and CM-3, respectively) is connected to the HDPE flange adapter. A valve extension handle connects to the butterfly valve and extends above the maintenance platform for easy access. A 6-in.-diameter motor-operated plug valve (V-1303, V-2103, and V-2203 for CM-1, CM-2, and CM-3, respectively) is connected to the butterfly valve. The motor-operator is installed above the maintenance platform and is connected to the valve by a valve extension handle. The motor-operated valve closes automatically if there is a power failure at the Lift Station Manhole Control Panel. The motor-operated valve in a control manhole will also close if the liquid level in the downstream Lift Station rises above the high-high-level alarm setpoint. The motor-operated valve can also be manually closed, if needed, for maintenance activities. The steel piping is transitioned to single-wall HDPE piping after the motor-operated plug valve. Prior to exiting the manhole, the LTS gravity line is transitioned to 6 in./10 in. double-wall HDPE SDR-11/SDR-17 pipe. The outlet containment pipe termination and monitoring port/valves (V-1304, V-2104, and V-2204 for CM-1, CM-2, and CM-3, respectively) are constructed the same as the inlet. This port monitors the containment pipe that runs between the control manhole and the downgradient lift station. The monitoring port sample valve can be accessed at the maintenance platform.

North and South Lift Stations. The North and South LTS Gravity Lines discharge to the North and South Lift Stations, respectively. The components of the lift stations are shown on Design Drawings X-780-M-10688, X-780-M-10658, and X-780-M-10702. Each lift station is contained in a 7-ft interior diameter, prefabricated dual containment IDR-41 HDPE manhole. The annular space between the primary and secondary HDPE containment rings can be monitored via a 2-in.-diameter monitoring/pumping tube that extends to the base of the lift station; the tube is secured by a lockable cap.

The 6 in./10 in. double-wall LTS gravity line(s) penetrates the HDPE walls of the manhole. The South LTS Gravity Line, which is regulated downstream by CM-1, discharges to the South Lift Station. The northeast and northwest sections of the North LTS Gravity Line, regulated downstream by CM-2 and CM-3, respectively, discharge to the North Lift Station. Inside the lift stations, the HDPE containment pipes are terminated and a fixed HDPE end seal is installed. The carrier pipes are routed downward using 90-degree elbows. The ends of the 6-in.-diameter carrier pipes discharge at the bottoms of the two lift stations through tees aligned to direct the gravity flow away from the pump inlets.

The North and South Lift Stations are each equipped with two submersible pumps designed to operate in alternating mode. This parallel pump configuration satisfies compliance with ARAR *OAC* 3745-27-19(K)(2) because the second pump serves as a back-up installed in the lift station. If one pump goes down the other can take its place. Additionally, a spare pump will be kept on site and can be installed quickly to replace the failed pump to provide further redundancy. For the North Lift Station, two 25-hp submersible pumps were selected to provide 500 gpm against a hydraulic head of 111 ft. For the South Lift Station, two 30-hp submersible pumps were selected to provide 500 gpm against a hydraulic head of 128 ft. Each submersible pump can be installed and removed using a pair of 3-in.-diameter pump rail guides secured to the primary containment ring of the HDPE manhole; a pump pull chain is connected to the pump and secured at the top of the lift station. The 3-in.-diameter steel discharge pipe for each pump is routed vertically to an elevation approximately 1.5 ft below the base of the manhole; each discharge pipe is then transitioned to 6-in.-diameter steel pipe. Prior to exiting the lift station, the two 6-in.-diameter steel discharge lines are transitioned to 6 in./10 in. double-wall HDPE SDR-11/SDR-17 pipe and routed toward the downstream valve manhole.

The start and stop function of the lift stations is based on liquid level control. Each lift station is equipped with a level transmitter (LT-XX10, where XX=14 and XX=23 for the South and North Lift Stations, respectively) and two level switches ([level switch high] LSH-XX20 and [level switch high high] LSHH-XX30, where XX=14 and XX=23 for the South and North Lift Stations, respectively). The control strategy for pump operation is described in Section 4.1.2.5.

The North and South Lift Stations have sufficient capacity to accommodate the postconstruction flow rate over a 1-week period. The lift station capacities also meet the operational criteria of the selected pumps. The recommended maximum number of starts for the North and South Lift Station pumps is five per hour and four per hour (i.e., the pumps should turn on a maximum of once every 12 minutes and once every 15 minutes), respectively. For both the North and South Lift Stations, the estimated time between pump starts is greater than the minimum allowable time based on the maximum allowable number of starts per hour. Similarly, the pump run time required to empty the design storage volume is greater than the recommended minimum run time of approximately 2 minutes. The preceding operational criteria are satisfied for the anticipated range of flows to the lift stations from the North and South Gravity Lines.

Valve Manholes (VM-1 and VM-2). Immediately downstream of each lift station is a valve manhole (VM-1 or VM-2) in which the two double-wall HDPE forcemain pipes from the lift station pumps are recombined into a single forcemain for conveyance to the ILTS. The valve manholes are 6-ft inside diameter, prefabricated IDR-44 HDPE manholes. The components of the valve manholes are shown on Design Drawing X-780-M-10687.

At each valve manhole, the two HDPE forcemain pipes from the lift station penetrate the HDPE wall of the manhole. Inside each manhole, the two HDPE containment pipes are terminated using 6 in./10 in. SDR-11/SDR-17 force transfer dogbone end termination seals. A monitoring port with a ¾-in.-diameter ball valve (V-1501/V-1504 and V-2401/V-2404 for VM-1 and VM-2, respectively) is installed in the end of each termination seal.

In VM-1 and VM-2, the piping material of the 6-in.-diameter carrier pipes is then transitioned to 6-in.-diameter single-wall steel piping. At the material transition point on each pipe, a 6-in.-diameter check valve (V-1502/V-1505 or V-2402/V-2405) and then a 6-in.-diameter butterfly valve (V-1503/ V-1506 or V-2403/V-2406) are installed. The two pipes in each manhole are then combined into a single forcemain pipe using assorted fittings, including a 6-in.-diameter tee. Prior to exiting the manhole, the single forcemain pipe is transitioned to 6 in./10 in. double-wall HDPE SDR-11/SDR-17 pipe; the outlet containment pipe termination and monitoring port/valve (V-1507 or V-2409) are constructed the same as the inlets.

In addition to the valves described above in VM-2, an air release valve (ARV-2408) is installed on the 6-in.-diameter steel cross pipe fitting after V-2406 where the two pipes are combined. A piece of flexible tubing is connected to the air discharge port of ARV-2408; the tubing is routed to a 5-gal bucket that provides secondary containment for any liquids that may be discharged through the air discharge port.

LTS Forcemains. The LTS forcemains are constructed of 6 in./10 in. double-wall HDPE SDR-11/SDR-17 pipe. The LTS South Forcemain is approximately 2,000 ft long, and connects to the IMTA Conveyance Pipeline which conveys the leachate to the ILTS for treatment. Forcemain cleanouts (FCO-1, FCO-2, and FCO-3) are installed along the length of the LTS South Forcemain as shown on the design drawings. An air release valve (ARV-1901) is installed in the LTS South Forcemain. The LTS North Forcemain is approximately 750 ft long, and connects to the IMTA Conveyance Pipeline which conveys the leachate to the ILTS for treatment. One forcemain cleanout (FCO-4) is installed as shown on the drawings along the length of the LTS North Forcemain. The North and South Forcemains tie into the influent conveyance pipeline inside the North and South Lift Station Tie-in Vault. The ILTS Design Package and procedures address the operation and maintenance of the North and South Lift Station Tie-in Vault and the influent conveyance pipeline.

Forcemain Cleanouts. The components of the LTS Forcemain Cleanouts are shown on Design Drawing X-780-M-10678. Each cleanout assembly is contained in a 7.5-ft inside diameter, prefabricated IDR-40 HDPE manhole. The 6-in./10 in. double-wall HDPE SDR-11/SDR-17 forcemain inlet pipe penetrates the HDPE wall of the manhole. Inside the manhole, the HDPE containment pipe is terminated and a fixed HDPE end seal and containment pipe monitoring port is installed. The material of the 6-in.-diameter carrier pipes is then transitioned to 6-in.-diameter single-wall steel piping. At the material transition point, a 6-in.-diameter nonrising stem gate valve is installed, followed by a 6-in. × 4-in. A53 steel wye with a 4-in.-diameter blind flange and 2-in.-diameter threaded nipple; the 4-in.-diameter branch is oriented to provide access to the downstream forcemain pipe. A 2-in.-diameter ball valve (V-1603, V-1703, V-1803, and V-2503 for FCO-1, FCO-2, FCO-3, and FCO-4, respectively) is attached via the 2-in.-diameter threaded nipple. Immediately downstream of the first 6-in. × 4-in. A53 steel wye, a second 6-in. × 4-in. A53 steel wye with a 4-in.-diameter blind flange and 2-in.-diameter threaded nipple is installed; the 4-in.-diameter branch is oriented to provide access to the upstream forcemain pipe. A 2-in.-diameter ball valve (V-1604, V-1704, V-1804, and V-2504 for FCO-1, FCO-2, FCO-3, and FCO-4, respectively) is attached via the 2-in.-diameter threaded nipple. A 6-in.-diameter nonrising stem gate valve (V-1605, V-1705, V-1805, and V-2505 for FCO-1, FCO-2, FCO-3, and FCO-4, respectively) is installed after the second steel wye. The steel piping material is then transitioned to 6-in.-diameter single-wall HDPE SDR-11 pipe after the second rising stem gate valve. Prior to exiting the manhole, the forcemain is transitioned to 6 in./10 in. double-wall HDPE SDR-11/SDR-17 pipe; the outlet containment pipe termination and monitoring port are constructed to the same as the inlet.

4.1.2.5 Electrical and Process Control

Electrical power is supplied to the OSWDF, which includes the LMS, via a primary feeder with the ability to transfer load to a secondary feeder. The operation and maintenance of electrical systems that support the OSWDF will be performed by site maintenance personnel following existing procedures.

Valve House Electrical and Control Components. The valve houses are provided with 120/240-volt power and a fiber optic connection via an overhead service.

The building is heated by unit heaters. Ventilation is provided by a ceiling fan and an exhaust fan with an intake louver to provide fresh air. The louvers are on an exterior wall of the building and a duct on the intake louver of the exhaust fan is routed above the floor to promote mixing of fresh air. The exhaust fan flow rate is 1,400 standard cubic feet per minute (scfm) and the fan provides approximately six to nine air changes per hour. The exhaust fan can be turned on by a switch in the control cabinet outside the building.

The valve house has an oxygen and methane alarm mounted in the control cabinet outside the building. The methane alarm will provide an audible and visual alarm both inside and outside the building if the detected concentration exceeds 5 percent of the lower explosive limit (LEL). The alarm will notify personnel not to enter, or notify personnel already inside to exit immediately.

The LCS and LDS Containment Vessels (300 gallon tanks) are vented by a duct fan to prevent the potential accumulation of methane in the tanks. The tanks have air admittance valves to provide fresh air and preclude the extraction of methane from the landfill by preventing a vacuum in the tank. The duct fan operates at approximately 100 scfm and provides approximately 60 air changes per hour in the tank.

The control panel for the valve house is located in the control cabinet outside the building. Design Drawing X-780-E-10650 shows the layout of a typical valve house control panel. The control panel has an alarm light for the sump high level. The alarm latches and must be reset manually using a button on the panel. The LCS and LDS flow rate and total flow are displayed on a meter on the panel face. The LCS and LDS Containment Vessel levels are displayed on separate meters.

The high level alarm and methane alarm will also signal a remote input/output device that connects by fiber optic cable to the ILTS control system.

Lift Station Electrical and Control Components. Drawing X-780-E-10651 shows the layout of a typical lift station equipment rack, including the Lift Station Pump Control Panel, the Lift Station Level

Control Panel, and the Mini Power Zone (MPZ). The lift stations are provided with 120/240 volt power and a fiber optic connection via an overhead service.

The lift station equipment rack has two control panels. The Lift Station Level Control Panel provides alarms for and operates the Lift Station Control Manhole. The Lift Station Pump Control Panel operates the pumps. The Lift Station Level Control Panel operates independently from the Lift Station Pump Control Panel. The level control functions are operated by float switches and the pump control is operated by a pressure transmitter. The lift station high alarm and lift station high high alarm will also signal a remote input/ output device that connects by fiber optic cable to the ILTS control system.

The LTS Control Manhole Control Panels are installed adjacent to the LTS Control Manholes, and receive input signals from the Lift Station Level Control Panel to operate the motor-operated plug valve based on the water levels in the Lift Station.

The OSWDF LMS's operational logic and alarm strategy are shown on Design Drawings X780-M-10654, X-780-M-10667, and X-780-M-10668.

4.1.3 IMTA Leachate Management System

The components and function of the IMTA LMS are affected by the phasing of construction, startup, and operations. The IMTA LMS is not required to support initial operations. The IMTA LMS can be constructed, but cannot operate until the ILTS Phase 2 is operational.

The objective of the IMTA LMS is to manage leachate generated in the IMTA. The IMTA LMS includes the IMTA, Tank 1, the Tank 1 Pump Station, and the Tank 1 Forcemain. Leachate generated in the IMTA is conveyed to Tank 1, where it is stored until the ILTS is ready to receive leachate for treatment. In addition, the Wheel Wash Facility discharges to Tank 1. The leachate stored in Tank 1 is pumped by the Tank 1 Pump Station to the ILTS via the Tank 1 and IMTA Conveyance Pipeline. Detailed descriptions of these components and their functional descriptions are provided in this section.

4.1.3.1 IMTA

The IMTA includes a composite liner system consisting of a drainage layer, a geomembrane liner, and a compacted clay liner (Figure 4-3). The IMTA is sloped such that surface runoff on the top of the aggregate base (above the drainage layer) will be conveyed and collected in the perimeter leachate runoff drainage channel. Liquids that percolate through the aggregate base will be collected in the drainage layer of the IMTA liner system and conveyed to the perimeter leachate runoff channel. Liquids (i.e., leachate) collected in the perimeter leachate runoff channel will be collected and conveyed through a 36-in. SDR-32.5/42-in. SDR-19 double-wall HDPE pipe (i.e., leachate runoff pipe 702/703) to Tank 1. These liquids are considered leachate and will be sent to the ILTS for treatment.

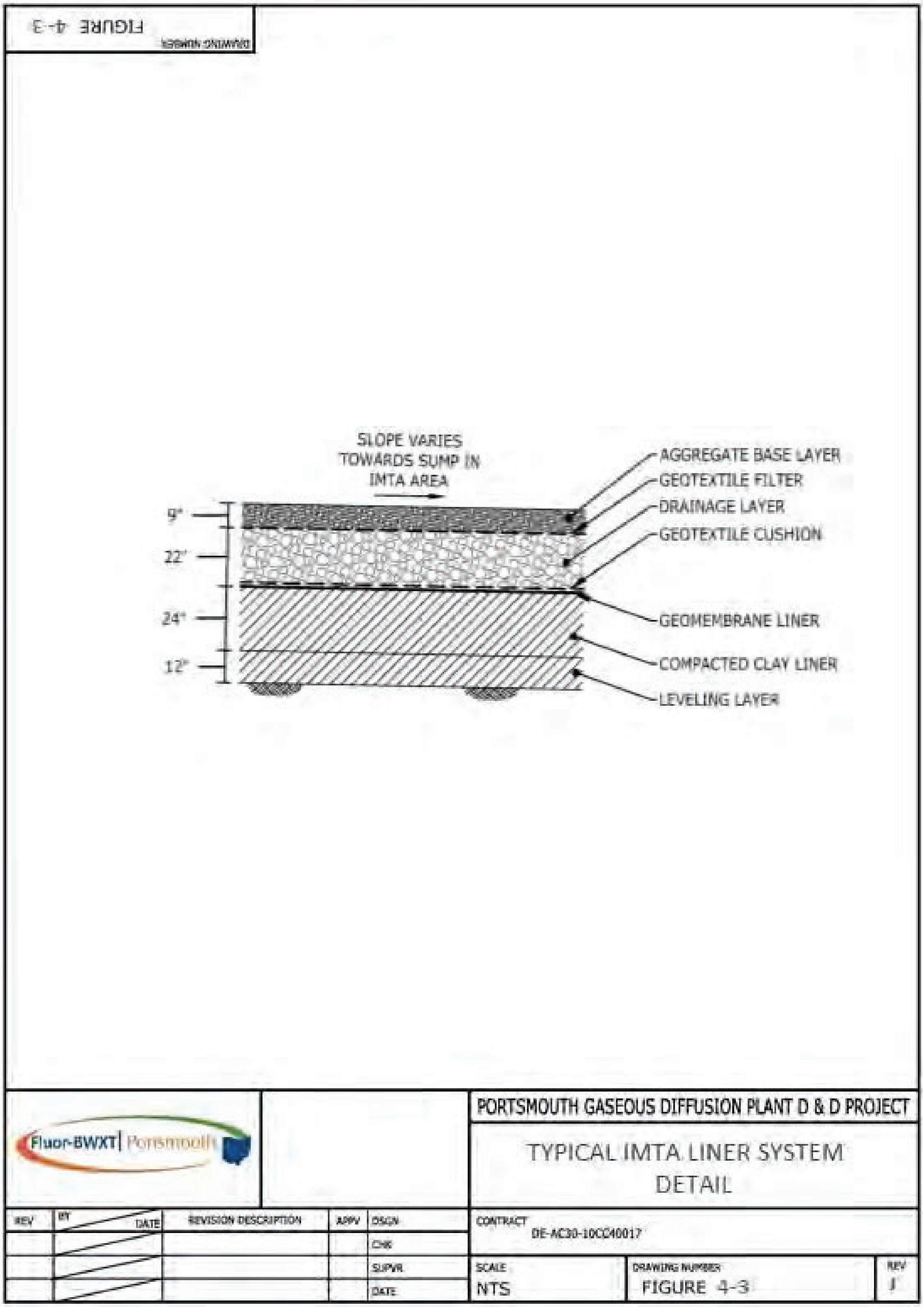


Figure 4-3. Liner System for Impacted Material Transfer Area

4.1.3.2 Tank 1

Tank 1 is an aboveground, modular bolted steel tank with a total storage capacity of 1,535,000 gal. The tank walls are constructed of modules that are bolted together and support the installation of the double-liner system and associated leak detection system. Tank 1 is designed to store the calculated runoff volume from a 25-year, 24-hour design storm event with 1 ft of freeboard at the top of the tank and 0.5 ft of dead storage at the bottom. The storage capacity of Tank 1 is also sufficient to store the calculated runoff volume from a 100-year, 24-hour design storm event with no freeboard. The leachate stored in Tank 1 is pumped by the Tank 1 Pump Station to the ILTS via the Tank 1 and IMTA Conveyance Pipeline as described in the following section.

4.1.3.3 Tank 1 Pump Station

The components of the Tank 1 Pump Station are shown on Design Drawings X-780-M-10839, X-780-M-10857, X-780-M-10877, X-780-M-10859, X-780-S-10842, X-780-S-10865, X-780-S-10876, and X-780-S-10875. The P&ID for the Tank 1 Pump Station is shown on Design Drawing X-780-M-10837 and includes the key components described below.

The Tank 1 Pump Station includes two 30-hp centrifugal pumps (PMP-900 and PMP-910) plumbed in parallel and designed to operate in alternating mode. Each pump is designed to handle 500 gpm against 120 ft of hydraulic head. The Tank 1 Pump Station is covered by a canopy that extends beyond the four edges of the pump station pad. The canopy protects the pump station equipment from direct exposure to the sun and limits the amount of precipitation that falls directly on the concrete pad. The Tank 1 Pump Station pad is equipped with a 25-gal capacity sump and a 0.75-hp submersible pump (PMP-500). The discharge from the submersible pump is routed back to Tank 1. The sump and pump provide the means to manage any leachate that might leak onto the pad via a pipe leak, valve leak, pump drip, or similar event.

The pumps are supplied by an 8-in.-diameter schedule 80 polyvinyl chloride (PVC) manifold as shown on Design Drawing X-780-M-10839. Between Tank 1 and the manifold, an 8-in.-diameter plug valve (V-100) is installed for isolation and maintenance purposes. Each pump can be isolated from the supply manifold via an 8-in.-diameter plug valve (V-901 or V-911) installed on the 8-in.-diameter schedule 80 PVC pipe that connects the supply manifold to the pumps. Immediately after the gate valve, an 8-in.-diameter basket strainer (BS-901 or BS-911) is installed on the supply line to prevent foreign objects from entering and damaging the pumps. Following the basket strainers, the pipe diameter is reduced from 8-in. diameter to 4-in. diameter via an 8-in. × 4-in. steel reducer.

The diameter of the discharge pipe of each pump is increased from 3-in. to 6-in. via a 3-in. x 6-in. steel reducer. Immediately after the increase in the size of the discharge pipe, a pressure instrumentation and sample port assembly is installed to measure pump discharge pressure and collect water quality samples. The discharge pressure is measured by a pressure indicator (PI-900 or PI-910) and a pressure indicating transmitter (PIT-900 or PIT-910) installed after the reducer. The primary function of each pressure switch is to shut down the pump if its line pressure exceeds 65 psi for more than 10 seconds. Each pressure indicator and pressure indicating transmitter can be isolated for maintenance by a 0.25-in. steel ball valve (V-902, V-906, V-912 or V-916) installed on the 0.25-in. tap into the 6-in.-diameter discharge pipe. Each assembly also includes a 0.25-in sample port (V-905 or V-915) from which a water quality sample can be collected.

Following the pressure instrumentation and sample port assembly, a 6-in.-diameter check valve (V-903 or V-913) is installed to prevent backflow through the pumps. Each check valve can be isolated from the discharge manifold for maintenance via a 6-in.-diameter gate valve (V-904 or V-914) installed immediately prior to the discharge manifold. After the 6-in.-diameter gate valves, the 6-in. diameter steel pipe is changed to a 6-in.-diameter schedule 80 PVC pipe. The pipe diameter is then increased from 6-in. diameter to 8-in. diameter via an 8-in. × 6-in. PVC reducer and combined into a single 8-in.-diameter PVC discharge line via an 8-in. × 8-in. × 8-in. PVC tee. Manual air relief at the peak height of the 8-in.-diameter discharge line is provided by a 1-in.-diameter ball valve (V-1000). Following the air relief assembly, the 8-in.-diameter discharge line is transitioned to 8 in./12 in. double-wall HDPE SDR-11/SDR-17 pipe prior to leaving the footprint of the pump station pad. After leaving the pump station pad, the double-wall HDPE pipe is routed underground and becomes the Tank 1 Forcemain.

The Equipment Schedule for the valves and pumps is provided on Design Drawing X-780-M-10837; the Instrumentation Schedule is provided on Design Drawing X-780-M-10878.

4.1.3.4 Tank 1 Forcemain

The Tank 1 Forcemain is constructed of 8 in./12 in. double-wall HDPE SDR-11/SDR-17 pipe. The Tank 1 Forcemain is approximately 50 ft long and connects to the IMTA Conveyance Pipeline.

4.1.3.5 Electrical and Process Control

Electrical. The IMTA LMS electrical components are shown on Design Drawings X-780-E-10835, X-780 E-10862, and X-780-E-10874.

Process Controls. The automated control system for the IMTA LMS is contained in a control panel installed adjacent to the Tank 1 Pump Station. Design Drawing X-780-E-10874 shows the layout of the Tank 1 Control Panel. The function of the control panel is described in Section 6.1.2. The IMTA LMS's operational logic and alarm strategy are shown on Design Drawing X-780-M-10837.

4.2 IMTA IMPACTED SURFACE WATER MANAGEMENT SYSTEM

Unlike the OSWDF LMS, the components and function of the IMTA ISWMS are affected by the phasing of the project. The IMTA, and therefore the IMTA ISWMS, will not be operational during initial operations. The information in this section pertains to IMTA ISWMS and full-scale operations. The IMTA and IMTA ISWMS can be constructed, but cannot operated until the ILTS Phase 2 is operational.

Potentially impacted surface water is managed by the IMTA ISWMS. The objective of the IMTA ISWMS is to manage surface water from the portion of the IMTA Haul Road that is potentially impacted, the area surrounding the Wheel Wash Facility, Equipment Maintenance Area #1, Water Filling Station #2, and the West Maintenance Building Area. The potentially impacted surface water will be conveyed through channels, pipes, catch basins, sewer pipes, drop inlet structures, and manholes to Tank 2A, where it is temporarily stored. Tank 2A is the larger of two aboveground modular storage tanks that comprise the Tank 2A/2B storage system. Tank 2B is the second tank of the system and is approximately 27 percent of the size of Tank 2A.

Per the concurred with OSWDF Final (100%) Design plans and specifications, the Tank 2A/2B storage system is designed to allow potentially impacted surface water to be stored, sampled, and released to Sedimentation and Detention Pond 2 without treatment if the water meets Ohio EPA approved criteria. The design plans and specifications for the Tank 2A/2B storage system have received Ohio EPA concurrence as part of the OSWDF Final (100%) design. This LISWP describes the configuration, operation and maintenance of the concurred design, but does not include the sampling and analysis plan and discharge levels required to release water to Sedimentation and Detention Pond 2 without treatment. Discharge of water from Tank 2B to Sedimentation and Detention Pond 2 will not be implemented unless the complete operational approach has been explicitly authorized by Ohio EPA. Until such time as a sampling and analysis plan and discharge levels have been developed by the DOE and concurred upon by Ohio EPA, all waters collected in Tanks 2A/2B will be pumped to the ILTS for treatment prior to discharge. The SAP will include parameters listed in the Priority Pollutant List, 40 *CFR* Part 423, Appendix A, that may be present in potentially impacted surface water. To prevent inadvertent discharge without treatment, the valves or piping designed to allow discharge of water from Tanks 2A/ 2B to Sedimentation or Detention Pond 2 will be secured by the use of a blind flange, welded cap or other positive means.

4.2.1 Tank 2A

Tank 2A is an aboveground, modular bolted steel tank with a total storage capacity of 1,756,000 gal. The tank walls are constructed of modules that are bolted together and support the installation of the single-liner system. Tank 2A is designed to store the calculated runoff volume from a 25-year, 24-hour design storm event with 1 ft of freeboard at the top of the tank and 0.5 ft of dead storage at the bottom. The storage capacity of Tank 2A is also sufficient to store the calculated runoff volume from a 100-year, 24-hour design storm event if freeboard is not considered.

4.2.2 Tank 2B

As noted in Section .2, all water collected in Tanks 2A/2B will be treated by the ILTS unless a sampling and analysis plan (SAP) and discharge levels have been developed by the DOE and concurred upon by Ohio EPA.

Tank 2B is an aboveground, modular bolted steel tank with a total storage capacity of 473,000 gal. The tank walls are constructed of modules that are bolted together and support the installation of the single-liner system. Tank 2B is designed to store the calculated runoff volume from a 1.5-in. total precipitation storm event over the drainage area. This storm event captures approximately 96 percent of storms that occurred in the 20-year historical record for PORTS. Tank 2B provides at least 0.5 ft of freeboard at the top of the tank and 0.5 ft of dead storage at the bottom for the design storm.

Potentially impacted surface water conveyed to Tank 2A will be pumped to Tank 2B until Tank 2B reaches a predetermined level. Tank 2B serves a holding tank, allowing water to be stored and sampled to determine whether the water meets discharge criteria concurred upon by Ohio EPA. Collection and analysis of samples from Tank 2B will occur in accordance with an Ohio EPA concurred SAP .

If the contents of Tank 2B meet discharge criteria, the water can be released to Sedimentation and Detention Pond 2. If sampling is not conducted, or if weather conditions create a risk of Tank 2A or 2B overflowing before sample results are received, the accumulated water will be pumped to the ILTS Phase 2 for treatment.

4.2.3 Tank 2A/2B Pump Station

The components of the Tank 2 Pump Station are shown on Design Drawings X-780-M-10839, X-780-M-10857, X-780-M-10877, X-780-M-10859, X-780-S-10842, X-780-S-10890, X-780-S-10876, and X-780-S-10875. The P&ID for the Tank 2A/2B Pump Station is shown on Design Drawing X-780-10878 and includes the key components described below.

The Tank 2A/2B Pump Station includes two 40-hp centrifugal pumps (PMP-800 and PMP-810) plumbed in parallel and designed to operate in alternating mode. Each pump is designed to handle 1,000 gpm against 100 ft of hydraulic head. The Tank 2A/2B Pump Station is covered by a canopy that extends beyond the four edges of the pump station pad. The canopy protects the pump station equipment from direct exposure to the sun and limits the amount of precipitation that falls directly on the concrete pad. The Tank 2A/2B Pump Station pad is equipped with a 25-gal capacity sump and a 0.75-hp submersible pump (PMP-600). The discharge from the submersible pump is routed back to Tank 2A. The sump and pump provide the means of managing any potentially impacted surface water that might leak onto the pad via a pipe leak, valve leak, pump drip, or similar event.

The pumps are supplied by a 10-in.-diameter schedule 80 PVC manifold as shown on Design Drawing X-780-M-10839. Between Tank 2A and the manifold, a 10-in.-diameter plug valve (V-201) is installed for isolation and maintenance purposes. Between Tank 2B and the manifold, a 10-in.-diameter plug valve (V-211) is installed for isolation and maintenance purposes. Each pump can be isolated from the supply manifold via a 10-in.-diameter plug valve (V-801 or V-811) installed on the 10-in.-diameter schedule 80 PVC pipe that connects the supply manifold to the pumps. Immediately after the plug valve, a 10-in.-diameter basket strainer (BS-801 or BS-811) is installed on the supply line to prevent foreign objects from entering and damaging the pumps. Following the basket strainers, the pipe diameter is reduced from 10-in. to 6-in. via a 10-in. × 6-in. steel reducer.

The diameter of the discharge pipe of each pump is increased from 4-in. to 8-in. via a 4-in. × 8-in. steel reducer. Immediately before the increase in discharge pipe size, a pressure instrumentation and sample port assembly is installed to measure pump discharge pressure and collect water quality samples. The discharge pressure is measured by a pressure indicator (PI-800 or PI-810) and a pressure indicating transmitter (PIT-800 or PIT-810). The primary function of each pressure indicating transmitter is to shut down the pump if its line pressure exceeds 60 psi for more than 30 seconds. Each pressure indicator and pressure indicating transmitter can be isolated for maintenance by a 0.25-in. steel ball valve (V-802, V-806, V-812, or V-816) installed on the 0.25-in. tap into the 4-in.-diameter discharge pipe. Each assembly also includes a 0.25-in. sample port (V-805 or V-815) from which a water quality sample can be collected.

Following the pressure instrumentation and sample port assembly and reducer, an 8-in.-diameter check valve (V-803 or V-813) is installed to prevent backflow through the pumps. Each check valve can be isolated from the discharge manifold for maintenance via an 8-in.-diameter gate valve (V-804 or V-814) installed immediately prior to the discharge manifold. After the 8-in.-diameter gate valves, the 8-in.-diameter steel pipe is changed to 8-in.-diameter schedule 80 PVC pipe. The pipes are combined into a single 8-in.-diameter PVC discharge line via an 8-in. × 8-in. × 8-in. PVC tee. Manual air relief at the peak height of the 8-in.-diameter discharge line is provided by a 1-in.-diameter ball valve (V-2000). An 8-in. magnetic flow element and flow indicating transmitter (FIT-800) is installed 40 in. (i.e., a minimum of five pipe diameters) after the manual air relief saddle. Following FIT-800, the 8-in.-diameter discharge line splits; one line goes to Tank 2B and the other line goes to the Tank 2A/2B Forcemain. The lines are isolated with two coordinated motor-operated butterfly valves (V-807 and V-817) to control the destination of the flow. The line to the Tank 2A/2B Forcemain is transitioned to 8 in./12 in. double-wall HDPE SDR-11/SDR-17 pipe prior to leaving the footprint of the pump station pad. After leaving the pump station pad, the double-wall HDPE pipe is routed underground and becomes the Tank 2A/2B Forcemain. Immediately after the 90-degree elbow that routes the forcemain horizontally, a leak detection and monitoring assembly is installed to allow monitoring of the annular space between the carrier and containment pipes. After the leak detection and monitoring assembly, the Tank 2A/2B Forcemain is transitioned to 10 in./14 in. double-wall HDPE SDR-11/SDR-17 pipe.

The Equipment Schedule for the valves and pumps is provided on Design Drawing X-780-M-10837; the Instrumentation Schedule is provided on Design Drawing X-780-M-10878.

4.2.4 Tank 2A/2B Forcemain

The Tank 2A/2B Forcemain is constructed of 10 in./14 in. double-wall HDPE SDR-11/SDR-17 pipe. The Tank 2A/2B Forcemain is approximately 400 ft long and connects to the IMTA Conveyance Pipeline.

4.2.5 Electrical and Process Control

Electrical. Electrical power is supplied to the OSWDF, which includes the IMTA, via a primary feeder with the ability to transfer load to a secondary feeder. The operation and maintenance of electrical systems that support the OSWDF will be performed by site maintenance personnel following existing procedures.

The IMTA ISWMS electrical components are shown on Design Drawings X-780-E-10835, X-780-E-10862, and X-780-E-10874.

Process Controls. The automated control system for the IMTA ISWMS is contained in a control panel adjacent to the Tank 2A/2B Pump Station. Design Drawing X-780-E-10874 shows the layout of the IMTA ISWMS Control Panel. The function of the control panel is described in Section 6.1.3.

Under control decisions made by a programmable logic controller (PLC) in the IMTA ISWMS Control Panel, the Tank 2A/2B system has two automated control processes that are dependent on weather conditions, used storage volume, sample results, and discharge location. These parameters lead to one of two automated operational processes: pumping potentially impacted surface water from Tank 2A to Tank 2B, and pumping potentially impacted surface water from Tank 2A to the ILTS. Two additional manual processes can be initiated by the operator: draining the contents of Tank 2B to Sedimentation and Detention Pond #2 without treatment, and pumping the contents of Tank 2B to the ILTS. During manual operations, the automated controls processes are disabled and vice versa. If sampling, analysis and discharge criteria have not been concurred for release of water from Tank 2B to Sedimentation and Detention Pond #2, the valves or piping designed to allow discharge of water from Tanks 2A/ 2B to Sedimentation or Detention Pond 2 will be secured by the use of a blind flange, welded cap or other positive means.

Process Selection Logic. The control system evaluates a range of input parameters to decide if water in Tank 2A should be pumped to Tank 2B or to the ILTS. The process selection logic is illustrated on Figure 4-4.

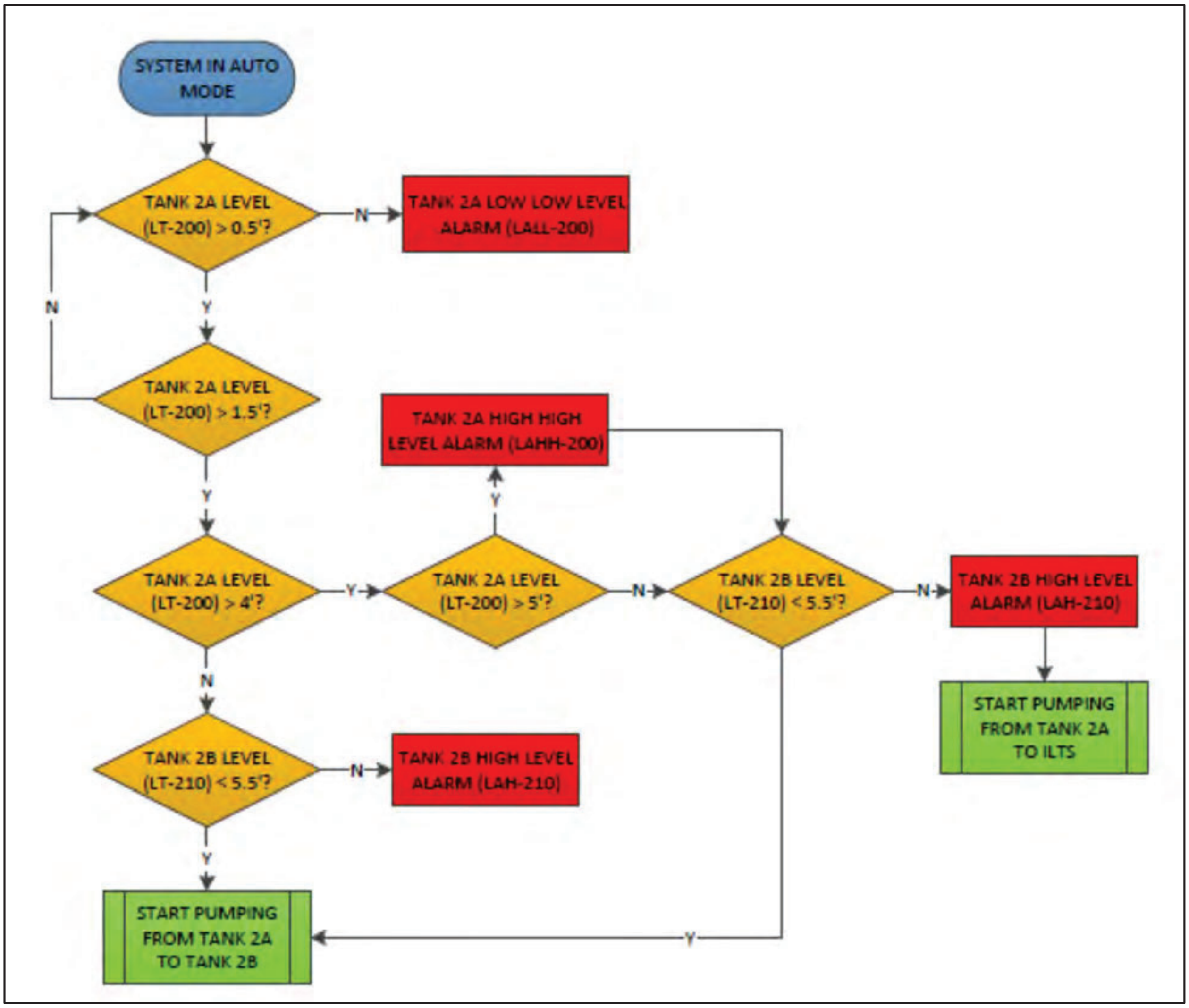
Pumping from Tank 2A to Tank 2B. Figure 4-5 presents the operational logic executed once it has been decided that potentially impacted surface water is to be pumped from Tank 2A to 2B.

Pumping from Tank 2A to ILTS. The operational logic executed by the PLC once it has been decided that potentially impacted surface water is to be pumped from Tank 2A to the ILTS is illustrated on Figure 4-6.

Manual Discharge of Surface Water from Tank 2B to Sedimentation and Detention Pond #2.
As noted in Section .2, all water collected in Tanks 2A/2B will be treated by the ILTS unless a sampling and analysis plan (SAP) and discharge levels have been developed by the DOE and concurred upon by Ohio EPA.

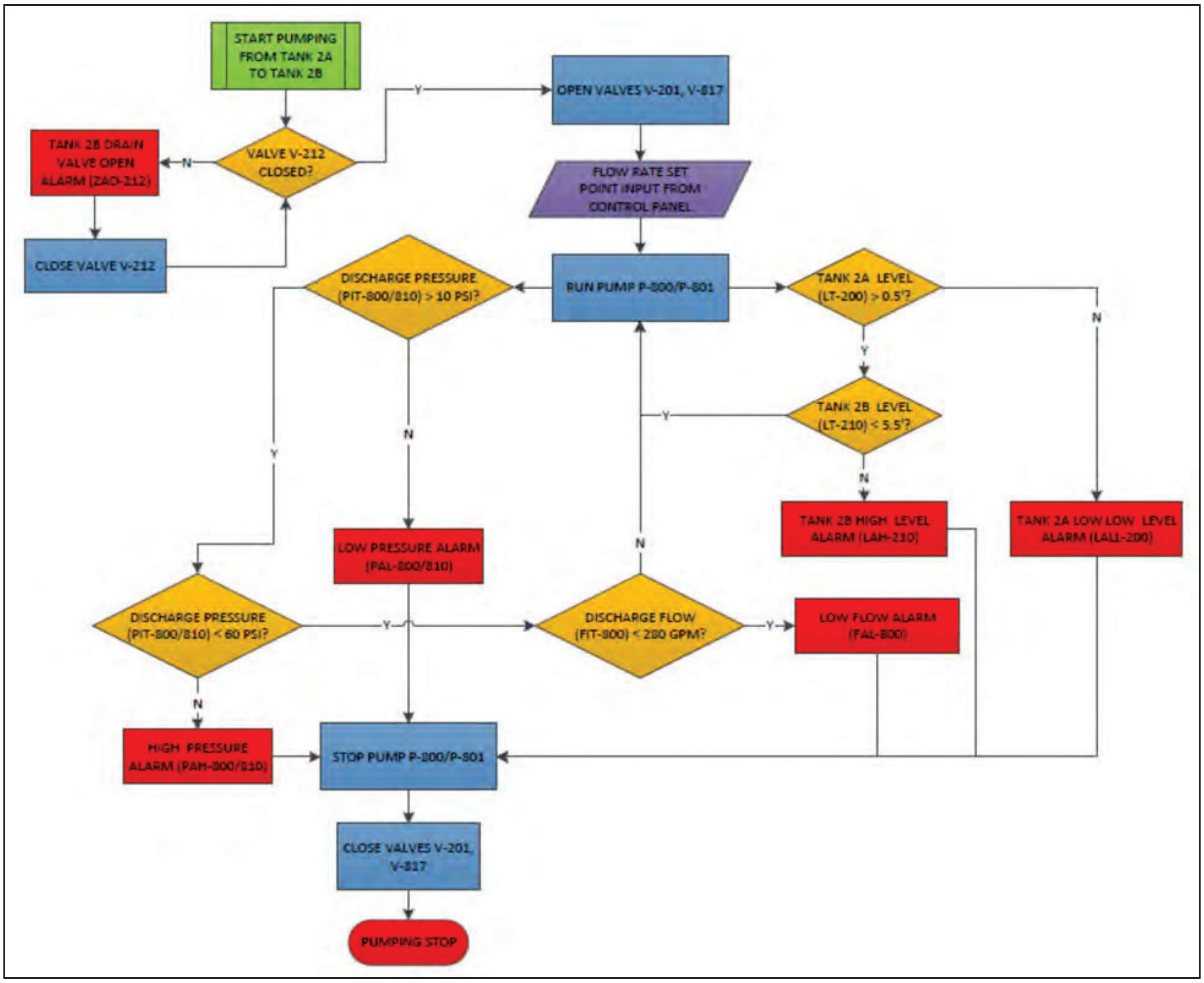
A SAP for Potentially Impacted Surface Water will provide the decision levels used to determine whether or not the water in Tank 2B requires treatment prior to release. If no treatment is required, the contents will be discharged to Sedimentation and Detention Pond #2. Tank 2B is drained under gravity conditions via the 12-in.-diameter bottom drain installed in the base of the tank; flow through the bottom drain is regulated by an actuated 12-in. plug valve (V-212) installed on the 12-in. SDR-17 HDPE pipe connected to the bottom drain and routed to Sedimentation and Detention Pond #2.

Manual Pumping of Potentially Impacted Surface Water from Tank 2B to the ILTS. If the water quality of the contents of Tank 2B does not meet the discharge limits in the OSWDF PSVP or if sampling of Tank 2B is not being conducted, the contents will be pumped from Tank 2B to the ILTS.



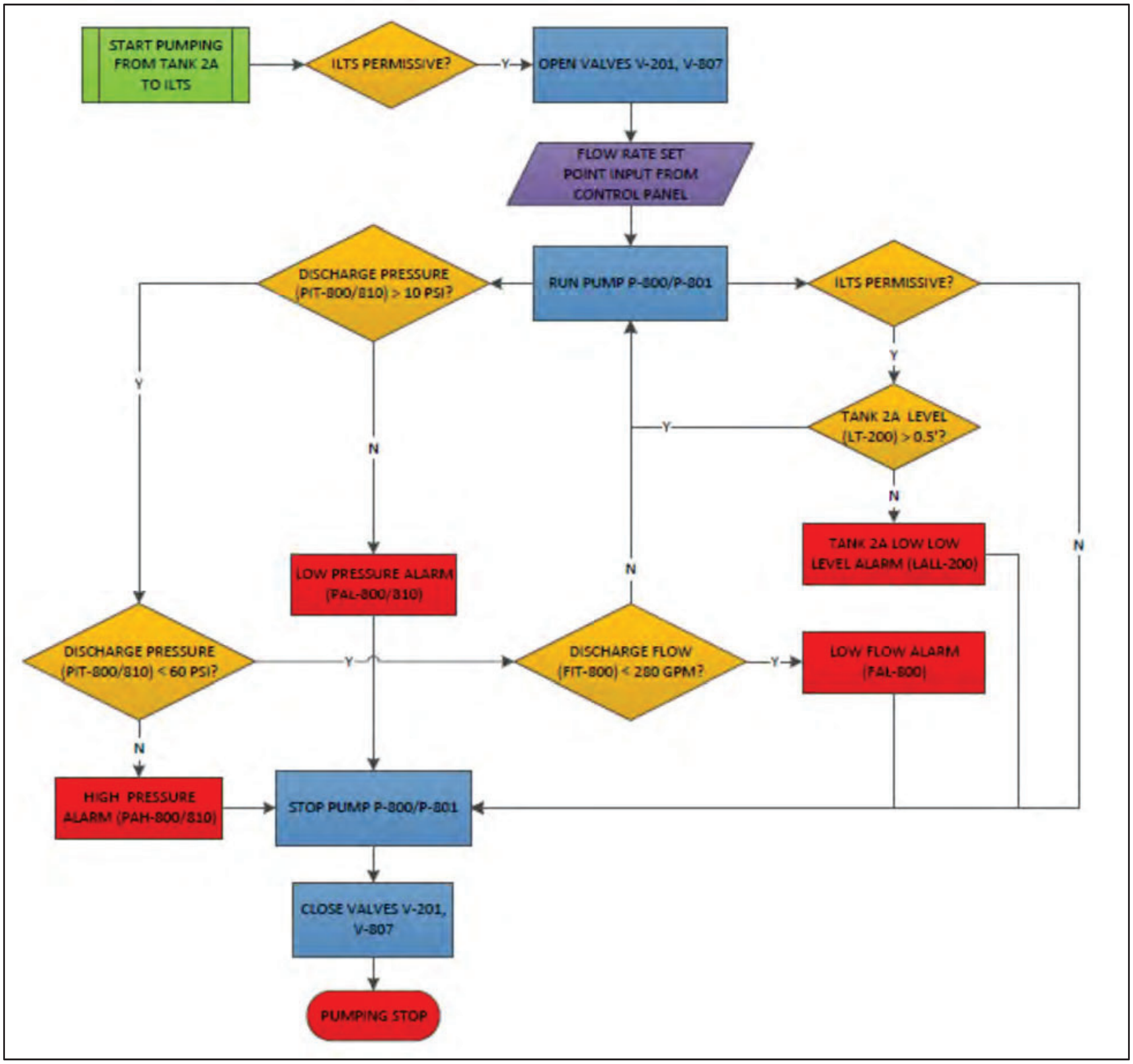
ILTS = Interim Leachate Treatment System
LAH = level alarm high
LAHH = level alarm high high
LALL = level alarm low low
LT = level transmitter

Figure 4-4. Tank 2A/2B Process Selection Control Logic Diagram



FAL = flow alarm low
FIT = flow indicating transmitter
LAH = level alarm high
LALL = level alarm low low
LT = level transmitter
PAH = pressure alarm high
PAL = pressure alarm low
PIT = pressure indicating transmitter

Figure 4-5. Tank 2A to Tank 2B Pumping Control Logic Diagram



FAL = flow alarm low
FIT = flow indicating transmitter
ILTS = Interim Leachate Treatment System
LALL = level alarm low low
PAH = pressure alarm high
PAL = pressure alarm low
PIT = pressure indicating transmitter

Figure 4-6. Tank 2A to ILTS Pumping Control Logic Diagram

5. LMS AND ISWMS FUNCTIONAL CHECKOUT

This section describes the requirements for the functional checkout of the LMS and the IMTA ISWMS. The functional checkout will verify that key system components have been installed correctly and are functional. The Technical Specifications require that the Contractor provide a detailed Functional Checkout and System Start-up Plan. The contractor-provided Functional Checkout and System Start-up Plan should at a minimum include the functional checkout requirements described in this section.

Functional checkout activities will proceed according to the following sequence for each system:

- Verification of correct operation of electrical, mechanical, and instrumentation
- Pipe filling and purging
- Limited system operation to verify system interlocks
- Flow adjustments of the pump stations and lift stations
- Full system operation and observation to confirm each system is operating consistent with design criteria.

Detailed procedures will be developed for the check-out activities.

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6. OPERATING PROCEDURE DEVELOPMENT

The LMS and IMTA ISWMS consist of automated and manual system components. Section 6.1 describes the function, control, and operation of the automated components of the systems to be incorporated in operating procedures for these systems. Section 6.2 describes the start-up process, routine operation, alarm conditions, and shutdown procedures that will be developed for each system. Development of proper operating procedures is necessary for compliance with DOE Manual 435.1-1 (IV)(P)(6)(a), a TBC listed in Appendix A.

6.1 AUTOMATED SYSTEM CONTROL

6.1.1 OSWDF Leachate Management System

The automated control system for the OSWDF LMS is comprised of individual control panels at the valve houses, the LTS control manholes, and the North and South Lift Stations.

6.1.1.1 Valve House Control Panel

The valves, LCS and LDS 300-gal storage tank pumps, and level recorders installed in the valve houses are operated manually. Automation in the valve houses is limited to: monitoring the LCS and LDS pipe flow rates and totals, monitoring LCS and LDS tank levels, local notification of interior sump high level alarm, sump high level alarm reset button, and local notification of methane level high alarm. The set point for the Valve House sump high alarm is 0.5 ft. The set point for the methane level high alarm is 1.25 percent by volume (i.e., 25 percent of the LEL, which is defined as 5 percent by volume).

6.1.1.2 Leachate Transmission System Control Manhole Control Panel

Control of the motor-operated valve installed in each LTS control manhole is based on the water level in its downstream lift station. If the water level in the downstream lift station reaches 16 ft, the Lift Station level high high 2 alarm (i.e., LAHH-XX30) is triggered and a signal transmitted to the upstream motor-operated valve instructs it to close. If a power outage occurs, the upstream motor-operated valve will close. The LTS Control Manhole Control Panel is equipped with an LAHH-XX30 alarm indicator and a reset button. Each control panel is installed adjacent to its respective LTS Control Manhole.

6.1.1.3 Lift Station Pump and Level Control Panels

Drawing X-780-E-10651 shows the layout of a typical lift station equipment rack, including the Lift Station Pump Control Panel, the Lift Station Level Control Panel, and the MPZ. The pump motor controls for the lift stations are accessible on the front enclosure of the Lift Station Pump Control Panel. Each pump motor can be controlled separately by a hand-off automatic (HOA) switch. Each pump motor can be controlled separately by a HOA switch.

The Lift Station Level Control Panel includes a sump high level alarm light and a sump high level alarm reset button.

6.1.2 IMTA Leachate Management System

The pump motor controls for the Tank 1 Pump Station are accessible on the front enclosure of the IMTA LMS Control Panel. Each pump motor can be controlled separately by a HOA switch.

A pump selector is also installed on the face of the control panel enclosure.

6.1.3 IMTA Impacted Surface Water Management System

The pump motor controls for the Tank 2A/2B Pump Station are accessible on the front enclosure of the Tank 2A/2B Control Panel. Each pump motor can be controlled separately by an HOA switch. A pump selector is installed on the face of the Tank 1 Control Panel enclosure. If the "Tank 2A/2B" button is depressed, the Tank 2A/2B Pump Station pumps are enabled to run according to the control panel relay logic. The Tank 1 Pump Station pumps are disabled when the "Tank 2A/2B" button is depressed.

6.2 SYSTEM OPERATION

This section describes the procedures for routine system start-up, routine operation, alarm condition reconciliation, and system shutdown.

6.2.1 OSWDF Leachate Management System

6.2.1.1 Pre-Start-Up activities

Prior to the start-up of the OSWDF LMS, the inspection activities described in Sections 7.1.1 and 7.1.2 shall be conducted to confirm that the system is ready to be placed in active service. Additional details will be included in pre-start-up procedures or work instructions.

6.2.1.2 Routine operations

To place the OSWDF LMS in operation, open the shut-off valves for the LCS and LDS carrier pipes that will be active after start-up. This will allow leachate generated in the active cells to be removed from the LCS and LDS Drainage Layers and processed through the OSWDF LMS. Operation of the system shall be performed consistent with the instructions provided in Section 4.1.2, Section 5, and Section 6.1.1. Required inspection, monitoring, and maintenance activities for the OSWDF LMS components are provided in Sections 7.1.1 and 7.1.2.

6.2.1.3 Alarm conditions

The individual system control panels monitor the operation of the system components according to the specified control logic. If an alarm set point is exceeded, an alarm notification is issued to site staff and the appropriate automated action is executed. Upon receipt of an alarm notification, the cause of the alarm shall be evaluated and addressed by site personnel. For example, if a high-level alarm is triggered at one of the valve house sumps, the cause of the alarm would be assessed. Alarm notifications and corrective actions will be recorded on the appropriate inspection/operation/maintenance form.

6.2.1.4 System shutdown

For maintenance on pipes, valves, fittings, instrumentation, and other components upstream of the LTS Lift Stations, it is not necessary to shut down the North and South Lift Stations. For these types of maintenance activities, it is sufficient to isolate the item targeted for maintenance using the nearest upstream and downstream shut off valves.

6.2.1.5 Emergency system shutdown

An "Emergency Stop" button is located on the front of the North and South Lift Station Control Panels to minimize exposure of personnel to potential undue hazards resulting from system failure or an emergency situation. Once the emergency situation has expired, and if the lift station is not able to return to immediate service, the appropriate shutdown procedure should be executed. Once the situation leading to the emergency situation has been addressed, and the lift station is ready to return to service, the lift station should be started using the procedure. The emergency shutdown and the restart, including the dates and times of the events, should be recorded according to the procedures described in Section 7.2.

6.2.1.6 Potential operating problems

A list of common malfunctions and operating problems, potential causes, sources of information to troubleshoot operational issues, and recommended corrective actions for operational issues that may be encountered during normal operations of the OSWDF LMS will be available to help maintenance personnel properly identify and isolate equipment malfunctions. System repairs will be recorded as described in Section 7.2.

6.2.2 IMTA Leachate Management System and IMTA Impacted Surface Water Management System

6.2.2.1 Routine system start-up

The start-up process for the IMTA LMS and the IMTA ISWMS will be detailed in procedures or work instructions.

6.2.2.2 Routine operation

Under routine operational conditions, the system control panels will operate the individual systems within the specified set points unless an alarm condition develops. When operational, each system's status shall be monitored daily. Minor adjustments to system set points (e.g., position of flow control valve at the forcemain discharge points [e.g., ILTS, level alarms]) may be necessary depending on operating conditions. Changes to system set points shall be recorded on the appropriate inspection/operation/maintenance form.

6.2.2.3 Alarm conditions

The individual system control panels monitor the operation of the system components according to the control logic shown on Design Drawings X-780-M-10837 and X-780-M-10878. If an alarm set point is exceeded, an alarm notification is issued to site staff and the appropriate automated action is executed. Upon receipt of an alarm notification, the cause of the alarm will be evaluated and addressed by site personnel. For example, if there is a system shutdown due to a high-pressure alarm at one of the pump discharge pressure switches, the cause of the high pressure at the Pump Station would be assessed. Alarm notifications and corrective actions will be recorded on the appropriate inspection/operation/maintenance form.

6.2.2.4 System shutdown

The process for shutting down a pump station for maintenance on the pumps and/or pipes, valves, fittings, and instrumentation downstream of the pump station will be detailed in procedures or work instructions.

6.2.2.5 Emergency system shutdown

An "Emergency Stop" button is located on the front of each of the Pump Station control panels to minimize exposure of personnel to potential undue hazards resulting from system failure or an emergency situation. Once the emergency situation has expired, and if the Pump Station is not able to return to immediate service, the appropriate shutdown procedure should be executed. Once the situation leading to the emergency situation has been addressed, and the Pump Station is ready to return to service, the Pump Station should be started using the appropriate procedure. The emergency shutdown and the restart, including the dates and times of the events, should be recorded according to the procedures described in Section 7.2.

6.2.2.6 Potential operating problems

A list of common malfunctions and operating problems, potential causes, sources of information to troubleshoot operational issues, and recommended corrective actions for operational issues that may be encountered during normal operations of the IMTA LMS and the IMTA ISWMS will be available to help maintenance personnel properly identify and isolate equipment malfunctions. System repairs will be recorded as described in Section 7.2.

6.3 EMERGENCY PROCEDURES FOR SPILLS

The OSWDF LMS, the IMTA LMS, and the IMTA ISWMS have been designed with multiple safeguards and redundancies to prevent the accumulation of liquids in the secondary containment or the overflow of liquids from the primary containment components of the systems. These safeguards and redundancies include the following:

- The LDS and LCS Containment Tanks in the valve houses are equipped with level indicators that transmit digital displays of tank levels to exterior mounted control panels.

- The valve houses' sumps include level switches, which will activate a level alarm high light if the liquid level exceeds the setpoint. The liquid level switch consists of a submersible switch and alarm light. Personnel shall respond to the alarm immediately to assess the problem and to take appropriate corrective actions.

- The sidewalls of Tank 1 and Tank 2A/2B are above ground and are readily visible to inspect for leaks.

- Tank 1 and Tank 2A/2B are enclosed in bermed areas separated from the site surface water drainage system by valves that are normally maintained in a closed position. Any release to the bermed area would be contained. Personnel shall respond if a release to the bermed area from the modular tank is suspected to assess the problem and to take appropriate corrective actions.

The OSWDF O&M plan describes the implementation of the site emergency management program for OSWDF operations activities, including the OSWDF LMS, the IMTA LMS, and the IMTA ISWMS.

If a leachate or potentially impacted surface water leak or spill to the environment is observed or suspected, the OSWDF Operations Manager shall be immediately notified of the potential release and corrective actions shall be implemented. Spills will be managed in accordance with the spill response section of the OSWDF O&M Plan, including notifications to DOE and Ohio EPA. If the spill is a leachate outbreak, the LMS will be inspected as described in Section 7.1.1 and clogs or damage will be addressed accordingly. Collected leachate will be treated at the leachate treatment facility prior to discharge and the outbreak will be repaired.

7. INSPECTION AND MAINTENANCE

Maintenance shall be carried out in accordance with the recommendations outlined in this document and equipment and instrumentation literature that shall be included in Appendices C and D upon completion of the LMS and ISWMS installations. Site personnel will keep records of maintenance activities.

7.1 ROUTINE INSPECTIONS AND MAINTENANCE

This section provides the inspections and maintenance plan necessary to identify and remedy malfunctions and deteriorations on a schedule and in a manner that ensures the problem does not lead to an environmental or human health hazard.

7.1.1 Leachate Collection System, Leak Detection System, and Valve Houses

The LCS pipes, LDS pipes, and valve houses shall be inspected and maintained in accordance with the schedule and activity requirements outlined in Table 7-1, or until leachate is no longer generated and an alternative activity schedule has been concurred with by Ohio EPA. Specific details of the required inspection and maintenance activities are described below.

For the inspection and maintenance activities described below that require access to a valve house, personnel shall follow approved procedures for entering confined space or permit required confined space locations, including any monitoring of the atmosphere that may be required. If monitoring indicates the atmosphere is unsafe for entry, personnel shall not enter the valve house until the Operations Manager has been notified and the valve house condition has been assessed and remedied.

Per ARAR *OAC* 3745-27-19(K)(3) and *OAC* 3745-57-03(C)(3)(d), the LDS, LCS, and RLCS pipe networks shall be inspected after placement of the initial lift of impacted material and annually thereafter to ensure that crushing and/or clogging has not occurred. Clogging can occur by deposition of particles in the pipe or by biological growth inside the pipe. The pipe network shall be inspected between the valve houses and 100 ft into each cell (the RLCS pipe extends approximately 25 ft into each cell and inspection will include the full length). The portion of the pipe beyond this point inside each cell is redundant because the gradation of the LCS granular drainage material is designed to limit the level of leachate on the geomembrane liner to less than 1 ft (0.3 m) without the need for a subdrain pipe.

Access to the LDS, LCS, and RLCS carrier pipes for inspection shall be through the cleanouts located in the valve houses. Inspections shall be performed using a video camera. The inspection equipment shall have the ability to monitor its location (e.g., distance counter), be sized to fit within the LDS, LCS, and RLCS carrier pipes, and be able to be pushed 100 ft beyond the penetration box.

If an inspection indicates that a LDS, LCS, or RLCS pipe is obstructed, the pipe shall be flushed by pumping fresh water through a hose inserted in the pipe cleanout. If flushing does not remove the obstruction, other methods shall be used to clean the pipe. These other methods may include blowing out the obstruction with air, vacuuming, rodding, or inserting a snake, fish tape, or other suitable device. If air or water pressure is used, the working pressure inside the pipe shall not exceed the rated pressure of the pipe (i.e., less than 160 psi). The specific pipe maintenance procedures to be used for removing a pipe obstruction should be selected on a case-by-case basis.

The final control system design will require that the alarm signals be transmitted to a central control center. The frequency of the alarm checks will be adapted based on the final control system architecture.

Table 7-1. Leachate Collection System, Leak Detection System, and Valve House Inspection, Monitoring, and Maintenance Schedule

Worker safety shall always take precedence over compliance with the inspection frequencies specified in Table 7-1. If an inspection is not performed due to safety concerns (e.g., severe weather), it will be performed as soon as practicable once conditions are safe.

	Activity Frequency[a]			
System Component	Active Period	Postconstruction Period	Activity	Response to Alarm or Observed Condition
LDS, LCS, and RLCS Pipes[b]	1. After placement of initial lift of impacted material 2. Annually thereafter	Annually	Use a video camera to inspect the LDS, LCS, and RLCS pipe network to check if crushing and/or clogging has occurred; inspect between the valve houses and 100 ft into the subdrain pipe inside each cell. Inspection equipment shall have the ability to monitor its location (e.g., distance counter)	Notify Operations Manager; specific pipe maintenance procedures should be selected on a case-by-case basis.
Methane Alarms (Valve Houses)	Minimum Once per day	Weekly	Check alarm status to confirm that methane is not present at unacceptable levels.	Personnel shall not enter until the Operations manager has been notified and condition has been assessed and resolved.
Sump Level Alarm (Valve House)	Minimum Once per day	Weekly	Check alarm status to confirm that liquids have not accumulated in the valve house sump.	If methane levels and ventilation system operation are satisfactory, inspect valve house and interior equipment to identify the source of liquid accumulation; notify the Operations Manager to schedule appropriate maintenance.
Piping Systems (Interior to Valve House)	Daily	Weekly	Perform visual inspection from the access platform of the valve house piping systems to confirm that there are no leaks or other equipment issues.	Notify Operations Manager and take appropriate corrective actions (e.g., replace or repair valve, tighten fittings).
Primary LDS Containment Tanks	Daily[c]	Weekly	Measure and record liquid levels in active Primary LDS Containment Tanks (data is viewable at valve house control panel).	Transfer the accumulated liquids from the tanks to the LDS pipes as needed to prevent tank overflow. Based on the volume transferred, calculate the average daily flow rate (gal/acre/day) and compare the value against the action leakage rate. Notify the Operations Manager if the action leakage rate has been exceeded.

Table 7-1. Leachate Collection System, Leak Detection System, and Valve House Inspection, Monitoring, and Maintenance Schedule (Continued)

System Component	Activity Frequency[a] Active Period	Activity Frequency[a] Postconstruction Period	Activity	Response to Alarm or Observed Condition
Primary LCS Containment Tanks	Daily[c]	Weekly	Measure and record liquid levels in active Primary LCS Containment Tanks (data is viewable at valve house control panel).	Transfer the accumulated liquids from the tanks to the LCS pipes as needed to prevent tank overflow.
Sump High Level Alarm (Valve House)	Daily	Weekly	Test operational status of the high-level alarm.	Repair alarm if not functional.
Piping Systems (Interior to Valve House)	Weekly	Monthly	Perform hands-on inspection of instruments, valves, pipes, and appurtenances to confirm operational integrity; check tubing and hoses for physical wear and poor connections.	Notify Operations Manager and take appropriate corrective actions (e.g., replace or repair valve, tighten fittings, replace hoses and tubing).
LDS, LCS, RLCS, and LTS Containment Pipes	Weekly	Monthly	Monitor containment pipes via their monitoring ports.	If liquid is present, quantify the volume of liquid. Record the quantity in the pipe's monitoring log. Evaluate potential corrective actions to address leak(s).
Mechanical and Electrical Equipment/ Instruments	Per manufacturer	Per manufacturer	Calibrate, operate, maintain, and service in accordance with the manufacturer's instructions for the equipment or instrument.	

Notes:
[a]Frequencies are based on the judgment of the A-E if not specified by ARARs. These frequencies shall be followed to the extent practicable.
[b]Frequency is specified by an ARAR.
[c]A minimum frequency of weekly is specified by ARARs. Daily frequency shall be implemented to the extent practicable.

LCS = Leachate Collection System
LDS = Leak Detection System
LTS = Leachate Transmission System
RLCS = Redundant Leachate Collection System

In addition to the requirements provided in Table 7-1, a leachate sample from active LCS carrier pipes shall be collected once per month and analyzed for its physiochemical characteristics; the sample should be collected and analyzed in accordance with the requirements of the OSWDF PSVP.

7.1.2 LTS

The LTS, including control manholes, lift stations, valve manholes, forcemains, and forcemain cleanouts, shall be inspected and maintained in accordance with the schedule and activity requirements outlined in Table 7-2 or until leachate is no longer generated and an alternative activity schedule has been concurred with by Ohio EPA. Specific details of the required inspection and maintenance activities are described below.

If an inspection indicates that a LTS pipe is obstructed, the pipe shall be flushed by pumping fresh water through a hose inserted in the pipe cleanout. If flushing does not remove the obstruction, other methods shall be used to clean the pipe. These other methods may include blowing out the obstruction with air, vacuuming, rodding, or inserting a snake, fish tape, or other suitable device. If air or water pressure is used, the working pressure inside the pipe shall not exceed the rated pressure of the pipe (i.e., less than 160 psi). The specific pipe maintenance procedures to be used for removing a pipe obstruction should be selected on a case-by-case basis.

Table 7-2. Leachate Transmission System Inspection, Monitoring, and Maintenance Schedule

Worker safety shall always take precedence over compliance with the inspection frequencies specified in Table 7-2. If an inspection is not performed due to safety concerns (e.g., severe weather), it will be performed as soon as practicable once conditions are safe.

	Activity Frequency[a]			
System Component	**Active Period**	**Postconstruction Period**	**Activity**	**Response to Alarm or Observed Condition**
LTS Gravity Pipes	1. After installation 2. Every 3 years	Every 3 years	Use a video camera to inspect the LTS gravity pipe network to check if crushing and/or clogging has occurred.	Notify Operations Manager; specific pipe maintenance procedures should be selected on a case-by-case basis.
LTS Forcemain Pipes	1. After installation 2. As needed	As needed	Use a video camera to inspect the LTS forcemain pipe network to identify cause of reduced flow.	Notify Operations Manager; specific pipe maintenance procedures should be selected on a case-by-case basis.
High Level Alarms (Control Manholes and Lift Stations)	Minimum once per day	Weekly	Check alarm status to confirm that liquid levels are within acceptable levels.	Inspect structure (i.e., control manhole or lift station) and interior equipment to identify source of operational anomaly; notify Operations Manager.
Piping Systems (Control Manholes, Lift Stations, Valve Manholes, Forcemain Cleanouts, and Forcemains)	Daily	Weekly	Perform visual inspections of the piping systems (e.g., pipes, valves, fittings, pipe supports) to confirm that there are no leaks or other equipment issues.	Notify Operations Manager and take appropriate corrective actions (e.g., replace or repair valve, tighten fittings).
LTS Containment Pipes (Control and Valve Manholes, Forcemain Cleanouts)	Weekly	Monthly	Monitor containment pipes via their monitoring ports.	If liquid is present, notify Operations Manager and quantify the volume of liquid. Record the quantity in the pipe's monitoring log. Evaluate potential corrective actions to address leak(s).
Lift Station Witness Zone	Weekly	Monthly	Measure and record the presence of liquid in annular space between primary and secondary containment HDPE shells of the lift station manholes.	Notify Operations Manager and transfer the accumulated liquid from the annular space to an approved container for disposal or treatment.
High Level Alarms (Control Manholes and Lift Stations)	Weekly	Monthly	Test operational status of the high-level alarms.	Repair alarm if not functional.

Table 7-2. Leachate Transmission System Inspection, Monitoring, and Maintenance Schedule (Continued)

System Component	Activity Frequency[a] Active Period	Activity Frequency[a] Postconstruction Period	Activity	Response to Alarm or Observed Condition
Piping Systems (Control and Valve Manholes, Forcemain Cleanouts)	Annually	Monthly	Exercise hand valves.	Notify Operations Manager and take appropriate corrective actions if valve operation is inhibited.
Mechanical and Electrical Equipment and Instruments	Per manufacturer	Per manufacturer	Calibrate, operate, maintain, and service in accordance with the manufacturer's instructions for that equipment or instrument.	

Notes:
[a]Frequencies are based on the judgment of the A-E if not specified by ARARs. These frequencies shall be followed to the extent practicable.
[b]Frequency is specified by an ARAR.

HDPE = high-density polyethylene
LTS = Leachate Transmission System

If the pipe obstruction cannot be dislodged, or in the very unlikely event that a pipe has undergone crushing, the following procedures should be considered in the following order. The specific repair method selected will be submitted to the proper regulatory agencies for review and concurrence prior to proceeding with the work:

- Insert a new, smaller diameter pipe within the obstructed or collapsed pipe.
- If the obstruction or collapse is sufficiently outside the cell perimeter berm such that shoring can be safely utilized, replace the pipe.

Equipment inserted in the LTS gravity line or the LTS Forcemain for inspection and/or maintenance shall be decontaminated prior to removal from the OSWDF and boundaries of the radiological boundary fence.

The final control system design will require that the alarm signals be transmitted to a central control center. The frequency of the alarm checks will be adapted based on the final control system architecture.

In the event of a failure or prolonged disruption of the LTS line, lift stations, or the LTS, actions will be implemented to ensure compliance with the specifications of the ARARs as described in Section 3 of this plan.

7.1.3 IMTA Leachate Management System and IMTA Impacted Surface Water Management System

The IMTA LMS and IMTA ISWMS will be inspected and maintained in accordance with the schedule and activity requirements outlined in Table 7-3, or until leachate is no longer generated and an alternative activity schedule has been concurred with by Ohio EPA.

7.2 RECORDS AND DOCUMENTATION

Records and documentation are addressed in the OSWDF O&M Plan.

Table 7-3. IMTA LMS and IMTA ISWMS Inspection, Monitoring, and Maintenance Schedule

Worker safety shall always take precedence over compliance with the inspection frequencies specified in Table 7-3. If an inspection is not performed due to safety concerns (e.g., severe weather), it will be performed as soon as practicable once conditions are safe.

System Component	Activity Frequency[a]	Activity	Response to Alarm or Observed Condition
Piping System (Pump Stations)	Daily	Perform visual inspections of the piping systems (e.g., pipes, valves, fittings, pipe supports) to confirm that there are no leaks or other equipment issues.	Notify Operations Manager and take appropriate corrective actions (e.g., replace or repair valve, tighten fittings).
Piping System (Tank 1 and Tanks 2A/2B)	Daily	Inspect shutoff valves for tank bottom drain pipes to confirm valves are locked and in correct position and are not obstructed by debris that would prevent a seal. Perform visual inspection of each tank's surface water discharge point to confirm absence of drainage from tank.	Notify Operations Manager and take appropriate corrective actions if valve operation is inhibited or if drainage is observed.
Tanks	Daily	Inspect tanks for leaks or signs of damage to the liner, tank support structure, or related pumping and piping.	If tank condition is unacceptable, notify Operations Manager and take appropriate corrective actions.
High Level Alarms (Tanks)	Weekly	Test operational status of the high-level alarms.	Repair alarm if not functional.
Tank 1 and Tanks 2A/2B forcemain Containment Pipes	Weekly	Monitor containment pipes via their monitoring ports.	If liquid is present, notify Operations Manager and quantify the volume of liquid. Record the quantity in the pipe's monitoring log. Evaluate potential corrective actions to address leak(s).
Piping Systems (Forcemain Cleanouts)	Weekly and Daily During Use	Perform visual inspections of the piping systems (e.g., pipes, valves, fittings, pipe supports) to confirm that there are no leaks or other equipment issues.	Notify Operations Manager and take appropriate corrective actions (e.g., replace or repair valve, tighten fittings).
Piping System (Pump Stations and Forcemain Cleanouts)	Monthly	Exercise hand valves.	Notify Operations Manager and take appropriate corrective actions if valve operation is inhibited.
Tanks	After large storm events	Inspect tanks for the accumulation of excess sand or gravel that would affect tank or pump station operation.	If excess sand or gravel is present, notify Operations Manager and take appropriate corrective actions.
Mechanical and Electrical Equipment and Instruments	Per manufacturer recommendations	Calibrate, operate, maintain, and service in accordance with the manufacturer's instructions for that equipment or instrument.	

Note:
[a]Frequencies are based on the judgement of the A-E and not specified by ARARs. These frequencies shall be followed to the extent practicable.

8. REFERENCES

DOE 2015, *Record of Decision for the Site-wide Waste Disposition Evaluation Project at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio*, DOE/PPPO/03-0513&D2, U.S. Department of Energy, Piketon, OH, June.

Ohio EPA 2012, *The April 13, 2010 Director's Final Findings and Orders for Removal Action and Remedial Investigation and Feasibility Study and Remedial Design and Remedial Action including the July 16, 2012 Modification thereto*, *DFF O*, Ohio Environmental Protection Agency, Columbus, OH, July 16.

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APPENDIX A: ARARS

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Media/Location/Action	Requirements[a]	Prerequisite	Citation	LISWSP Section Addressing ARAR
HAZARDOUS WASTE				
Design, construction, operation, and closure of a hazardous waste landfill				
Liner and leachate collection design for a RCRA landfill	Must be designed, constructed, operated, and maintained to collect and remove leachate from the landfill during the active life and postclosure period and ensure that the leachate depth over the liner does not exceed 30 cm, and comply with Paragraphs (c)(3)(iii) and (iv) of this section	Construction of a RCRA hazardous waste landfill—**applicable**	40 *CFR* 264.301 (c)(2) *OAC* 3745-57-03 (C)(2)	Section 4.1.2.1, *Leachate Collection System* Section 5, *LMS and ISWMS Functional Checkout* Provides the plan for verifying system construction is correct
Top leachate collection and removal system	Leachate collection and removal system must be constructed of materials that are: • Chemically resistant to waste managed in landfill and leachate generated • Of sufficient strength and thickness to prevent collapse under pressures exerted by overlying wastes, waste cover materials, and any equipment used		40 *CFR* 264.301 (c)(3)(iii) *OAC* 3745-57-03 (C)(3)(c)	Section 4.1.2 *OSWDF Leachate Management System (Initial Operations and Full-scale Operations) – Components and Functional Description* Describes the design, materials of construction, and operation of the leachate management system developed to satisfy ARAR requirements

[a]The requirements portion of the ARARs table is intended to provide a summary of the cited ARAR. The omission of any particular requirement does not limit the scope of the cited ARARs.

Media/Location/Action	Requirements[a]	Prerequisite	Citation	LISWSP Section Addressing ARAR
Liner and leachate collection design for a RCRA landfill (continued)	Must be designed and operated to minimize clogging during the active life of the facility and postclosure care period of the landfill		40 *CFR* 264.301 (c)(3)(iv) *OAC* 3745-57-03 (C)(3)(d)	4.1.2 *OWSDF Leachate Management System (Initial Operations and Full-scale Operations) – Components and Functional Descriptions* Identifies cleanout points included the system Section 7.1.1, *Leachate Collection System, Leak Detection System, and alve Houses* Describes inspection and cleanout actions
Bottom leachate collection and removal system/leak detection system	Leachate collection and removal system must be capable of detecting, collecting, and removing leaks of hazardous constituents at the earliest practicable time through all areas of the top liner likely to be exposed to waste or leachate during the active life and postclosure care period. Requirements for a leak detection system are satisfied by installation of a system that is:	Construction of a RCRA hazardous waste landfill—**applicable**	40 *CFR* 264.301 (c)(3) *OAC* 3745-57-03 (C)(3)	4.1.2 *OSWDF Leachate Management System (Initial Operations and Full-scale Operations) – Components and Functional Description* Describes the design, materials of construction, and operation of the leachate management system developed to satisfy ARAR requirements
	• Constructed of granular drainage materials with a hydraulic conductivity of $1{\times}10^{-2}$ cm/s and a thickness of 12 in. or more or synthetic or geonet drainage materials with a transmissivity of $3{\times}10^{-5}$ m^2/s		40 *CFR* 264.301 (c)(3)(ii) *OAC* 3745-57-03 (C)(3)(b)	Figure 4-1, *Typical OSWDF Liner and Cover (Cap) System Detail* Shows the 12-in. LCS Drainage Layer

Media/Location/Action	Requirements[a]	Prerequisite	Citation	LISWSP Section Addressing ARAR
Liner and leachate collection design for a RCRA landfill (continued)	• Constructed of materials that are chemically resistant to waste managed and expected leachate to be generated, and structurally sufficient to resist pressures exerted by waste, cover, and equipment used at the landfill		40 *CFR* 264.301 (c)(3)(iii) *OAC* 3745-57-03 (C)(3)(c)	Section 4.1.2.2, *Leak Detection System* Describes the materials of construction specified to meet the design criteria
	• Designed and operated to minimize clogging during the active life of the facility and postclosure care period		40 *CFR* 264.301 (c)(3)(iv) *OAC* 3745-57-03 (C)(3)(d)	Section 7.1.1, *Leachate Collection System, Leak Detection System, and alve Houses* Describes inspection and cleanout actions
	• Constructed with sumps and liquid removal methods (e.g., pumps) of sufficient size to collect and remove liquids from the sump and prevent liquids from backing up. Each unit must have its own sump(s). The design of each sump and removal system must provide a method for measuring and recording the volume of liquids present in the sump and of liquids removed.		40 *CFR* 264.301 (c)(3)(v) *OAC* 3745-57-03 (C)(3)(e)	4.1.2 *OSWDF Leachate Management System (Initial Operations and Full-scale Operations) – Components and Functional Description* Describes the design, materials of construction, and operation of the leachate management system developed to satisfy ARAR requirements
	Must collect and remove liquids in the leak detection system sumps to minimize the head on the bottom liner		40 *CFR* 264.301 (c)(4) *OAC* 3745-57-03 (C)(4)	See above.

Media/Location/Action	Requirements[a]	Prerequisite	Citation	LISWSP Section Addressing ARAR
Facility and equipment inspection, testing and maintenance	Must inspect facility for malfunctions and deterioration, operator errors, and discharges to identify any problems and remedy any deterioration or malfunction of equipment or structures on a schedule and in a manner that ensures that the problem does not lead to an environmental or human health hazard, as detailed in 40 *CFR* 264.15 [*OAC* 3745-54-15]	Operation of a RCRA hazardous waste facility—**applicable**	40 *CFR* 264.15 (a) – (d) *OAC* 3745-54-15 (A) – (D)	Section 7.1, *Routine Inspections and Maintenance*
	All facility communications or alarm systems, fire protection equipment, spill control equipment, and decontamination equipment, where required, shall be tested and maintained as necessary to assure its proper operation in time of emergency.		40 *CFR* 264.33 *OAC* 3745-54-33	Section 7.1, *Routine Inspections and Maintenance* Contains requirements for alarm systems Inspection, testing and maintenance of other equipment is addressed in the OSWDF O&M Plan.
Action leakage rate testing for the RCRA leachate detection system	To determine if the action leakage rate has been exceeded, must convert the weekly or monthly flow rate from the monitoring data obtained under 40 *CFR* 264.303(c) to an average daily flow rate (gal/acre/day) for each sump. The average daily flow rate for each sump must be calculated weekly during the active life and closure period, and monthly during the postclosure period when monthly monitoring is required under 40 *CFR* 264.303(c).	Construction and operation of a RCRA hazardous waste landfill—**applicable**	40 *CFR* 264.302(b) *OAC* 3745-57-04(B)	Table 7-1, *Leachate Collection System, Leak Detection System, and alve House Inspection, Monitoring and Maintenance Schedule*

Media/Location/Action	Requirements[a]	Prerequisite	Citation	LISWSP Section Addressing ARAR
Monitoring of liners and cover systems during and after construction and installation	Must record the amount of liquids removed from the leak detection system sumps at least weekly during the active life and closure period	Construction and operation of a RCRA landfill—**applicable**	40 *CFR* 264.303 (c)(1)	Table 7-1, *Leachate Collection System, Leak Detection System, and alve House Inspection, Monitoring and Maintenance Schedule*
Run-on/runoff control systems	Runoff management system must be able to collect and control the water volume from a runoff resulting from a 24-hour, 25-year storm event.		40 *CFR* 264.301(h) *OAC* 3745-57-03(H)	Section 2.2.1, *Liquids Management Strategy During Initial Operations* Section 2.3.2, *Liquids Management Strategy During Full-scale Operations*
	Collection and holding facilities must be emptied or otherwise expeditiously managed after storm events to maintain design capacity of the system.		40 *CFR* 264.301(i) *OAC* 3745-57-03(I)	*Section* 4.1.3, *IMTA Leachate Management System* Section 4.2, *IMTA Impacted Surface Water Management System*

Media/Location/Action	Requirements[a]	Prerequisite	Citation	LISWSP Section Addressing ARAR
SOLID WASTE				
	Design, construction, operation, and closure of a solid waste landfill			
Liner and leachate collection design for a composite liner system *Leachate collection layer*	Leachate collection and management system shall incorporate an adequate number of sumps that shall be protected from adverse effects from leachate and differential settling and be equipped with automatic high level alarms located no greater than 1 ft above the top elevation of sump.	Construction and operation of a sanitary landfill—**applicable**	*OAC* 3745-27-08 (D)(15)	4.1.2 *OSWDF Leachate Management System (Initial Operations and Full-scale Operations) – Components and Functional Description* Describes the design, materials of construction, and operation of the leachate management system developed to satisfy ARAR requirements Section 6.1, *Automated System Control*
	Leachate collection and management system shall incorporate adequate measures that will automatically remove leachate from the landfill to leachate storage tank(s), a permitted discharge to a public sewer, or a permitted WWTU to facilitate the transfer of leachate from the storage tank(s) for the purpose of disposal.		*OAC* 3745-27-08 (D)(16)	See above.
	Any leachate conveyance apparatus located outside the limits of solid waste placement shall be monitored, be double cased with a witness zone, and be protected from the effects of freezing temperatures, crushing, or excess deflection.		*OAC* 3745-27-08 (D)(16)(a) – (c)	Section 4.1.2.4, *Leachate Transmission System*

Media/Location/Action	Requirements[a]	Prerequisite	Citation	LISWSP Section Addressing ARAR
Facility maintenance and repair	Maintain integrity of the engineered components of the facility and repair any damage to or failure of the components.	Operation of a sanitary landfill—**applicable**	*OAC* 3745-27-19 (E)(1)(c)	Table 7-1, *Leachate Collection System, Leak Detection System, and alve House Inspection, Monitoring and Maintenance Schedule*
Leachate management at a solid waste landfill	If a leachate outbreak occurs at the facility, must repair all outbreaks and contain, properly manage, collect, and dispose of the leachate in accordance with *OAC* 3745-27-19(K)(5) and (K)(6) and take action to minimize, control, or eliminate the conditions which contribute to the production of leachate.	Construction and operation of a sanitary landfill—**applicable**	*OAC* 3745-27-19 (K)(1)	Section 6.3, *Emergency Procedures for Spills*
	Maintain at least one lift station back-up pump at facility at all times.		*OAC* 3745-27-19 (K)(2)	Section 4.1.2.4, *Leachate Transmission System*
	Visually or physically inspect collection pipe network of leachate management system after placement of initial lift of waste to ensure that crushing has not occurred and inspect network annually thereafter to ensure that clogging has not occurred.		*OAC* 3745-27-19 (K)(3)	Section 7.1.1, *Leachate Collection System, Leak Detection System, and alve Houses*
	If approved, may temporarily store leachate within limits of waste placement until the leachate can be treated and disposed as outlined in the leachate contingency plan under *OAC* 3745-27-19(K)(6).		*OAC* 3745-27-19 (K)(4)	Section 6.3, *Emergency Procedures for Spills*

Media/Location/Action	Requirements[a]	Prerequisite	Citation	LISWSP Section Addressing ARAR
Leachate management at a solid waste landfill (continued)	Treat and dispose of collected leachate in accordance with *ORC* Chapter 6111 and with one of the following: • Treat and dispose of collected leachate on site at the disposal facility. • Pretreat collected leachate on site and dispose of off-site of facility. • Treat and dispose of collected leachate off-site of facility.	Operation of a sanitary landfill—**applicable**	*OAC* 3745-27-19 (K)(5)	See above.
	Must plan for storage and disposal of leachate to address immediate and long-term steps, including the setting aside of land for the construction and operation of an on-site treatment facility, to be taken for leachate management in the event that leachate cannot be managed in accordance with *OAC* 3745-27-19(K)(5).	Operation of a sanitary landfill—**applicable**	*OAC* 3745-27-19 (K)(6)	An on-site treatment facility is available to treat leachate during active operations of the OSWDF.
TSCA/PCB WASTE				
Design, construction, operation and closure of a TSCA chemical waste landfill				
Leachate collection system monitoring and handling	Leachate collection systems shall be monitored monthly for quantity and physicochemical characteristics of leachate produced. The leachate should be either treated to acceptable limits for discharge in accordance with legally applicable discharge limits or disposed of by another legally appropriate method. Water analysis shall be conducted as provided in Paragraph (b)(6)(iii) of 40 *CFR* 761.75.	Construction of a TSCA chemical waste landfill—**applicable**	40 *CFR* 761.75(b)(7)	Table 7-1, *Leachate Collection System, Leak Detection System, and alve House Inspection, Monitoring and Maintenance Schedule* The OSWDF PSVP addresses characterization of leachate.

Media/Location/Action	Requirements[a]	Prerequisite	Citation	LISWSP Section Addressing ARAR
RADIOACTIVE WASTE				
Design, construction, operation, and closure of a low-level radioactive waste landfill				
Siting, design, and operation of a DOE LLW disposal facility	Operating procedures must protect the public, workers, and the environment, ensure the security of the facility, minimize subsidence during and after waste placement, achieve long-term stability and minimize the need for long-term active maintenance, and meet the requirements of the closure/postclosure plan.	Operation of a LLW disposal facility at a DOE site—**TBC**	DOE Manual 435.1-1 (IV)(P)(6)(a)	Section 6, *Operating Procedure Development*

ARAR = applicable or relevant and appropriate requirement
CFR = *Code of Federal Regulations*
DOE = U.S. Department of Energy
IMTA = Impacted Material Transfer Area
ISWMS = Impacted Surface Water Management System
LCS = Leachate Collection System
LISWSP = Leachate and Impacted Surface Water Systems Plan
LLW = low-level (radioactive) waste
LMS = Leachate Management System
O&M = operation and maintenance
OAC = *Ohio Administrative Code*
OSWDF = On-site Waste Disposal Facility
PCB = polychlorinated biphenyl
PSVP = Performance Standards Verification Plan
RCRA = Resource Conservation and Recovery Act of 1976, as amended
TBC = to-be-considered (guidance)
TSCA = Toxic Substances Control Act of 1976
WWTU = wastewater treatment unit

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