Department of Energy

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October 30, 2024

Ms. Grace Stutler
Site Coordinator
Ohio Environmental Protection Agency
Southeast District Office
2195 E. Front Street
Logan, Ohio 43138

PPPO-03-10028370-25

Dear Ms. Stutler:

AT- AND BELOW-GRADE DEMOLITION DESIGN PLAN FOR THE X-326 PROCESS BUILDING AT THE PORTSMOUTH GASEOUS DIFFUSION PLANT, PIKETON, OHIO (DOE/PPPO/03-1140&D1)

Please find enclosed for your review and concurrence the U.S. Department of Energy (DOE) submittal of the *At- and Below-grade Demolition Design Plan for the X326 Process Building at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (DOE/PPPO/03-1140&D0) (X326 At- and Below-grade Demolition Design Plan [DDP]). This demolition design and implementation plan was prepared in accordance with *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) and the *Comprehensive Deactivation, Demolition, and Disposition Remedial Design/Remedial Action Work Plan for the Process Buildings and Complex Facilities Remedial Action Project and Remedial Design for Deactivation of Complex Facilities at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (Comprehensive Process Buildings RD/RA Work Plan).

The X-326 At- and Below-grade DDP presents the design plan for the demolition of the remaining at- and below-grade structures associated with the former X-326 Process Building. DOE would like to request that the review of this document take priority over other recently submitted documents.

If you have any questions or require additional information, please contact Kristi Wiehle of my staff at (740) 897-5020.

Sincerely,

JEREMY DAVIS

Digitally signed by JEREMY DAVIS
Date: 2024.10.30 07:47:45 -04'00'

Jeremy D. Davis
Portsmouth Site Lead
Portsmouth/Paducah Project Office

Enclosure:
At- and Below-grade DDP for the X-326 Process Building at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio (DOE/PPPO/03-1140&D1)

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AT- AND BELOW-GRADE DEMOLITION DESIGN PLAN FOR THE X-326 PROCESS BUILDING AT THE PORTSMOUTH GASEOUS DIFFUSION PLANT, PIKETON, OHIO

U.S. Department of Energy
DOE/PPPO/03-1140&D1

October 2024

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AT- AND BELOW-GRADE DEMOLITION DESIGN PLAN FOR THE X-326 PROCESS BUILDING AT THE PORTSMOUTH GASEOUS DIFFUSION PLANT, PIKETON, OHIO

U.S. Department of Energy
DOE/PPPO/03-1140&D1

October 2024

Prepared for
U.S. Department of Energy

Prepared by
Fluor-BWXT Portsmouth LLC, Under Contract DE-AC30-10CC40017
FBP-ER-RDRA-BG-PLN-0109, Revision 3

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ACRONYMS

ACM	asbestos-containing materials
ACR	area control room
ARAR	applicable or relevant and appropriate requirement
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended
CFR	U.S. Code of Federal Regulations
CMI	corrective measures implementation
DDP	demolition design plan
D&D	decontamination and decommissioning
DOE	U.S. Department of Energy
DU	deferred unit
FCN	field change notice
FWCR	field work completion report
GPS	global positioning system
GWMP	generator waste management plan
IMTA	Impacted Material Transfer Area
LLW	low-level (radioactive) waste
NCS	Nuclear Criticality Safety
NPDES	National Pollutant Discharge Elimination System
NSA	northern slab area
O&M	operations and maintenance
OAC	*Ohio Administrative Code*
ODH	Ohio Department of Health
Ohio EPA	Ohio Environmental Protection Agency
OSWDF	On-site Waste Disposal Facility
PCB	polychlorinated biphenyl
PORTS	Portsmouth Gaseous Diffusion Plant
QA	quality assurance
RC	regulatory category
RCRA	Resource Conservation and Recovery Act of 1976, as amended
RCW	recirculating cooling water
ROD	Record of Decision
SSA	southern slab area
TCE	trichloroethene
TSCA	Toxic Substances Control Act of 1976
VOC	volatile organic compound
WAC	waste acceptance criteria
WAO	Waste Acceptance Organization

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1. INTRODUCTION

This *At- and Below-grade Demolition Design Plan for the X-326 Process Building at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (X-326 At- and Below-grade DDP), has been prepared under *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* (D&D DFF&O) (Ohio Environmental Protection Agency [Ohio EPA] 2012). The D&D DFF&O is an agreement between the U.S. Department of Energy (DOE) and Ohio EPA establishing the regulatory framework for conducting building decontamination and decommissioning (D&D) under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA). This X-326 At- and Below-grade DDP describes the plans for demolition of remaining at- and below-grade structures in coordination with follow-on soil excavation corrective measures conducted under a separate regulatory authority (in a portion of the former X-326 Process Building footprint). To complete the soil corrective measures implementation (CMI), the at- and below-grade structures within the area will first be cleared by the activities implemented under this demolition design plan (DDP).

This X-326 At- and Below-grade DDP presents the design plan for at- and below-grade structure demolition from the city block that was formerly the site of the X-326 Process Building. The demolition of the at- and below-grade structures will occur in two phases, as further described in Section 2, an initial phase to remove structures from the southern portion of the city block of the former process building and a later phase to remove the remaining structures in the city block.

The plan also identifies field work in coordination with the deferred unit (DU) soil excavation corrective measure at the southwest corner of the X-326 Process Building, as presented in the *5-Unit Groundwater Plume Area Excavation Work Plan at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (5-Unit Excavation Work Plan) (DOE 2022). The DU corrective measure excavation plan for the southwest corner of the X-326 Process Building as presented in the 5-Unit Excavation Work Plan is hereafter referred to as the X-326 CMI. The X-326 At- and Below-grade DDP and the X-326 CMI are two separate scopes of work that are planned for integration during field activities. Following the completion of activities conducted for the X-326 CMI, additional soil excavation under the 5-Unit Excavation Work Plan will also be performed in the footprint of the former X-326 Process Building.

The DU soil excavation corrective measure will address Resource Conservation and Recovery Act of 1976, as amended (RCRA)-contaminated soil beneath the southwest portion of the X-326 Process Building slab (hereafter slab), which will be demolished under the first phase of the X-326 at- and below-grade demolition. Excavation of the RCRA-contaminated soil can commence after removal of the slab (and sub-structures) from the area to be excavated. The demolition of the remaining northern portion of the slab will occur during the second phase of the X-326 at- and below-grade demolition.

1.1 DEMOLITION DESIGN PLAN INTRODUCTION

This design submittal and implementation plan for the at- and below-grade structures of the X-326 Process Building follows the demolition of the above-grade structures of the X-326 Process Building that was conducted pursuant to the *Above-grade Demolition Design Plan for the X-326 Process Building and Associated Special Nuclear Material Monitoring Portals, Tie Lines, and Pipe Racks at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (X-326 Above-grade DDP) (DOE 2024a). Demolition and disposition of the above-grade structures was completed in August 2023, and the final equipment decontamination and demobilization processes were completed in May 2024. The demolition of the remaining at- and below-grade structures (e.g., concrete slab and supporting foundations, below-grade utilities, tunnels, and basements) continues implementation of the remedy for the X-326 Process Building.

This X-326 At- and Below-grade DDP provides the project-specific demolition design content to augment the demolition approach defined in the *Comprehensive Deactivation, Demolition, and Disposition Remedial Design/Remedial Action Work Plan for the Process Buildings and Complex Facilities Remedial Action Project and Remedial Design for Deactivation of Complex Facilities at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (Comprehensive Process Buildings RD/RA Work Plan) (DOE 2024b). This X-326 At- and Below-grade DDP does not restate the content of the Comprehensive Process Buildings RD/RA Work Plan; however, demolition of the remaining at- and below-grade structures of the X-326 Process Building and associated utility system segments will follow the approach outlined in the Comprehensive Process Buildings RD/RA Work Plan. The location of the concrete slab of the former X-326 Process Building is shown in Figure 1.

1.2 BACKGROUND

The X-326 Process Building was one of three similar large structures at the Portsmouth Gaseous Diffusion Plant (PORTS) that were used to enrich uranium. Construction of the X-326 Process Building, which measured 2,280 ft long, 552 ft wide, and 62 ft tall, was completed in 1956. With a footprint of approximately 29 acres, the X-326 Process Building was the smallest of the three large process buildings at PORTS. The former X-326 Process Building housed the diffusion equipment for the final phase of the uranium-235 enrichment process. The structure contained 58 acres of floor space on two levels. The second floor, known as the cell floor, housed 2,340 diffusion cascade stages that enriched the uranium-235 stream and 60 purge stages that separated the light gas contaminants and technetium-99 from the uranium-235 stream. The main control facilities were housed on the ground floor, known as the operating floor, along with the electrical switchgear and maintenance shop. The figure identifies property parcel areas removed from the DOE site to date, but also includes Parcel 3, which had not yet been transferred when this work plan and design document was prepared.

Although production of high-enriched uranium for the U.S. Navy ceased in 1991, uranium was enriched at PORTS for commercial power producers until May 2001, at which time the production facilities were placed in a cold standby mode. DOE terminated that operation in September 2005, and the facility entered cold shutdown. Demolition of the above-grade structure pursuant to the X-326 Above-grade DDP began in February 2021 shortly after deactivation activities for the structure were completed. The above-grade structure demolition and disposal of the associated demolition waste debris was completed in August 2023, and the decontamination and demobilization processes were completed in May 2024 (see Section 3).

During environmental investigations conducted at PORTS since the 1990s, trichloroethene (TCE) contamination was identified in groundwater beneath the southwest portion of the X-326 Process Building. While containment and treatment of the contaminated groundwater were addressed, the contamination source was not identified and deduced to likely be under the building. The potential source of groundwater contamination in this area was further investigated during preparation of the *Deferred Units Resource Conservation and Recovery Act Facility Investigation/Corrective Measures Study Report at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (DU RFI/CMS Report) (DOE 2021), and a potential source area for TCE was identified in the southwest area of the X-326 Process Building where TCE had been used in a cooling process utilizing refrigerated TCE baths to cool the uranium hexafluoride gas product into a solid phase. The potential source may have been a TCE leak within that process that resulted in the groundwater contamination under the building. The DU RFI/CMS Report recommended excavation of soil in a 200 ft by 300 ft area under the southwest corner of the X-326 Process Building (i.e., the X-326 Southwest Corner Soil DU) to remove soil potentially contaminated with TCE. Ohio EPA memorialized the recommendation as a decision in the *Decision Document for Resource Conservation and Recovery Act Deferred Units at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (Ohio EPA 2023a) on July 27, 2023.

Figure 1. Location of the Former X-326 Process Building at the Portsmouth Gaseous Diffusion Plant

The X-326 Southwest Corner Soil DU is located within the footprint of the Quadrant I Groundwater Investigative (5-Unit) Area (herein referred to as the 5-Unit Plume Area) excavation but is a distinct separate unit from the soils targeted for excavation for disposal pursuant to the 5-Unit Excavation Work Plan. The excavation of DU soils will be followed by excavation of soils identified as Phase 6 in the 5-Unit Excavation Work Plan. The X-326 CMI is presented as part of Phase 6 the 5-Unit Excavation Work Plan and will be implemented in coordination with this X-326 At- and Below-grade DDP. Figure 2 shows the location of the X-326 CMI excavation area at the southwest corner of the concrete slab of the former X-326 Process Building, and the 5-Unit Plume Area excavations.

1.3 PREDECESSOR AND RELATED DOCUMENTS

The at- and below-grade demolition planned for the remaining components of the former X-326 Process Building is a complex project being performed under a framework including multiple previously approved or concurred-with predecessor or related regulatory documents, as applicable. This work is also being integrated with soil excavation work being performed under separate regulatory frameworks. This section of the DDP summarizes key predecessor documents and related documents important to the understanding of this X-326 At- and Below-grade DDP. The predecessor and related documents for the DDP represent the overall sequence of evaluations, decisions, and plans developed subsequent to the signing of the D&D DFF&O.

Remedial investigation and feasibility study activities for addressing the two major portions of the D&D DFF&O were undertaken and documented in *Remedial Investigation and Feasibility Study Report for the Process Buildings and Complex Facilities Decontamination and Decommissioning Evaluation Project at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (Process Buildings RI/FS) (DOE 2014a) and *Remedial Investigation and Feasibility Study Report for the Site-wide Waste Disposition Evaluation Project at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (Waste Disposition RI/FS) (DOE 2014b).

The Process Buildings RI/FS presents the information necessary to evaluate alternatives for addressing the long-term management of risk from the contaminated buildings/structures and infrastructure at PORTS identified in Attachment H, *List of Remedial Action (RI/FS) Process Buildings and Complex Facilities*, of the D&D DFF&O. The Process Buildings RI/FS identifies each building structure and system subject to remedial action under the D&D DFF&O and provides a summary of relevant information about the use of the structure and the significant contaminants present.

The Waste Disposition RI/FS presents the evaluation of disposal options for waste generated from the D&D of the buildings/structures and infrastructure at PORTS. Alternatives evaluated include the on-site disposal of D&D waste materials meeting disposal criteria for the On-site Waste Disposal Facility (OSWDF) and off-site disposal at properly permitted and/or licensed disposal and/or treatment facilities. Additionally, the Waste Disposition RI/FS evaluated the availability of soil sources for waste placement requirements in the OSWDF. This evaluation included the potential of using soils generated from RCRA-based PORTS cleanup activities.

Phase 1 Sampling and Analysis Plan for the Process Equipment Characterization in Support of the Sitewide Waste Disposition Evaluation Project at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio (Phase 1 PGE SAP) (DOE 2015a) provided characterization support to the Process Buildings RI/FS by addressing characterization of process gas equipment components and auxiliary systems in the three large process buildings. The characterization data obtained under the Phase 1 PGE SAP was also used to support development of the X-326 Above-grade DDP.

Figure 2. Excavation Area for the X-326 Southwest Corner Soil Deferred Unit

As a result of the environmental information and alternatives evaluation completed in the RI/FS reports, DOE subsequently developed proposed plans that received extensive public review and discussion. The resulting Record of Decision (ROD) documents issued provide the basis for the deactivation and demolition of the D&D DFF&O Attachment H facilities (which includes the X-326 Process Building), and the disposition of the resulting wastes:

- The *Record of Decision for the Process Buildings and Complex Facilities Decontamination and Decommissioning Evaluation Project at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (Process Buildings ROD) (DOE 2015b) presents D&D via controlled demolition as the selected remedy for the Process Buildings and Complex Facilities D&D Evaluation Project (Process Buildings Project) at PORTS (i.e., the buildings, structures, and infrastructure listed in Attachment H of the D&D DFF&O).

- The *Record of Decision for the Site-wide Waste Disposition Evaluation Project at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (Waste Disposition ROD) (DOE 2015c) presents a combination of on-site and off-site disposal as the selected sitewide waste disposition remedy and established the OSWDF as the on-site waste disposal option.

The Process Building ROD and the Waste Disposition ROD detail the remedial actions required at PORTS in order to complete D&D of the Attachment H structures and safely dispose of the D&D wastes.

Initial remedial action activities for a building or structure, known as deactivation, are designed to prepare the building or structure for later demolition. The *Remedial Design/Remedial Action Work Plan and Remedial Design for the Process Buildings Deactivation at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio – Deactivation of X-326, X-330, X-333, X-111A, X-111B, X-232C1, X-232C2, X-232C3, X-232C4, and X-232C5* (Process Buildings Deactivation RD/RA Work Plan) (DOE 2023a) includes all activities to be performed as deactivation tasks for the three large Process Buildings at PORTS (and closely associated structures, such as tie lines between buildings). The work addressed by the Process Buildings Deactivation RD/RA Work Plan incorporates the requirements of the D&D DFF&O, the Process Buildings ROD, the Waste Disposition ROD, and the applicable or relevant and appropriate requirements (ARARs). The deactivation process was designed to leave a building and its remaining contents in a condition that would meet the OSWDF waste acceptance criteria (WAC) upon demolition (after appropriate waste stream segregation and sizing of the resulting debris).

The Comprehensive Process Buildings RD/RA Work Plan identifies building/structure deactivation activities to be performed for all of the Attachment H buildings and structures (other than the three large process buildings and related structures addressed by the Process Buildings Deactivation RD/RA Work Plan) and also provides for the preparation of DDPs as the means to document and obtain concurrence for planned demolition project activities and associated engineering designs, generally addressing the post-deactivation activities for the structure. DDPs (such as this one) are prepared in accordance with the requirements of the Comprehensive Process Buildings RD/RA Work Plan.

The X-326 Above-grade DDP is a design submittal and implementation plan, prepared under the D&D DFF&O. The above-grade demolition of the X-326 Process Building continued implementation of the remedy for the X-326 Process Building and the closely associated buildings and structures following its deactivation and provided the project-specific demolition design content to augment the general demolition approach defined in the Comprehensive Process Buildings RD/RA Work Plan.

The *X-326 Process Building Demolition Design Materials of Construction Sampling and Analysis Plan for the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (X-326 MOC SAP) (DOE 2019) was prepared to augment characterization information available for the X-326 Process Building. The X-326 MOC SAP provided the design for sampling of major construction media for chemical hazards and technetium-99. A total of 367 samples were collected from eight different populations of construction materials used in the X-326 Process Building, including the concrete slab. Evaluation of the data from this sampling program supported final preparations for the demolition actions and provided useful insights for air and water emissions management. Tabular summaries of the analytical results from this data collection, including characterization information for the concrete slab, were published in Appendix B, *Supporting Information for the X-326 Process Building Demolition Design*, of the X-326 Above-grade DDP.

The *Waste Acceptance Criteria Implementation Plan for the On-site Waste Disposal Facility at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (WAC Implementation Plan) (DOE 2020) presents the criteria for acceptance of waste into the OSWDF from site projects authorized to transfer waste to the OSWDF. The WAC Implementation Plan is a component of the integrated OSWDF remedial design package required by the D&D DFF&O. The WAC Implementation Plan is designed to provide waste generators with specific directions on preparing wastes for disposal in the OSWDF. Debris from the demolition activities will be transferred to the OSWDF for placement if all WAC are met.

The *On-site Waste Disposal Facility (OSWDF) Operations and Maintenance Plan, Final Design, Portsmouth Gaseous Diffusion Plant, Decontamination and Decommissioning Project, Piketon, Ohio* (OSWDF O&M Plan) (DOE 2023b) guides management of all generated waste transferred from the project site to the OSWDF. The OSWDF O&M Plan describes the on-site waste disposal operations, including waste transfer routing, haul road operations, waste and transfer vehicle loading controls, and waste transfer and staging processes available during two different operations phases identified for the OSWDF.

For each significant remedial action project, the potential for hazardous air emissions and dispersion is evaluated in advance. Air emissions modeling includes development of air emissions estimates from concurrent on-site remedial action activities, such as building demolition activities, soil excavation activities, waste hauling to the OSWDF from projects, and waste placement and construction activities at the OSWDF. The modeling also evaluates the concentration of airborne contaminants due to dispersion of estimated emissions. Project-specific air monitoring plans are prepared based on the results. The project-specific air monitoring plan included with this DDP includes information such as number, type, and location of air sampling stations; frequency of sample collection; analytical suites and methods; and action levels for monitoring results.

1.4 ORGANIZATION OF THE PLAN

This X-326 At- and Below-grade DDP provides design and implementation details for the demolition and waste disposition activities and is organized as follows.

- Section 1 presents the introduction and background necessary to understand the role of this X-326 At- and Below-grade DDP under the D&D DFF&O.
- Section 2 identifies the scope and the objectives to be achieved.
- Section 3 describes the buildings and structures to be demolished as they exist at the completion of the above-grade structure demolition activities performed under the X-326 Above-grade DDP.
- Section 4 describes the end-point configuration planned as a result of this X-326 At- and Below-grade DDP.

- Section 5 provides the technical approach for the demolition activities, presenting a descriptive design for each major activity, including preparatory actions necessary to support demolition and highlighting coordination with follow-on soil excavation projects.

- Section 6 outlines the management approach to the project, including project organization roles and responsibilities, management control systems, quality assurance (QA), health and safety, environmental compliance, and training.

- Section 7 outlines the schedule and milestones.

- Section 8 includes the references for this report.

Appendix A presents ARARs related to the work to be performed under the scope of this X-326 At- and Below-grade DDP.

Appendix B provides a series of schematic figures depicting the remaining underground utilities in the project area to assist the reader in gaining a better understanding of the general configuration and complexity of below-grade structures involved in the scope of the demolition.

Appendix C provides design drawings for construction-related demolition plans associated with this X-326 At- and Below-grade DDP. Due to the highly integrated nature of planned field activities at the southern end of the X-326 Slab, some designs relevant to the DDP are also included in Appendix B, *Design Drawings*, of the 5-Unit Excavation Work Plan (including the design for the supplemental berm on the X-326 Slab), and Appendix A, *Design Drawings*, of the *Demolition Design Plan for At- and Below-grade Components of the X-626 Recirculating Cooling Water Complex at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (X-626 DDP) (DOE 2023c) (including tunnel and basement excavation drawings). These drawings have also been included in Appendix C.

Appendix D presents the post-demolition confirmatory soil sampling plans for surface soils that will remain after the demolition actions, to ensure that concentrations of D&D-related contaminants are not present in surface soils in excess of risk-based protectiveness criteria.

Appendix E presents the X-326 Process Building At- and Below-grade Demolition Air Monitoring Plan, which identifies air sampling and monitoring plans for the demolition project, including action levels established for evaluating measurement results.

2. SCOPE AND OBJECTIVES FOR THE X-326 AT-AND BELOW-GRADE DDP

The purpose of this X-326 At- and Below-grade DDP is to describe the scope of work and objectives for demolition of the at- and below-grade structures of the former X-326 Process Building and management of the resulting wastes. Most of the waste debris generated under this X-326 At- and Below-grade DDP will be concrete. Smaller amounts of metal wastes from reinforcing rods and utility system wastes will also be generated. Any soil (such as residual soil, as defined in the D&D DFF&O) may be used to support the placement of waste in the OSWDF.

2.1 SCOPE AND OBJECTIVES OF THE AT- AND BELOW-GRADE DDP FOR THE X-326 PROCESS BUILDING

This X-326 At- and Below-grade DDP and its incorporated references provide the design and implementation elements for demolition of the remaining at- and below-grade structures associated with the former X-326 Process Building (see Section 5).

The scope of the demolition of the at- and below-grade structures of the former X-326 Process Building includes removal of the remaining at- and below-grade structures of the X-326 Process Building, including utility system segments associated with the building from the areas surrounding the building footprint (to the inner edge of the city block defined by Scioto Avenue on the west, Pike Avenue on the east, 5th Street on the south, and 15th Street on the north), where those structures and systems have been deactivated to allow for removal, followed by waste management, including both on-site and off-site waste disposition options. The initial project area falls within the approximately 34-acre project site area within the existing impacted water containment and management system installed during the X-326 Above-grade DDP field activities. The at- and below-grade structures to be removed under the scope of this X-326 At- and Below-grade DDP will be demolished in a two-phase project that includes the following:

- The approximately 29-acre concrete slab, which varies in thickness from 6 to 8 in. above a compacted stone base (see Section 5.4.2 for additional details)
- The underlying slab support structures, including the concrete footer slabs under column lines and the concrete piers on top of footers where deeper footers were used (see Section 5.4.4)
- The track alley that runs along the entire length of the west side of the building with an 8-in.-thick slab across most of its cross-section, including the embedded railroad rails
- Three grout-filled basements, structures, and associated east-west instrumentation tunnel segments, previously deactivated utility systems under the slab and under the bermed area (including duct banks containing conduits and deactivated electrical cables) (see Sections 5.4.5 and 5.4.6)
- The berm structure and bermed area materials (see Section 5.4.1) surrounding the slab, installed in 2019 as the impacted water containment and management system prior to the above-grade demolition as a contaminant mitigation strategy, including the following:
  - The 40-mil textured polyethylene liner and cushioning geotextile layers above and below the liner
  - The protective gravel bed layer (18 in. minimum of stabilized crushed aggregate) placed above the liner

  - The sediments/solids, which settled within the gravel layer

  - The associated impacted water conveyance lines and sumps

- The remaining inactivated utilities between the berm system mounds and the inner edge of the city block.

All above-grade structures associated with the X-326 Process Building and a portion of the tie lines were demolished under the X-326 Above-grade DDP. The X-232C2, Tie Line X-330 to X-326, was removed from the face of the X-326 Process Building to the first support column north of the footprint of the bermed area. The balance of the X-232C2 Tie Line will be removed later during the demolition of the X-330 Process Building. Portions of the three instrumentation tunnels, which run east from the three grout-filled basements under the concrete slab of the former X-326 Process Building, will be removed (see Section 5.4.6 and Figure 3). These segments to be removed are the deactivated tunnel segments east of the basement and west of the existing outer isolation headwall that was installed prior to above-grade demolition. Portions of the north-south tunnel may also be removed where it is no longer in service. The northern portion of the north-south tunnel within the city block currently remains active.

Figure 3 highlights the major at- and below-grade structures to be demolished under this X-326 At- and Below-grade DDP. The demolition work is planned to be performed in two phases and the areas corresponding to those phases are identified in Figure 3; the scope of work associated with each phase is further described in Section 2.1.1. For clarity, the underground utilities, which are also part of the work scope, are not shown on this figure and are instead provided on a series of schematic figures in Appendix B. The area shown in Figure 3 outlined by a yellow line is identified on the figure as the X-326 Process Building "City Block." This city block area, which is referred to several times within Section 5 as an aid to describing the work, is bounded by Scioto Avenue on the west, Pike Avenue on the east, and 5th Street and 15th Street on the south and north, respectively. This area still contains some active utility system segments, both above-grade and below-grade, outside of the bermed area. Section 5.4.3 discusses the physical extent of the utilities demolition. Initial demolition activities within each demolition phase will be bounded by the elevated earthen berm of the existing impacted water containment and management system. The approximate location of the elevated berm is identified in Figure 3 as a solid white line. As more contaminated surface materials are removed, foundation materials and other below-grade structures (e.g., deactivated utilities, basements, pipelines, and tunnels) will be removed as part of the demolition activities and demolition can progress beyond the original berm system boundaries. Utility system segments and other structures in the city block represent portions of site systems, some of which are individually identified and numbered under Attachment H of the D&D DFF&O, such as the X-230G Recirculating Cooling Water (RCW) System.

Section 5.4.3 provides additional information on these systems that will be removed in part by this work. Utility systems being addressed within the project generally extend beyond the city block boundary of the project area. None of these site system structures will be completely removed by the X-326 Process Building at- and below-grade demolition, but site engineering processes will track the segments removed and what is left in place. There are several utilities outside the bermed area and within the city block that are currently active and some that may continue to need to be active beyond the Phase 2 portion of the demolition schedule (e.g., high pressure fire water, storm drain piping, sanitary sewer). A future DDP will address the removal of any utility system segments in the city block that must be removed but will still be active during the final phase of field work performed under this X-326 At- and Below-grade DDP.

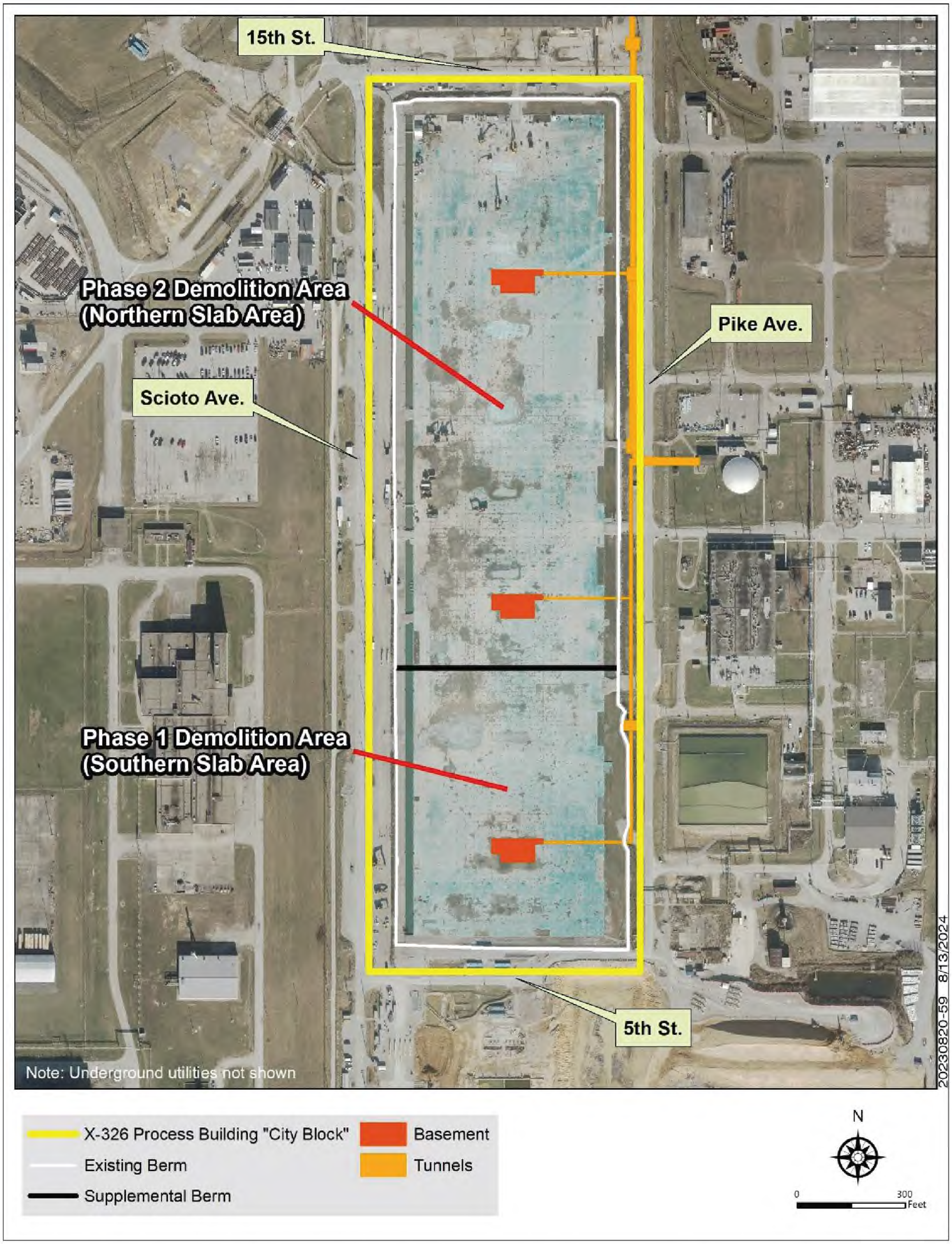


Figure 3. Location of the Remaining X-326 Process Building At- and Below-grade Structures

As part of the scope of the DDP, post-demolition soil sampling will be conducted following demolition actions (see Appendix D) to collect representative soil samples from locations originally beneath the concrete slab, at the slab/liner interface and at other locations where demolition contaminants are encountered in the soils during the demolition actions. Samples will also be collected at other areas, such as under the bermed area and at debris load-out stations. Analytical results will be evaluated to confirm that concentrations of D&D-related contaminants (see Table D.3 in Appendix D) do not exceed the risk-based protectiveness criteria. Confirmatory soil sampling results and summary information will be included in the demolition field work completion reports (FWCRs) (see Section 7). This post-demolition confirmatory soil sampling is in addition to field survey tool evaluation and ad hoc sampling conducted during the demolition to evaluate materials for removal and disposal.

Demolition support designs for this X-326 At- and Below-grade DDP are presented in Appendix C of this document. A portion of the designs (those including other nearby project activities) were already included in other project submittals (i.e., partly in Appendix B, *Design Drawings*, of the 5-Unit Excavation Work Plan, and partly in Appendix A, *Design Drawings*, of the X-626 DDP), but have also been included in Appendix C for reference and convenience. The Phase 1 demolition activities are highly integrated with follow-on excavation activities of the X-326 CMI and Phase 6 of the 5-Unit Plume Area excavation (see 5-Unit Excavation Work Plan).

2.1.1 Overview of Demolition Approach

The approach to demolition activities is presented in Section 5.1, with additional details throughout Section 5 subsections. The demolition approach includes preparation of prerequisite documentation (considered pre-mobilization activities as discussed in Section 5.2), site preparation activities to support the planned demolition field activities (Section 5.3), the specific physical demolition activities and associated excavation activities to remove underground structures and utilities and contaminated soils (Section 5.4), follow-on waste management and loading activities (Section 5.5), identification and management of impacted soil (Section 5.6), management of impacted water including work area drainage and impacted water treatment (Section 5.7), and a description of post-demolition management (Section 5.8) including site restoration, equipment decontamination, and demobilization. Removal of the at- and below-grade structures is addressed in engineering design drawings included in Appendix C of this DDP.

The project area under the scope of this demolition project encompasses the approximate 45 acres total within the city block, which includes the approximate 34-acre bermed area and the approximate 29-acre concrete slab within the berm (see Figure 3). The lined bermed area within the impacted water containment and management system begins at the edge of the slab where the liner is physically attached/anchored to the slab and extends to the berm mound, an elevated earthen mound approximately 2 ft (minimum) higher than the elevation of the slab.

The demolition work is planned to be performed in two phases. Phase 1 includes the demolition of the southern 745 ft (approximately) of the slab (and related subgrade structures) referred to also as the southern slab area (SSA), and Phase 2 includes demolition of the remainder of the slab to the north (and related subgrade structures) referred to also as the northern slab area (NSA). A supplemental berm installed at approximately 745 ft north from the southern edge of the concrete slab has been completed under the 5-Unit Excavation Work Plan (see Figure 3). The supplemental berm created two separate impacted water containment areas from the original single area and effectively defines the boundary between the SSA and the NSA. Section 5.4.1 provides a more detailed description of the two phases of the planned demolition work. The demolition activities for Phase 1 are being coordinated with the excavation plans detailed in the scope of the 5-Unit Excavation Work Plan for the southwestern portion of the project area. Where applicable, the specific work descriptions provided in the subsections within Section 5 identify coordination interfaces.

The at- and below-grade demolition activities will be performed with heavy equipment, such as track-mounted excavators, hydraulic breakers, and concrete processors. Excavation will be an integral part of the demolition due to the presence of basement structures (which were filled with a low-strength grout during the above-grade demolition), concrete tunnels, footers (effectively one footer per building column), and buried utility system segments. Potential air emissions due to demolition, discussion of mitigation activities, and air monitoring plans are addressed in Section 5.2.2. Appendix E provides the project-specific air monitoring plan, X-326 Process Building At- and Below-grade Demolition Air Monitoring Plan, to be implemented during the demolition activities.

Section 5.1 discusses the term D&D residual soils as it relates to any soils generated from demolition-related excavation of the slab, footers, piers, and utilities under this scope. Soils generated from demolition-related excavation during implementation of this X-326 At- and Below-grade DDP are considered D&D residual soil. Residual soil can be transferred to the OSWDF, if it meets the OSWDF WAC, for placement as regulatory category 1 (RC-1) D&D waste, as described in the Waste Disposition ROD, as needed.

Until the NSA is removed by demolition in Phase 2 of the project, portions of the NSA will be used for project support activities. Shearing operations for miscellaneous equipment and materials from other locations at PORTS will be conducted on the NSA for sizing materials to meet the OSWDF WAC. The NSA is well-suited for the incidental material sizing work because (1) it provides for impacted water collection and management (including transfer of impacted water to treatment), (2) a robust air monitoring program continues to operate for the overall area, and (3) infrastructure for material transfers is also present. Candidate equipment and material for the size reduction operation at the NSA is deactivated (i.e., processed under the Comprehensive Process Buildings RD/RA Work Plan requirements for deactivation) prior to movement to the NSA. This activity is managed under the authority of other concurred-with regulatory documents, but is performed within the footprint of the NSA; therefore, an additional description of the activity has been included in Section 5.5.5. The NSA will also be used for performing concrete debris size reduction in support of the DDP. These operations will be performed atop areas where additional protective layers have been added above the original slab (see Section 5.4.2).

2.1.2 Overview of Demolition Impacted Water Management

The impacted water containment and management system surrounding the former X-326 Process Building was designed and constructed for the X-326 Process Building above-grade demolition project to collect and manage the water potentially impacted by demolition contaminants. This system is expected to continue to be utilized during the demolition of the remaining at- and below-grade structures of the X-326 Process Building until it is no longer needed, as further described in Section 5.1. The system includes an elevated earthen berm (hereafter referred to as a berm), a liner system, collection sumps, and force mains (i.e., conveyance lines), which convey the impacted water for treatment at the X-622-1 Water Treatment Facility. The new supplemental berm installed in support of the 5-Unit Plume Area excavation divides the former system into two compartments, a northern and a southern, as depicted in Figure 3. The impacted water will initially be treated in C-Train, and as work progresses under the two separate demolition phases, the impacted water produced will eventually be treated in D-Train. Chemical and radiological contaminant types that may be present in the at- and below-grade structures of the former X-326 Process Building are effectively the same as those encountered in the X-326 Process Building above-grade structure; however, contaminant concentrations may vary and will still be effectively treated at the X-622-1 Water Treatment Facility.

The impacted water management structures are also supportive of the follow-on excavation projects, which will remove soil contaminated with TCE at the southwest corner of the X-326 Process Building after the slab has been removed. As the slab is removed and excavation under the X-326 CMI (or at an earlier time based on sediment management needs) progresses, the wastewater from the area will be diverted to D-Train for treatment. Note that a similar wastewater treatment switchover will occur when the NSA is removed at a later time, but it is possible that X-622-1 Water Treatment Facility (which currently houses C-Train and D-Train) will have been replaced by other similar impacted water treatment options before that time. The D-Train includes additional solids settling pre-treatment, such as the modular sedimentation tank (hereafter referred to as the X-900 T-6, 2-Million-Gallon [2M-Gallon] Tank), which is not available for the C-Train and is better optimized for management of wastewater with higher levels of volatile organic compound (VOC) content. Section 5.7 provides an additional description of this switchover process, which would be expected to occur when utility excavations or basement and tunnel excavations are undertaken for the project.

The impacted water containment and management system includes a collection sump and pump at each corner of the system with an attached piping system to convey the impacted water to the X-622-1 Water Treatment Facility. Water that has come into contact with contaminated materials within the containment area (remaining slab, debris from demolition, and planned ancillary equipment shearing) will continue to be collected and directed to one of the four sumps or collected with supplemental sumps until no longer necessary (see Section 5.7 for additional details on the operation of the impacted water containment and management system during both Phase 1 and Phase 2 of the demolition project).

2.1.3 Overview of Demolition Waste Management and Waste Disposition

The demolition debris generated under this project is anticipated to be disposed of in the OSWDF. Waste handling and loading is discussed in Section 5.5 and presents the approach to management of the various types of debris produced by demolition, including loading the appropriate transfer vehicles with the waste. Waste transfer from the project site to the OSWDF is addressed under the OSWDF O&M Plan. Waste will be transferred along dedicated haul routes to access the OSWDF. Figure 4 illustrates the location of the X-326 Process Building, the OSWDF, and the proposed haul route for waste transfer to the OSWDF. Waste transfer activities for on-site disposal are further described in Section 5.5.3.

The majority of the expected demolition debris volume from this X-326 At- and Below-grade DDP will be concrete, which will typically be size reduced to meet requirements for management as OSWDF Type 1 waste (soil) or Type 2 waste (debris), using a concrete crushing processor. The concrete joint material will potentially contain asbestos. Debris from the initial demolition of concrete will typically be staged for further processing to the specific materials size and corresponding OSWDF waste type desired. The initial materials generated during the Phase 1 demolition activities are expected to be managed on the south end of the NSA.

This approach, to move the large pieces of demolished concrete to a processing area, supports more expedient removal of demolition materials from the SSA footprint and facilitates the earliest schedule for relocation of project infrastructure supporting the 5-Unit Plume Area excavation. This strategy also provides the earliest access for the X-326 DU excavation to be performed pursuant to the X-326 CMI in the 5-Unit Excavation Work Plan. Further, the approach makes the best use of the available construction season in the SSA (since the follow-on concrete sizing operation can be performed even in weather not conducive to demolition and excavation). During Phase 1, the pre-existing infrastructure for waste load-out used during the X-326 Process Building above-grade demolition project is expected to be reused, although other similar infrastructure may be installed for optional load-out stations at different locations. Depending on the timing for the Phase 2 demolition, the same load-out approach may be used, or another load-out location could be established.

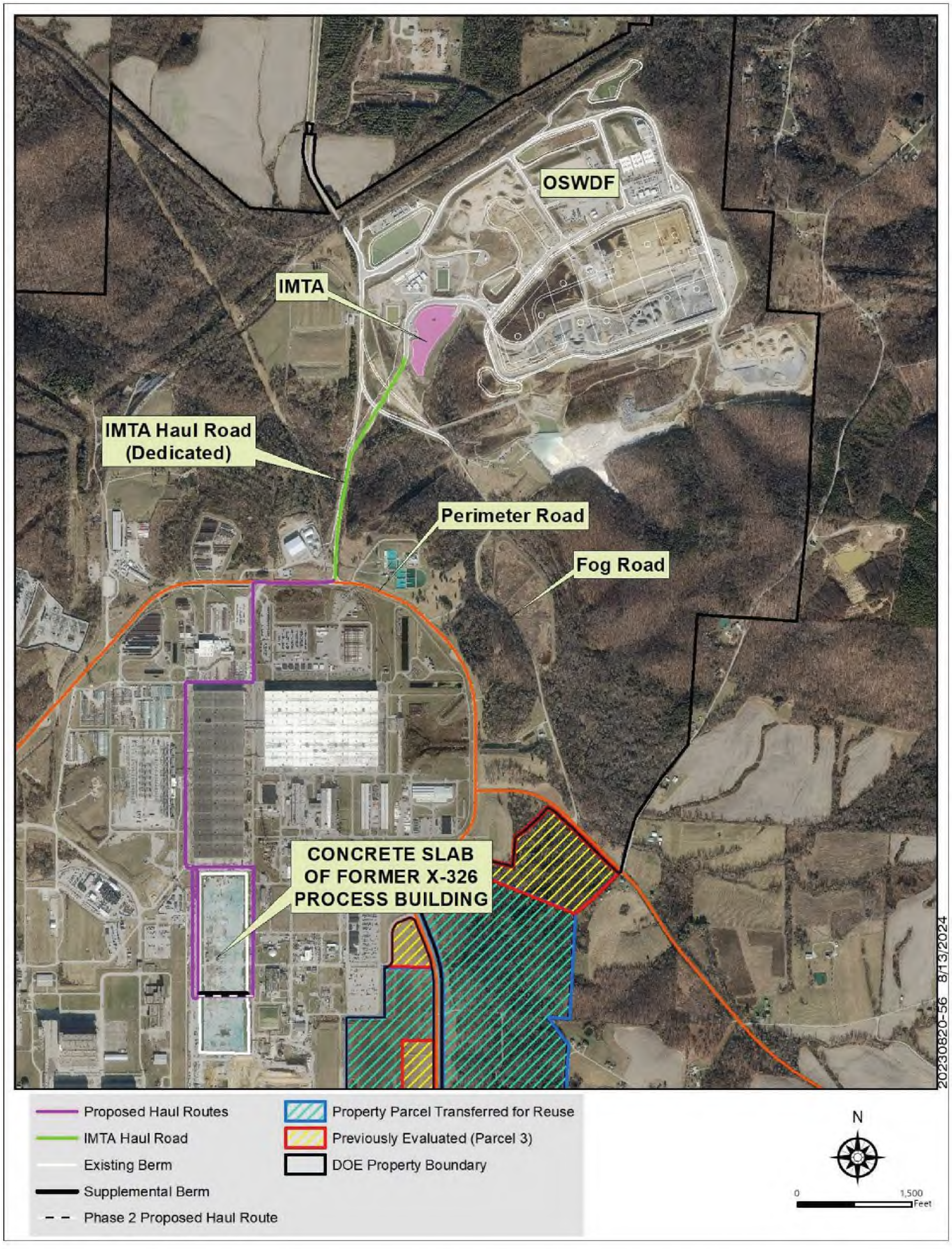


Figure 4. Proposed Haul Route from Former X-326 Process Building to the On-site Waste Disposal Facility.

In addition to concrete and associated reinforcing steel, the demolition debris will include piping from deactivated utilities, duct banks with conduits potentially made with transite, large diameter (up to 42 in.) RCW piping with asbestos content, berm materials (e.g., liner, gravel, sediments, conveyance lines), railroad rails from the track alley, and residual soils. Debris piles will be treated with a fixative to protect against the spread of contamination and generation of fugitive emissions. Storage, staging, and waste characterization of the demolition debris is discussed in Section 5.5.1.

Section 5.5.2 discusses WAC compliance verification and transfer vehicle loading. The PORTS Waste Acceptance Organization (WAO) performs visual oversight of the demolition waste load-out operations and provides final authorization to transfer waste to the OSWDF. Debris that has been verified to meet the OSWDF WAC will be loaded in transfer vehicles (such as over-the-road dump trucks or articulating dump trucks) and transferred to the OSWDF.

A discussion of waste transfer for on-site disposal is provided in Section 5.5.3. Off-site waste packaging and transfer is addressed in Section 5.5.4.

3. DESCRIPTION OF CURRENT CONDITION OF AT- AND BELOW-GRADE STRUCTURES

The remedial actions executed under the X-326 Above-grade DDP began in February 2021 and resulted in the demolition and disposal of the above-grade portions of the X-326 Process Building and associated structures. The demolition activities continued through August 2023. The demolition field activities for the X-326 above-grade demolition have been documented in an FWCR. Slab rinsing, equipment decontamination, and equipment demobilization were the three main activities occurring as the project fieldwork was being completed. These activities transitioned the area from active demolition of the above-grade structures to the management of the remaining at- and below-grade structures. Demobilization of project equipment in May 2024 was the final step in the above-grade demolition.

The impacted water containment and management system constructed for the X-326 Above-grade DDP continues to operate by containing impacted water and conveying it to the X-622-1 Water Treatment Facility, C-Train for treatment. Air monitoring activities around the site of the former X-326 Process Building have also continued.

Post-demolition use of the X-326 Process Building concrete slab was authorized under a field change notice (FCN) to the X-326 Above-grade DDP and commenced on February 6, 2023. This FCN allowed post-demolition use of a portion of the X-326 Process Building concrete slab for size reduction and load-out activities for large, non-structural debris items from the X-333 Process Building. The X-333 Process Building equipment shearing was initiated only once the slab rinse was completed for involved areas of the slab. The size-reduced deactivation debris was staged on the west side of the slab and sprayed with fixative while awaiting load-out and transfer to the OSWDF. Once the load-out was completed, the slab area used for these deactivation activities was cleaned. Cleaning areas of the slab no longer being used for debris management involved removing the remaining very small pieces of debris by brushing loose debris from the slab. Sweeping with a vehicle-mounted horizontal rotating type brush sweeper was performed first, followed by rinsing with water via a high-pressure water hose and/or a water truck. The goal of the effort was to move as much of the remaining contamination as possible to the water treatment systems by rinsing the slab and directing the rinse water to the adjacent bermed area for subsequent management and follow-on treatment at the X-622-1 Water Treatment Facility, C-Train. Fixative was applied to the slab as a final step to control the potential for fugitive emissions.

DOE plans to continue to utilize a portion of the NSA for additional equipment and materials shearing in support of disposal operations, prior to the removal of the NSA by demolition. As discussed in Section 2.1.1, infrastructure still present at the NSA establishes it as a location well-suited for supporting preparation of waste for OSWDF disposal. Existing systems and infrastructure at the NSA include: impacted water collection and management (including transfer of impacted water to treatment); a robust air monitoring program that continues to be operated for the area; and infrastructure for material transfers. Materials being downsized by this shearing operation will have been deactivated (i.e., content prohibited under the OSWDF WAC has been removed, including liquids, universal waste, etc. as required under the applicable deactivation regulatory documents) and friable asbestos will be removed for separate management before being transferred to the NSA. The process will use a continuous flow approach for materials management, thereby minimizing the creation of piled waste at the NSA. To protect the slab from additional damage (beyond what has already occurred as a result of the mechanical demolition processes from the above-grade demolition), protective layers are being installed atop the original building slab in areas where mechanical work will be performed. The planned materials management activity is managed under the authority of other concurred-with regulatory documents, but is performed within the footprint of the NSA; therefore, an additional description of the activity has been included in Section 5.5.5.

Two areas near the western side of the slab were heavily damaged during the size reduction activities of the X-333 Process Building deactivation debris. Approximately 12,000 sq ft of the slab (total for two areas) was repaired on November 16, 2023, using approximately 200 cy of low-strength grout. The Global Positioning System (GPS) coordinates for the area were collected and the soil beneath the damaged portion will be sampled during the post-demolition confirmatory soil sampling effort as described in Appendix D.

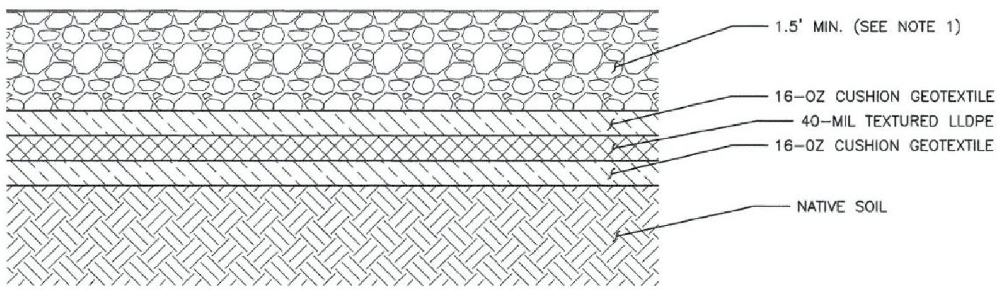
Demolition of the remaining at- and below-grade portions of the X-326 Process Building is the next step in the remedial action for the X-326 Process Building. Figure 5 is an aerial photograph taken in November 2023, which depicts the condition of the slab and surrounding bermed area. The greenish appearance of the cleared portions of the slab is due to tinted fixative that had been sprayed over the slab, once the slab had been cleaned and rinsed, in an effort to keep fine dust and particulates from becoming airborne.

Figure 5. Aerial Photograph of the Condition of the Remaining Concrete Slab of the X-326 Process Building (as of November 2023)

Prior to installing the impacted water containment and management systems in 2019, several utilities within the planned bermed area were either deactivated, isolated, or re-routed. Once deactivated and isolated, most of the below-grade utilities were abandoned in place because their depth below-grade would not have been an obstacle or interference for the berm installation and operation.

Obstacles and deactivated utilities in the shallower depths were removed prior to the liner installation. One of the major underground utilities abandoned in place was the RCW pipelines (which vary from 30-in. to 42-in. diameter) that run north/south along the east and west side of the slab (see Figure B.1 of Appendix B). The electrical duct banks feeding the building from the west were similarly abandoned in place at the time.

The berm materials include the soil used to construct the elevated berm structure with conveyance lines buried within the elevated berm mounds in some locations. The components of the liner system within the bermed area include the following: gravel layer (minimum of 1.5 ft depth); any sediments and particulates that may have settled within the bermed area; and the 40-mil textured linear low-density polyethylene liner placed between two cushioning geotextile layers. For reference, Figure 6 shows a profile view of the typical detail of the liner installation for the bermed area (as provided in Design Drawing X-326-1098-C in Appendix C, *Demolition Support Designs*, of the X-326 Above-grade DDP).



NOTES:

1. STONE LAYER TO CONFORM TO OHIO DOT SPECIFICATION ITEM 411 – STABILIZED CRUSHED AGGREGATE. SEE SPECIFICATION SHEET X-326-1104-C.

Figure 6. Typical Berm Liner Section

Many of the utility systems that once provided support for the former X-326 Process Building are also included as separately identified structures or systems for remedial action in Attachment H of the D&D DFF&O. These structures and systems are subject to the D&D decision of the Process Buildings ROD. Section 5.4.3 includes a list of the utility systems and other infrastructure associated with the X-326 Process Building by their site designation number and name as reflected in the D&D DFF&O, if applicable. In all cases, only a portion of these systems has been removed during utility isolation and only segments of much larger systems will be demolished under the scope of this X-326 Process Building at- and below-grade demolition project.

Appendix B provides a series of figures depicting the locations of the below-grade utility system segments outside of the slab footprint, under the slab footprint, and in the vicinity of the remaining at- and below-grade structures of the X-326 Process Building. Figures 7 and 8 show the existing below-grade utilities for the SSA and NSA, respectively. As shown on the figures, it is anticipated that all inactive utilities within the city block will be removed during each phase of excavation.

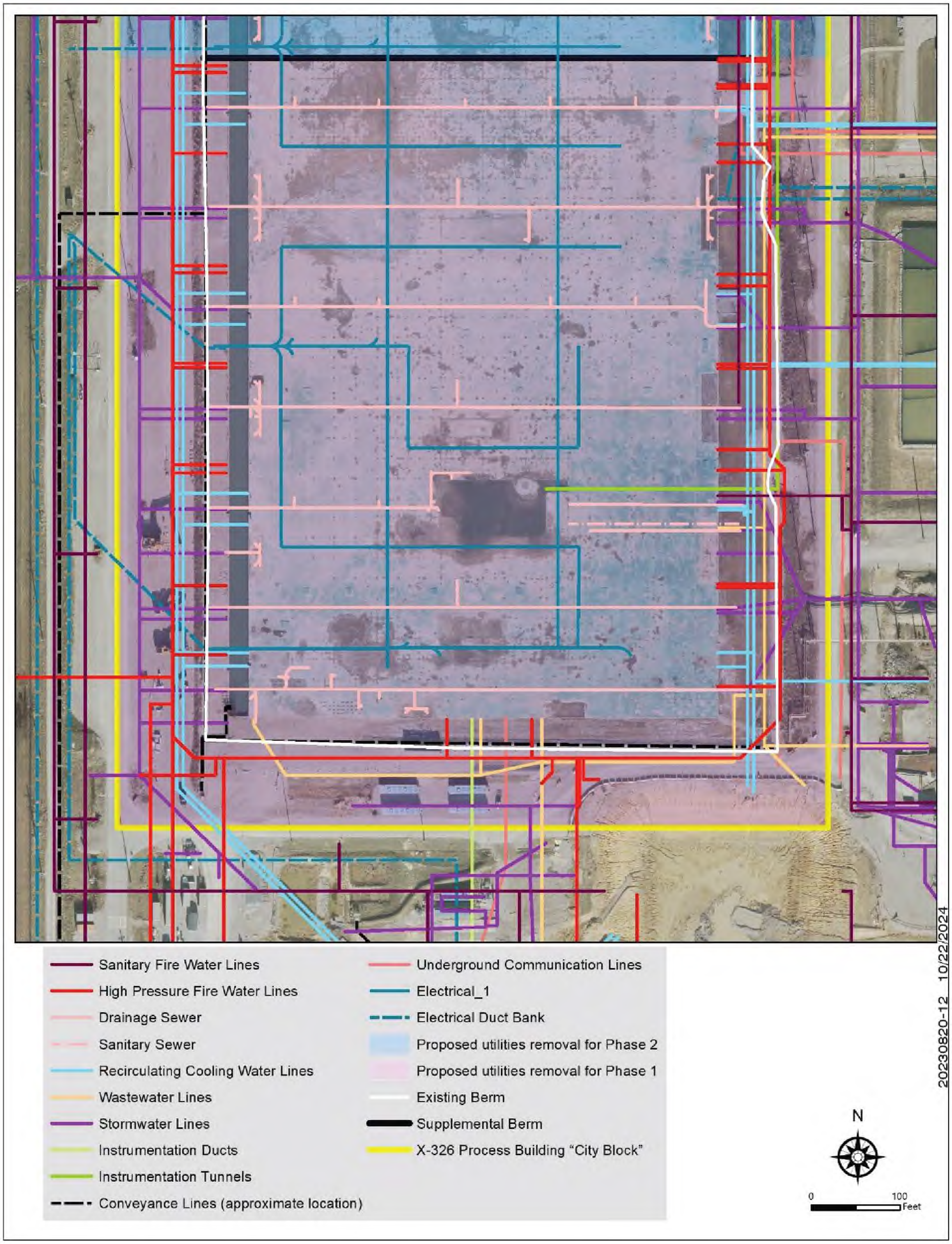


Figure 7. Southern Slab Area Underground Utilities Proposed to be Removed

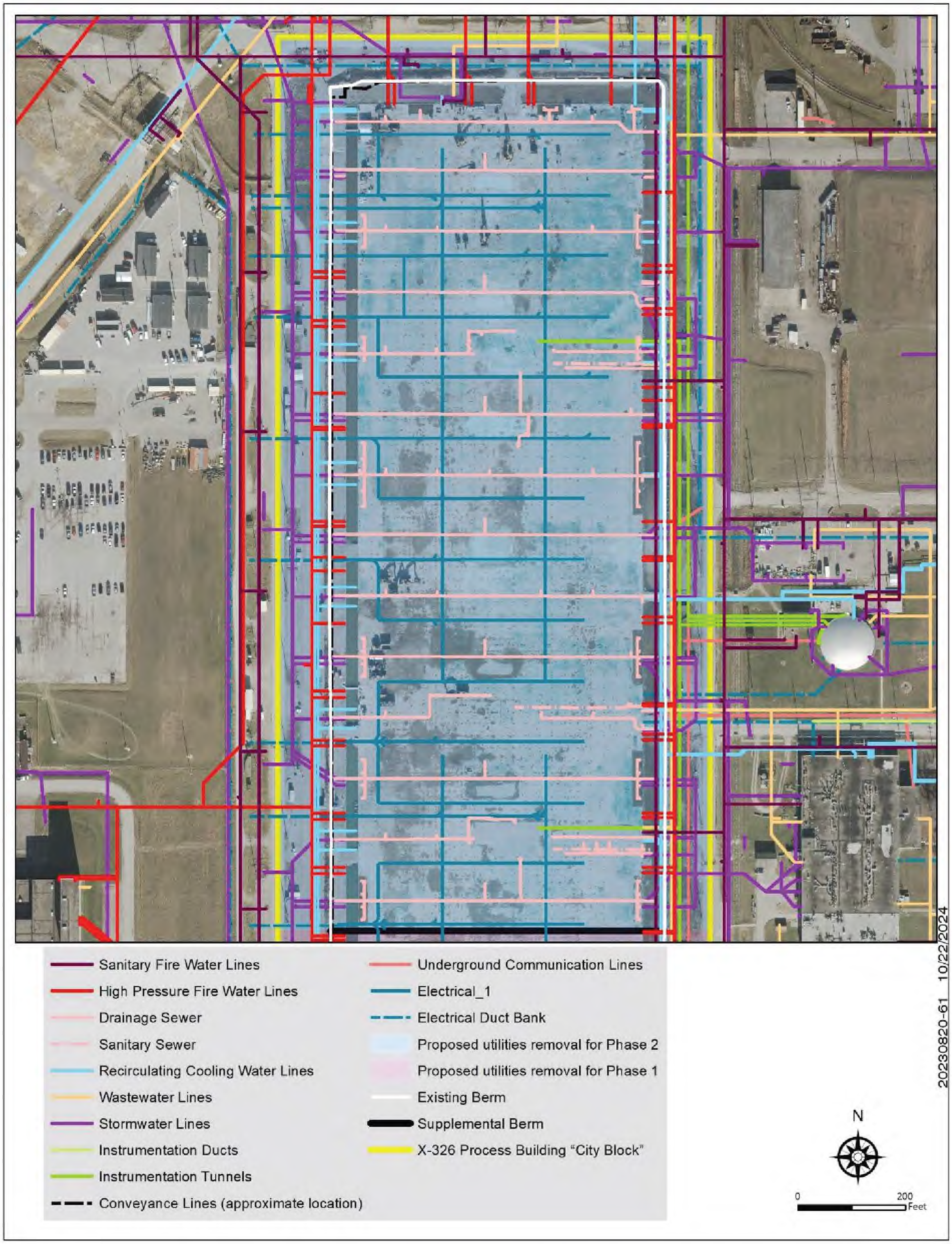


Figure 8. Northern Slab Area Underground Utilities Proposed to be Removed

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4. PLANNED DEMOLITION END-POINT CONFIGURATION

This section describes the planned end-point configuration of the project site once the demolition activities have been completed for the remaining X-326 Process Building at- and below-grade structures. This section also addresses the requirements identified in Section 3.2.2, *Documentation Strategy for Demolition*, of the Comprehensive Process Buildings RD/RA Work Plan, which states that "Demolition plans will document the planned actions to safely and compliantly demolish a given building/structure or group of buildings/structures and will address their management throughout demolition and restoration activities." This section provides the basis of comparison between the starting configuration (as previously described in Section 3) and the planned demolition endpoint configuration.

Section 4.1 addresses the conditions expected at the completion of the demolition of the SSA. The demolition of the remaining at- and below-grade structures within the SSA will be performed first as a strategy to accommodate the schedule for the approved 5-Unit Plume Area excavation project, which includes the X-326 CMI excavation. Once the demolition activities are completed in the SSA, an interim project site restoration will be implemented, and the area will transition to management as part of the 5-Unit Plume Area excavation project.

Section 4.2 addresses the conditions expected at the completion of the demolition of the NSA. The NSA will be demolished at a future date that has not yet been established. Additional area-wide grading may be performed later as more demolition activities are completed in nearby areas.

Significant features of the end-point configuration of the project area following the completion of all demolition actions (both for the SSA and the NSA) are discussed below. The overall planned end-point configuration for the project site area includes the demolition, debris waste management, and waste disposition of the following structures:

- Concrete slab, foundations, footers, and piers of the former X-326 Process Building (including any residual soils)
- Grout-filled basements and lube oil pits of the former X-326 Process Building
- Instrumentation tunnels of the former X-326 Process Building (see Figure 3)
  - Southern east/west tunnel segment from the southern basement (Phase 1 scope – demolition of the SSA)
  - Remaining two tunnel segments from the basements, as well as the tunnel system running north/south along the east side of the slab (Phase 2 scope- demolition of the NSA)
- Track alley slab and embedded railways adjacent to the west side of the slab (including any residual soils)
- Berm materials (liner materials, gravel layer with accumulated and potentially contaminated sediments settled within the gravel layer)
- Elevated berm mounds (earthen structure), including the soil and any utilities or conveyance pipelines within the elevated berm mound

- Buried utilities within the city block (where deactivated for removal prior to the demolition activities) (e.g., RCW pipelines, sanitary sewer pipelines, high-pressure fire water pipelines, electrical duct banks)

- Surface features within the bermed area

- Subsurface features such as the concrete foundations for the tie lines (and any associated residual soils) within the city block.

Following demolition activities, including the removal of contaminated soils for disposal, post-demolition confirmatory surface soil sampling will be performed separately for each area (i.e., SSA and NSA), as described in Appendix D. The confirmatory sampling will provide data for statistical evaluation to determine if D&D-related contaminants remaining in surface soil meet risk-based protectiveness criteria (e.g., preliminary remediation goals or documented background levels). Results of the statistical data comparison to criteria will provide information for considering if follow-on actions are needed.

Additionally, influent to the X-622-1 Water Treatment Facility (C-Train or D-Train, as necessary) will be monitored to determine when treatment would no longer be necessary for demolition contaminants. Following demolition activities, contaminant concentrations in collected wastewater would be expected to meet current treatment standards without the need for treatment.

The remedial actions addressed by this X-326 At- and Below-grade DDP will result in the demolition and disposal of the remaining at- and below-grade portion of the X-326 Process Building. Final restoration of the area may be contingent upon actions in the nearby areas and the extent of utility systems in the city block that will still remain active at the end of the Phase 2 demolition and the continuing extensive 5-Unit Plume Area excavation activities. However, temporary restoration will be performed to ensure the two demolition project areas are stable, well-drained, and have been seeded (where immediate follow-on project activities do not occur) to provide vegetative cover to protect from soil erosion after the demolition work is complete. Details regarding the operation of the impacted water containment and management system related to the phased implementation for demolition of the SSA and the NSA are presented in Section 5.7.

4.1 SOUTHERN SLAB DEMOLITION AREA

Once the demolition of the slab for the SSA has been completed, follow-on actions will be implemented to address the X-326 CMI excavation and the 5-Unit Plume Area excavation. Water generated by excavation activities will be conveyed to the X-622-1 Water Treatment Facility, D-Train.

Since the follow-on excavation activities described in the 5-Unit Excavation Work Plan are expected to follow completion of the SSA demolition and other areas of the SSA footprint will generally be reutilized immediately for 5-Unit Plume Area excavation project support activities, interim project site restoration for the SSA area will be limited to outlying areas that are not immediately being reutilized (such as areas to the east of the former slab area). The final grading plan for this area is addressed in the 5-Unit Excavation Work Plan.

4.2 NORTHERN SLAB DEMOLITION AREA

The requirements of the D&D DFF&O for the footprint area will be considered complete once the Phase 2 demolition and waste activities addressed by this X-326 At- and Below-grade DDP have been completed, an evaluation of the wastewater from the area has determined no further need for treatment, and post-demolition confirmatory soil sampling demonstrates that D&D-related contaminants in soil do not exceed risk-based protectiveness criteria (see Appendix D for post-demolition sampling strategy).

Wastewater treatment will be curtailed after consultation with Ohio EPA. As further described in Section 5, it is anticipated that the berm mound would no longer be considered necessary after the demolition project has removed contaminated berm contents and the contaminated concrete slab (i.e., removed the contaminated materials from the area). Conveyance piping in the northern portions of the western berm would be expected to be relocated or deactivated prior to the NSA demolition activities. Water collected from the northern area would then be directed to the stormwater sewer system, either by construction of new segments of that system, connecting the existing sumps to that system, or modifying drainage to flow to existing storm sewer collection points in the north portion of the city block.

Project site restoration for the NSA will be implemented after the demolition materials have been removed from the area (see Appendix C, Attachment C.2, Drawing X-326-C-34879). The Phase 2 demolition footprint is envisioned to undergo temporary site restoration, such as grading to facilitate proper drainage, immediately upon completion of the demolition actions and follow-on soil confirmatory sampling activities. Temporary restoration will be performed to ensure the project area is stable, well drained, and seeded to provide vegetative cover to protect from soil erosion after the demolition work is complete. Any utilities that must remain active in the city block beyond the NSA project window would need to be addressed under a future DDP. Additionally, a wider area approach to grading may be necessary (beyond just areas within the city block) as other demolition and soil remediation activities in nearby areas progress.

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5. TECHNICAL APPROACH – AT- AND BELOW-GRADE DEMOLITION

This section describes the design and implementation of the remedial action for the X-326 Process Building at- and below-grade structures. The tasks performed under the design presented in this section take the at- and below-grade structures of the former X-326 Process Building from the conditions existing at the end of the above-grade demolition (see Section 3) to the final conditions planned at the end of the at- and below-grade demolition scope (see Section 4). The demolition activities described in this section will be conducted using a phased project approach until the remaining at- and below-grade structures have been demolished, sized, packaged, and transported for disposal.

The designs and demolition processes, including emissions mitigation strategies for the X-326 Process Building at- and below-grade demolition, benefit from the experiences and improvements developed during the earlier demolition projects conducted at PORTS. The X-326 Process Building above-grade demolition was completed successfully to the established criteria (e.g., worker safety, emissions management, and schedule) following extensive planning and review. Where applicable, improved approaches developed during the X-326 Process Building above-grade demolition have been built into the designs of this X-326 At- and Below-grade DDP.

As described in previous sections, the scope of the demolition of the at- and below-grade portions of the X-326 Process Building includes the remaining concrete slab (originally the ground floor or operating floor of the X-326 Process Building) plus underlying support structures (footer slabs under column lines, piers on top of footers where deeper footers were used, and potentially the gravel layer, or the compacted stone base, under the slab). The gravel layer under the slab is considered overburden material and will be left at the project site as backfill material where it is not identified as contaminated above risk-based criteria (see Appendix D). The scope also includes other subgrade structures (three grout-filled basements that were located directly under each of the three area control rooms [ACRs] of the former X-326 Process Building, three east-west tunnels that connected these basements to the main north-south tunnel system for the X-300 Plant Control Facility, the north-south tunnel system to the extent no longer in use by the endpoint of the project, and various buried utility system segments under the slab within the city block area). The scope also includes removal of the lined berm system placed around the slab to collect impacted water for management and conveyance to treatment, once it is no longer needed. The entire city block bounded by Scioto Avenue, 15th Street, Pike Avenue, and 5th Street (see Figure 3) is included as scope under this X-326 At- and Below-grade DDP with the exception of utility systems that will remain active beyond the timeframe of this project or may be better addressed under other future scopes. Utility systems present within the city block are identified in schematic figures provided in Appendix B. Engineering drawings in Appendix C provide additional detail for reference.

The demolition work, which includes demolition of features within the approximately 34-acre bermed area, as well as systems beyond the berm in the approximately 45-acre city block (where they are accessible and deactivated), is planned to be performed in two phases. Phase 1 includes the demolition of the SSA, which is approximately 745 ft of the slab (and related surface and subgrade structures) (see Figure 3 for reference). Phase 2 includes the demolition of the NSA, which is the remainder of the slab to the north (and related surface and subgrade structures). In addition, the demolition activities for Phase 1 demolition are being coordinated with the excavation plans for the X-326 CMI in the southwestern portion of the project area. Where applicable, the work descriptions provided in the sections of this X-326 At- and Below-grade DDP will identify coordination interfaces.

Due to the near-term plans for removal of the SSA, the full east-west removal of all utility system segments in the southern portion of the city block will not be possible, since multiple systems (including the north-south instrumentation tunnel) near Pike Avenue remain active and a portion of the western berm includes conveyance piping that will remain active beyond the planned performance period for the SSA demolition. The berm section retained will also preclude access to some underlying structures requiring demolition. The planned later demolition of the NSA is expected to provide the opportunity to remove structures that are currently in use near the SSA but may be deactivated by the time the NSA is demolished, such as additional portions of the north-south tunnel system in the eastern portion of the city block.

The demolition approach includes preparation of prerequisite documentation (see Section 5.2 for pre-mobilization activities), site preparation activities that are needed in support of the planned demolition field activities, the specific physical demolition activities (and associated excavation activities), follow-on waste management (including debris size reduction) and loading activities, and a description of anticipated post-demolition management activities. These activities are each addressed in separate subsections of Section 5. Because of the phased approach, each subsection identifies if the approach presented for the work described must be completed differently for Phase 1 versus Phase 2. The work elements are generally the same for each phase, with differences related primarily to the timeframe the work is planned to be performed and other project interfaces that may exist during this phase of the work.

For the purpose of providing visibility for activities authorized under other regulatory documents that are being performed in the footprint addressed under this X-326 At- and Below-grade DDP, additional discussion of an ongoing shearing operation for ancillary site deactivation wastes, which is being performed on the NSA portion of the slab, is discussed further in Sections 5.3.3 and 5.5.5.

5.1 GENERAL APPROACH TO DEMOLITION

This section provides a general overview of the flow of the work planned for the demolition project. Additional demolition details, including contaminant controls and methods, are provided in later sections. Each of the proposed phases of the at- and below-grade demolition (Phase 1 = SSA and Phase 2 = NSA) will remove the manmade structures from within the specific area applicable to that work phase. The phase boundaries correspond to the secondary containment berm built across the slab approximately 745 ft north of the southern limit of the slab to support the 5-Unit Plume Area soil excavations. The installation will initially create two separate impacted water containment areas, north and south. Demolition Phases 1 and 2 will be similar but separated in time. Because follow-on excavation activities occur within the footprint of Phase 1 (and because it occurs first), the steps of the demolition differ somewhat and reflect integration with these other activities as well as interferences from utility system segments that will still be active during the Phase 1 demolition.

Each of the separate phases of the demolition will initially focus on areas within the existing impacted water containment and management system berms. During the demolition activities, the berms are expected to be retained during initial demolition activities as a means to continue to separate the area where potentially impacted water is being collected for water treatment from the areas outside the berm not requiring wastewater treatment. As the demolition activities progress, the overall mass of contaminants left in the project area will continue to diminish (through demolition/excavation and waste disposition actions) so that contaminant levels in impacted water will continue to reduce ultimately to a point that will no longer require treatment, as demonstrated by sampling. Simultaneously, the overall elevation of the project area will be significantly lowered due to the volume of materials being removed, resulting in a shift of the overall water management focus more to the central portions of the work areas rather than the lined berm areas. Grading of the area will be necessary to facilitate water flow to active sump pumps. As the ongoing demolition removal of materials creates additional retention volume beyond what is required to contain the design event storm and the contaminant levels drop from removal of contaminated materials, portions of the berm system will be removed to gain access to remove underlying utility system segments and utilities outside the berm mounds. In the SSA, follow-on soil excavation and wastewater management will transition to and become integrated with activities underway under the 5-Unit Excavation Work Plan (including the X-326 CMI) as excavation under that project also continues.

The work of each phase will also demolish nearby structures, such as deactivated tunnel segments and disconnected utility segments. However, portions of the city block (as described in Section 2.1 and shown in Figure 3) still contain active utilities, both above-grade and below-grade. Some of these utility systems are expected to remain in place indefinitely (and some may ultimately be determined long-term needed infrastructure for the site), so they will be protected to avoid damage during demolition activities (see Section 5.4.3 for additional discussion). The existing north-south instrument tunnel on the east side of the city block still contains active communication cables connecting from the X-300 Plant Control Facility from the X-330 Process Building, which are expected to remain active until the X-330 Process Building is fully deactivated. As described above, the potential exists for the Phase 2 demolition work to include at least the southern portion of the north-south tunnel removal and potentially all within the city block if the connection to the X-330 Process Building is no longer in use when the Phase 2 demolition work is performed.

The demolition activities will be performed with heavy equipment, such as track-mounted excavators, hydraulic breakers, and concrete processors. Excavation will be an integral part of the demolition due to the presence of basement structures, tunnels, footer blocks (typically one footer per building column), piers in some locations, and sub-grade utility system segments. Most of the concrete footers are located just below the concrete slab, but in some locations, footers were placed deeper, and pier structures were installed atop these deeper footers to carry the load from the respective building structural column to the footer below. Grade beams are also common in the structure. In the event any deep foundation structures, such as pilings (which are not expected, based on records), are encountered, these structures could be considered for being left in place if appropriate approvals are obtained as required by the Process Buildings ROD. Any structures that remain in the city block will be included on site engineering documentation.

The southern berm system sumps will be retained during the initial part of the Phase 1 demolition activities and will continue to be used to the extent possible during the demolition activities, supplemented with localized pumping operations, as needed, and grading activities to facilitate drainage. As the demolition activities progress from demolition of the slab to activities involving soil excavation (such as utility segment excavation and demolition), it is anticipated that the resulting impacted water will be directed via the X-900 T-6, 2M-Gallon Tank to the D-Train of the X-622-1 Water Treatment Facility, rather than the C-Train. This impacted water management approach is also supportive of the X-326 CMI, which is expected to generate soils with TCE content. The C-Train, which is optimized to support wastewater treatment from demolition actions, does not include equipment to manage VOC air emissions and is therefore not suited for treatment of wastewaters with significant volatile organic air emissions potential. In contrast, the D-Train, which shares the X-622-1 Water Treatment Facility with the C-Train, includes equipment selections and treatments suitable for wastewater with VOC content. Management of the impacted water is addressed in Section 5.7.

As the demolition work in each phase progresses and contaminants in the berm materials are removed and more portions of the contaminated slab are removed, it is anticipated that water collected from within the bermed area will be demonstrated (based on influent sampling at the wastewater treatment facility) to no longer benefit from water treatment. In the Phase 1 area, follow-on work planned there under separate projects, including the X-326 CMI excavation and the 5-Unit Plume Area excavation, is expected to require the continued collection and treatment of the water until those activities have been completed. However, the berm system on the south end will be removed at that time to facilitate the excavation activities and resulting wastewater collection will become integrated in that area with wastewater collection activities under the 5-Unit Excavation Work Plan. Once Phase 2 demolition activities for the NSA portion of the slab are completed (including post-demolition confirmatory soil sampling and management of demolition debris for disposal), there are no follow-on project activities expected and the area would no longer be expected to have the potential to generate water with contaminants requiring treatment before release. If contaminants still remain at levels requiring treatment, DOE would consult with Ohio EPA to determine an approach for removing contamination. At that time, the resulting water collected would be expected to be directed to storm sewers instead of treatment. Decisions about wastewater treatment and containment will be made in consultation with Ohio EPA.

The concrete waste removed by the initial demolition/excavation during Phase 1 will be moved to a designated location within the project footprint, on the northern slab, for additional size reduction (see Section 5.4). Prior to piling the waste in the NSA, a protective layer will be placed for additional protection of the existing slab. For Phase 2, the same processes will be needed, and portions of the remaining slab will be utilized as needed to perform temporary staging and size reduction processing for concrete, as needed, until demolition progresses to a point when remaining slab areas are insufficient for the activity. At that stage the concrete will be direct-loaded for transfer to the Impacted Material Transfer Area (IMTA) or OSWDF. Concrete size reduction using heavy equipment could be performed *in situ* or might be an option available at the IMTA at that time. The degree to which concrete is size reduced is subject to operational considerations.

The contents of the berm system of the SSA (the protective gravel bed, the liner, and any materials collected there) will be removed during the SSA demolition and disposed directly to the OSWDF. If berm contents require soil conditioning prior to acceptance for OSWDF placement, the conditioning may be performed *in situ* prior to demolishing the materials.

Removal of the at- and below-grade structures for both the SSA and NSA is addressed in engineering design drawings included in Appendix C of this document. The engineering design drawings that include the demolition of the SSA are integrated with work to be performed under the 5-Unit Excavation Work Plan, and were published initially in Appendix B of that work plan. Soil excavation layback designs to reach the foundation materials for ACR basements and tunnels are also included in the designs provided. Soils generated from excavation under this scope, because they are necessarily removed to facilitate the demolition activities, are considered D&D residual soil as described in the D&D DFF&O definition of D&D (Article III, Paragraph 5.e.(4) of the D&D DFF&O). Residual soil can be transferred to the OSWDF for placement as RC-1 D&D waste, as described in the Waste Disposition ROD, as needed. In general, the bulk of the residual soils will be expected to be separated from the debris generated and remain in the excavation area unless considered contaminated based on support from visual inspection, field survey tools and test kits and ad hoc sampling as needed (see Section 5.6). Infrastructure in place in support of the 5-Unit Plume Area excavation (such as load-out areas, a wheel wash station, and project support trailers) may be utilized in support of the X-326 at- and below-grade demolition activities.

Demolition and demolition preparatory activities are further described in the following sections, including additional descriptions of approaches to be used. Table 1 identifies these activities under general groupings and indicates the section of this X-326 At- and Below-grade DDP that provides the associated design information.

Table 1. Demolition and Supporting Activities

Activity Category	Activity	X-326 At- and Below-grade DDP Section
Pre-mobilization	Overview	5.2
	Waste stream planning	5.2.1
	Air monitoring plan summary	5.2.2
Site Preparation Activities	Overview	5.3
	Supplemental berm installation	5.3.1
	Documented visual inspection	5.3.2
	Discontinue waste sizing operations	5.3.3
Demolition	Berm area materials and liner	5.4.1
	Concrete slab	5.4.2
	Sub-grade utilities	5.4.3
	Foundations and piers	5.4.4
	Basements	5.4.5
	Tunnels	5.4.6
	Processing and sizing demolition debris	5.4.7
Waste Handling and Loading	Management of wastes pending acceptance	5.5.1
	WAC compliance verification and transfer vehicle loading	5.5.2
	Waste transfer for on-site disposal	5.5.3
	Off-site waste packaging and transfer	5.5.4
	Ancillary size reduction processing on the NSA	5.5.5
Identification and Management of Impacted Soil	Overview	5.6
Management of Impacted Water	Overview	5.7
	Work area drainage	5.7.1
	Water treatment	5.7.2
Post-demolition Management	Project completion	5.8.1
	Site restoration	5.8.2
	Equipment decontamination and demobilization	5.8.3
PCB Waste Management Summary	Risk evaluation for alternate PCB remediation waste storage – demolition debris	5.9.1
	Risk evaluation for alternate PCB remediation waste storage – IMTA storage	5.9.2
	On-site disposal of PCB wastes	5.9.3
Supporting Engineering Designs		Appendix C

Notes:
DDP = Demolition Design Plan
IMTA = Impacted Material Transfer Area
NSA = northern slab area
PCB = polychlorinated biphenyl
WAC = waste acceptance criteria

5.2 PRE-MOBILIZATION

Pre-mobilization activities are focused on completion of prerequisite non-field activities.

Pre-mobilization activities that are to be completed prior to the X-326 Process Building at- and below-grade demolition field activities include preparation of the internal generator waste management plans

(GWMPs), preparation of the X-326 Process Building At- and Below-grade Demolition Air Monitoring Plan (included as Appendix E), making provisions for groundwater monitoring for contaminants related to the demolition, and completing confirmatory sampling of the wastes to be generated.

Many of the pre-mobilization tasks that would typically be required for a large demolition activity like this have already been previously completed in support of the X-326 Process Building above-grade demolition. For example, air modeling conducted in support of demonstration of regulatory compliance and development of an effective air monitoring approach was previously performed for the more concentrated contaminant loading present for the above-grade demolition of the X-326 Process Building. The basic framework of the air monitoring program established for the above-grade demolition of the X-326 Process Building is being reused for the at- and below-grade demolition, with the addition of VOC monitoring, as needed and where beneficial (such as during the Phase 1 [SSA] demolition activities that include the area to be later excavated under the 5-Unit Excavation Work Plan) (see Section 5.2.2 for summary information and Appendix E for a more detailed presentation of the X-326 Process Building At- and Below-grade Demolition Air Monitoring Plan). The phased demolition work will result in the removal of remaining contaminated structures, moving generally from south to north, and the air monitor placements will transition over the course of the project to match the work locations, as was conducted in support of the X-326 Process Building above-grade demolition. In support of the concrete demolition work and subsequent concrete sizing operations planned, an engineering evaluation was performed confirming that particulate emissions from the project would fall within the bounds of values originally established for the above-grade demolition of the X-326 Process Building (see Section 5.2.2 and Appendix E).

Groundwater monitoring that was established for the above-grade demolition of the X-326 Process Building will continue to be performed at wells east, west, and north of the work footprint. Existing monitoring wells X710-07G (east), X326-PZ-07G (north), X326-04G (northwest), F-19G (west), and X231B-19G (southwest) will continue to be sampled semi-annually for total metals, polychlorinated biphenyls (PCBs), and radionuclides (i.e., total uranium, isotopic uranium, and technetium-99). These wells will additionally include sampling for transuranics. The monitoring activities include evaluating for trends and evaluation against drinking water standards. Groundwater monitoring in the areas south of the slab is not occurring due to the removal of contaminated materials to bedrock in that area pursuant to the 5-Unit Excavation Work Plan. Post-remedial action plans for monitoring wells in the former 5-Unit Plume Area will also offer an opportunity to monitor for demolition contaminants in future wells to the south of the X-326 area and potentially to the southeast. Note that well locations may be impacted by future remedial actions and may be abandoned prior to completion of the monitoring activities. If such an occasion arises, alternate wells will be evaluated for their potential for providing meaningful replacement contaminant monitoring.

Utility systems and other obstructions in the vicinity of the X-326 Process Building were identified prior to the above-grade demolition project to support the deactivation utility isolation and the construction of the lined berm system. The resulting engineering documentation from that effort has been updated to support the at- and below-grade demolition project. Significant subgrade utility system segments are depicted in the figures provided in Appendix B.

5.2.1 Pre-mobilization – Waste Stream Planning

As described in later subsections of Section 5, each demolition activity generates waste and collectively the wastes under this X-326 At- and Below-grade DDP will be disposed, both at the OSWDF and potentially at off-site locations. Waste generated for disposal at the OSWDF must meet all WAC and fall within specified waste type descriptions that have corresponding waste placement requirements. Waste stream types are defined in Section 2.3, *Waste Type Requirements of the OSWDF*, of the WAC Implementation Plan and summarized in Table 2.

Table 2. OSWDF Waste Type Descriptions

Waste Type	Description
Type 1	Soils and soil-like materials with no agglomerations larger than 12 in.
Type 2	Concrete, metal, debris, and other miscellaneous waste resulting from D&D activities that can be spread in lifts of 21 in. thick ± 3 in.
Type 3	Larger incompressible D&D wastes that can be placed in lifts of up to 4 ft thick
Type 4	Wastes subject to decomposition, including wooden debris, bulk paper products, pallets, utility poles, tree root structures, sewage plant waste, and railroad ties
Type 5	A general category for wastes requiring special handling. Examples include large PGE such as intact compressors, containerized waste, ACM, broken pieces of transite panels, double-bagged asbestos, and asbestos-covered piping

Notes:
ACM = asbestos-containing material
D&D = decontamination and decommissioning
OSWDF = On-site Waste Disposal Facility
PGE = process gas equipment

Table 3 identifies waste streams anticipated to be generated from the phased demolition work activities under this X-326 At- and Below-grade DDP for on-site disposal and their associated estimated volumes by project phase. The entries in the table reflect waste streams expected to be segregated from each other and managed separately during the demolition waste disposition processes. The overwhelming majority of the expected demolition debris volume from the X-326 Process Building at- and below-grade demolition project will be concrete, which may be processed to meet requirements for management as either Type 2 waste (debris) or as Type 1 waste (soil) (or a portion of both). Type 1 waste is the preference due to the benefits created from turning a debris material into a material that can facilitate burial of other debris materials (i.e., reducing overall burial space taken and engineered soil needs). Reinforcing steel associated with concrete would be managed separately as Type 2 waste for concrete processed to Type 1 waste criteria.

Concrete wastes will be generated from demolition of the building slab, underlying footers and piers, basement and tunnel structures, fill materials in basements, some manhole and other utility-related structures, and duct banks constructed without transite asbestos cement materials content.

Electrical duct banks, if found to be constructed with transite content, may require management as Type 5 waste, although size reduction of asbestos-containing materials (ACM) to Type 2 waste may be performed. Large piping associated with the RCW processes that are coated with an ACM may also require a separate waste placement plan if the decision is made to direct that waste to the OSWDF.

The liner and gravel of the bermed impacted water containment and management system that was built around the X-326 Process Building for collection and conveyance of the impacted water to wastewater treatment will be managed as Type 1 waste (gravels and collected solids) and Type 2 waste (liner materials).

Table 3. X-326 Process Building At- and Below-grade Demolition OSWDF Waste Streams

Waste Stream Description	OSWDF Waste Type[a]	Original Volume (yd³)[b]	Waste Categorization			
			RAD	ACM	PCB	RCRA
Phase 1						
Concrete debris[c]	2 or 1	19,800	LLW	Nonfriable	RW	Nonhaz
Metal debris[d]	2	70	LLW	Nonfriable	RW	Nonhaz
RCW piping[e]	2 or 5	1,050	LLW	Nonfriable	Non-PCB	Nonhaz
Berm liner contents	1	3,600	LLW	Non-ACM	RW	Nonhaz
Berm liner	2	250	LLW	Non-ACM	RW	Nonhaz
Phase 2						
Concrete debris[c]	2 or 1	50,500	LLW	Nonfriable	RW	Nonhaz
Metal debris[d]	2	160	LLW	Nonfriable	RW	Nonhaz
RCW piping[e]	2 or 5	1,050	LLW	Nonfriable	Non-PCB	Nonhaz
Berm liner contents	1	7,000	LLW	Non-ACM	RW	Nonhaz
Berm liner	2	450	LLW	Non-ACM	RW	Nonhaz
Non-Phase						
Water treatment wastes[f]	1	<3	LLW	TBD	TBD	TBD

Notes:

[a]The FWCRs for the at- and below-grade demolition, to be submitted following completion of the demolition work under each phase, will summarize actual waste dispositioned.

[b]Reflects original in-place volumes, rounded.

[c]Concrete debris may be size reduced to meet OSWDF Type 2 or Type 1 waste size criteria, depending on programmatic needs. Reinforcing steel removed from concrete will be managed as OSWDF Type 2 waste. Includes ~9,100 yd³ additional volumes associated with protective work areas constructed on the NSA and to be demolished during the NSA demolition.

[d]Reinforcing steel from concrete, rails from the track alley, drain pipe, and electrical cables will be managed as OSWDF Type 2 waste.

[e]RCW Piping disposition may be on site or off site and if disposed in the OSWDF may fit Type 2 or Type 5 criteria depending on how the material is managed with respect to asbestos abatement and final sizing.

[f]Water treatment wastes are primarily soil-like solids such as filter cake, spent resins, and granular activated charcoal. Other waste, such as used containers, used PPE, etc. will also be generated. Wastewater treatment waste volumes are very small in comparison to building demolition debris. Characterization may vary by specific waste lot, based on sample results. Wastes are not expected to require management as hazardous waste based on initial engineering evaluations.

ACM = asbestos-containing material
FWCR = field work completion report
LLW = low-level (radioactive) waste
Nonhaz = nonhazardous
NSA = northern slab area
OSWDF = On-site Waste Disposal Facility
PCB = polychlorinated biphenyl
PPE = personal protective equipment
RAD = radiological
RCRA = Resource Conservation and Recovery Act of 1976, as amended
RCW = recirculating cooling water
RW = remediation waste
TBD = To be determined

Metal piping (other than the RCW piping), rails from the track alley demolition, and reinforcing steel from poured concrete demolition will be managed as Type 2 waste.

Wastes to be managed and disposed of as Type 3 waste (large debris) or Type 4 waste (decomposable) are not anticipated to be generated from the demolition.

The waste volume estimates in the table represent in-place material volumes and do not account for swell that will occur during the demolition and waste management processes.

Radionuclide activities present in the materials to be demolished under this X-326 At- and Below-grade DDP were previously included in the radiological source term for the above-grade demolition of the X-326 Process Building (because any radioactivity remaining at the site is a residual portion from that original total estimated by the source term document). Primary radionuclides present in the slab and berm materials are the same as those identified for the X-326 Process Building above-grade demolition radiological source term, including technetium-99, uranium (i.e., uranium-232, uranium-234, uranium-235, uranium-236, and uranium-238) uranium decay progeny (i.e., thorium-228 and thorium-230) and trace levels or transuranic isotopes (i.e., neptunium-237, plutonium-238, plutonium-239, and americium-241). During demolition activities, waste types will be sampled to confirm radiological content to support OSWDF waste characterization, tracking, and accounting processes.

The overall contamination present in the slab and the berm materials are the residual of contaminants originally identified as part of the above-grade demolition actions and represent a small portion of the original chemical and radiological contaminants originally present. Higher levels of radionuclides occurred from the waste sizing operations that included a subset of process gas equipment from the X-333 Process Building. Other materials from around the site will continue to be size reduced on the NSA. Contaminants from additional sizing operations are not expected to alter the current contamination present at the slab. Specific contamination levels associated with the additional sizing operations will be determined as waste is generated. Consistent with the characterization for the X-326 Process Building provided in the X-326 Above-Grade DDP, the waste concrete and berm materials will be managed as low-level (radioactive) waste (LLW) and PCB remediation waste.

Other contaminants are also present, such as heavy metals (e.g., contributions from vintage paints). These former building contaminants are expected primarily in the gravel materials in the berm system and damaged areas of the slab, along with residual radionuclides and PCB-contaminated solids. Friable ACM were removed from the former X-326 Process Building during asbestos abatement activities before its demolition. However, ACM is expected to be encountered during excavation and management of utility system segments to be removed (such as the large RCW piping that served the former X-326 Process Building). These piping systems have been determined to have an asbestos-containing coating where they have been encountered elsewhere at PORTS. Electrical duct banks that provided power to the building may also incorporate transite materials in their construction.

As required by the WAC Implementation Plan, waste management activities under the X-326 Process Building at- and below-grade demolition are addressed in internal project-specific GWMPs. Wastes from the impacted water treatment operation conducted at the X-622-1 Water Treatment Facility are also addressed under a GWMP. The GWMPs include a summary of the waste streams anticipated to be generated during the project (or in support of the project) and address internal management requirements for these wastes, such as packaging requirements, procedures applicable, etc. GWMPs also identify a process to be used if unexpected conditions are identified, such as if OSWDF-prohibited waste types are encountered in demolition debris or moisture accumulation is identified during transfer vehicle loading.

As discussed in the WAC Implementation Plan, a Master Waste Profile Form is selected for each waste stream as part of the Project Planning Checklist. A Project Planning Checklist for disposal of waste at the OSWDF will be prepared prior to generation of the waste. The checklist preparation process is supported by the information in the GWMPs, including activities such as identification of each anticipated waste stream, identification of available information and sample/measurement data, and identification of the methods to be used to meet WAC requirements and any special requirements. The Project Planning Checklist, the Waste Form Compliance Checklist, and associated backup materials provide the basis for the waste generator to certify the waste streams (and individual waste loads) for OSWDF acceptance and transfer for both radiological and chemical content. The waste generator, in this case, the X-326 Process Building at- and below-grade demolition project, provides WAO with a certification that the waste presented for disposition complies with the requirements. The process is overseen and verified by WAO.

5.2.2 Pre-mobilization – Air Monitoring Plan Summary

Appendix E provides the X-326 Process Building At- and Below-grade Demolition Air Monitoring Plan for the X-326 Process Building at- and below-grade demolition activity. The plan builds from the approach already employed for the X-326 Process Building above-grade demolition. A limited summary of the X-326 Process Building At- and Below-grade Demolition Air Monitoring Plan (Appendix E) is provided in this section. Additional details and supporting information are provided in the appendix.

Project-specific air monitoring will be conducted during the demolition project around the perimeter of the work areas to collect samples and other measurements to provide objective evidence of the airborne concentration of pollutants. Project perimeter air monitoring will occur initially at seven locations with environmental samplers, each location with multiple types of air sampling equipment, plus an additional monitoring location associated with demolition and waste hauling, located near Perimeter Road north of the process buildings (identified as station A72). Initial placement of air monitoring stations for the Phase 1 portion of the demolition project is depicted in Figure 9. The same figure is included in Appendix E. Table E.3 in Appendix E identifies the initial location of each air monitoring station and the air monitoring equipment initially associated with each air monitoring station at the start of Phase 1 of the demolition activities. Both retrospective sampling equipment (equipment that collects a sample over a period of time to represent a time period) and real-time measurement equipment (equipment that reports data results and summaries in near real-time) are included.

Retrospective air samplers will collect particulate samples for analysis for radionuclides and hazardous air pollutant metals. Specialized sampling for PCBs will be conducted with samplers that include both particulate collection and vapor collection (vapors are deposited in polymer foam). Devices for measurement of particulate content in the air will be able to provide data in near real-time. Asbestos and VOC sampling will be conducted when work activities have the potential to encounter these contaminants at monitoring station locations nearest to the activities. Air monitoring conducted at location A72 (see Figure 9) also includes VOC sampling. Air monitoring station locations may be moved during the project to provide perimeter coverage for the specific types and locations of work underway.

The project perimeter environmental air monitoring described above is in addition to the existing PORTS ambient air monitoring network that monitors radiological constituents, radiological dose levels, and fluorides present in site emissions at locations on site and off site. In addition to retrospective air monitoring samples for radiological particulate, extensive radiological air monitoring will also be conducted under the PORTS radiological protection program, inside the work zone, at or near the project work boundary, and at locations beyond the project area. Additionally, two State of Ohio agencies, the Ohio EPA and Ohio Department of Health (ODH), have located air monitoring equipment in the same locations as many of DOE's programmatic air monitoring stations to provide a convenient means to compare results, add a layer of redundancy for air measurements, and provide an alternate source for air monitoring data to address concerns of residents. Figure E.1 in Appendix E identifies these co-located air monitoring station locations.

Following the completion of the Phase 1 demolition activities and the Phase 2 demolition activities, air monitoring activities will be downsized to fit the needs of the remaining slab area and the contaminants present. At the completion of each demolition phase, the contaminated structural materials associated with the respective area will have been removed and follow-on confirmatory sampling of soils will be conducted as described in Appendix D.

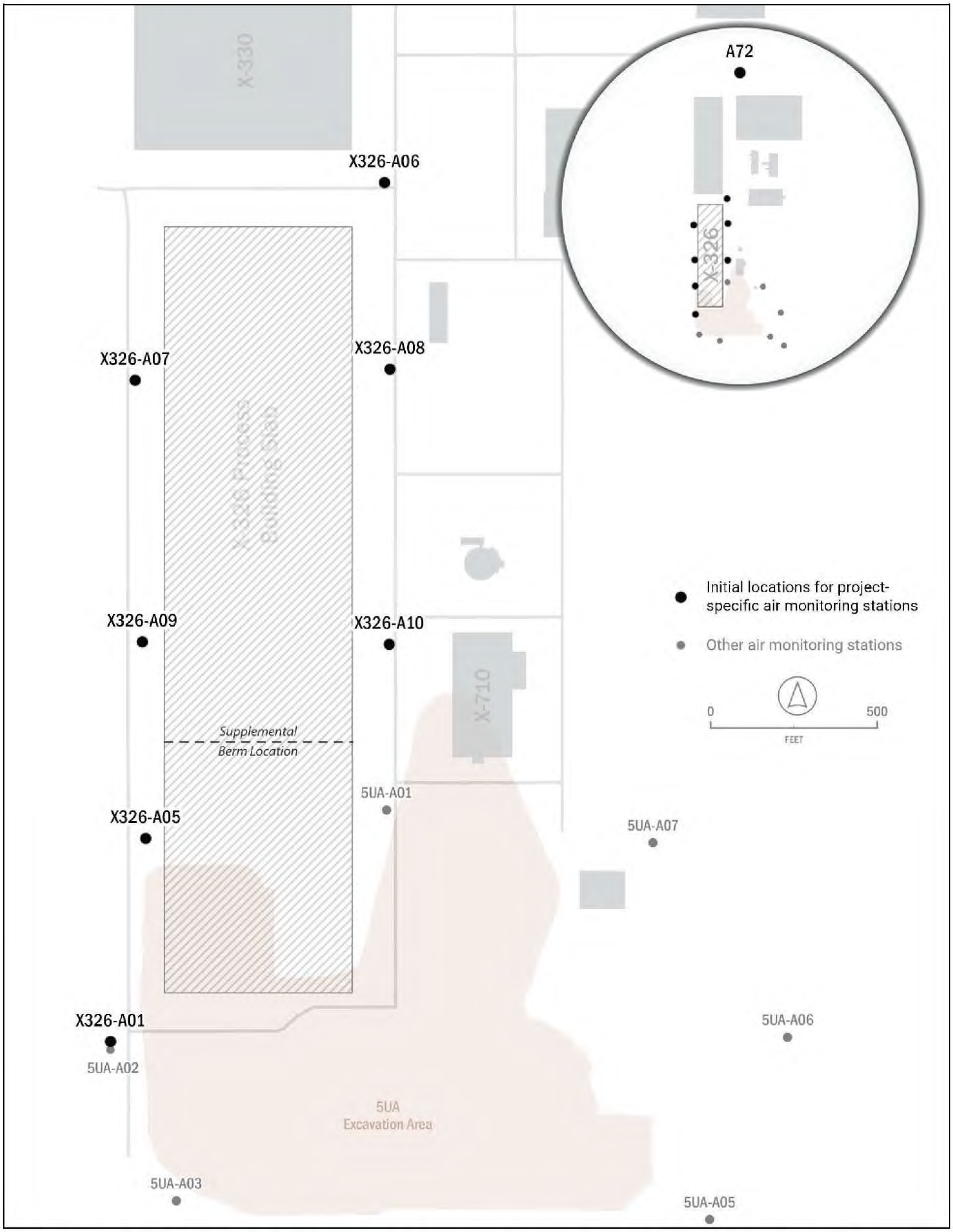

Figure 9. X-326 Process Building At- and Below-grade Demolition Initial Air Monitoring Locations

Air samples collected during Phase 2 are expected to support a determination that project-specific air monitoring is no longer necessary for the former X-326 Process Building area after the remaining contaminated structures have been removed (i.e., the concrete slab and berm contents) and soil sampling has determined levels of contamination remaining in area soils. At such time DOE will, in consultation with Ohio EPA, determine if project-specific air monitoring under this plan can be concluded. When such a decision is determined, DOE will notify the Ohio EPA of the conclusion of supplemental air monitoring under this plan.

5.3 SITE PREPARATION ACTIVITIES

Site preparation activities are field activities that support the planned demolition but that occur in advance of primary demolition activities. This section addresses the site preparation activities that will be performed under the authority of this X-326 At- and Below-grade DDP. Because the X-326 Process Building above-grade demolition already established much of the necessary project infrastructure, these features will continue to be used for the at- and below-grade demolition project to the extent needed. Examples include the existing impacted water containment and management system (including the berm, liner system, and associated sumps and conveyance piping systems), the existing air monitoring equipment installations, the waste load-out equipment and haul route, and the project fence lines and area access controls. These features may be modified or removed as described in this plan.

The site preparation activities authorized under this X-326 At- and Below-grade DDP will be conducted in parallel with the 5-Unit Excavation Work Plan.

5.3.1 Site Preparation Activities – Supplemental Berm Installation

The impacted water containment and management system surrounding the X-326 Process Building was designed and constructed as a lined berm system for collection of water potentially impacted by contaminants from building demolition activities. Sumps at each corner with an attached piping system provide for the conveyance of the impacted water to treatment at the X-622-1 Water Treatment Facility. To facilitate wastewater management under the 5-Unit Plume Area excavation project, a new conveyance pipeline and a supplemental berm will be installed, by the 5-Unit Plume Area excavation project, at approximately 745 ft north of the south end of the X-326 Process Building slab (Design Drawing X-900-C-33513 in Appendix C). The supplemental berm provides the separation of wastewater management from the slab into two compartments necessary for the planned phased approach to removal of the slab. Since this activity is instrumental to the planned approach, it has been included in this section even though it was completed under the separate authority of the 5-Unit Excavation Work Plan.

The southern portion of the containment system will initially continue to collect impacted water in the berm and use the two sumps remaining within that portion of the system (southeast and southwest) to direct impacted water to the X-622-1 Water Treatment Facility. Later, as demolition progresses to activities involving soil disturbance, impacted water will be directed to treatment via the X-900 T-6, 2M-Gallon Tank to the east of the slab (Design Drawing X-900-C-34352.10 in Appendix C). A ramp system to facilitate movement of debris to the north portion of the slab as it is generated is included in the supplemental berm design (Design Drawing X-900-C-33513 in Appendix C).

5.3.2 Site Preparation Activities – Documented Visual Inspection

To facilitate later evaluation of underlying soils, areas of the slab being prepared for demolition have received a visual inspection (walkdowns) of the surface to document large cracks and openings that could indicate pathways for migration of contaminants from the slab surface to underlying media. The significant openings have been documented using GPS coordinates. The walkdowns supported the development of the sampling approach for the areas after the remedial actions by identifying potential soil sample locations for post-demolition biased soil sample collection (see Appendix D). The records from visual inspections are also expected to support later evaluation of anomalous conditions encountered during slab demolition.

5.3.3 Site Preparation Activities – Discontinue Ancillary Waste Sizing Operations

Prior to initiating demolition actions for the NSA, any equipment or material sizing operations conducted on the slab (such as shearing of equipment from other areas of the PORTS) will be terminated and resulting debris appropriately dispositioned (e.g., loaded and transferred to the OSWDF for disposal). Disposition of construction materials used at this operation (such as gravel and steel plates) will include evaluation for movement to other areas of PORTS for reuse. Residual materials, such as loose fine materials from such an operation, will also be removed from the slab, for example by sweeping and collection of the materials for disposal.

5.4 DEMOLITION

The demolition activities described in the following subsections constitute the components of the demolition design necessary to implement the next phase of the remedial action for the X-326 Process Building and the other structures included in the scope of this X-326 At- and Below-grade DDP. Each demolition activity is described in the following subsections using the same set of subcategories with bolded headings and content as indicated below.

Material Description. Description of the material being demolished.

Contaminants. Contaminants present and associated discussion.

Contaminant Controls. Controls that will be put in place for additional safety and/or mitigation of emissions.

Job-level Monitoring and Controls. Controls such as supplemental air monitoring and impacted water containment and treatment, are not described since these apply throughout the operation and their discussion would be repetitive.

Demolition Approach. Description of the demolition approach and a general description of the types of equipment to be used to perform the activity.

Waste Form. Identification of the end product being generated from the specific activity, including a description of the waste characteristics. This may include identification of OSWDF Waste Type, where applicable (see Table 3 for an overview of the OSWDF waste types).

Key ARARs. A brief discussion of one or more ARARs that tie directly to the controls necessary for the activity or is considered to be one of the primary areas of focus for the specific task. The identification of a key ARAR is not intended to suggest that compliance with other ARARs is not equally as important.

Because of the large footprint of the X-326 Process Building at- and below-grade demolition activities, demolition, debris sizing, loading of debris, and transport to OSWDF activities could potentially be underway concurrently, using teams of machines to perform demolition, sizing, and loading of transfer vehicles. Demolition methods presented in the following sections are not intended to be performed fully across the entire area before other demolition actions can be performed (i.e., multiple types of demolition can be underway in different parts of the project area simultaneously and soil excavation work under other projects may also be underway in the project footprint in areas where materials have already been removed to support such activities.

During remedial action, unforeseen conditions and changes in approach may be considered major or minor modifications under the D&D DFF&O. Using the FCN process (see Section 5.10), Ohio EPA review and concurrence will be sought prior to implementation of any modification when required per the criteria listed in Section 3.4.2, *Design Changes During Construction*, of Attachment B of the D&D DFF&O. Consistent with the requirements of the D&D DFF&O, Ohio EPA will be notified of other changes to the remedial action made during construction through D&D DFF&O progress reports; however, minor changes will be identified and communicated to DOE and Ohio EPA verbally as they are identified to the extent possible.

5.4.1 Demolition – Berm Area Materials and Liner

Components of the berm and liner system (the impacted water containment and management system) are subject to removal as part of the planned demolition activities addressed by this X-326 At- and Below-grade DDP. During Phase 1 of the at- and below-grade demolition project, only the portions of the berm system adjoining the SSA will be considered for inclusion in demolition activities. The liner and gravel contents of the bermed area (including solids and contaminants that did not make their way to the water treatment processes) will be removed by equipment, such as track-mounted excavators, for transfer to the OSWDF. If the materials require soil conditioning to meet the OSWDF WAC requirements, conditioning agents may be added, potentially *in situ*. The materials may either be moved to existing transfer vehicle loading operation areas (for transfer to the OSWDF) or direct loading of transfer vehicles may be possible from some areas.

The impacted water collection and management system berms will be retained during the early stages of the demolition actions to continue to facilitate collection of potentially-contaminated water from inside the system for potential treatment. Water collected within the physical boundary of the impacted water management system will continue to be conveyed to treatment until it is demonstrated no longer necessary (e.g., if contaminated materials have been removed from the area and the water influent to the treatment system already meets current treatment standards). Cessation of water treatment will be determined for each phase of the demolition, if applicable, in consultation with Ohio EPA.

One of the later steps conducted under the X-326 Process Building above-grade demolition was the collection of loose solids by sweeping (and removal for disposal), followed by a water rinse to move finer materials and soluble contaminants, and then application of a fixative to the surface of the concrete. These operations removed a significant portion of the fine materials (and associated contaminants) that would be considered more mobile from the slab and helped to prevent migration or emission of remaining contaminants.

Above-grade demolition released fine materials and contaminants that collected in the gravels of the berm system. Removal of the gravel contents of the berm and the liner system will result in the removal of the most significant sources of potentially mobile contaminants remaining in the project area. Therefore, the removal of the existing contents of the basin areas of the berm system (including gravels, collected materials and liner system) is expected to be coordinated with the removal of the concrete slab components in an area to prevent contaminated berm contents from having the potential to migrate from the berm system into areas where concrete has been removed or is being removed based on elevation differences.

During Phase 2, the remaining northern portion of the berm system will be addressed (and the NSA concrete slab will also have been similarly prepared with sweeping, rinsing, and application of fixative prior to that time). Until that time, water collected from the NSA will continue to receive impacted water treatment, as needed.

During both demolition phases, the demolition of the concrete slab and its underlying footers (as well as other structures like ACR basements, tunnel segments, and utility system segments), followed by area-wide grading operations to facilitate drainage, will result in a general lowering of the areas by several feet. Once the slab is removed, maintaining water flow to the impacted water collection and management system sumps will require grading in the area to address elevation differences that will be created. Existing sumps from the impacted water collection and management system are expected to continue to be utilized for water collection during the demolition actions for as long as the approach is practical (e.g., based on elevation issues). Modifications to the sump basins may be needed to facilitate inflow and extend the useful life of the sumps in support of the later demolition activities. Other water collection and conveyance approaches may also be included, such as pumping water directly from excavation areas to piping systems or to the existing sumps.

Material Description. Details of the berm and liner system design are contained in Appendix C of the X-326 Above-grade DDP. In general, the materials of the bermed area include the liner system (a cushion geotextile layer, the 40-mil textured polyethylene liner, and another cushion geotextile layer) plus 18 in. minimum of stabilized crushed aggregate. In some areas, substantially more aggregate is used and multiple ramps over the berm use extensive aggregate as well. The berm compartment areas to the east and north are expected to contain significant quantities of fine materials produced by the demolition activities that were conducted on the former X-326 Process Building. The west section of the bermed containment system, beyond the basin (west of) created from the former track alley, included a roadway for debris loading equipment to utilize for transfer vehicle loading operations. The far southeastern portion of the secondary southern berm compartment was previously removed in support of the 5-Unit Plume Area excavation project.

Based on the nature of the gravel bed of the bermed basin areas, significant moisture content in the materials may be encountered following periods of rain activity, and these materials may require soil conditioning during waste generation (to meet disposal requirements) as a result.

Contaminants. The berm and liner system were constructed prior to the above-grade demolition of the X-326 Process Building. Contaminants now present in the materials are representative of the fine particulate produced by the demolition actions (including concrete dust, paint chips, and metal fines) and residues from products applied during the demolition for emissions mitigation (fixatives). Radiological contaminants and PCBs may also be present.

Contaminant Controls. Depending on the moisture already present in the materials, misting will be applied as needed to control the generation and migration of airborne particulate.

Demolition Approach. Following removal of any free-standing water, the materials will be removed using heavy equipment, such as a track-mounted excavator. Gravel fill materials will be scooped from the berm areas. Where the liner materials are fastened to the concrete slab of the former X-326 Process Building, the connection will be severed. Where the liner materials key into the top of the berm, the liner materials will be pulled free of the mound, with the intent to maintain the mound materials as uncontaminated. To facilitate handling for disposal under differing OSWDF waste types, liner materials will be segregated from berm contents and either cut mechanically or manually. To address potential prior release of contaminants from the above-grade demolition activities near the liner-slab interface, limited amounts of residual soil would be expected to be included as part of the collected materials to be disposed.

Waste Form. The berm content materials will be handled as bulk materials and would generally be expected to meet the OSWDF WAC for Type 1 waste (soil-like). Liner materials will be separated from the other materials to the extent practical for management as OSWDF Type 2 wastes (debris). If the waste must be stored awaiting availability of disposal space at the OSWDF, berm contents will be piled on an upgraded area (area with a protective layer applied) on the slab and an appropriate fixative will be applied to minimize the potential for airborne particulate generation and contaminant migration.

Key ARARs. *Ohio Administrative Code (OAC)* 3745-17-08(B), *Restriction of Emission of Fugitive Dust*, governing the management of fugitive dust, is a key ARAR for this work. Fugitive dust will be minimized or eliminated using control measures such as water misting. Also, radiological controls implemented under DOE Order 458.1(4)(b), *Public Dose Limit,* and (c), *Temporary Dose Limit*, are a key focus that will ensure that exposure to individual members of the public from radiation shall not exceed a total effective dose equivalent of 100 millirem/year from DOE's operations.

5.4.2 Demolition – Concrete Slab

The demolition of the concrete slab of the former X-326 Process Building and other surface features like sidewalks and driveways will be performed with heavy equipment. The work is expected to be coordinated with activities to remove underlying foundation structures (although differing equipment may be used for each task).

During Phase 1, the slab will be cut on the south side of the installed supplemental berm separating the NSA and SSA to make a physical separation of the SSA materials from the NSA and the supplemental berm structure. As the SSA slab is demolished, slab debris from the SSA will be moved from its original demolition location (generally using articulated dump trucks) to an area on the NSA designated for further size reduction, to maximize generation of OSWDF Type 1 waste sizing criteria to the extent practical. As described in previous sections of this document, areas of the NSA to be used for waste piles and areas that will be subject to significant mechanical forces from planned work, such as concrete crushing or equipment shearing, have been upgraded with the addition of a protective layer over the original slab (see Figure 10). Processing of the waste to OSWDF Type 1 (excluding materials such as steel reinforcing bars) is expected, but if OSWDF Type 1 material needs are satisfied, Type 2 waste may be produced instead (see Section 5.4.7). The debris (both what has been processed to meet the OSWDF WAC and what is awaiting processing) may be stored during Phase 1 awaiting priority for placement at the OSWDF.

Prior to conducting demolition of the NSA (Phase 2), use of the NSA for processing wastes from other PORTS areas and projects will cease. During Phase 2, areas outside of the active demolition area on the NSA will again be used to stage and process the debris to meet either OSWDF Type 1 or Type 2 waste size criteria as needed. Once slab space is no longer available for these debris management and size reduction activities, debris will be direct-loaded for transfer to the OSWDF or IMTA.

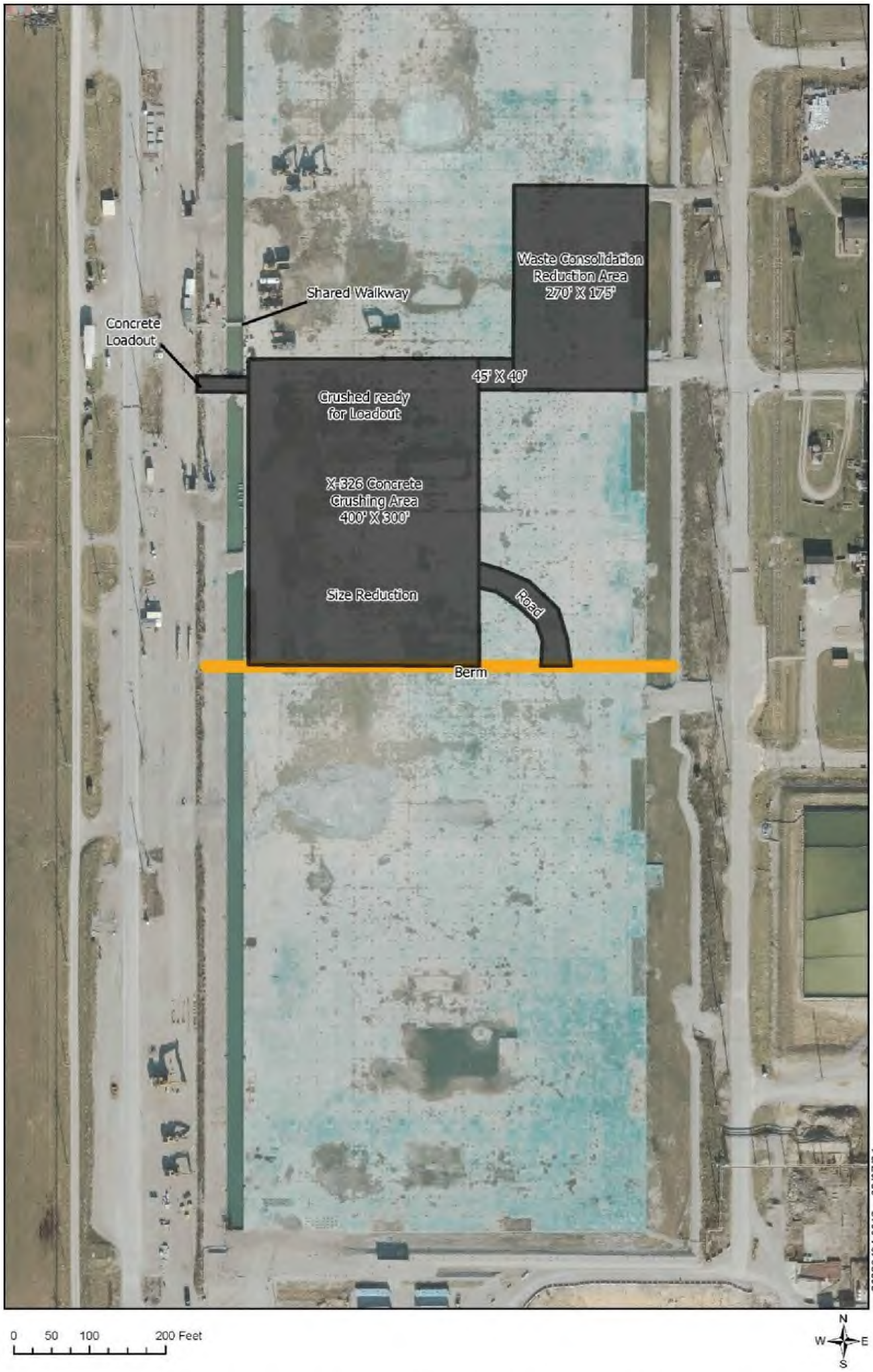

Figure 10. X-326 Process Building Slab Locations for Protective Layer Installations

Material Description. Surface features comprised of poured concrete slabs include either steel reinforcing bars or steel mesh. According to *Gaseous Diffusion Plant at Portsmouth, Ohio, Project No. E2-24X-3701, Project History and Completion Report* (Giffels & Vallet Report) (Giffels & Vallet, Inc. 1957), the concrete slab of the X-326 Process Building includes 26,828 cy of concrete and 563 tons of reinforcing steel, and the track alley was formed with 400 cy of concrete and 12 tons of reinforcing steel. The concrete slab of the former building varies from 6 to 8 in. in thickness and rests on a compacted stone base. The greater thickness of 8 in. was used in areas where heavy electrical equipment was installed. The slab was poured section-by-section (i.e., poured in strips running east west). The sectional concrete pours were completed after steel columns had been seated onto supporting foundation materials (footers or piers sitting atop deeper footers). During above-grade demolition activities, steel columns were generally pulled out from the slab concrete during the demolition, rather than cut off at the exposed base.

The track alley on the west side of the building has an 8 in. thick slab across most of its cross-section and includes embedded railroad rails. Concrete that reached a minimum compressive strength of 2,500 pounds per square in. (psi) at 28 days was used in most applications, including the slab and the track alley.

The packed gravel that will be encountered under many portions of the concrete slab would not automatically require removal if not contaminated, but is expected to generally contain contaminants from the above-grade demolition actions. Uncontaminated portions of the packed gravel can be considered overburden material and can be left at the project site as backfill material. Field survey tools, such as radiological survey instruments, along with visual inspection practices and sampling activities as necessary, will be used to determine if the material exhibits contamination that requires its removal (see Section 5.6).

Contaminants. The concrete slab, the operations floor of the former X-326 Process Building, received numerous leaks of lubricating oil contaminated by PCBs during the operating period of the plant, as described in Appendix B of the X-326 Above-grade DDP. Prior to the above-grade demolition, the slab was sampled for confirmation of contamination with PCBs (and other contaminants) and the results were also reported in Appendix B (Attachment B.3) of the X-326 Above-grade DDP. The concrete of the operations floor (the slab) exhibited a mean of 1.3 mg/kg PCB content and 13 picocuries per gram (pCi/g) technetium-99 content. Table 4 provides a summary of the 31 operating floor concrete sampling results from the materials of construction sampling performed under the X-326 MOC SAP (i.e., prior to the demolition of the above-grade portion of the building). During the above-grade structures and equipment demolition process, the slab potentially became further contaminated by the mix of contaminants present in the former X-326 Process Building (primarily PCBs, radiological compounds involved in uranium enrichment, and heavy metals contained paint pigments and other applications). However, the slab has been subsequently swept, water-rinsed, and coated with a fixative application. Overall, the slab would represent a significantly reduced contaminant source compared to the previous contaminant content of the former X-326 Process Building; however, the joint material within the concrete slab may potentially contain asbestos.

Locations where slab damage occurred and areas where the berm liner system may have been damaged during demolition represent potential pathways for demolition contaminant migration to lower strata (footers, gravel, underlying soil), which will be exposed during the at- and below-grade demolition activities. Post-demolition confirmatory soil sampling identified in Appendix D includes sampling focused on areas where damage was known to have occurred (such as beneath where large surface cracks have been identified) as well as sampling under the berm areas and along the interface between the berm and slab where potential for contaminated water may have migrated. These areas will be subject to visual inspection, field surveys, and ad hoc soil sampling in support of the remedial action (including identification and removal of contaminated soils) (see Section 5.6) prior to the post-demolition confirmatory soil sampling identified in Appendix D.

Table 4. Summary of X-326 Process Building Operating Floor Concrete Results

Method/Analyte	Units	Detects	Minimum Detect	Maximum Detect	Mean Value
EPA SW-846 6010/6020/7471					
Arsenic	mg/kg	5 of 31	1.2	2.7	2
Barium	mg/kg	31 of 31	20.2	152	63.7
Cadmium	mg/kg	1 of 31	0.12	0.12	0.12
Chromium	mg/kg	31 of 31	1.9	336	16.8
Lead	mg/kg	22 of 31	0.7	51.5	4.6
Mercury	mg/kg	6 of 31	0.004	0.02	0.01
Selenium	mg/kg	27 of 31	0.79	60	6.7
Silver	mg/kg	17 of 31	0.31	3.9	2.1
EPA SW-846 6010/6020/7070a					
Chromium	mg/L	3 of 3	0.01	0.04	0.02
Selenium	mg/L	1 of 3	0.11	0.11	0.11
EPA SW-846 8082					
PCBs	mg/kg	31 of 31	0.1	5.6	1.3
EPA SW-846 8260					
1,1,1-Trichloroethane	mg/kg	0 of 31	ND	ND	ND
1,1,2-Trichloroethane	mg/kg	0 of 31	ND	ND	ND
TCE	mg/kg	3 of 31	0.00036	0.00047	0.0043
LSC/ICP-MS					
Technetium-99	pCi/g	21 of 31	1.1	172	13

Notes:
EPA = U.S. Environmental Protection Agency
LSC/ICP-MS = Liquid scintillation counting/inductively coupled plasma mass spectrometry
ND = not detected
PCB = polychlorinated biphenyl
pCi/g = picocuries per gram
TCE = trichloroethene

Contaminant Controls. Pre-wetting with water and water misting appropriate for emissions control during demolition and loading operations will be performed. Piled materials will receive fixative application by the end of the shift in which the material is piled.

In the event of encountering sub-slab areas presenting visual staining or other indications of potential demolition contaminant migration (such as contaminant detection from field monitoring tools), materials will be evaluated and may be removed for disposal at the OSWDF to avoid the potential for contaminating larger areas of the demolition project.

Demolition Approach. A variety of methods will be used for the initial demolition of surface features, predominantly the slab, in the scope of this X-326 At- and Below-grade DDP. Heavy equipment, such as track-mounted excavators, track-mounted hydraulic breakers, or other heavy equipment are expected to be used. Because of the extensive area covered by the main concrete slab, the ultimate selection of equipment may include a period of optimization based on experimentation with various differing equipment options so that the most efficient methods can be developed. Demolition of driveways, sidewalks, and other types of surface features (which represent a minor portion of the planned work) will utilize the same types of equipment selected for the primary demolition scope.

The selection of a demolition sequence will include consideration of the need for maintaining a general flow of water from precipitation and water used for dust mitigation to sumps used for water collection and conveyance as well as considering control of migration of sources of significant contaminant content (such as the existing berm system gravels). Excavation of the slab sections in the southwest portion of the SSA, where excavation of DU soils pursuant to the 5-Unit Excavation Work Plan will occur following the demolition, may be sequenced to coordinate with these follow-on activities.

Waste Form. The initial waste from the concrete removal will be larger pieces of concrete and reinforcing steel mixed with finer materials generated by the methods employed. The goal for the initial demolition is to size the materials enough that they can be readily moved to a location for further processing to sizes acceptable as either OSWDF Type 1 waste or Type 2 waste, whichever is determined needed. Materials movement would occur within the project as needed to support planned debris sizing activities. In the event that residual soils are generated for disposal from the slab demolition, they would be expected to be disposed as OSWDF Type 1 waste. If available, the soil management infrastructure in place in support of the 5-Unit Plume Area excavation can be used to facilitate soil conditioning, soil staging, load-out, and waste certification.

Key ARARs. *OAC* 3745-17-08(B), governing the management of fugitive dust, is a key ARAR for this work. Fugitive dust will be minimized or eliminated using control measures such as water misting.

5.4.3 Demolition – Sub-grade Utilities

An array of disconnected sub-grade utilities is known to remain in the areas surrounding the slab and under the slab. The figures in Appendix B provide schematic depictions of utility system segments for reference. The RCW system piping that carried excess heat from the X-326 Process Building to the X-626-2 Cooling Tower and X-626-1 Recirculating Water Pump House and back to the process building includes piping as large as 42 in. in diameter at the southern end and numerous branches connecting to the building along the east and west sides of the building. A ground cable is present near the slab on all sides of the building (connecting to numerous ground rods driven into the ground and connected to water piping systems as well). Storm drain piping segments, instrumentation and communication duct banks, electrical duct banks, sanitary fire water, and high-pressure fire water segments also exist in the space between the edge of the slab and the bounding streets. Several of these utility systems also passed under the slab. Each system also includes other associated structures, such as manholes and valve vaults, to be removed. These systems will be isolated at key points to ensure work area contaminants cannot migrate to other areas. In cases where portions of systems will remain active, such as storm sewers, appropriate inlet protection measures will be undertaken and maintained. Table 5 provides a summary of the various infrastructure and utility systems affected by the removal of the slab.

Only a portion of each of the utility systems listed on Table 5 is being removed under this project. This demolition project will remove all of the disconnected utility system segments where they fall within the extent of the impacted water containment system's footprint. Where berm mounds can be removed during the project time period (where they do not include active utility system segments and are no longer required to fulfill an impacted water containment role), such removal will also facilitate access to and removal of inactive utility system segments beyond the extent of the original berm mounds (up to and including to the inner edges of the city block area). A portion of the utilities in the city block will remain active through the SSA project activities and will not be removed during that sub-project. Some of the utilities may also remain active past the period when the NSA is demolished.

Table 5. Area Infrastructure Affected by the Demolition Project

D&D DFF&O Designation	D&D DFF&O Title
X-215A	Electrical Distribution to Process Buildings
X-215B	Electrical Distribution to Other Areas
X-215D	Electrical Power Tunnels
X-220A	Instrumentation Tunnels[a]
X-220D2	Process Telephone System
X-220D3	Emergency Telephone System
X-220E1	Evacuation PA System
X-220E2	Process PA System
X-220H	McCalloh Alarm System
X-220J	Radiation Alarm System
X-220S	Power Operations SCADA System
X-230A	Sanitary and Fire Water Distribution System
X-230B	Sanitary Sewers
X-230C	Storm Sewers
X-230G	RCW System
X-230H	Fire Water Distribution System
X-240A	RCW System (Cathodic Protection System)
n/a	High Pressure Fire Water

Notes:

[a]Since the definition of the X-326 Process Building in the D&D DFF&O includes instrumentation tunnels, the three east-west tunnels are considered part of the X-326 Process Building definition and the X-220A designation is considered to refer to the main north-south tunnel close to Pike Avenue.

D&D 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*

n/a = not applicable
PA = Public Address
RCW = recirculating cooling water
SCADA = Supervisory Control and Data Acquisition

Areas outside of the impacted water collection and management system are not expected to be fully accessible for demolition under this X-326 At- and Below-grade DDP, particularly during demolition of the SSA. Outside of the bermed area but within the city block defined by Scioto Avenue on the west, Pike Avenue on the east, 5th Street on the south, and 15th Street on the north, several utility systems are still in use and will be left in place unless deactivated prior to the final field work under this X-326 At- and Below-grade DDP. A sanitary sewer segment on the east side of the building (along Pike Avenue) remains live near about 9th Street and north to about 15th Street. Several storm sewer drain line segments near 9th Street pass within the berm boundary on the east side of the building. One of the pedestals supporting the remaining portion of the X-232C2 Tie Line sits inside the city block, but north of the northern berm. Other systems still in use include a sanitary fire water line near 15th Street, a sanitary sewer segment along 15th Street, and a wide variety of storm sewer drain lines outside the bermed area in all outer areas of the city block. The conveyance piping force main from the X-900 T-6, 2M-Gallon Tank to the X-622-1 Water Treatment Facility will continue to be in use at the completion of Phase 1 demolition activities and but may no longer be in use during the Phase 2 demolition activities. If it continues to be needed during the Phase 2 demolition activities, relocation of the piping may be needed to support removal of the slab in that vicinity.

The demolition project will remove inactive utility system segments from under the slab area as well. The most extensive of the utility systems that will be encountered under the slab will be the electrical power duct banks that fed electricity to hundreds of locations in the building from feeder systems with manholes on the west side of the building. A drain system with connections to the site storm sewer and a sanitary sewer system were also located under the slab. Earlier in the history of the X-326 Process Building, many of the drain inlets in the building were either grouted closed or modified to include a lip to keep liquids released from inside the building from passively flowing to the drain system and downstream to site retention ponds and beyond. Nonetheless, such utility systems and the backfilled areas for their piping systems are suspect pathways for contaminant migration, and soils in the vicinity of these systems will receive heightened scrutiny during the utility system segment removal activity.

Material Description. Utility system segments are composed of steel piping, copper wiring, conduit, and poured concrete (such as in duct banks and manholes). The material of construction of the conduit of the electrical duct banks is uncertain but may include transite asbestos cement, to be determined during initial excavations. Disconnected wiring is still present in the duct banks and the duct bank structures are significant in scale under the northern portion of the slab. RCW piping ranges to diameters as large as 42 in. and has an asbestos-containing coating, based on RCW piping excavated in the 5-Unit Plume Area excavation to the south of the X-326 Process Building at- and below-grade demolition project area.

Contaminants. RCW piping is coated in a material that contains asbestos, but otherwise is not considered to require management for chemical hazards (including PCBs). Small amounts of chromium could still be present from pre-1989 operations that used a chromium-containing corrosion inhibitor. Duct banks may include transite in the form of asbestos cement tubing. Electrical cables may include contaminants such as PCBs. Water soluble contaminants present on the slab, such as uranium and technetium, may have migrated to utility system segments. Since utility system segments were often installed with backfill materials more porous than the surrounding soils, such as sand and gravel, utility systems may provide corridors for water-driven contaminant migration. Excavation and demolition activities will segregate visibly stained soils and fill materials (and other soils identified with contaminants detected by field instruments) for OSWDF disposal, and field survey tools will also be employed to detect contaminants *in situ* (see Section 5.6). During vapor intrusion sampling in the X-326 Process Building, conducted for the DU RFI/CMS Report, TCE was detected in vapor collected from an area under the slab to the north of ACR 5. During demolition in that area TCE-contaminated utility system segments and associated soils are anticipated.

Contaminant Controls. Appropriate controls for asbestos containment will be in use for removal of RCW system piping and the electrical duct banks, as necessary. General airborne particulate controls, such as water misting, will be used for all excavation activities where dust generation is likely. Where utility systems pass outside of the areas being remediated, they will be sealed, if applicable, to ensure that they do not present a path for contaminant migration. For example, where duct banks exit the boundary of the demolition, conduit openings will be grouted to seal them. Sediment controls (including features such as silt fences and rock strainers) will be used where needed to minimize sediment content for wastewater from the area, which is being collected for treatment. TCE-containing waste materials will be managed in compliance with *Supplement No. 1 to the Remedial Investigation and Feasibility Study Report for the Site-wide Waste Disposition Evaluation Project: Proposed Corrective Action Management Unit and Area of Contamination Designations for Alternative 2 at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (DOE 2014c).

Demolition Approach. Utility excavation in an area will follow berm content removal or slab removal (whichever is applicable) in a given area. Heavy equipment such as track-mounted excavators will be used. Large piping may require cutting for removal once excavated for access and ACM may require abatement activities or containment materials.

Waste Form. Waste from demolition of the utility systems would generally be expected to meet OSWDF criteria as Type 2 waste following processing. Due to the complexities of reducing the void space for placing large RCW piping coated with ACM in the OSWDF, this material may be managed for off-site disposal. Large concrete could potentially be reduced in size to meet OSWDF Type 1 and Type 2 waste sizing criteria. Soil generated from excavation of the utility system segments is considered residual soil and any transferred to the OSWDF would be expected to meet criteria for Type 1 waste.

Key ARARs. 40 U.S. Code of Federal Regulations (CFR) 61.150(a), *Standard for Waste Disposal for Manufacturing, Fabricating, Demolition, Renovation, and Spraying Operations* and *OAC* 3745-20-05(B), *Standard for Asbestos Waste Handling*. ACM requiring wetting when managed will be adequately wetted to ensure no visible emissions. *OAC* 3745-17-08(B), governing the management of fugitive dust, is a key ARAR for this work. Fugitive dust will be minimized or eliminated using control measures such as water misting.

5.4.4 Demolition – Foundations and Piers

Each column of the former X-326 Process Building was supported by a large, poured footer, including reinforcing steel. Where deeper footers were used, concrete pier columns beneath the slab were used to transfer the load from the steel columns to the deeper footers. Footers and piers were designed specifically to meet the load and configuration demands for a given location; therefore, 34 different concrete footer designs were used, and 28 different concrete pier styles were used for the over 2,600 columns of the building. Some locations use more involved designs, such as basement areas under the three ACRs, instrument tunnel runs, lube oil pits, and coolant pits. Because of the significant excavation needed for removal of ACR basements and tunnel runs, their demolition is described separately in Sections 5.4.5 and 5.4.6, respectively. Also see Design Drawing X-626-C-34836.20 in Appendix C.

By overall abundance, the typical footers are 6.5 to 8.5 ft and are between 1.5 and 1.75 ft thick. In locations where footers were constructed at shallow depths (most locations), the baseplates of the structural steel columns were seated in grout directly on the footers and the poured concrete floor slab covered the first few in. of the columns. Where deeper footers with piers were constructed, the baseplates of the structural steel columns sit on the top of the piers at essentially the same elevation as their shallow counterparts (that sit directly on shallow footers). Per the Giffels & Vallet Report, 17,584 cy of concrete were used in the concrete work for footings, walls, piers, grade beams, elevator pits, instrument tunnels, and basements under ACRs.

Since none of the footers are known to be significantly deeper than other structures planned for demolition removal, the footers and piers are expected to be removed during the demolition activities under this X-326 At- and Below-grade DDP. However, consistent with the Process Buildings ROD, if deep foundation structures, such as pilings, are encountered (not expected), these structures may be proposed for exclusion from the remedial action. Action to leave specific subsurface structures would only be considered if leaving the structures is protective of human health and ecological species, would protect surface water and groundwater from further degradation, and would support potential future reindustrialization of the PORTS property. Uncontaminated foundation structures encountered below normal depths for utilities placement could meet these criteria.

Material Description. As described above.

Contaminants. Because the potential exists for migration of building contaminants from the previous above-grade demolition activities, the field workforce and workforce protection program (e.g., industrial hygiene and radiological protection) personnel will be vigilant for visible signs of contaminants (such as stains) and other materials identified with contaminants detected by field survey tools (see Section 5.6).

Contaminant Controls. Controls for mitigation of particulate emissions will be in place for all demolition and excavation work to mitigate emissions. If other contaminants are identified that require alternative controls (for example, asbestos fibers that would require adequate wetting), such controls will be incorporated into the operations as needed. Sediment controls (including features such as silt fences and rock strainers) will be used where needed to minimize sediment content for wastewater from the area, which is being collected for treatment.

In the event of encountering sub-slab areas presenting visual staining or other indications of potential demolition contaminant migration, materials will be evaluated and potentially may be removed for disposal at the OSWDF to avoid the potential for contaminating larger areas of the demolition project.

Demolition Approach. Heavy equipment, such as track-mounted excavators and track-mounted hydraulic breakers, will be used to break up and excavate the footers, as needed. In some cases, footers and piers may be removed concurrently with the poured concrete slab.

Waste Form. Concrete wastes with reinforcing steel from utility system segment removal will be managed in the same manner as concrete from the concrete slab removal (see Section 5.4.2). Residual soil requiring OSWDF disposal will be separated from debris to the extent practical and conditioned as necessary for the OSWDF WAC. As needed, soil management infrastructure of the 5-Unit Plume Area excavation project may be utilized in support of such activities as load-out and waste certification for soils. Residual soil may also be used as backfill.

Key ARARs. *OAC* 3745-17-08(B), governing the management of fugitive dust, is a key ARAR for this work. Fugitive dust will be minimized or eliminated using control measures such as water misting. 40 CFR 761.61(c), governing the risk-based management of PCB remediation waste, is also a key ARAR for this work activity. Fixatives will be applied to piled waste.

5.4.5 Demolition – Basements

The three basements of the former X-326 Process Building were positioned under the three ACRs on the operating floor of the building and were a location for data and communication systems and cabling that communicated back and forth with the X-300 Plant Control Facility. In preparation for above-grade demolition, the basements and associated east-west tunnels were stripped of equipment and cable systems and other hardware, and two headwalls were placed (one in the tunnel entrance from the ACR basement and one at the end of the east-west segment where the north-south tunnel is joined). As a precursor to the demolition of the building, the basements were initially filled to within one foot of the ceiling structures with 150 psi flowable fill (grout). The grout is excavatable for ease of later removal. After the removal of the building from above, the slab was cut to access each basement area from above and the remainder of the void space was filled with additional flowable fill, to the level of the top surface of the slab.

Material Description. The basement areas generally represent the deepest areas to be excavated under this X-326 At- and Below-grade DDP. The basements were constructed of reinforced concrete. Walls and columns for these basement areas rest on rectangular concrete footings, and originally supported a reinforced concrete beam and girder type slab above, which formed the floor of the control rooms. A typical ACR basement is shown in Figure 11 prior to the filling with flowable fill. Reinforced columns and beams are visible in the figure, as well as a poured reinforced concrete floor. Additionally, non-load-bearing grade beams were designed as precast units bearing on the concrete column footings and designed for concreting or grouting into place. The ACR basements measure four column sections across and five column sections in length, with the reinforced concrete walls of the basement falling inside the outer column lines (i.e., the column loads are transferred to footers rather than the basement walls).

Figure 11. Typical Area Control Room Basement Prior to Filling with Grout

Contaminants. Significant contamination of these sub-grade materials is not expected, but because the potential exists for migration of building contaminants from the previous above-grade demolition activities, the field workforce and workforce protection program (e.g., industrial hygiene and radiological protection) personnel will be vigilant for visible signs of contaminants (such as oil stains) and contaminants detected with field survey instruments.

As with the concrete slab of the former X-326 Process Building, the concrete making up the basements and tunnels of the building was also sampled under the X-326 MOC SAP (prior to completion of the above-grade building demolition), as summarized in Table 6. No VOCs were detected and only one of the 29 basement and tunnel locations sampled had a detectable level of technetium-99. Very low-level PCB content was noted at essentially all locations. Additional information is provided in Appendix B, *Supporting Information for the X-326 Process Building Demolition Design*, Attachment B.3: *Chemical Characterization – Materials of Construction Sampling and Analysis Plan Data Summary and Evaluation*, of the X-326 Above-grade DDP.

Table 6. Summary of X-326 Process Building Basements and Tunnels Concrete Results

Method/Analyte	Units	Detects	Minimum Detect	Maximum Detect	Mean Value
EPA SW-846 6010/6020/7471					
Arsenic	mg/kg	7 of 29	1.1	1.8	1.4
Barium	mg/kg	28 of 29	23.7	563	77.6
Cadmium	mg/kg	1 of 29	0.71	0.71	0.71
Chromium	mg/kg	27 of 29	2.7	38.1	5.5
Lead	mg/kg	22 of 29	0.74	32.3	3.8
Mercury	mg/kg	9 of 29	0.006	0.03	0.01
Selenium	mg/kg	9 of 29	1.7	4.7	3.6
Silver	mg/kg	10 of 29	1.8	6.8	3.2
EPA SW-846 8082					
PCBs	mg/kg	28 of 29	0.03	2.8	0.79
EPA SW-846 8260					
1,1,1-Trichloroethane	mg/kg	0 of 29	ND	ND	ND
1,1,2-Trichloroethane	mg/kg	0 of 29	ND	ND	ND
TCE	mg/kg	0 of 29	ND	ND	ND
LSC/ICP-MS					
Technetium-99	pCi/g	1 of 29	4.8	4.8	4.8

Notes:
EPA = U.S. Environmental Protection Agency
LSC/ICP-MS = Liquid scintillation counting/inductively coupled plasma mass spectrometry
ND = not detected
PCB = polychlorinated biphenyl
pCi/g = picocuries per gram
TCE = trichloroethene

Contaminant Controls. Controls for mitigation of particulate emissions will be in place for all demolition and excavation work and in use to the extent necessary to control emissions. If other contaminants are identified that require additional or alternate controls (e.g., asbestos fibers that would require adequate wetting), such controls will be incorporated into the operations as needed. Sediment controls (including features such as silt fences and rock strainers) will be used where needed to minimize sediment content for wastewater from the area, which is being collected for treatment.

Demolition Approach. The excavation designs provided in Appendix C illustrate the soil layback plans for the demolition of the ACR basements. Demolition and excavation activities for basements will utilize heavy equipment, such as track-mounted excavators and track-mounted hydraulic breakers. Demolition of the filled basement structure and excavation of the fill material (and demolition of the related tunnel segment) are expected to be performed as the excavation of soil from the exterior progresses, rather than at the completion of the full excavation depth required. Uncontaminated residual soil removed to complete the demolition of basements is expected to be retained for use as backfill.

Waste Form. Concrete wastes with reinforcing steel will be managed in the same manner as concrete from the concrete slab removal (see Section 5.4.2). Residual soil requiring OSWDF disposal will be separated from debris to the extent practical and conditioned as necessary for OSWDF waste acceptance. As needed, soil management infrastructure of the 5-Unit Plume Area excavation project may be utilized in support of conditioning, stockpiling, load-out, and waste certification for soils. Uncontaminated residual soil removed to complete the demolition of basements may also be retained for use as backfill.

Key ARARs. *OAC* 3745-17-08(B), governing the management of fugitive dust, is a key ARAR for this work. Fugitive dust will be minimized or eliminated using control measures such as water misting. 40 CFR 761.61(c), governing the risk-based management of PCB remediation waste (see Table 7), is also a key ARAR for this work activity. Fixatives will be applied to piled waste.

5.4.6 Demolition – Tunnels

An instrument tunnel extends to the east from each of the three ACR basements to connect with a main north-south tunnel approximately 230 ft to the east of the former X-326 Process Building, closer to Pike Street. One of the basement and tunnel pairs exists within the area to be demolished in Phase 1 and the other two are located in the area to be demolished in Phase 2. The instrument tunnels are nominally seven ft by seven ft inside, designed as a tubular box, and were waterproofed. They are sloped to support drainage of possible seepage. Access manholes are included at key locations in the tunnel system and some surface locations include small buildings providing access. A typical tunnel segment is shown in Figure 12 (prior to completion of deactivation work to remove cables and cable trays).

Figure 12. Typical Instrument Tunnel Prior to Deactivation

Prior to the above-grade demolition of the X-326 Process Building, two headwalls were poured in each east-west tunnel segment to isolate the tunnel segment between the basement area and the main north-south tunnel to the east of the building. Tunnel segments east of the basement to just west of the outer headwall will be removed under this X-326 At- and Below-grade DDP. The north-south tunnel within the city block will also be removed to the extent deactivated by the time of the Phase 2 demolition activities. The northern portion between the X-330 Process Building and the X-300 Process Control Building is currently still in service but is expected to be deactivated as the deactivation in the X-330 Process Building continues. South of the crossover to the X-300 Process Control Building, the north-south tunnel is already inactive. The southernmost section would be available for removal during the Phase 1 demolition activities, but demolition to the outer concrete headwall installed in the east-west tunnel segment from ACR 6 is the initial plan for Phase 1.

Material Description. The tunnels were fabricated using poured concrete and reinforcing steel. Each east-west segment to be removed is approximately 210 to 220 ft in length.

Contaminants. Because the potential exists for migration of building contaminants from the previous above-grade demolition activities, the field workforce and workforce protection programs (e.g., industrial hygiene and radiological protection) personnel will be vigilant for visible signs of contaminants (such as oil stains), and field survey tools (such as radiological survey instruments) will be used to support the demolition field activities. Soil sampling throughout the demolition activities, to support determination of contaminated media, will also be performed as needed (see Section 5.6). Table 6 provides a summary of concrete sampling results from X-326 Process Building basements and tunnels. These samples were collected prior to the above-grade building demolition.

Contaminant Controls. Controls for mitigation of particulate emissions will be in place for all demolition and excavation work and in use to the extent necessary to control emissions. If other contaminants are identified that require alternative controls (for example, asbestos fibers that would require adequate wetting), such controls will be incorporated into the operations as needed. Sediment controls (including features such as silt fences and rock strainers) will be used where needed to minimize sediment content for wastewater from the area, which is being collected for treatment.

Demolition Approach. The excavation designs provided in Appendix C illustrate the soil layback plans for the tunnel demolition. Excavation and demolition activities for tunnels will utilize heavy equipment, such as track-mounted excavators and track-mounted hydraulic breakers. Demolition of the tunnel segment is expected to be performed as the excavation of soils from the exterior progresses rather than at the completion of the full excavation depth required. While the berms are being maintained intact (prior to demonstrating the area no longer requires water treatment for water collected from the area), the segment removal will end either once the headwall is reached or once the berm is reached, whichever is reached first as the excavation extends to the east. Following a decision that water treatment is no longer needed for the area, portions of the north-south tunnel may be removed if they are no longer in use.

Waste Form. Concrete wastes with reinforcing steel will be managed in the same manner as concrete from the concrete slab removal (see Section 5.4.2). Residual soil requiring OSWDF disposal will be separated from debris to the extent practical and conditioned as necessary for the OSWDF WAC. As needed, soil management infrastructure of the 5-Unit Plume Area excavation project may be utilized in support of conditioning, stockpiling, load-out, and waste certification for soils. Uncontaminated residual soil removed to complete the demolition of tunnels may also be retained for use as backfill.

Key ARARs. *OAC* 3745-17-08(B), governing the management of fugitive dust, is a key ARAR for this work. Fugitive dust will be minimized or eliminated using control measures such as water misting.

5.4.7 Demolition – Processing and Sizing Demolition Debris

Concrete debris generated by initial concrete structure demolition will typically be moved from the initial generation location to a location where longer term optimized concrete processing for size reduction can be performed. In the Phase 1 portion of the project, concrete wastes may be stockpiled on the south end of the NSA, to be processed to WAC sizes at that location. At locations in the NSA where waste will be piled and where significant mechanical work will be performed, that have the potential to further damage the remaining concrete slab, a protective layer will be placed. This approach to consolidating concrete for size reduction supports more expedient removal of materials from the SSA footprint, allowing more timely execution of follow-on project activities in the area (such as the X-326 CMI excavation and Phase 5 and Phase 6 of the 5-Unit Excavation Work Plan).

Concrete materials may also be processed to meet the OSWDF WAC sizing criteria at the location of initial demolition. However, it is expected that concrete processing operations would require more extended periods of time to be completed for a given area than the initial demolition of the concrete and would interfere with expedient removal of footers and other sub-grade concrete structures and buried utility system segments. Therefore, most concrete size reduction activities are expected to be performed at the location in the project area specifically dedicated to those activities (see Figure 10).

Material Description. The material to be further processed/sized will be rough pieces of reinforced concrete with pieces of reinforcing steel protruding.

Contaminants. The concrete slab of the former X-326 Process Building is known to include PCBs from former leakage from the equipment ventilation ductwork system. Hazardous metals are potentially present in paints where the slab (the former operations floor) was painted. Uranium and other radionuclides that were present in the demolished building equipment may be present on the surface of the slab concrete or in cracks created by the above-grade demolition activities. Materials determined to contain contaminants requiring specialized management may be segregated from those that do not, though this is not expected. Efforts that were conducted following the completion of the above-grade demolition to remove surface particulate from the slab and then rinse and apply fixative to the slab will also help to limit potential contaminant release from the slab materials during demolition activities. The concrete from sub-slab areas, such as the very large concrete footers, are expected to be intact and less contaminated than surface concrete; nonetheless, these materials will be managed as contaminated.

Contaminant Controls. Controls for mitigation of particulate emissions, such as misting during work activities and application of fixatives to new waste piles (or those significantly disturbed during the work shift), will be in use. If other contaminants are identified that require alternative controls (for example, asbestos fiber controls that would require adequate wetting), applicable controls will be incorporated into the operations. The water containment approach using the existing berm system and subsequent wastewater treatment represent ongoing area-wide contaminant controls.

Demolition Approach. Processing and sizing of concrete debris will utilize heavy equipment, such as track-mounted processors and track-mounted hydraulic breakers. Concrete may either be sized for the OSWDF WAC Type 1 or Type 2. Alternatively, stationary equipment designed for crushing concrete wastes and removing reinforcing steel may be used for this operation.

Waste Form. The final waste form for the processed concrete will depend on the OSWDF waste type determined desired (either Type 1 or Type 2). Reinforcing steel removed during the process will be managed to meet the size criteria for OSWDF waste Type 2.

Key ARARs. *OAC* 3745-17-08(B), governing the management of fugitive dust, is a key ARAR for this work. Fugitive dust will be minimized using control measures such as water misting during size reduction operations or movement. 40 CFR 761.61(c), governing the risk-based management of PCB remediation waste, is also a key ARAR for this work activity. Fixatives will be applied to piled waste.

5.5 WASTE HANDLING AND LOADING

The following subsections describe the approaches that will be used to manage the various types of debris produced by demolition and to load appropriate transfer vehicles with the waste. Management of waste transfer from the project site to the OSWDF is addressed under Section 1.3.2, *Full-scale Operations*

Phase Review, Section 3, *Full Scale Operations Phase,* and Section 4, *Transportation Plan,* of the OSWDF O&M Plan. Waste is transferred along dedicated haul routes to access the OSWDF.

5.5.1 Waste Handling and Loading – Management of Wastes Pending Acceptance

Debris waste from the demolition activities that is not immediately loaded for waste transfer to the OSWDF may be managed as bulk material in piles. Temporary in-process piles may be formed in the demolition area to facilitate truck loading for removal from the demolition area. Debris from concrete demolition will typically be staged for further processing to meet WAC. Because of the extended timeframe expected to complete sizing of concrete debris, the initial materials generated during the Phase 1 demolition are expected to be moved to an area within the project footprint on the NSA where a concrete processing/sizing operation would be established. The location is near pre-existing waste load-out infrastructure used during the X-326 Process Building above-grade demolition project and is expected to be reused during Phase 1 of the X-326 Process Building at- and below-grade demolition. Depending on the timing for Phase 2 of the demolition activities, the same load-out approach may be used, or another load-out location could be established, when needed. Although demolition of the slab during Phase 2 will ultimately remove the slab area used for waste staging and debris down-sizing, the same processes will be used, and slab space will be utilized as a place for these functions until the demolition progresses to the point where that is no longer possible. After slab space is no longer available for staging of waste requiring further processing, waste will be transferred to the OSWDF or IMTA.

Debris piles will be treated with a fixative to protect against the spread of contamination and generation of fugitive dust. Fixative will be applied to minimize contaminant migration following the creation of a pile as well as following significant disturbance of a pile by the end of the work shift in which the pile activity occurred. Wastewater treatment will continue in an area at least until such time as demolition waste is fully removed.

Storage of other materials requiring further processing (such as size reduction or packaging for off-site disposal) will utilize space within the project footprint area (including the NSA during the Phase 1 demolition).

5.5.2 Waste Handling and Loading – WAC Compliance Verification and Transfer Vehicle Loading

Waste characterization and identification documentation, as described in the Comprehensive Process Buildings RD/RA Work Plan and the WAC Implementation Plan, will be prepared for each waste stream and waste transfer vehicle load to meet WAC and tracking requirements. Waste tracking will originate upon creation of discrete waste units at each truckload load-out. Waste tracking information will be maintained along with the waste placement records at the OSWDF.

As described in the WAC Implementation Plan, WAO serves as the gatekeeper for the OSWDF, charged with the responsibility to verify that only WAC-compliant materials enter the OSWDF. The scope of WAO's responsibilities begins in the project planning phase and continues through all aspects of waste handling, including waste generation, packaging, transfer to the OSWDF, and placement in OSWDF cells. WAO personnel perform visual oversight of the demolition waste load-out operations and provide final authorization to transfer waste to the OSWDF. WAO personnel sign-off on waste characterization and transfer documentation is a hold point for releasing waste transfer vehicles from the X-326 Process Building at- and below-grade demolition project to the OSWDF.

Debris that has been verified to meet the OSWDF WAC will be loaded in transfer vehicles (such as over-the-road dump trucks or articulating dump trucks) following an enhanced visual inspection process developed during the X-326 Process Building above-grade demolition. Materials managed as individual items, such as large piping or large individual items, will be loaded on flatbed trucks, typically using telescoping fork transfer vehicles, for transfer to the OSWDF. Other waste types will be loaded as appropriate for the specific waste configuration and as required by OSWDF transport and operational requirements.

During the waste loading, the X-326 Process Building at- and below-grade demolition project will certify on the Waste Form Compliance Checklist that the waste meets OSWDF WAC Component 5 Waste Packaging Standards), Component 6 (Waste Safe Handling Standards), and Component 7 (Waste Transportation Standards).

The X-326 Process Building at- and below-grade demolition project will coordinate with the OSWDF Organization to align waste delivery schedules and logistics and establish daily communication processes (including methods to communicate waste hazards). Bar coding and other electronic waste tracking processes are being planned for use to track waste shipments. A corresponding paper-based system will be available as a backup to the electronic system.

5.5.3 Waste Handling and Loading – Waste Transfer for On-site Disposal

Management of waste transfer from the project site to the OSWDF is addressed in the OSWDF O&M Plan. The transfer of hazardous and nuclear materials within the contiguous property owned and managed by DOE at PORTS is conducted in a manner fully compliant with DOE Order 460.1D, *Hazardous Materials Packaging and Transportation Safety* and DOE Guide 460.1-1, *Implementation Guide for Use with DOE Order 460.1A, Packaging and Transportation Safety.* Compliance documentation for approval by DOE establishes the specific transportation requirements to be met at PORTS during the transfer of all hazardous and nuclear materials within the federal reservation. 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.

If waste transfer is required to utilize roads normally accessible to the public, the roads will be removed from commerce (closed to the public) during the waste transfer, as needed. Haul routes from the X-326 Process Building at- and below-grade demolition project to Perimeter Road will lead to the dedicated IMTA Haul Road to the OSWDF and IMTA (see Figure 4). Any non-dedicated site roads used to transfer demolition waste to the OSWDF will be removed from commerce (made inaccessible to the public, including members of PORTS workforce not involved in the transfer activities), as applicable, during waste transfer activities.

Waste transfers to the OSWDF from the X-326 Process Building at- and below-grade demolition project will comply with transfer requirements identified in Section 4, *Transportation Plan*, of the OSWDF O&M Plan.

Every effort is expended to remove prohibited materials and wastes prior to waste transfer to the OSWDF, but additional visual inspection of the waste is completed at the OSWDF. Anomalous items received at the OSWDF from the X-326 Process Building at- and below-grade demolition project are the responsibility of the demolition project to retrieve, in compliance with processes identified in Section 4.4.2, *Risk-based Anomaly Response Plan,* of the WAC Implementation Plan.

5.5.4 Waste Handling and Loading – Off-site Waste Packaging and Transfer

Wastes removed from the demolition activities for off-site disposal (such as waste that cannot be readily managed into forms to meet the void space requirements of the OSWDF) will generally be packaged in containers (or, in some cases, transfer vehicles) specified by the site waste management organization at the X-326 Process Building at- and below-grade demolition project site, marked with required identifications, and delivered to the site waste management organization for subsequent management and disposition. The waste management organization of DOE's D&D contractor will be responsible for all off-site waste management processes, including final waste characterization, selection of compliant packaging and labeling, waste transfer, arranging any necessary waste treatment, completing ultimate disposal, and maintaining necessary records.

Wastes for off-site disposition will be managed in uniquely identified waste containers and packages (or appropriately marked transfer vehicles) and tracked through final disposition.

5.5.5 Waste Handling and Loading – Ancillary Size Reduction Processing on the NSA

Under the authority of other PORTS concurred-with regulatory documents, a portion of the NSA will continue to be used to perform shearing operations for miscellaneous equipment and materials from other locations at PORTS requiring size reduction to meet OSWDF size criteria for debris, until the NSA is removed by the Phase 2 slab demolition. The NSA provides continued impacted water collection and management to direct impacted water to treatment, a robust air monitoring system continues to be operated for the area, and infrastructure for material transfers is present, so the NSA is well-suited for the incidental material sizing work. To mitigate the potential for further damage to the slab at the NSA, at locations where waste will be piled and where significant mechanical work will be performed, that have the potential to cause slab damage, a protective layer will be placed.

Candidate equipment and material to be sized is comprised primarily of metal (such as unused and empty containers, outdated site vehicles and mobile equipment, etc.) being collected from outside storage areas, various warehouses and buildings at PORTS. Candidate wastes will have undergone deactivation steps to remove those materials prohibited from disposal at the OSWDF, and material will be readily characterized from situational process knowledge, radiological surveys, and sampling as needed. These activities are identified in Section 4.2 of the Comprehensive Process Buildings RD/RA Work Plan and will have been completed prior to movement of the materials to the NSA for waste sizing and management for disposal at the OSWDF. The materials will be compatible with the work area (i.e., no VOCs will be introduced) and will not include any process gas equipment (equipment or piping that carried uranium process gas).

The shearing activities at the NSA are operated as an ongoing processing activity where materials are received periodically, processed (cut to size with track-mounted shearing equipment), evaluated and certified, and transferred to the OSWDF for placement. This approach minimizes the creation of large debris piles, both for incoming materials awaiting shearing and sheared debris waste. The shearing is performed consistent with the applicable steps of Section 5.4.3, *Demolition – Processing and Sizing Demolition Debris*, of the X-326 Above-grade DDP. Resulting waste pile management and waste handling and loading are performed consistent with processes described in the other subsections of Section 5.5 of this X-326 At- and Below-grade DDP. Prior to conducting demolition of the NSA (Phase 2), use of the NSA for processing wastes from other PORTS areas and projects will cease.

As described in Section 4 and further detailed in Appendix D, upon demolition of the structures in the NSA, confirmatory soil sampling will be performed. If chemical contaminants associated with the ancillary waste materials shearing activity introduce significant different contaminants from those already anticipated as contaminants from the X-326 Process Building, they will be included in analysis suites requested for the post-demolition confirmatory soil samples.

5.6 IDENTIFICATION AND MANAGEMENT OF IMPACTED SOIL

As discussed briefly in earlier sections, the demolition project will use a combination of visual inspection, field survey tools, and soil sampling activities to identify soils requiring management for contamination. These steps are integral to field activities that must address residual soils associated with the demolition. The processes described in this section initially are put in action once the demolition of the slab layer exposes underlying soils for evaluation. Although removal of the deeper structures (foundations, utilities, basements, and tunnels) will require excavation of deeper soils (which may be contaminated), the initial surface soils encountered will be thoroughly evaluated before progressing to the deeper layers. This same approach will also be applied in the berm areas beyond the slab and in the former debris loadout areas to the west.

Once the slab has been removed, underlying soils and gravel are expected to be first encountered in areas between the large foundation blocks that provided support for the former building's structural columns. Visual inspection and field survey screening tools (radiological detection equipment, VOC detection equipment, and other field capabilities [such as test kits]) may be utilized to select biased sampling locations for soils in this initial soil layer encountered, to gauge if contamination is present from the building demolition activities.

The project will use the results of the initial surveys and biased sampling to target excavation approaches to minimize the spread of identified contamination and minimize disposal of soils not requiring removal. Contaminant migration via underlying utility systems is also potentially present. Soils excavated to remove utility system segments will be evaluated as the demolition progresses to deeper layers to determine whether they will require disposal based on contaminant content. The same processes for identifying contaminated soils will be used throughout the demolition process, in both project phases, to locate and manage those soils with contamination above screening levels for segregation and disposal. As the at- and below-grade structures are removed, the soil directly underneath and nearby will have a visual inspection and field screening to gauge if contamination is present. The approach also provides an effective means to identify and remove contaminant pathways in the soil, where contaminants may have migrated to deeper levels.

After completing demolition under each project phase, confirmatory surface soil sampling identified in Appendix D will be conducted to more formally evaluate the final state of the surface soils, intended to demonstrate that the soils remaining require no further action relative to risk-based screening levels. If the results from the confirmatory sampling conducted under Appendix D identify an area (or areas) requiring further contaminant removal, the same processes as described above (i.e., using field screening tools) will be used to address the nonconforming area(s) and determine the extent of contamination for removal. After additional excavation of the field screened soils has been completed, final confirmatory samples of the remediated area(s) will be collected to the same standards as performed under initial Appendix D sampling. These samples will be used to document the endpoint condition for the area(s).

5.7 MANAGEMENT OF IMPACTED WATER

Throughout the at- and below-grade demolition activities, demolition and excavation progress will necessitate changes to how wastewater within the work area is managed and where it is directed for wastewater treatment. As demolition and associated excavation progress, materials being removed for disposal (such as the slab, utility system segments, basement and tunnel structures, and foundation structures) will result in many shallow and deeper excavations that will require general regrading of areas within the work footprint to facilitate drainage of wastewater to collection points. The transition from surface demolition to removal of materials below-grade will also result in significant potential for entrainment of fine soil solids in wastewater and the potential for encountering different contaminants, which drive the need for directing resulting wastewater to alternate treatment. The following subsections address the activities that will be undertaken to manage wastewater from the project. The same basic approach is envisioned to support both Phase 1 and Phase 2.

5.7.1 Management of Impacted Water – Work Area Drainage

As discussed above, footers that supported the structural steel columns of the former X-326 Process Building typically were just below the slab and averaged between 6.5 to 8.5 ft in length and between 1.5 and 1.75 ft thick. Besides the typical footers, some of the footers exist at greater depths and include piers. Various grade beams are also included. Excavations will be needed to remove these structures. Deeper excavations will be needed to remove basements and tunnels and the various utility system segments in the project footprint. As materials are removed and localized depressions are formed, soils in the surrounding areas will be graded to facilitate drainage from the area toward the wastewater sumps active in the project footprint. If large-scale drainage to existing sumps cannot be maintained, one or more supplemental sumps will be installed to move collected wastewater from the work areas to the existing sumps (or directly into main piping systems, as needed).

During Phase 1, the two original southern wastewater sumps will continue to be utilized to the extent practical to support wastewater collection and conveyance until impacted by the demolition activities. This may include modifying the collection housings of the sumps to accommodate elevation changes. Excavation to be performed south of the footprint of the X-326 Process Building at- and below-grade demolition area (as part of the 5-Unit Plume Area excavation) is expected to require the removal of the southwest sump before the completion of the Phase 1 demolition scope of this X-326 At- and Below-grade DDP. After that time, other methods will be employed, including grading drainage to the southeast sump and the addition of supplemental temporary pumping operations, as needed.

During Phase 2, the two original northern wastewater sumps are expected to be retained and utilized until later in the demolition sequence. Due to elevation changes resulting from excavations, sump modifications may be necessary to prolong the use of the sump systems.

In both demolition phases, the berm of the impacted water collection and management system will be retained until the berm is no longer necessary for containment of impacted water (which may occur when water managed in the area is determined to no longer require wastewater treatment or due to redirection of impacted water to other management strategies, such as the collection of impacted water in excavated areas of the 5-Unit Plume Area excavation [applicable to the X-326 CMI area]). The decision to cease wastewater treatment will be made by DOE in consultation with Ohio EPA and is not expected until removal of demolition materials has completed and confirmatory sampling has concluded. Wastewater will continue to be collected for treatment while waste piles containing PCB remediation waste are present. Once contaminant levels in potentially impacted water no longer necessitate wastewater treatment, the water may be directed to storm sewers (with silt protection as needed) or to acceptable outfalls (for example, see Drawing X-326-C-34873 in Appendix C [and other related predecessor drawings highlighting wastewater management]). The berm mound structure would no longer be needed at such a time (where not used to house active conveyance piping or other utility services) and may be used as backfill in the work areas where not contaminated above risk-based levels. Removal of the berm is necessary to provide access to additional disconnected utility system segments requiring removal in the city block (under and beyond the extent berms).

Sizing of concrete debris is planned to occur in the NSA for both phases of the demolition. Water collection and treatment from the area will continue as needed while PCB remediation waste debris is still present and being managed in piles.

5.7.2 Management of Impacted Water – Water Treatment

At the start of the X-326 Process Building at- and below-grade demolition field activities, water entering the existing impacted water containment and management system (the bermed area around the slab) is expected to continue to be directed to the C-Train in the X-622-1 Water Treatment Facility for processing. The C-Train is the wastewater treatment system optimized for treatment of the contaminants associated with structures demolition, such as those encountered from demolition of the former X-326 Process Building. Prior to the start of Phase 1 of this demolition project, a new supplemental berm will have been installed across the existing slab, approximately 745 ft north of the south limit of the slab, creating a north compartment and a south compartment from the original bermed area. The new supplemental berm will allow separate management of water from the NSA and the SSA. Initially, the impacted water from both compartments can be directed via existing conveyance systems to the C-Train. As the demolition activities progress from demolition of the slab to activities involving soil excavation, the resulting impacted water will be directed via the X-900 T-6, 2M-Gallon Tank to the D-Train of the X-622-1 Water Treatment Facility rather than the C-Train.

The follow-on use of the SSA, after completion of the demolition actions, includes additional excavations (Phase 6 and Phase 7) under the 5-Unit Excavation Work Plan, as well as use of areas outside the excavation for truck load-out and excavated soil management. Wastewater from the area was included in plans for treatment at D-Train as part of the planning for the 5-Unit Excavation Work Plan. As demolition material removal progresses in the area, wastewater storage capacity within the bermed compartment is increased significantly (approximately 4 million gallons based on the concrete volume for removal within the SSA) and further enhanced with each additional structure removal from within the area. Additionally, wastewater contaminant content would be expected to be very low after removal of the slab and foundation concrete and removal of the materials collected in the bermed areas of the impacted water containment and management system.

This impacted water management approach (the switch to D-Train upon involving significant soil work) is also supportive of the planned X-326 CMI excavation under the 5-Unit Excavation Work Plan, which follows the demolition activities and is expected to generate soils with TCE content after the structural materials have been removed from the affected area. The C-Train, which is optimized to support wastewater treatment from demolition actions, is not suited to treatment of wastewater with significant VOC content. The D-Train, which shares the X-622-1 Water Treatment Facility with the C-Train, is optimized for treatment of wastewater with VOCs and includes additional solids settling pre-treatment, such as the X-900 T-6, 2M-Gallon Tank.

The approach described for managing impacted water via the D-Train once wastes with potential VOC content are being managed in the Phase 1 demolition also applies to the later Phase 2 demolition with the exception that available wastewater treatment options at that later date could be modified from what is currently available for the PORTS D&D Project (such as addition of options or relocation of current treatment facilities). Potentially impacted water from the Phase 2 demolition area will be directed to appropriate treatment available at the time of the performance of the work, considering the contents of the wastewater stream and the potential volumes for treatment.

No significant areas of VOC-contaminated soils are anticipated in the Phase 2 demolition area based on sampling conducted for the DU RFI/CMS Report, although one area with VOC content was identified from vapor intrusion sampling near a former maintenance area in the X-326 Process Building. The impacted water generated after excavation activities commence would be expected to contain more significant quantities of entrained soil solids. Once excavation activities commence, wastewater treatment from the Phase 2 area will be directed to treatment suited to the additional solids settling needed.

Inspection and operations and maintenance (O&M) of the impacted water management system (i.e., berm, sumps, sump pumps, and visible piping) and wastewater treatment systems are conducted in accordance with internal site procedures. Since the demolition activities will remove components of the impacted water collection and management system (such as the liner system and its contents), as the demolition progresses, the removed components will no longer require inspection and maintenance activities. The berm mound is expected to be retained until later in each respective phase of the demolition project to continue to separate potentially impacted water that may require treatment from water outside the area of impact that does not receive treatment prior to release. Discontinuing treatment of wastewater from the project area will occur only after consultation with Ohio EPA. The impacted water collection and management system, designed for the original above-grade demolition project, provides limited utility once contaminants from the original building operations have been removed from the area. Soil from the berm mound may be removed for use as backfill, where contamination does not preclude this, and once water retention for treatment is no longer needed and any integral conveyance or electrical systems are deactivated, if applicable. Field monitoring tools will be used to identify materials suspect for contamination.

Treated effluent from the wastewater treatment systems combines with other site wastewaters and is conveyed via Outfall 004 (under the site National Pollutant Discharge Elimination System [NPDES] Permit) to the Scioto River. Performance of the wastewater treatment operations is evaluated per the requirements of the NPDES Permit and also per the requirements of a wastewater treatment systems performance standard verification plan (Wastewater Treatment PSVP), in addition to sampling activities conducted for managing the daily wastewater treatment operations (as needed for controlling treatment processes in the X-622-1 Water Treatment Facility). O&M information for the systems is included in the Wastewater Treatment PSVP.

5.8 POST-DEMOLITION MANAGEMENT

The following subsections describe the activities that occur after completion of the at- and below-grade demolition activities addressed in this X-326 At- and Below-grade DDP. Project completion is discussed in Section 5.8.1. Site restoration is addressed in Section 5.8.2. Demobilization is discussed in Section 5.8.3. These steps transition from project field work to the post-demolition condition as described in Section 4.

5.8.1 Project Completion and Site Restoration

The project areas within the footprints of the respective demolition phases described are expected to no longer require remedial actions under the D&D DFF&O once the structures identified in this X-326 At- and Below-grade DDP have been removed and the resulting waste dispositioned. Confirmatory soil sampling to be performed separately for the SSA and NSA, as described in Appendix D, will provide data for evaluation to determine if soil contaminants remaining in project area soils meet soil risk-based protectiveness criteria.

Site restoration activities will follow the demolition activities; however, site restoration in the Phase 1 demolition area footprint will be deferred because additional project scopes (in addition to those being performed under the D&D DFF&O) will be conducted in the footprint area; specifically, the X-326 CMI excavation, followed by excavation of the remaining Phase 6 to be conducted under the 5-Unit Excavation Work Plan. Additionally, project support facilities for the 5-Unit Plume Area excavations are also expected to be located in the overall general area of the SSA after the demolition activities have been completed. The scope of work to be completed under the D&D DFF&O for the structures in the footprint of Phase 1 will be considered complete following demolition of the structures, their removal from the area, and completion of post-demolition confirmatory sampling. The areas will be graded to drain and seeded where not immediately involved in additional follow-on projects. Further management activities related to the area (including appropriate site restoration) will be the responsibility of the follow-on projects being conducted there. Temporary site restoration requirements for the area will be met after follow-on uses for the area have concluded.

No follow-on internal uses or additional remedial actions are anticipated for the footprint of Phase 2 of the demolition project. Once the Phase 2 demolition scope described in this X-326 At- and Below-grade DDP has been completed and water from the area has been determined to no longer require water treatment prior to release (in consultation with Ohio EPA), demolition requirements of the D&D DFF&O for the footprint area will be considered complete. At this point confirmatory soil sampling results (see Appendix D) would be expected to demonstrate that soils remaining in the area meet risk-based protectiveness criteria. Subsequently, berm mound soils no longer in use for active wastewater conveyance will be removed (i.e., soils used as backfill). Runoff in the area would then be directed to the stormwater sewer system (with appropriate silt protection), either by construction of new segments of that system, connecting the existing sumps to that system, or modifying drainage to flow to existing storm sewer collection points in the north portion of the city block. Modifications will be made as necessary.

5.8.2 Site Restoration

The Process Buildings ROD states: "When they are no longer needed, temporary roads and laydown areas will be removed, and the area will be restored. Equipment and materials used in these activities will be demobilized from the area. A final cut-and-fill operation, if needed, will occur once all actions in the area are complete to allow the area to drain. The area will include sufficient drainage to meet the requirements of the final restoration design and sufficient topsoil will be placed to support revegetation efforts. It is not necessary for the area to be returned to original grade. Temporary site restoration may be used if actions in the area are phased, and significant time will elapse between phases."

Since the areas immediately outside the footprints of the phased demolition work contain significant utility system segments to be removed under later projects, and areas to the south and east of the demolition project area are subject to continuing extensive plume excavation activities, final restoration is not envisioned for the two project footprint areas until actions in the nearby areas have also been completed. However, temporary restoration will be performed to ensure the two project areas are stable, well-drained, and soils are covered with appropriate vegetation after the demolition work is complete.

As the planned demolition activities are completed within each of the areas defined for the phases of the project, the area will undergo temporary restoration. Each area will be graded to facilitate drainage, followed by seeding for revegetation. However, since additional remedial actions will occur in the Phase 1 footprint and then the area will be reutilized for excavation project support, temporary restoration of this area will be limited to areas not being immediately reused.

The Phase 2 footprint is envisioned to undergo temporary site restoration immediately upon completion of the demolition actions and follow-on confirmatory sampling activities.

5.8.3 Equipment Decontamination and Demobilization

A general demobilization will occur upon completion of each of the phases of the at- and below-grade demolition, but individual pieces of equipment may mobilize or demobilize at various times in the project depending on need. General demobilization includes removal of demolition equipment and materials, temporary facilities, and waste from the project work area. Removal of equipment from the demolition project area will include decontamination of equipment and vehicles to release standards applicable, based on the type of area to which the equipment will be released.

Demobilization of temporary buildings and support structures (see Figure 3) between the two demolition phases is not anticipated, but if the structures are needed elsewhere on site before Phase 2 demolition activities are set to be underway, then some or all the structures could be moved. Their initial positioning near the slab is not essential but represents a practical consideration based primarily on efficiency and near-term planning for related project activities. Other project support facilities are also available in the nearby vicinity and could be utilized.

Following demobilization from the respective areas addressed by each of the project phases, if portions of the impacted water containment and management system remain intact to collect and direct potentially impacted water to wastewater treatment, the remaining systems will be subject to periodic inspections and maintenance to maintain operability.

Groundwater monitoring in wells identified by X-326 Above-grade DDP for monitoring for X-326 Process Building demolition contaminants (X710-07G [east], X326-PZ-07G [north], X326-04G [northwest], F-19G [west], and X231B-19G [southwest]) is expected to be curtailed once the structure demolition described in this X-326 At- and Below-grade DDP has been completed and separate confirmatory soil sampling for each of the demolition footprint areas demonstrates that soils do not contain demolition-related contaminants in excess of risk-based protectiveness criteria. Note that any wells identified for monitoring of other demolition projects would continue to be sampled while the other demolition project(s) require it. Discontinuation of groundwater monitoring for demolition-related contaminants will be determined by DOE in consultation with Ohio EPA.

5.9 PCB WASTE MANAGEMENT SUMMARY

Due to leaks of liquids containing PCBs and widespread use of PCB-containing materials in the former X-326 Process Building, all demolition waste will be managed as PCB remediation waste. The Toxic Substances Control Act of 1976 (TSCA) regulations address the management of PCB remediation waste and allow the requirements for the storage of PCB remediation waste to be modified pursuant to 40 CFR 761.61(c), *PCB Remediation Waste Risk-based Disposal Approval*. DOE as lead agency for compliance with TSCA regulations under the CERCLA framework of the remedial actions is implementing an alternate method of compliance for storage of PCB remediation waste debris from the X-326 Process Building at- and below-grade demolition (i.e., an alternate approach demonstrated to not present an unreasonable risk of injury to health, or the environment can be used).

DOE's approach for managing PCB remediation waste includes temporary storage of the wastes on the slab to facilitate disposal (such as to perform concrete crushing), followed by waste transfer to the OSWDF for direct placement (or for storage at the IMTA for later OSWDF placement). Prior to placing waste piles or performing potentially damaging mechanical work on the existing slab, an additional protective layer will be placed in the respective area. Wastewater from the slab areas managing PCB remediation waste will continue to be collected and conveyed to wastewater treatment systems that include treatment processes designed to remove PCBs. In the final stage of slab demolition for the NSA, storage on the slab will no longer be possible. At that time, all demolition waste will be loaded directly from demolition and transferred to the OSWDF or IMTA.

Table 7 provides an evaluation of the regulations associated with managing and storing demolition debris, characterized as PCB remediation waste, at the demolition site. The table identifies the TSCA regulatory requirement, DOE's planned method for meeting the requirement, and if an alternate approach to meeting the requirements is proposed, the proposed mitigation includes a qualitative judgment of the impact on human health and the environment.

PCB remediation waste that meets all WAC components can be disposed of in the OSWDF. The OSWDF has been designed, constructed, and operated in compliance with the substantive portions of regulations addressing siting, design, construction, operation, capping, closure, and post-closure care. These ARARs include landfill siting, design, and operational requirements under TSCA for chemical waste disposal facilities; federal and state requirements under Subtitle C of RCRA for hazardous waste disposal facilities; appropriate DOE Manual 435.1-1 requirements for LLW disposal facilities; state requirements under *OAC* 3745-27, *Solid Waste and Infectious Waste Regulations*, for solid waste landfills; and federal and state Clean Air Act requirements for ACM disposal facilities.

All specific requirements for the siting, design, and operation of a chemical waste landfill have been or will be met or, in many cases, exceeded. Documentation of the compliance approaches for these TSCA requirements is provided in Appendix A. The OSWDF meets all substantive elements of a TSCA chemical waste landfill.

Table 7. Risk Evaluation for Alternate PCB Remediation Waste Storage − Demolition Debris

TSCA Requirement	Planned Method/Alternate Method	Proposed Mitigation
761.65(c)(9) Bulk PCB remediation waste or PCB bulk product waste may be stored at the clean-up site or site of generation for 180 days subject to the following conditions:	DOE intends to demolish, size reduce, load, and transport PCB remediation waste in a continuous manner. PCB remediation waste will be managed in working piles, on portions of the slab, until slab space is no longer available (due to demolition progress in Phase 2). Concrete waste awaiting crushing is expected to be stored at the X-326 Process Building at- and below-grade demolition site longer than 180 days due to the amount of concrete to be crushed. Other forms of waste (such as utility piping may require additional storage controls, such as for asbestos content. Demolition debris will be transferred to the OSWDF as it is sized to meet WAC and either placed for disposal or stored in the OSWDF IMTA prior to placement for disposal.	When PCB remediation waste is stored at the project site it will be stored on the concrete slab within an area that has been enhanced with the addition of a protective layer above the concrete, treated with a fixative, and it will be inspected regularly while stored to verify the continued viability of the fixative (additional fixative will be applied as needed based on visual inspection). While PCB remediation waste is being managed, impacted wastewater will be directed to wastewater treatment. Remedial action work is performed using heavy equipment, with workers separated from direct contact with the contaminated waste materials. The planned waste staging and storage approach, which may include storage beyond 180 days, will not pose an unreasonable risk of injury to health or the environment.
761.65(c)(9)(i) The waste is placed in a pile designed and operated to control dispersal of the waste by wind, where necessary, by means other than wetting.	PCB remediation waste staged or stored in piles will utilize the remains of the slab, until that is no longer practical (due to demolition progress in Phase 2). Encapsulating fixatives will be applied to debris piles.	None. DOE's pile management plan meets the requirement of this regulation.

Table 7. Risk Evaluation for Alternate PCB Remediation Waste Storage − Demolition Debris (Continued)

TSCA Requirement	Planned Method/Alternate Method	Proposed Mitigation
761.65(c)(9)(ii) The waste must not generate leachate through decomposition or other reactions.	PCB remediation waste debris will not be stored in the presence of chemical or biological agents that could produce decomposition during storage.	None. DOE's plan meets the requirement of this regulation.
761.65(c)(9)(iii) The storage site must have: 761.65(c)(9)(iii)(A) A liner that is designed, constructed, and installed to prevent any migration of wastes off or through the liner into the adjacent subsurface soil, groundwater, or surface water at any time during the active life (including the closure period) of the storage site. The liner may be constructed of materials that may allow waste to migrate into the liner. The liner must be: (A)(1) Constructed of materials that have appropriate chemical properties and sufficient strength and thickness to prevent failure due to pressure gradients (including static head and external hydrogeologic forces), physical contact with the waste or leachate to which they are exposed, climatic conditions, the stress of installation, and the stress of daily operation. (A)(2) Placed upon a foundation or base capable of providing support to the liner and resistance to pressure gradients above and below the liner to prevent failure of the liner due to settlement, compression, or uplift. (A)(3) Installed to cover all surrounding earth likely to be in contact with the waste.	DOE's approach does not include a liner for temporary storage of debris piles at the demolition site. Debris storage and size reduction will occur on the NSA portion of the former X-326 Process Building reinforced concrete slab (on an area with additional protective enhancements). Once that approach is no longer sustainable, due to demolition progress in Phase 2 of the demolition plans, direct movement of wastes to another location, such as IMTA, for size reduction will occur. Demolition activities will remove the manmade structures of the NSA and also remove soils identified as potentially contaminated, based on visual inspection and field monitoring tools.	PCB remediation waste will be managed on the remains of the slab within an area that has been enhanced with the addition of a protective layer. Impacted water will be collected for wastewater treatment (including treatments designed for removal of PCBs) prior to release. General access to the area is restricted and workers do not come in direct contact with contaminated materials. Piled PCB remediation waste will be treated with fixative and will be inspected regularly while stored to verify the continued viability of the fixative. Once demolition progresses to the point that no slab space remains for staging, the waste will be sized in place, loaded out, and transferred directly to OSWDF. Follow-on confirmatory soil sampling for PCB contamination, pursuant to 40 CFR 300.410, *Removal Site Evaluation*, will be performed as described in Appendix D. The planned waste staging and storage approach will not pose an unreasonable risk of injury to health or the environment.

Table 7. Risk Evaluation for Alternate PCB Remediation Waste Storage − Demolition Debris (Continued)

TSCA Requirement	Planned Method/Alternate Method	Proposed Mitigation
761.65(c)(9)(iii)(B) A cover that meets the requirements of paragraph (c)(9)(iii)(A) of this section is installed to cover all the stored waste likely to be contacted with precipitation and is secured so as not to be functionally disabled by winds expected under normal seasonal meteorological conditions at the storage site.	DOE's approach does not include covered storage for the demolition debris PCB remediation wastes.	Piled PCB remediation waste stored at the project site will be treated with fixative and will be inspected regularly while stored to verify the continued viability of the fixative for emissions control. Additional fixative will be applied as needed based on visual inspection and when piles are disturbed with debris additions or subtractions. While PCB remediation wastes are being stored or processed, the wastewater from the area will be directed to wastewater treatment. This alternate strategy will not pose an unreasonable risk of injury to human health or the environment.
761.65(c)(9)(iii)(C) A run-on control system designed, constructed, operated, and maintained such that: (C)(1) It prevents flow onto the stored waste during peak discharge from at least a 25-year storm. (C)(2) It collects and controls at least the water volume resulting from a 24-hour, 25-year storm. Collection and holding facilities (e.g., tanks or basins) must be emptied or otherwise managed expeditiously after storms to maintain design capacity of the system.	DOE's wastewater collection activities in the demolition work areas will continue to use the bermed collection system and associated sumps and pumping system which has been evaluated to manage back-to-back 25-year, 24-hour storm events and is designed to process up to 400 gpm, which is sufficient to expeditiously process the design storm event. As work progresses with removal of slabs, foundations, and utilities, berms will also be removed, but collection of water for treatment will continue. Waste will not be piled in areas with potential for flooding. Where needed, berms will be created for waste piles.	None. DOE's plan meets the requirement of this regulation.

Notes:
CFR = U.S. Code of Federal Regulations
DOE = U.S. Department of Energy
IMTA = Impacted Material Transfer Area
NSA = northern slab area
OSWDF = On-site Waste Disposal Facility
PCB = polychlorinated biphenyl
TSCA = Toxic Substances Control Act of 1976
WAC = waste acceptance criteria

5.10 DESIGN CHANGES/FIELD CHANGE NOTICES

As stated in Section 4.5, *Design Changes/Field Change Notices During Remedial Action*, of the Comprehensive Process Buildings RD/RA Work Plan, remedial actions may encounter unforeseen conditions and changes in approach may be determined to be required. The changes may result in major or minor deviations from this X-326 At- and Below-grade DDP. Per Section 3.4.2, *Design Changes During Construction*, of Attachment B of the D&D DFF&O, the following changes require Ohio EPA review and concurrence prior to implementation:

- Those that involve the deletion or addition of a major component of a concurred-with or approved, as applicable, remedy
- Any changes that may result in an increase of the exposure to chemicals of concern and/or risk to human health, safety, or the environment as compared to the remedy performance standards presented in this work plan
- Those that result in a significant delay in the completion of the remedial action
- Any other changes that alter or are outside of the scope or intent of the concurred-with work plan and the remedial design.

The FCN process will be used to obtain Ohio EPA review and concurrence of any of the aforementioned changes should they occur during implementation of the remedial action. Per the D&D DFF&O, Ohio EPA will be notified of other minor changes for the remedial action made during construction (demolition) through the D&D DFF&O Quarterly Progress Reports.

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6. MANAGEMENT APPROACH

This section addresses how the at- and below-grade demolition project for the X-326 At- and Below-grade DDP will be managed by DOE's contractors. The manner in which major site programs support the effort of the demolition field project team is outlined in the following paragraphs.

DOE is responsible for D&D at PORTS, and multiple contractors manage the various DOE programs at the site. DOE's D&D Contractor is responsible for D&D of the former gaseous diffusion process buildings and associated facilities, environmental restoration of the contaminated areas, environmental compliance monitoring and reporting, disposition of legacy radioactive waste, management of uranium, operation of the site's waste storage facilities, and construction and operation of the OSWDF. The D&D Contractor's duties include operation of the impacted water treatment facilities in compliance with ARARs and permit requirements.

DOE's Infrastructure Support Services Contractor is responsible for maintenance of facilities, grounds, and roadways; janitorial services; security access for DOE's facilities; site security training; records management; and information technology and network support for DOE Operations.

This X-326 at- and below-grade demolition project will be managed by PORTS D&D Contractor using the project organization roles and responsibilities for D&D projects identified in Section 7.1, *Organization,* of the Comprehensive Process Buildings RD/RA Work Plan. This X-326 At- and Below-grade DDP does not revisit that information; however, additional project management information is provided in this section. Figure 13 is consistent with the information and graphic provided by the Comprehensive Process Buildings RD/RA Work Plan with additional content.

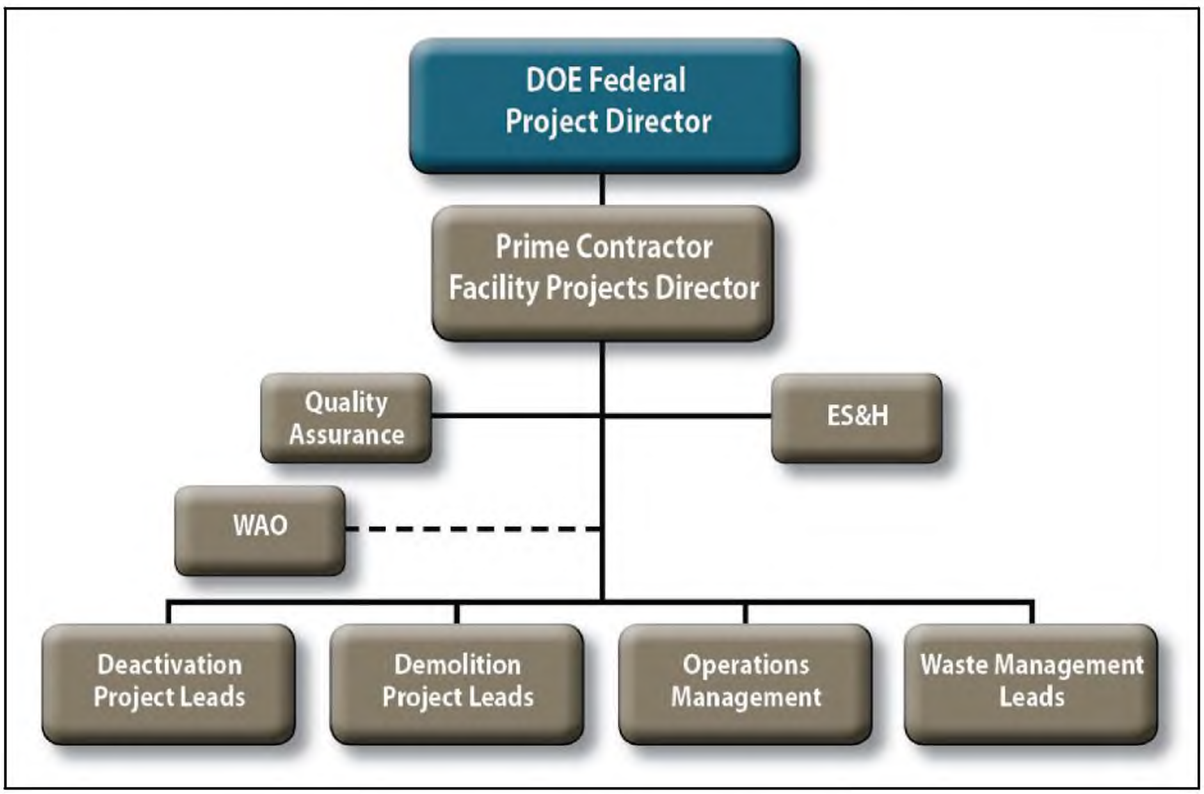

Figure 13. Facility Projects Organization

6.1 MANAGEMENT CONTROL SYSTEMS

DOE's D&D Contractor at PORTS maintains comprehensive systems to plan and control all work activities on site in compliance with applicable regulations and standards. This includes the ARARs and associated compliance strategies identified for the demolition activities associated with this X-326 At- and Below-grade DDP (Appendix A), as well as numerous other requirements not specifically addressed in ARARs (e.g., training of workers and work authorization and control systems). The site's management control system directly benefits the implementation of this X-326 At- and Below-grade DDP in the following ways:

- Training and qualification of workers and subcontractors
- Work authorization and control system based on review, approval, and authorization of work control documents (such as procedures and work plans)
- Review and approval processes that incorporate safety and quality considerations in every type of work planned
- Development of lessons learned at the end of a work cycle, and evaluation of lessons learned from previous work efforts and similar work activities performed at the site and elsewhere.

6.2 QUALITY ASSURANCE

This X-326 At- and Below-grade DDP has been planned in compliance with site QA program requirements, and QA oversight will continue throughout the implementation of the project through major QA categories such as construction QA, sample QA, and oversight of WAC processes by WAO. WAO is operated as a separate organization from site QA programs and is discussed separately below.

Construction QA requirements are included in approved designs to ensure the ultimate constructed design meets the needs identified by the initial design criteria and operates as designed. Construction QA includes verifying the quality of materials of construction and the quality of construction methods through field practices that ensure adherence to written standards.

Any sampling to support this remedial action (e.g., impacted water treatment system effluent samples, air monitoring samples, or surface soil samples collected per Appendix D) will adhere to the requirements of the *Sample Analysis Data Quality Assurance Project Plan (SADQ) at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (DOE 2014d). Throughout the implementation of this project, existing PORTS-specific QA program requirements (compliant with DOE Order 414.1D, *Quality Assurance*, and the American Society of Mechanical Engineers *Quality Assurance Requirements for Nuclear Facility Operations*, Nuclear Quality Assurance-1) will be applied to ensure that the appropriate levels of rigor, review, and independent evaluation are employed.

WAO provides independent oversight of this at- and below-grade demolition project from the point of waste generation to final waste disposition for each load of waste. WAO is organizationally distinct and separate from the project organizations to ensure it is independent of project delivery, schedule, and budget pressures. WAO is responsible for verifying that waste generated from the demolition of the X-326 Process Building at- and below-grade structures presented for disposal at the OSWDF is in full compliance with WAC, including procedural and documentation requirements.

During demolition WAO will:

- Verify waste documentation meets the waste characterization standard of WAC
- Visually inspect waste for prohibited items at the point of generation
- Verify waste is separated as one of five OSWDF engineered waste types
- Verify compliance with waste packaging and transportation WAC before releasing transfer vehicles from generating projects
- Visually inspect the waste again for prohibited items when it is offloaded at the OSWDF
- Verify all wastes destined for the OSWDF are tracked throughout their lifecycle, from generation to disposition
- Monitor and track anomalous conditions and corrective actions.

Complete roles and responsibilities of WAO are described in the WAC Implementation Plan.

6.3 HEALTH AND SAFETY

Safety and health organizations at PORTS identify and administer relevant safety and health requirements to site organizations and projects, provide resources for meeting health and safety requirements, and also perform independent evaluations of site performance and compliance. Sampling and monitoring for worker safety and avoidance of environmental impacts are fundamental processes associated with these focus areas.

Demolition activities for the at- and below-grade portion of the X-326 Process Building present significant potential hazards to workers due to heavy equipment operations and the potential for exposure to physical and airborne hazards. PORTS safety and health organizations have participated in planning the overall demolition project approach and individual job activities. Each planned job activity has been evaluated to identify necessary controls (such as personal protective equipment) and limits (such as chemical exposure concentrations). During implementation, work activities will be actively monitored to verify safety or to adjust work practices, controls, and limits to obtain results within acceptable ranges.

The radiological protection program ensures that the unique hazards of radiation exposure are evaluated and controlled. The demolition design presented in this X-326 At- and Below-grade DDP utilizes practices and controls established by this program to meet limits that ensure compliance and protect workers and the public. Site radiological protection practices associated with monitoring activities are based on 10 CFR 835, *Radiological Protection*, and limits outlined in DOE Order 458.1. A DOE-approved *Radiation Protection Plan, Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (FBP 2024), 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-generating devices are governed by the ODH Bureau of Radiation Protection as specified in *OAC* 3701:1−66, *Radiation Generating Equipment*. 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. Deliberate efforts are taken to further reduce exposure and releases to as low as reasonably achievable. Subcontractors are required to adhere to the Radiation Protection Plan, protocols, and procedures. Any liquids discharged from the site must meet the requirements of DOE Order 458.1.

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 control technician(s) will be assigned to this X-326 at- and below-grade demolition project. In conjunction with the Environmental Remediation 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.

Demolition of the at- and below- grade portions of the X-326 Process Building will occur under Nuclear Criticality Safety (NCS) controls established by the NCS program. The NCS program ensures that the unique hazards of nuclear criticality are evaluated and controlled. The evaluation of X-326 Process Building at- and below-grade demolition is documented in an approved NCS evaluation. The demolition design presented in this X-326 At- and Below-grade DDP utilizes practices and controls established by this program to meet limits that ensure compliance and protect workers and the public.

6.4 WASTE MANAGEMENT

The Waste Management organization provides project planning and execution support focused on the compliant management of project wastes. In addition to the activities identified in the Comprehensive Process Buildings RD/RA Work Plan (characterization, handling, storage, treatment, packaging, tracking, transportation, and disposal of waste from the project), it is important to highlight the role that the organization plays in preparing the GWMPs (see Section 5.2.1) for the project and supporting development of documentation required under the WAC Implementation Plan.

6.5 ENVIRONMENTAL PROTECTION

The Environmental Protection organization has a role fundamentally similar to that of the health and safety organizations, but with a focus on protecting the environment and public from exposures due to PORTS activities or inventories. Environmental Protection identifies and informs site organizations and projects of relevant environmental protection and compliance requirements and provides resources for environmental protection activities (e.g., preparing permits or evaluating compliance through sampling).

With respect to the X-326 Process Building at- and below-grade demolition project, Environmental Protection identifies acceptable work practices in compliance with requirements (such as ARARs and existing permits) and arranges collection of data (such as through sampling or monitoring) to verify that the project and site conditions meet requirements, or to adjust activities to meet requirements. For the X-326 Process Building at- and below-grade demolition project, Environmental Protection has overseen airborne emissions modeling; identified air monitoring requirements for environmental compliance; reviewed the impacted water treatment influent constituents, treatment processes, and effluent prediction; and prepared the NPDES Permit revision submittal (refer to Section 5.7.2). Additionally, Environmental Protection has overseen the sample collection, data analyses, and reporting for both the X-326 Process Building At- and Below-grade Demolition Air Monitoring Plan and the X-622-1 Water Treatment Facility influent and effluent sampling associated with the recently completed X-326 Process Building above-grade demolition project.

Section 5.9 includes a stand-alone description of the compliance approach to be used by this X-326 At- and Below-grade DDP to comply with the strategy listed in the ARARs (Appendix A) related to TSCA regulations from the Process Buildings ROD and Waste Disposition ROD.

Spill response plans are provided in Section 6.1.6, *Spill Response*, of the Comprehensive Process Buildings RD/RA Work Plan. Spills that occur within the lined impacted water containment and management system surrounding the concrete slab of the former X-326 Process Building will be collected as appropriate, with consideration for protection of the underlying liner system.

6.6 TRAINING

The PORTS D&D Contractor maintains a training database that tracks the minimum training requirements for all site employees consistent with DOE Order 426.2, *Personnel Selection, Training, Qualification, and Certification Requirements for DOE Nuclear Facilities*. In addition, workers and their supervisors may agree on additional training for proficiency and employee development. To meet the requirements of this demolition and excavation project, workers and project management personnel will need additional training to meet their job responsibilities. Additional implementation procedures and the training requirements system (e.g., Greenlight) will provide detailed information on project personnel training needs. Table 8 provides an example of expected training areas required for demolition workers.

Table 8. Potential Training Areas for Demolition Personnel

• Radiation Worker I or II (as applicable)	• PORTS General Employee Training	• 40-hour HAZWOPER
• WAC Implementation Plan	• RCRA Hazardous Waste	• TSCA Waste
• DOE Order 435.1, *Radioactive Waste Management*	• ISMS	• Project-specific Work Plans
• Project-specific JHAs	• 10 CFR Part 830 Subpart A *Quality Assurance*	• GWMPs

Notes:
WAC Implementation Plan = *Waste Acceptance Criteria Implementation Plan for the On-site Waste Disposal Facility at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (DOE 2020).

CFR = U.S. Code of Federal Regulations
DOE = U.S. Department of Energy
GWMP = generator waste management plan
HAZWOPER = hazardous waste operations and emergency response
ISMS = Integrated Safety Management System
JHAs = job hazard analyses
PORTS = Portsmouth Gaseous Diffusion Plant
RCRA = Resource Conservation and Recovery Act of 1976, as amended
TSCA = Toxic Substances Control Act of 1976

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7. SCHEDULE AND MILESTONES

The project activities included in this X-326 At- and Below-grade DDP represent a major remedial action project. Demolition is planned as a continuous activity, even during periods of weather impact that result in closure of the OSWDF WAC for waste acceptance and placement (including scheduled winter closure of the OSWDF). Demolition activities could be curtailed during dangerous weather, but long-term impacts to a continuous remedy implementation schedule are not anticipated. Since this X-326 At- and Below-grade DDP includes project information consistent with that of a Remedial Action Implementation Plan, it is required under the D&D DFF&O to include schedule information. Table 9 provides a high-level representation of the schedule for the activities to be conducted under this X-326 At- and Below-grade DDP, and shows tasks for Phase 1, or the SSA demolition. Table 10 provides a high-level representation of the schedule for the activities to be conducted under this X-326 At- and Below-grade DDP, and shows tasks for Phase 2, or the NSA demolition. The specific demolition start date (following Ohio EPA concurrence with this plan) has not yet been established for Phase 1 or Phase 2.

Site preparation activities are discussed in Section 5. Operation of the impacted water systems, with modifications as necessary, occurs throughout the above-grade demolition project or until the system is no longer required (see Section 5.7).

Project progress reporting for the X-326 Process Building at- and below-grade demolition will be included in the D&D DFF&O Quarterly Report during active project periods.

Table 1B, *Milestones for Remedial Action of Process/Complex Buildings/Structures* of the D&D DFF&O requires each RD/RA Work Plan to set milestones for submitting the remedial design, if applicable, and for initiating remedial action. The Comprehensive Process Buildings RD/RA Work Plan included those required milestones and referred to the D&D DFF&O Annual Milestone report for setting target dates and milestones for future demolition design submittals and field work. This X-326 At- and Below-grade DDP provides the designs necessary to accomplish the scope of work addressed, or the designs have been transmitted separately (such as with the impacted wastewater treatment system designs). Therefore, no milestones are established for future design submittals and no additional submittals are planned to support execution of this work scope. A preconstruction inspection and conference will be offered to Ohio EPA, to occur at least 10 days prior to the start of the demolition project. Table 11 identifies the timing for notification prior to initiating major demolition field work and submittal of an FWCR for each phase of the demolition that will document the completion of X-326 Process Building at and below-grade demolition field work.

Table 9. Schedule for X-326 Process Building At- and Below-grade Demolition (Phase 1 - SSA)

Decision/Task	Year 1				Year 2			
Site Preparation								
Remove At- and Below-grade Structures								
Waste Processing and Disposal								
Confirmatory Surface Soil Sampling								
Site Grading and Demobilization								

Notes:
SSA = southern slab area

Table 10. Schedule for X-326 Process Building At- and Below-grade Demolition (Phase 2 - NSA)

Decision/Task	Year 1				Year 2				Year 3			
Site Preparation												
Remove At- and Below-grade Structures												
Waste Processing and Disposal												
Confirmatory Surface Soil Sampling												
Site Grading and Demobilization												

Notes:
NSA = northern slab area

Table 11. X-326 Process Building At- and Below-grade DDP Milestones

Milestone/Target	Due Date
Notification to Ohio EPA of initiation of demolition of the X-326 Process Building at- and below-grade structures (Phase 1)	After receipt of Ohio EPA concurrence with this DDP and within 30 days of DOE notifying Ohio EPA that DOE is prepared to proceed with demolition
Notification to Ohio EPA of initiation of demolition of the X-326 Process Building at- and below-grade structures (Phase 2)	Within 30 days of DOE notifying Ohio EPA that DOE is prepared to proceed with demolition
Submittal of draft FWCR for Phase 1 (SSA) of the at- and below-grade demolition field project	Within 120 days after completion of field activities of Phase 1, excluding completion of waste disposition
Submittal of draft FWCR for Phase 2 (NSA) the at- and below-grade demolition field project	Within 120 days after completion of field activities of Phase 2, excluding completion of waste disposition
Complete off-site shipment of waste and materials (i.e., recycling) not being disposed in the OSWDF (Phase 1)	Within 1 year of completion of the field activities for the project phase that generated the material or waste (Phase 1)
Complete off-site shipment of waste and materials (i.e., recycling) not being disposed in the OSWDF (Phase 2)	Within 1 year of completion of the field activities for the project phase that generated the material or waste (Phase 2)

Notes:
DDP = Demolition Design Plan
FWCR = field work completion report
NSA = northern slab area
Ohio EPA = Ohio Environmental Protection Agency
OSWDF = On-site Waste Disposal Facility
SSA = southern slab area

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8. REFERENCES

DOE 2024a, *Above-grade Demolition Design Plan for the X-326 Process Building and Associated Special Nuclear Material Monitoring Portals, Tie Lines, and Pipe Racks at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio*, DOE/PPPO/03-0888&D7, U.S. Department of Energy, Piketon, Ohio, May.

DOE 2024b, *Comprehensive Deactivation, Demolition, and Disposition Remedial Design/Remedial Action Work Plan for the Process Buildings and Complex Facilities Remedial Action Project and Remedial Design for Deactivation of Complex Facilities at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio*, DOE/PPPO/03-0758&D3, U.S. Department of Energy, Piketon, Ohio, June.

DOE 2023a, *Remedial Design/Remedial Action Work Plan and Remedial Design for the Process Buildings Deactivation at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio – Deactivation of X-326, X-330, X-333, X-111A, X-111B, X-232C1, X-232C2, X-232C3, X-232C4, and X-232C5*, DOE/PPPO/03-0665&D4, U.S. Department of Energy, Piketon, Ohio, February.

DOE 2023b, *On-Site Waste Disposal Facility (OSWDF) Operations and Maintenance Plan, Final Design, Portsmouth Gaseous Diffusion Plant, Decontamination and Decommissioning Project, Piketon, Ohio*, DOE/PPPO/03-0701&D5, U.S. Department of Energy, Piketon, Ohio, April.

DOE 2023c, *Demolition Design Plan for At- and Below-grade Components of the X-626 Recirculating Cooling Water Complex at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio*, DOE/PPPO/03-1144&D1, U.S. Department of Energy, Piketon, Ohio, June.

DOE 2022, *5-Unit Groundwater Plume Area Excavation Work Plan at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio,* DOE/PPPO/03-0868&D4, U.S. Department of Energy, Piketon, Ohio, July.

DOE 2021, *Deferred Units Resource Conservation and Recovery Act Facility Investigation/Corrective Measures Study Report at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio*, DOE/PPPO/03 0772&D2, U.S. Department of Energy, Piketon, Ohio, August, Changed Pages, December.

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DOE 2019, *X-326 Process Building Demolition Design Materials of Construction Sampling and Analysis Plan for the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio*, FBP-ER-RDRA-BG-PLN-0093, Revision 3, U.S. Department of Energy, Piketon, Ohio, May.

DOE 2018, *Comprehensive On-Site Waste Disposal Facility Remedial Design/Remedial Action Work Plan for the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio, Phase III Balance of the On-Site Disposal Remedy*, DOE/PPPO/03-0751&D3, U.S. Department of Energy, Piketon, Ohio, March.

DOE 2015a, *Phase 1 Sampling and Analysis Plan for the Process Equipment Characterization in Support of the Sitewide Waste Disposition Evaluation Project at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio*, DOE/PPPO/03-0210&D4, U.S. Department of Energy, Piketon, Ohio, April.

DOE 2015b, *Record of Decision for the Process Buildings and Complex Facilities Decontamination and Decommissioning Evaluation Project at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio*, DOE/PPPO/03-0425&D2, U.S. Department of Energy, Piketon, Ohio, July.

DOE 2015c, *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, Ohio, June.

DOE 2014a, *Remedial Investigation and Feasibility Study Report for the Process Buildings and Complex Facilities Decontamination and Decommissioning Evaluation Project at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio*, DOE/PPPO/03-0245&D3, U.S. Department of Energy, Piketon, Ohio, June.

DOE 2014b, *Remedial Investigation and Feasibility Study Report for the Site-wide Waste Disposition Evaluation Project at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio*, DOE/PPPO/03-0246&D3, U.S. Department of Energy, Piketon, Ohio, February.

DOE 2014c, *Supplement No. 1 to the Remedial Investigation and Feasibility Study Report for the Site-wide Waste Disposition Evaluation Project: Proposed Corrective Action Management Unit and Area of Contamination Designations for Alternative 2 at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio*, DOE/PPPO/03-0646&D1, U.S. Department of Energy, Piketon, Ohio, October.

DOE 2014d, *Sample Analysis Data Quality Assurance Project Plan (SADQ) at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio*, DOE/PPPO/03-0278&D2, U.S. Department of Energy, Piketon, Ohio, February.

FBP 2024, *Radiation Protection Plan, Portsmouth Gaseous Diffusion Plant, Piketon, Ohio,* Revision 14, FBP-RP-PL-00002, Fluor-BWXT Portsmouth LLC, Piketon, Ohio, June.

Giffels & Vallet, Inc. 1957, *Gaseous Diffusion Plant at Portsmouth, Ohio, Project No. E2-24X-3701, Project History and Completion Report*, (Redacted) GAT-Z-439, Volume 1, January 1957, Compiled by Giffels and Vallet, Incorporated, Architect-Engineers, January.

Ohio EPA 2023a, *Decision Document for Resource Conservation and Recovery Act Deferred Units at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio*, Ohio Environmental Protection Agency Columbus, Ohio, July.

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APPENDIX A: APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENT COMPLIANCE MATRIX FOR THE X-326 PROCESS BUILDING AT-AND BELOW-GRADE DEMOLITION

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TABLES

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The applicable or relevant and appropriate requirements (ARARs) crosswalk table in this appendix provides a compliance strategy for each ARAR or to-be-considered (guidance) (TBC) associated with the *Record of Decision for the Process Buildings and Complex Facilities Decontamination and Decommissioning Evaluation Project at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (Process Buildings ROD) (U.S. Department of Energy [DOE] 2015a) and for the portion of the ARARs or TBCs from the *Record of Decision for the Site-wide Waste Disposition Evaluation Project at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (Waste Disposition ROD) (DOE 2015b) that are applicable to the implementation of the remedial action design scope of work described in Section 2 of this document. Compliance strategies are based on demolition activities to be performed and assume that deactivation activities have been completed. Where the ARAR or TBC is not expected to be involved in the scope of the work addressed, the compliance strategy identifies the requirement as not applicable to the planned scope of work.

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Table A.1 Location-specific ARARs

Location	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
		Wetlands				
Presence of wetlands as defined in 10 CFR 1022.4	Avoid, to the extent possible, the long- and short-term adverse effects associated with destruction, occupancy, and modification of wetlands.	DOE actions that involve potential impacts to, or take place within, wetlands—**applicable**	10 CFR 1022.3(c)	X	X	Impact to wetlands is not anticipated due to the demolition of the at- and below-grade structures of the X-326 Process Building; however, potential impacts will be minimized with erosion and sediment controls incorporated into the demolition designs.
	Take action, to extent practicable, to minimize destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands.		10 CFR 1022.3 (a)(7) and (8)	X	X	See above.
	Undertake a careful evaluation of potential effects of any new construction in wetlands. Identify, evaluate, and, as appropriate, implement alternative actions that may avoid or mitigate adverse impacts on wetlands.		10 CFR 1022.3 (b) and (d)	X	X	See above.
	Measures to take to mitigate the adverse effects of actions in wetlands include, but are not limited to, minimum grading requirements, run-off controls, design and construction constraints, and protection of ecology-sensitive areas.		10 CFR 1022.13 (a)(3)	X	X	See above.
	If no practicable alternative to locating or conducting the action in the wetland is available, then before taking action, design or modify the action in order to minimize potential harm to or within the wetland, consistent with the policies set forth in Executive Order 11990.		10 CFR 1022.14(a)	X	X	See above.

Table A.1 Location-specific ARARs (Continued)

Location	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Presence of jurisdictional wetlands	Except as provided under the CWA Sect. 404(b)(2), no discharge of dredged or fill material into an aquatic ecosystem is permitted if there is a practicable alternative that would have less adverse impact on the aquatic ecosystem or if it will cause or contribute to significant degradation of the waters of the United States[a].	Actions that involve the discharge of dredged or fill material into waters of the United States, including jurisdictional wetlands—**applicable**	40 CFR 230.10 (a) and (c)	X	X	See above.
	Except as provided under the CWA Sect. 404(b)(2), no discharge of dredged or fill material shall be permitted unless appropriate and practicable steps in accordance with 40 CFR 230.70 *et seq*. are taken that will minimize potential adverse impacts of the discharge on the aquatic ecosystem.		40 CFR 230.10(d)	X	X	See above.
Presence of wetlands as defined under *OAC* 3745-1-02 (B)(90)	Wetlands designated uses, as assigned in accordance with *OAC* 3745-1-54(B)(2), shall be maintained and protected such that degradation of surface waters through direct, indirect, or cumulative impacts does not result in the net loss of wetland acreage or functions in accordance with the substantive wetland avoidance, minimization, and compensatory mitigation requirements of the paragraphs (D) and (E) of *OAC* 3745-1-54.	Activity that would cause loss of wetlands as defined under *OAC* 3745-1-02(B)(90)—**applicable**	*OAC* 3745-1-54 (B)(1) *OAC* 3745-1-51 through -54	X	X	See above.
	Wetland narrative criteria in *OAC* 3745-1-51(A) shall be protected to prevent significant adverse impacts on the hydrology necessary to support the biological and physical characteristics naturally present in wetlands.				X	See above.

Table A.1 Location-specific ARARs (Continued)

Location	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Presence of wetlands as defined under *OAC* 3745-1-02 (B)(90) (continued)	Wetland narrative criteria in *OAC* 3745-1-51(B) shall be protected to prevent significant adverse impacts on water quality necessary to support existing habitat and populations of wetland flora and fauna and to prevent conditions conducive to the establishment or proliferation of nuisance organisms.				X	See above.
Presence of "isolated" wetlands as defined under ORC 6111.02	No person shall engage in the filling of an isolated wetland unless authorized to do so pursuant to the substantive requirements of a general or individual state isolated wetland permit.	Actions that involve the discharge of dredged or fill material into "isolated wetlands"—**applicable**	ORC 6111.021 – 6111.028	X	X	See above.
	Must comply with the following substantive requirements and conditions of this permit: • Only suitable material free of toxic contaminants in other than trace quantities shall be used as fill material. • Use of asphalt and rubber tires as fill is prohibited. • Wetland narrative and chemical criteria in *OAC* 3745-1-51 and 3745-1-52 shall be maintained in isolated wetlands wholly or partially avoided. • Visible signage, as detailed in the general permit, shall be placed around the delineated boundary of the avoided wetlands.	Category 1 or 2 "isolated wetlands" of a total of ½ acre or less—**TBC** Category 1 or 2 "isolated wetlands" of a total of ½ acre or less—**TBC**	Ohio General Permit for Filling Category 1 and Category 2 Isolated Wetlands (effective April 10, 2007)	X	X	See above.

Table A.1 Location-specific ARARs (Continued)

Location	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Presence of "isolated" wetlands as defined under ORC 6111.02 (continued)	Mitigation is required either on or off-site, or at a mitigation bank within the same USACE district as the project location. Mitigation must be conducted in accordance with the ratios established in the general permit depending on the wetland category designation. The mitigation site shall be protected in perpetuity, and appropriate practicable management measures including vegetative buffers shall be implemented to restrict harmful activities that jeopardize the mitigation.	Actions that involve the discharge of dredged or fill material into Category 1 or 2 "isolated wetlands" of a total of ½ acre or less—**TBC**	Ohio General Permit for Filling Category 1 and Category 2 Isolated Wetlands (effective April 10, 2007)	X	X	Wetlands near the process buildings are low quality wetlands. Appropriate erosion and sediment controls will be in place to protect adjacent drainage ditches and storm sewer inlets. No further impacts to aquatic ecosystems are anticipated. Upon completion of sitewide D&D within Perimeter Road, any wetlands will be addressed in a mitigation plan.
			Aquatic Resources			
Location encompassing aquatic ecosystem as defined in 40 CFR 230.3(c)	Except as provided under Sect. 404(b)(2), no discharge of dredged or fill material into an aquatic ecosystem is permitted if there is a practicable alternative that would have less adverse impact on the aquatic ecosystem or if it will cause or contribute to significant degradation of the waters of the U.S.[a]	Action that involves discharge of dredged or fill material into waters of the United States—**applicable**	40 CFR 230.10 (a) and (c) *OAC* 3745-32-05	X	X	Wetlands near the process buildings are low quality wetlands. Appropriate erosion and sediment controls will be in place to protect adjacent drainage ditches and storm sewer inlets. No further impacts to aquatic ecosystems are anticipated.
	Except as provided under Sect. 404(b)(2), no discharge of dredged or fill material shall be permitted unless appropriate and practicable steps in accordance with the substantive provisions of 40 CFR 230.70 *et seq*. are taken that will minimize potential adverse impacts of the discharge on the aquatic ecosystem.		40 CFR 230.10(d) *OAC* 3745-32-05	X	X	See above.

Table A.1 Location-specific ARARs (Continued)

Location	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Location encompassing aquatic ecosystem as defined in 40 CFR 230.3(c) (continued)	Consideration of mitigation will occur throughout the activity and includes avoiding, minimizing, rectifying, reducing, or compensating for resource losses. Losses will be avoided to the extent practicable. Compensation may occur on site or at an off-site location. Mitigation requirements generally fall into three categories:	Action that involves discharge of dredged or fill material into waters of the United States—**applicable**	33 CFR 320.4 (r)(1)		X	See above.
	Minor project modifications considered feasible (cost, constructability, etc.) and that, if adopted, result in a project that generally meets the purpose and need.		33 CFR 320.4 (r)(1)(i)		X	See above.
Criteria for decision by director	The director shall evaluate the criteria in *OAC* 3745-32-05 and shall not issue a Section 401 water quality certification unless the director determines that the applicant has demonstrated that the discharge of dredged or fill material to waters of the state or the creation of any obstruction or alteration in waters of the state will not prevent or interfere with the attainment or maintenance of applicable water quality standards or not result in a violation of any applicable provision of sections of the Federal Water Pollution Control Act listed in *OAC* 3745-32-05(2).	Action that involves aquatic habitat alterations caused by an activity and associated construction disturbances that would result in the loss of an existing or designated stream use—**applicable**	*OAC* 3745-32-05		X	See above.

Table A.1 Location-specific ARARs (Continued)

Location	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Criteria applicable to all waters	Water quality criteria in *OAC* 3745-1-04 shall be applied to all surface waters of the state including mixing zones to every extent practical and possible as determined by the director.	Actions that may result in the lowering of water quality-applicable	*OAC* 3745-1-04		X	Appropriate controls and the continued maintenance of existing holding ponds and treatment systems will ensure that all wastewater discharged will result in receiving waters being free from floating debris, scum, discoloration, or sheen, or otherwise causing a nuisance. A wastewater treatment system for wastewater and stormwater runoff generated from demolition will treat wastewaters prior to discharge. This system is permitted through the NPDES permitting process, whereby limits have been established to maintain existing water quality.
			Cultural Resources			
Presence of archaeological resources	Must provide for the preservation of significant historical and archeological data which might otherwise be irreparably lost or destroyed as a result of any alteration of terrain caused as a result of any Federal construction project.	Federal agency construction or excavation projects that would cause the irreparable loss or destruction of significant historic or archeological resources or data—**applicable**	16 USC 469	X	X	Archaeological experts determined that all the area within Perimeter Road was significantly disturbed during plant construction, and demolition work inside Perimeter Road would have no impact on archaeological resources.
Presence of human remains, funerary objects, sacred objects, or objects of cultural patrimony for Native Americans	Must stop activities in the area of the discovery and take reasonable effort to secure and protect the objects discovered before resuming activity.	Federal agency construction or excavation activities that inadvertently discover Native American cultural items on Federal lands or lands under Federal control—**applicable**	25 USC 3002(d) 43 CFR 10.4 (c) and (d)(2)	X	X	Activities will immediately cease should human remains and/or Native American cultural items be inadvertently discovered. Work activities will recommence once object(s) have been secured and protected.

Table A.1 Location-specific ARARs (Continued)

Location	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Presence of historic properties	Federal agencies must take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion on the National Register.	Federal agency undertaking that may impact historic properties listed or eligible for inclusion on the National Register of Historic Places—**applicable**	16 USC 470f 36 CFR 800.1(a)	X	X	Mitigation measures to preserve historical data are taken through collection of artifacts and development of HAER photographs and documentation of selected PORTS facilities.
	Federal agencies must initiate measures to ensure that where, as a result of Federal action, historic property is to be substantially altered or demolished, timely steps are taken to make or have made appropriate records.	Substantial alteration or demolition of a historic property—**applicable**	16 USC 470h-2(b)	X	X	Mitigation measures to preserve historical data are taken through collection of artifacts and development of HAER photographs and documentation of selected PORTS facilities.

Notes:

[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.

PB ROD = DOE 2015, *Record of Decision for the Process Buildings and Complex Facilities Decontamination and Decommissioning Evaluation Project at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio*, DOE/PPPO/03-0425&D2, U.S. Department of Energy, Piketon, OH, July.

WD ROD = 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.

Wetland Mitigation Plan = *Wetland and Stream Compensatory Mitigation Plan at the Portsmouth Gaseous Diffusion Plant* (DOE 2022).

ARAR = applicable or relevant and appropriate requirement
CFR = Code of Federal Regulations
CWA = Clean Water Act of 1972
D&D = decontamination and decommissioning
DDP = demolition design plan
DOE = U.S. Department of Energy
HAER = Historic American Engineering Record
NPDES = National Pollution Discharge Elimination System
OAC = Ohio Administrative Code
PORTS = Portsmouth Gaseous Diffusion Plant
ORC = Ohio Revised Code
OSWDF = On-site Waste Disposal Facility
ROD = record of decision
TBC = to-be-considered (guidance)
USACE = U.S. Army Corps of Engineers
USC = United States Code

Table A.2. Action-specific ARARs

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
		Site Preparation, Construction, and Excavation Activities				
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	X	X	Control of emissions will be through water misting and/or the use of fixatives as appropriate and will be such that nuisance conditions do not occur.
	The operation of a hazardous waste facility shall not cause, permit, or allow the emission there from of any particulate matter, dust, fumes, gas, mist, smoke, vapor, or odorous substance that unreasonably interferes with the comfortable enjoyment of life or property by persons living or working in the vicinity of the facility or that is injurious to public health.	Site where hazardous waste will be managed such that air emissions may occur—**applicable**	ORC 3734.02(I)	X		N/A. The scope of work does not involve operation of a hazardous waste facility.
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)	X	X	Control of fugitive dust will be accomplished through water misting and/or the use of fixatives as appropriate. Application will be proactive to ensure unacceptable emissions of fugitive dust will not occur.
	• 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)	X	X	Control of fugitive dust will be accomplished through water misting and/or the use of fixatives as appropriate. Application will be proactive to ensure unacceptable emissions of fugitive dust will not occur.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Activities causing fugitive dust (particulate) emissions (continued)	• Periodic application of asphalt, oil (excluding used oil), water, or other suitable chemicals on dirt or gravel roads and parking lots, materials stockpiles, and other surfaces that 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)	X	X	Control of fugitive dust will be accomplished through water misting and/or the use of fixatives as appropriate. Application will be proactive to ensure unacceptable emissions of fugitive dust will not occur.
	• Install and use hoods, fans, and other equipment to adequately enclose, contain, capture, vent, and control the fugitive dust at the point(s) of capture to the extent possible with good engineering design. Equipment must meet the efficiency requirements of *OAC* 3745-17-08(B)(3)(a) and (b);		*OAC* 3745-17-08(B)(3)	X	X	The demolition of the remaining at- and below-grade structures of the X-326 Process Building is an open-air demolition activity. Capture and control of emissions related to demolition will not occur; rather, emissions related to demolition will be controlled through the application of water and/or fixatives. Emissions from the water treatment system supporting the demolition activities have been evaluated, and necessary controls are provided as identified in approved designs.
	• Use of adequate containment methods during sandblasting or similar operations;		*OAC* 3745-17-08(B)(5)	X	X	N/A. Sandblasting or similar operations are not expected to be used during demolition, but if used, adequate containment methods will be used.
	• Cover, at all times, open-bodied vehicles when transporting materials likely to become airborne;		*OAC* 3745-17-08(B)(7)	X	X	Debris from demolition activities will be loaded into vehicles for transfer to the OSWDF. Vehicle loads will be covered.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Activities causing fugitive dust (particulate) emissions (continued	• Pave and maintain roadways in a clean condition; and		*OAC* 3745-17-08(B)(8)	X	X	Dedicated haul routes for transferring demolition debris will be established. Paved roadways will be maintained in a clean condition and the application of fugitive dust measures will be implemented as necessary.
	• 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)	X	X	Paved roadways will be maintained in a clean condition and the application of fugitive dust measures will be implemented as necessary.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Airborne radionuclide emissions	Emissions of radionuclides to the ambient air from DOE facilities shall not exceed those amounts that would cause any member of the public to receive an EDE of 10 mrem per year.	Radionuclide air emissions to the ambient air from DOE facilities—**applicable**	40 CFR 61.92	X	X	The airborne radionuclide emissions for the demolition of the X-326 Process Building at- and below-grade structures are anticipated to be much less than those levels recorded during the X-326 Process Building above-grade demolition activities. The X-326 Process Building at- and below-grade demolition activities will utilize similar emissions mitigation approaches to other site demolition activities that have involved far greater quantities of residual radioactive materials which have been well-controlled and resulted in calculated radiological doses well below the 10 mrem/year standard. The dose contribution from the at- and below grade X-326 Process Building demolition activities will not adversely impact DOE's ability to comply with the 10 mrem/year standard. The application of fugitive dust controls discussed above will minimize impacts to workers.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Air emissions from process vents in treatment of VOC contaminated water	Except as provided in paragraphs (C), (D) and (H) of *OAC* 3745-15-05 and division (B) of section 3704.011 of the Revised Code, any air contaminant source is exempt from Chapter 3704 of the Revised Code and rules adopted thereunder, unless the potential emissions of any one of the following exceeds 10 lb/day: particulate matter, sulfur dioxide, nitrogen oxides, organic compounds, carbon monoxide, lead or any other air contaminant.	Air emissions from an air contaminant source—**applicable**	*OAC* 3745-15-05(B)		X	VOCs are not a significant COC related to the at- and below-grade X-326 Process Building demolition. Estimates have been made of potential VOC emissions and those emissions are considered de minimis, and therefore, no specific controls for VOCs have been designed for the demolition of the remaining at- and below-grade structures of the X-326 Process Building or the impacted water treatment system.
Radiation protection of the public and the environment	Except as provided in 458.1(4)(b)(1)(c), exposure to individual members of the public from radiation shall not exceed a total EDE of 0.1 rem/year (100 mrem/year), exclusive of the dose contributions from background radiation, any medical administration the individual has received, or voluntary participation in medical/research programs.	Radionuclide emissions from all exposure modes from all DOE activities (including remedial actions) at a DOE facility—**TBC**	DOE Order 458.1(4)(b) and (c)	X	X	Based on emissions experience with the X-326 Process Building above-grade demolition, demolition actions for the at- and below-grade structures of the X-326 Process Building will remain protective of the public, human health, and the environment. Ambient environmental monitoring activities will continue, and project-specific air monitoring will be conducted. The application of fugitive dust controls discussed above (under Activities causing fugitive dust [particulate] emissions) will minimize impacts to workers and the public.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Radiation protection of the public and the environment (continued)	Shall use, to the extent practicable, procedures and engineering controls based on sound radiation protection principles to achieve doses to members of the public that are ALARA.		DOE Order 458.1(4)(d)	X	X	Emissions from the demolition activities will be controlled through the application of water and/or fixatives and the wastewater and stormwater will be captured and undergo specific treatment to meet discharge criteria. These control efforts will ensure the dose to members of the public will be ALARA. Ambient environmental monitoring activities will also continue.
	Except as provided in *OAC* 3701:1-38-13(C), exposure to individual members of the public from radiation shall not exceed 1 mSv (0.1 rem) in a year, exclusive of the dose contributions from background radiation, any medical administration the individual has received, or voluntary participation in medical/research programs.	Conducting operations that release radioactivity—**relevant and appropriate**	*OAC* 3701:1-38-13 (A)(1)		X	See above.
	The dose in any unrestricted area from external sources, exclusive of the dose contribution from patients administered radioactive material and released in accordance with *OAC* 3701:1-58-30 or equivalent U.S. nuclear regulatory agency or agreement state regulations, shall not exceed 0.02 mSv (0.002 rem) in any 1 hour.		*OAC* 3701:1-38-13 (A)(2)		X	See above.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
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)		X	Demolition debris is considered to be LLW. Controls will be applied during demolition, debris staging, and debris transportation and during disposal operations. The expected dose to a member of the public will be well below the 25 mrem/year TED.
Activities causing stormwater runoff (e.g., demolition)	Dischargers must utilize best management practices to control pollutants in stormwater discharges during and after construction, which may include, as appropriate, soil stabilization practices (e.g., seeding), perimeter structural practices (e.g., gabions, silt fences, sediment traps), and stormwater management devices as detailed in Part III.G.2 ("Controls") of NPDES OHC000005.	Stormwater runoff discharges from land disturbed by construction activity—disturbance of ≥ 1 acre total, except where otherwise exempt as specified in 40 CFR 122.26(b)(15)—**applicable**	Authorization for Stormwater Discharges Associated with Construction Activity under NPDES OHC000005, Part III.G.2	X	X	Existing storm sewer systems and ponds will be maintained in service in those X-326 Process Building support areas. Practices such as inlet protection and erosion and sediment controls will be provided during the construction and operation of support areas. Compliance with the established NPDES effluent limits at the ponds will continue. During demolition, stormwater runoff will be collected, treated, and discharged in compliance with an individual NPDES permit covering such discharges.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
		Waste Generation, Characterization, and Segregation				
Characterization of solid waste	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)	X	X	Information for the characterization of waste destined for on-site or off-site disposal will first be based on process knowledge and/or available historic data. 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 (e.g., not compliant with OSWDF WAC). LDR status will be determined for hazardous waste shipped off-site for treatment or disposal.
	Must determine if solid waste is listed as a hazardous waste in 40 CFR 261 [*OAC* 3745-51-30 to 3745-51-35]	Generation of solid waste that is not excluded under 40 CFR 261.4—**applicable**	40 CFR 262.11(b) *OAC* 3745-52-11(B)	X	X	
	Must determine whether the waste is identified in Subpart C of 40 CFR 261 [*OAC* 375-51-20 to 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 in 40 CFR 261 and not excluded under 40 CFR 261.4—**applicable**	40 CFR 262.11(c) *OAC* 3745-52-11(C)	X	X	
	Must refer to Parts 261, 262, 264, 265, 266, 268, and 273 of Chapter 40 [*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)	X	X	

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
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 that 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)	X	X	Information for the characterization of waste destined for on-site or off-site disposal will first be based on process knowledge and/or available historic data. 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. All waste destined for on-site disposal will be characterized. It is anticipated that process knowledge will be satisfactory to characterize the waste, consistent with EPA 2015 guidance "Waste Analysis at Facilities that Generate, Treat, Store, and Dispose of Hazardous Waste – Final," which states that a facility may apply acceptable knowledge of the waste in lieu of testing the waste.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
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)	X	X	Disposal of waste on-site will be based on compliance with OSWDF WAC. If off-site shipment of waste is required, then treatment standards will be evaluated as well as disposal facility WAC. All waste destined for on-site disposal will be characterized. It is anticipated that process knowledge will be satisfactory to characterize the waste, consistent with EPA 2015 guidance "*Waste Analysis at Facilities that Generate, Treat, Store, and Dispose of Hazardous Waste – Final*," which states that a facility may apply acceptable knowledge of the waste in lieu of testing the waste.
	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)		X	N/A. No on-site hazardous waste treatment is included in the scope.
	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)	X	X	Per current procedures, all waste is evaluated based on process knowledge or analytical characterization to determine applicable hazardous waste codes.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
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)	X	X	Per current procedures, all hazardous waste is evaluated based on process knowledge or analytical characterization to determine underlying hazardous constituents.
	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)	X	X	Per current procedures, all hazardous waste is evaluated based on process knowledge or analytical characterization to determine all applicable codes for characteristic wastes.
Characterization and management of wastewater (e.g., decontamination water)	On-site wastewater treatment units (including tank systems, conveyance systems, and ancillary equipment used to treat, store, or convey wastewater to the wastewater treatment facility) are exempt from the requirements of RCRA Subtitle C standards.	On-site wastewater treatment units subject to regulation under Section 402 or Section 307(b) of the CWA—**applicable**	40 CFR 264.1(g)(6) *OAC* 3745-54-01(G)(6)	X	X	All discharge of wastewater or stormwater will be in compliance with the existing (or modified) NPDES permit or it will be demonstrated the discharge will comply with water quality standards pursuant to *OAC* 3745-1.
Characterization and management of industrial wastewater	Industrial wastewater discharges that are point source discharges under Section 402 of the CWA, as amended, are not solid wastes for purpose of hazardous waste management.	Generation of industrial wastewater for discharge—**applicable**	40 CFR 261.4(a)(2) *OAC* 3745-51-04(A)(2)	X	X	All discharge of wastewater or stormwater will be in compliance with the existing (or modified) NPDES permit or it will be demonstrated the discharge will comply with water quality standards pursuant to *OAC* 3745-1.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Characterization of LLW	Shall be characterized using direct or indirect methods and the characterization documented in sufficient detail to ensure safe management and compliance with the WAC of the receiving facility.	Generation of LLW for storage or disposal at a DOE facility—**TBC**	DOE M 435.1-1 (IV)(I)	X	X	The at- and below-grade structures demolition debris has been characterized as LLW based on process knowledge. Sampling will be used as necessary to meet WAC and transportation needs.
	Characterization data shall, at a minimum, include the following information relevant to the management of the waste:		DOE M 435.1-1 (IV)(I)(2)	X	X	Volumes, weights, containers (if used), and radionuclide content will be determined and documented based on the WAC Implementation Plan, OSWDF O&M Plan, or the off-site disposal facility requirements.
	• Physical and chemical characteristics;		DOE M 435.1-1 (IV)(I)(2)(a)	X	X	Demolition debris will be size-reduced in accordance with the OSWDF IMPP. Additional details related to the types of debris generated are found in Section 5 of this At- and Below-grade DDP.
	• Volume, including the waste and any stabilization or absorbent media;		DOE M 435.1-1 (IV)(I)(2)(b)	X	X	A waste volume estimate is included in the project descriptions of this At- and Below-grade DDP.
	• Weight of the container and contents;		DOE M 435.1-1 (IV)(I)(2)(c)	X	X	Demolition debris will be direct loaded into dump trucks. Each truck will be weighed to yield the weight of the debris being delivered to the OSWDF as well as to ensure safe transportation. The use of containers will be minimized, but if used, tare and total weights of the containers will be recorded.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Characterization of LLW (continued)	• Identities, activities, and concentrations of major radionuclides;		DOE M 435.1-1 (IV)(I)(2)(d)	X	X	The primary radionuclides expected to be present in the remaining slab and berm materials are addressed in Section 5.2.1, Pre-mobilization –Waste Stream Planning, of the X-326 At- and Below-grade DDP. During demolition activities, waste types will be sampled to confirm radiological content to support OSWDF WAC certification.
	• Characterization date;		DOE M 435.1-1 (IV)(I)(2)(e)	X	X	The characterization date will be documented in waste acceptance documentation.
	• Generating source; and		DOE M 435.1-1 (IV)(I)(2)(f)	X	X	The generating source is the D&D of the remaining at- and below-grade structures of the X-326 Process Building.
	• Any other information that 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)	X	X	Information to ensure safe and compliant disposal at the OSWDF will be that required by the OSWDF O&M Plan.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Packaging of solid LLW for storage (e.g., radioactively contaminated debris)	Shall be packaged in a manner that provides containment and protection for the duration of the anticipated storage period and until disposal is achieved or until the waste has been removed from the container.	Storage of LLW in containers at a DOE facility—**TBC**	DOE M 435.1-1 (IV)(L)(1)(a)	X	X	If the need arises for outdoor storage of these wastes, then the waste will be stored in the appropriate containers and sealed to prevent precipitation in-leakage. Off-site shipments of waste will be in appropriate containers and will comply with all applicable DOT and DOE regulations.
	Vents or other measures shall be provided if the potential exists for pressurizing or generating flammable or explosive concentrations of gases within the waste container. Containers shall be marked such that their contents can be identified.		DOE M 435.1-1 (IV)(L)(1)(b) and (c)	X	X	See above.
Segregation of scrap metal for recycle	Material is not subject to RCRA requirements for generators, transporters, and storage facilities under 40 CFR Parts 262 through 266, 268, 270, or 124 [*OAC* 3745-50-40 to 3745-50-235 or 3745-52, 3745-53, 3745-54 to 3745-57, 3845-65 to 3745-69, 3745-205, 3745-256, 3745-266, and 3745-270].	Scrap metal, as defined in 40 CFR 261.1(c)(6) intended for recycle—**applicable**	40 CFR 261.6 (a)(3)(ii) *OAC* 3745-51-06 (A)(3)(b)	X	X	Scrap metal to be evaluated for recycling will be segregated from other waste and placed in a clearly defined area to ensure proper evaluation.
Management of recyclable materials for precious metal recovery	Recyclable materials being collected, transported, or stored that are being reclaimed to recover economically significant amounts of gold, silver, platinum, palladium, iridium, osmium, rhodium, ruthenium, or any combination of these must be managed in accordance with the substantive requirements of *OAC* 3745-266-70.	Management of recyclable materials for precious metal recovery—**applicable**	*OAC* 3745-266-70	X	X	Recycling of scrap metal will be by a facility appropriately vetted for environmental performance and licensed. It is not expected that precious metals will be discovered in economically significant amounts.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Management of spent lead-acid batteries being reclaimed	Spent lead-acid batteries being collected, transported, and stored prior to regeneration must be managed in accordance with particular hazardous waste requirements depending on permit status and whether they are being reclaimed through regeneration or in other ways. Management options are detailed in 40 CF*R* 266.80 [*OAC* 3745-266-80]. Spent lead-acid batteries can also be managed as universal wastes under 40 CFR 273 [*OAC* 3745-273].	Management of spent lead-acid batteries being reclaimed—**applicable**	40 CFR 266.80 *OAC* 3745-266-80	X	X	All spent lead-acid batteries will be shipped off-site for recycling or disposal. Spent lead-acid batteries with radiological contamination will be managed as mixed waste and shipped off-site for disposal.
Decontamination of radioactively contaminated equipment and building structures	Property potentially containing residual radioactive material must not be released or cleared from DOE control unless it is either demonstrated not to contain residual radioactive material based on process and historical knowledge, radiological monitoring or surveys, or a combination of these; or the property is evaluated and appropriately monitored or surveyed in accordance with DOE Order 458.1(4)(k)(3)(b).	Residual radioactive material on equipment and building structures intended for unrestricted use—**TBC**	DOE Order 458.1 (4)(k)(3)	X	X	Release of contaminated property, if appropriate, will be consistent with DOE Order 458.1. Knowledge of the property is considered, and radiological surveys meet the requirement of the Order.
Release of radiological materials or scrap metal for reuse	Before being released, property shall be monitored or surveyed to determine the types and quantities of residual radioactive material within the property; the quantities of removable and total residual radioactive material on property surfaces (including residual radioactive material on or under any coating); and, that contamination within or on the property is in compliance with applicable DOE Authorized Limits of DOE Order 458.1(4)(k)(6).	Radionuclide-contaminated materials and equipment intended for recycle or reuse—**TBC**	DOE Order 458.1 (4)(k)(3)(b)(1)–(2) and (4)	X	X	Release of contaminated property, if appropriate, will be consistent with DOE Order 458.1. Knowledge of the property is considered, and radiological surveys meet the requirements of the Order.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Release of radiological materials or scrap metal for reuse (continued)	Where potentially contaminated surfaces are difficult to access for measurement (as in some pipes, drains, and ductwork), such property may be released after case-by-case evaluation and documentation based on both the history of its use and available measurements sufficient to demonstrate that surfaces that cannot be surveyed will not exceed DOE Authorized Limits.		DOE Order 458.1 (4)(k)(3)(b)(3)	X	X	Release of contaminated property, if appropriate, will be consistent with DOE Order 458.1. Knowledge of the property is considered, and radiological surveys meet the requirements of the Order.
Torch cutting of metal coated with paint that may contain PCBs	No person may openly burn PCBs. CMBST of PCBs by incineration as approved under Section 761.60(a) or (e), or otherwise allowed under Part 761, is not open burning.	Management of PCB waste for storage or disposal—**applicable**	40 *CFR* 761.50(a)(1)	X	X	Burning of PCBs will not be conducted. The use of cutting torches on equipment containing PCBs or having paint containing PCBs will not be allowed.
Management of PCB items	Any person removing from use a PCB Item containing an intact and nonleaking PCB article must dispose of it in accordance with Section 761.60(b), or decontaminate it in accordance with Section 761.79. PCB Items where the PCB Articles are no longer intact and nonleaking are regulated for disposal as PCB bulk product waste under Section 761.62(a) or (c).	Management of PCB waste for storage or disposal—**applicable**	40 CFR 761.50(b)(2)	X		PCB items are not expected to be encountered during this demolition project. However, if PCB items are encountered and are determined to be compliant with OSWDF WAC they will be processed with the other demolition debris as PCB remediation waste.
Demolition of a facility containing RACM	Remove all RACM from the facility before demolition and follow the procedures for asbestos emission control and RACM handling as appropriate and detailed in 40 CFR 61.145(c)(1) through (7) [*OAC* 3745-20-04(A)(1) through (7)].	Demolition of a facility that contains RACM exceeding the volume requirements of 40 CFR 61.145(a)(1) [*OAC* 3745-20-02(B)]—**applicable**	40 CFR 61.145(a)(1) *OAC* 3745-20-04(A)(1)	X		Asbestos abatement activities were completed during deactivation. All remaining ACM is considered as Category I or II nonfriable asbestos.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Demolition of a facility containing RACM (continued)	RACM need not be removed before demolition if: • It is Category I nonfriable ACM that is not in poor condition and is not friable;		40 CFR 61.145 (c)(1)(i) *OAC* 3745-20-04 (A)(1)(a)	X		Category I and II nonfriable ACM that is not practical to remove and has low potential for fiber release may be left in place for demolition and disposal at the OSWDF. The friability determination is based on process knowledge and the definition of friability, which is crumbled, pulverized, or reduced to powder by hand pressure.
	• It is on a facility component that is encased in concrete or other similarly hard material and is adequately wet whenever exposed during demolition;		40 CFR 61.145 (c)(1)(ii) *OAC* 3745-20-04 (A)(1)(b)	X		See above.
	• It is not accessible for testing and was, therefore, not discovered until after demolition began and, as a result of the demolition, the material cannot be safely removed (exposed RACM and asbestos-contaminated debris must be adequately wet at all times); or		40 CFR 61.145 (c)(1)(iii) *OAC* 3745-20-04 (A)(1)(c)	X		See above.
	• It is Category II nonfriable ACM and the probability is low that the materials will become crumbled, pulverized, or reduced to powder during demolition.		40 CFR 61.145 (c)(1)(iv) *OAC* 3745-20-04 (A)(1)(d)	X		See above.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
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 transportation of any ACM waste 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)	X	X	Adequate wetting of ACM will be applied to ensure no visible emissions.
	For facilities demolished where the RACM is not removed prior to demolition according to §§61.145(c)(i) – (iv) [*OAC* 3745-20-04(A)(1) or (D)], adequately wet ACM at all times after demolition and keep wet during handling and loading for transport. Such ACM does not have to be sealed in leak-tight containers or wrapping, but may be transported and disposed of in bulk in leak-tight transport vehicles that are securely covered or enclosed and cause no visible emissions.		40 CFR 61.150(a)(3) *OAC* 3745-20-05(B)(2)	X		See above.
	As applied to demolition and renovation, the requirement of 40 CFR 61.150(a) [*OAC* 3745-20-05(B) and (C)] do not apply to Category I or II nonfriable ACM that has not been crumbled, pulverized, or reduced to powder.		40 CFR 61.150(a)(5) *OAC* 3745-20-05(B)(5)	X		See above.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Management of ACM prior to disposal (continued)	All ACM waste shall be deposited as soon as practicable at a WD site operated in accordance with the provisions of 40 CFR 61.154 [*OAC* 3745-20-06] or an EPA-approved site that converts RACM and ACM waste into nonasbestos (asbestos-free) materials according to the provisions of 40 *CFR* 61.155 [*OAC* 3745-20-13].		40 CFR 61.150 (b)(1) - (2) *OAC* 3745-20-05(A)	X	X	Adequate wetting of ACM will be applied to ensure no visible emissions. ACM wastes will be packaged as required in the OSWDF IMPP.
	The requirements of 40 CFR 61.150(b)(1) and (2) do not apply to Category I nonfriable ACM that is not RACM.		40 CFR 61.150(b)(3)	X	X	See above.
Characterization and management of universal waste	A large quantity handler of universal waste is prohibited from disposing, diluting, or treating universal waste except in accordance with 40 CFR 273 [*OAC* 3745-273-33 or 3745-273-37].	Generation of universal waste [as defined in 40 CFR 273 and *OAC* 3745-273] for disposal—**applicable**	40 CFR 273.31 *OAC* 3745-273-31	X		Segregatable universal waste will be removed and dispositioned as required. Limited quantities of universal waste that cannot be segregated will become part of a heterogeneous demolition waste stream for on-site disposal. No universal wastes are known to be present in the materials to be demolished.
	A large quantity handler 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.		40 CFR 273.33 *OAC* 3745-273-33(A)	X	X	See above.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Characterization and management of universal waste (continued)	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. 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.	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)		X	See above.
	A large quantity handler of universal waste pesticide must contain the pesticide in a container that remains closed, structurally sound, compatible with the pesticide, and that lacks evidence of leakage, spillage, or damage that could cause leakage under reasonably foreseeable conditions. A leaking pesticide container must be put into an overpack container, tank, or transport container, as detailed in 40 *CFR* 273.33(b) [*OAC* 3745-273-33(B)].	Generation of universal waste pesticides [as defined in 40 *CFR* 273.9 and *OAC* 3745-273-03] — **applicable**	40 *CFR* 273.33(b) *OAC* 3745-273-33 (B)(1) – (4)		X	N/A. Large quanities of universal waste pesticides are not expected to be generated.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Characterization and management of universal waste (continued)	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. 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.	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)		X	DOE believes that all mercury-containing equipment has been removed during deactivation. However, if mercury-containing equipment is encountered during demolition and can be safely retrieved, it will be packaged for off-site disposition.
	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)		X	See above.
	Must label or mark the universal waste to identify the type of universal waste.		40 CFR 273.34 *OAC* 3745-273-34	X	X	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)		X	See above.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Characterization and management of universal waste (continued)	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)		X	N/A. Large quanities of universal waste pesticides are not expected to be generated.
	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)		X	N/A. Mercury-containing equipment was removed during the deactivation phase of work conducted in the X-326 Process Building and is not expected to be encountered during the at- and below-grade demolition activities.
	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)		X	See above.
	May accumulate waste for no longer than 1 year from the date the waste is generated or received from 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)	X	X	See above.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Characterization and management of universal waste (continued)	May accumulate universal waste for longer than 1 year from the date the universal 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)	X	X	See above.
	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	X	X	See above.
	A large quantity handler of universal waste 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	X	X	DOE removed and dispositioned universal wastes off site during the deactivation of the building. If additional universal wastes are generated during the demolition activities they will be packaged and dispositioned off site in compliance with applicable requirements.
	Must keep a record of each shipment of universal waste received and sent from the facility and retain record for at least 3 years. Record must include waste handler, shipper, or destination facility name and address, quantity and type of waste, and date shipment left or was received at facility.		40 CFR 273.39 *OAC* 3745-273.39	X	X	Appropriate records of universal waste shipments will be maintained.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Management of universal waste lamps (fluorescent, mercury vapor)	A large quantity handler of universal waste must contain any lamp in containers or packages that are structurally sound, adequate to prevent breakage, and compatible with the contents of the lamps. 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.	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)	X	X	DOE removed and dispositioned universal wastes off site during the deactivation of the building. If additional universal wastes are generated during the demolition activities they will be packaged and dispositioned off site in compliance with applicable requirements.
	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)	X	X	See above.
	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)	X	X	See above.
	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)	X	X	See above.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
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)	X	X	See above.
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)	X	X	Used oil will be stored only in appropriate tanks and/or containers.
	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)	X	X	Used oil will be stored only in appropriate tanks and/or containers. Tanks and containers will be of appropriate quality. Leaking containers will be over-packed, or contents will be transferred to another nonleaking container.
	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)	X	X	Used oil containers will be labeled as appropriate.
	Upon detection of a release of used oil to the environment, a generator must stop the release; contain, cleanup, and properly manage the released used oil; and, if necessary, repair or replace any leaking used oil storage containers or tanks prior to returning to service.	Release of used oil to the environment—**applicable**	40 CFR 279.22(d) *OAC* 3745-279-22(D)	X	X	Spills and releases of used oil to the environment will be contained and cleaned up. Leaking tanks and containers will be either repaired or removed from service.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
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)		X	Used oils that are determined to be hazardous and cannot be recycled will be managed in accordance with the hazardous waste management requirements.
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)		X	Used oils that are not hazardous waste will be managed and disposed of as solid waste.
Management of PCB waste	Any person storing or disposing of PCB waste must do so in accordance with 40 CFR 761, Subpart D.	Storage or disposal of waste containing PCBs at concentrations ≥ 50 ppm—**applicable**	40 CFR 761.50(a)	X	X	D&D debris will be managed as PCB remediation waste and will be managed in compliance with alternative storage and processing approaches. Controls, as described in this DDP will ensure there is no spread of PCB contamination.
	Any person cleaning up and disposing of PCBs shall do so based on the concentration at which the PCBs are found.	Cleanup or disposal of PCB remediation waste as defined in 40 CFR 761.3—**applicable**	40 CFR 761.61	X	X	PCB waste will be categorized and managed consistent with the as-found concentrations.
Cleanup of new PCB spills	Spills shall be cleaned up in accordance with 40 CFR 761, Subpart G, "PCB Spill Cleanup Policy." This policy does not apply to existing spills (old spills which occurred prior to May 4, 1987).	Release into the environment of materials containing PCBs at ≥ 50 ppm, which occurs after May 4, 1987—**applicable**	40 CFR 761.125		X	Spills of materials containing PCBs at ≥ 50 ppm will be cleaned up in compliance with the PCB Spill Cleanup Policy.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Cleanup of new PCB spills (continued)	There may be exceptional spill situations that require less stringent cleanup, or a different approach to cleanup because of factors associated with the particular spill. These factors may mitigate expected exposures and risks or make cleanup to these requirements impracticable.		40 CFR 761.120(a)(4)		X	The cleanup of spills will take into account the spill location and the status of the location relative to ongoing remediation activities.
Decontamination of PCB-contaminated materials prior to use, reuse, distribution in commerce, or disposal as a non-TSCA waste	Chopping (including wire chopping), distilling, filtering, oil/water separation, spraying, soaking, wiping, stripping of insulation, scraping, scarification or the use of abrasives or solvents may be used to remove or separate PCBs to the decontamination standards for liquids, concrete, or nonporous surfaces, as listed in 40 *CFR* 761.79(b).	Generation of PCB wastes, including water, organic liquids, nonporous surfaces (scrap metal from disassembled electrical equipment), concrete, and nonporous surfaces covered with porous surfaces, such as paint or coating on metal—**applicable**	40 *CFR* 761.79(b)	X	X	Water from decontamination of PCB-contaminated equipment or surfaces will be collected for treatment. Contaminated media will be disposed.
Decontamination of water containing PCBs to levels acceptable for discharge	For water discharged to a treatment works or to navigable waters, decontaminate to < 3 µg/L (approximately < 3 ppb) or a PCB discharge limit included in a permit issued under Section 304(b) or 402 of the CWA; or	Discharge of water containing PCBs to a treatment works or navigable waters—**applicable**	40 CFR 761.79 (b)(1)(ii)	X	X	PCB-contaminated wastewater and stormwater will be treated and discharged in compliance with the site NPDES permit, or it will be demonstrated the discharge will comply with water quality standards pursuant to *OAC* 3745-1.
Decontamination of water containing PCBs to levels acceptable for unrestricted use	Decontaminate to ≤ 0.5 µg/L (approximately ≤ 0.5 ppb) for unrestricted use.	Release of water containing PCBs for unrestricted use—**applicable**	40 CFR 761.79 (b)(1)(iii)	X	X	See above.
Decontamination of organic liquids or nonaqueous inorganic liquids containing PCBs	For organic liquids or nonaqueous inorganic liquids containing PCBs, decontamination standard is < 2 mg/kg (i.e., < 2 ppm) PCBs.	Release of organic liquids or nonaqueous liquid containing PCBs—**applicable**	40 *CFR* 761.79(b)(2)	X	X	N/A. Decontamination of PCB contaminated liquids is not expected to be performed. Wastewater treatment is conducted in the X-622-1 Water Treatment Facility.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Decontamination of nonporous surfaces in contact with liquid PCBs to levels acceptable for unrestricted use	For nonporous surfaces previously in contact with liquid PCBs at any concentration, where no free-flowing liquids are currently present, ≤ 10 µg PCBs per 100 square centimeters (≤ 10 µg/100 cm^2) as measured by a standard wipe test (40 *CFR* 761.123) at locations selected in accordance with Subpart P of 40 *CFR* 761.	Release of nonporous surfaces in contact with liquid PCBs at any concentration for unrestricted use—**applicable**	40 *CFR* 761.79 (b)(3)(i)(A)	X	X	PCB-contaminated wastes will be disposed of in the OSWDF in compliance with established WAC. PCB-contaminated equipment released from the work activities for unrestricted use will meet the identified standard.
Decontamination of nonporous surfaces in contact with nonliquid PCBs to levels acceptable for unrestricted use	For nonporous surfaces in contact with nonliquid PCBs (including nonporous surfaces covered with a porous surface, such as paint or coating on metal), clean to Visual Standard No. 2, Near-White Blast Cleaned Surface Finish of the NACE. A person shall verify compliance with standard No. 2 by visually inspecting all cleaned areas.	Release of nonporous surfaces in contact with nonliquid PCBs for unrestricted use—**applicable**	40 *CFR* 761.79 (b)(3)(i)(B)	X	X	See above.
Decontamination of nonporous surfaces in contact with liquid PCBs to levels acceptable for disposal in a TSCA smelter	For nonporous surfaces previously in contact with liquid PCBs at any concentration, where no free-flowing liquids are currently present, decontaminate to < 100 µg/ 100 cm^2 as measured by a standard wipe test (Section 761.123) at locations selected in accordance with Subpart P of 40 *CFR* 761.	Disposal of nonporous surfaces previously in contact with liquid PCBs at any concentration into a smelter operating in accordance with Section 761.72(b)—**applicable**	40 *CFR* 761.79 (b)(3)(ii)(A)	X	X	N/A. Decontamination and release of PCB-contaminated equipment or a surface for smelter disposal is not expected to be performed. PCB-contaminated wastes will be disposed in the OSWDF in a compliance with established WAC.
Decontamination of nonporous surfaces in contact with nonliquid PCBs to levels acceptable for disposal in a TSCA smelter	For nonporous surfaces in contact with nonliquid PCBs (including nonporous surfaces covered with a porous surface, such as paint or coating on metal) clean to Visual Standard No. 3, Commercial Blast Cleaned Surface Finish, of the NACE. A person shall verify compliance with Standard No. 3 by visually inspecting all cleaned areas.	Disposal of nonporous surfaces in contact with nonliquid PCBs into a smelter operating in accordance with Section 761.72(b) —**applicable**	40 *CFR* 761.79 (b)(3)(ii)(B)	X	X	N/A. Decontamination and release of PCB-contaminated equipment or a surface for unrestricted use is not expected to be performed. PCB-contaminated wastes will be disposed in the OSWDF in a compliance with established WAC.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Decontamination of concrete recently contaminated with PCBs	Decontamination standard for concrete is < 10 µg/100 cm^2 as measured by a standard wipe test (Section 761.123) if the decontamination procedure is commenced within 72 hours of the initial spill of PCBs to the concrete or portion thereof being decontaminated.	Decontamination of concrete within 72 hours of the initial spill of PCBs to the concrete—**applicable**	40 *CFR* 761.79(b)(4)	X	X	N/A. Decontamination of PCB-contaminated equipment or surfaces is not expected to be performed. PCB-contaminated wastes will be disposed in the OSWDF in a compliance with established WAC.
Disposal of materials previously contaminated with PCBs as non-TSCA waste	Materials from which PCBs have been removed by decontamination in accordance with 40 CFR 761.79, not including decontamination wastes and residuals under 40 CFR 761.79(g), are considered unregulated for disposal under Subpart D of TSCA (40 CFR 761).	Disposal of materials from which PCBs have been removed—**applicable**	40 CFR 761.79(a)(4)	X	X	Disposal of waste may be on-site or off-site in accordance with disposal facility WAC.
Risk-based decontamination of PCB-containing materials	May decontaminate to an alternate risk-based decontamination standard under 40 *CFR* 761.79(h) if the standard does not pose an unreasonable risk of injury to health or the environment.	Decontamination of materials contaminated with PCBs—**applicable**	40 *CFR* 761.79(h)	X	X	N/A. It is not anticipated to impose any alternate based decontamination. PCB-contaminated wastes will be disposed in compliance with established WAC.
Management of PCB/radioactive waste	Any person storing such waste ≥ 50 ppm PCBs must do so taking into account both its PCB concentration and radioactive properties, except as provided in 40 CFR 761.65(a)(1), (b)(1)(ii) and (c)(6)(i).	Generation of PCB/ radioactive waste for disposal—**applicable**	40 CFR 761.50 (b)(7)(i)	X	X	D&D debris will be managed as PCB remediation waste and will be managed in compliance with alternative storage and processing approaches. Controls, as described in this DDP, will ensure there is no spread of PCB contamination.
	Any person disposing of such waste must do so taking into account both its PCB concentration and its radioactive properties.		40 CFR 761.50 (b)(7)(ii)	X	X	Disposal of PCB waste will be in accordance with disposal facility WAC. Off-site disposal would be at an appropriately licensed and permitted facility.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Management of PCB/radioactive waste (continued)	If, after taking into account only the PCB properties in the waste, the waste meets the requirements for disposal in a facility permitted, licensed, or registered by a state as a municipal or nonmunicipal nonhazardous waste landfill, then the person may dispose of such waste without regard to the PCBs, based on its radioactive properties alone.		40 CFR 761.50 (b)(7)(ii)	X	X	D&D debris will be managed as PCB remediation waste and will be managed in compliance with alternative storage and processing approaches. Controls, as described in this DDP, will ensure there is no spread of PCB contamination.
Handling of regulated materials associated with a UST site	The handling, transportation, and disposal of any regulated substance removed from a UST system, regulated soil, backfill materials, ground water, wash water, or other similar materials removed from the system or facility shall be managed in accordance with all applicable federal, state, and local regulations in effect for the type, volume, constituent concentration, and classification of the material.	Out of Service, Closure in Place, Permanent Removal, Change in Service, and Closure Assessment of UST Systems—**applicable**	*OAC* 1301:7-9-12(C)	X		The one UST associated with the X-326 Process Building was removed during the previous above-grade demolition activities.
Removing a UST from service for greater than 90 days	Remove the contents of the UST such that there is no more than 1 in. of residue or 0.3 percent by volume of the total capacity of the UST system. Ensure all vent lines remain open and functioning. Cap and secure all other lines, pumps, manways, and ancillary equipment.	Out of Service, Closure in Place, Permanent Removal, Change in Service, and Closure Assessment of UST Systems—**applicable**	*OAC* 1301:7-9-12 (E)(3)(a-c)	X		See above.
Permanent removal of a UST system	The UST shall be maintained in a safe condition to ensure that an accumulation of explosive vapors does not occur.	Out of Service, Closure in Place, Permanent Removal, Change in Service, and Closure Assessment of UST Systems—**applicable**	*OAC* 1301:7-9-12 (G)(1)(c)	X		See above.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Closure Assessment of UST systems	Perform a visual site evaluation of the UST site to identify all evidence of past or present operational problems.	Out of Service, Closure in Place, Permanent Removal, Change in Service, and Closure Assessment of UST Systems—**applicable**	*OAC* 1301:7-9-12 (I)(2)(a)	X		See above.
	Perform soil sampling biased towards the areas of greatest suspected contamination.	Out of Service, Closure in Place, Permanent Removal, Change in Service, and Closure Assessment of UST Systems—**applicable**	*OAC* 1301:7-9-12 (I)(2)(b)(i-v)	X		See above.
	Remove water from the UST excavation, dispose in an appropriate manner, and conduct water sampling if water cannot be evacuated or recharge occurs.	Out of Service, Closure in Place, Permanent Removal, Change in Service, and Closure Assessment of UST Systems—**applicable**	*OAC* 1301:7-9-12 (I)(2)(c)	X		See above.
	All samples collected shall be sent to an accredited laboratory for analysis.	Out of Service, Closure in Place, Permanent Removal, Change in Service, and Closure Assessment of UST Systems—**applicable**	*OAC* 1301:7-9-12 (I)(2)(d)	X		See above.
	Contaminants of concern are determined based on the analytical group pursuant to *OAC* 1301:7-9-13(H)(1)(c).	Out of Service, Closure in Place, Permanent Removal, Change in Service, and Closure Assessment of UST Systems—**applicable**	*OAC* 1301:7-9-12 (I)(3)(a)	X		See above.
	Action level development and comparison; requires action level assumptions to include soils being class 1 soils, that groundwater exists and is used for drinking water; and the final land use will be residential.	Out of Service, Closure in Place, Permanent Removal, Change in Service, and Closure Assessment of UST Systems—**applicable**	*OAC* 1301:7-9-12 (I)(4)(a)	X		See above.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Closure Assessment of UST systems (continued)	Action level development and comparison; requires action level determinations for analytical groups 1, 2, and 3 pursuant to *OAC* 1301:7-9-13(H)(1)(c) to be obtained from Table 1 of *OAC* 1301:7-9-12(I)(4)(b)(i).	Out of Service, Closure in Place, Permanent Removal, Change in Service, and Closure Assessment of UST Systems—**applicable**	*OAC* 1301:7-9-12 (I)(4)(b)(i)	X		See above.
	Action level development and comparison. If the analytical results exceed the action levels in Table 1 of *OAC* 1301:7-9-12(b)(i) then proceed to corrective action in accordance with *OAC* 1301:7-9-13(H). If analytical results are below all applicable action levels, then no further action is required.	Out of Service, Closure in Place, Permanent Removal, Change in Service, and Closure Assessment of UST Systems—**applicable**	*OAC* 1301:7-9-12 (I)(4)(c)(i)(a) and (b)	X		There are no USTs associated with the planned demolition.
Petroleum UST Corrective Action	A Tier 1 source investigation is to determine the concentrations of chemicals of concern in the source area.	Out of Service, Closure in Place, Permanent Removal, Change in Service, and Closure Assessment of UST Systems—**relevant and appropriate**	*OAC* 1301:7-9-13 (H)(1)	X		N/A. There are no USTs associated with the planned demolition.
	Conduct a determination of the appropriate action levels for a UST site.	Out of Service, Closure in Place, Permanent Removal, Change in Service, and Closure Assessment of UST Systems—**relevant and appropriate**	*OAC* 1301:7-9-13 (H)(2)	X		See above.
	Conduct a Tier 1 delineation to define the vertical and horizontal extent of chemicals of concern in soil and groundwater.	Out of Service, Closure in Place, Permanent Removal, Change in Service, and Closure Assessment of UST Systems—**relevant and appropriate**	*OAC* 1301:7-9-13 (I)(1)	X		See above.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Petroleum UST Corrective Action (continued)	Develop a remedial action plan that describes the remedial action to be undertaken, the proposed target levels identified by chemical of concern and environmental media.	Out of Service, Closure in Place, Permanent Removal, Change in Service, and Closure Assessment of UST Systems—**relevant and appropriate**	*OAC* 1301:7-9-13 (N)(1)(a&b)	X		See above.
	Alternative methodologies and technologies may be used if the alternative methodology and technology are at least as effective as those required by this rule.	Out of Service, Closure in Place, Permanent Removal, Change in Service, and Closure Assessment of UST Systems—**relevant and appropriate**	*OAC* 1301:7-9-13 (R)(1)(a)	X		See above.
			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	X	X	If encountered, hazardous waste will be stored in areas that will be identified and controlled to protect human health and the environment. Appropriate containment will be provided based on the hazardous waste encountered.
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 the applicable requirements in 40 CFR 265.171-173 (Subpart I) [*OAC* 3745-66-70 to 3745-66-73],	Accumulation of RCRA hazardous waste on-site as defined in 40 CFR 260.1—**applicable**	40 CFR 262.34 (a)(1)(i) *OAC* 3745-52-34 (A)(1)(a)	X	X	If encountered, hazardous waste will be accumulated and managed in appropriate containers that are appropriately labeled.
	• 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)	X	X	See above.
	• Container is marked with the words "hazardous waste,"		40 CFR 262.34(a)(3) *OAC* 3745-52-34(A)(3)	X	X	See above.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Temporary storage and accumulation of hazardous waste in containers on site (continued)	• The generator complies with the requirements in paragraph (A)(5) of rule 3745-270-07 and rules 3745-65-16, 3745-65-30 to 3745-65-37, and 3745-65-50 to 3745-65-56 of the Administrative Code.		40 CFR 262.34(a)(4) *OAC* 3745-52-34(A)(4)	X	X	See above.
	Generator is exempt from all requirements in rules 3745-66-10 to 3745-66-21 and 3745-66-40 to 3745-66-48 of the Administrative Code except for paragraphs (A) and (B) of rule 3745-66-11 and rule 3745-66-14 of the Administrative Code.		40 CFR 262.34(a)(1) *OAC* 3745-52-34 (A)(1)(e)	X	X	If encountered, hazardous waste will be accumulated and managed in appropriate containers that are appropriately labeled.
	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 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)	X	X	If encountered, hazardous waste will be accumulated and managed in appropriate containers that are appropriately labeled.
	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.		40 CFR 262.34(c)(2) *OAC* 3745-52-34(C)(2)	X	X	If encountered, 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.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Accumulation of rejected shipments of hazardous waste	A generator that 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 *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)	X	X	Hazardous waste resulting from a rejected shipment will be accumulated and managed in appropriate containers that are appropriately labeled.
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	X	X	Hazardous waste will be placed only in containers of acceptable quality. Containers showing signs of significant defects will be over-packed or contents will be removed to an acceptable container.
	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	X	X	Appropriate containers will be selected based on compatibility with the waste being stored.
	Keep containers closed during storage, except to add/remove waste.		40 CFR 264.173(a) *OAC* 3745-55-73(A)	X	X	Containers used to store hazardous waste will be closed when not in use.
	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)	X	X	Hazardous waste will be accumulated and managed in a manner that will not cause containers to rupture or leak.
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	X	X	All hazardous waste storage locations will be evaluated periodically to ensure proper storage.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
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 wastes that do not contain free liquids—**applicable**	40 CFR 264.175(c) *OAC* 3745-55-75(C)	X	X	The storage of hazardous waste without free liquids will be sloped or designed to drain precipitation or otherwise protect the containers from contact with the liquid from precipitation.
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, F021, F022, F023, F026, and F027 in containers—**applicable**	40 CFR 264.175 (a) and (d) *OAC* 3745-55-75 (A) and (D)	X	X	Hazardous waste with free liquids or specified listed contents in containers will be stored on an impervious base, designed to protect from contact with accumulated liquids, have sufficient capacity, and be protected from run-on. Spilled or leaked material will be removed in a timely manner.
	• A base must underlie the containers that 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)	X	X	See above.
	• 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)	X	X	See above.
	• 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)	X	X	See above.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Storage of RCRA hazardous waste with free liquids in containers (continued)	• Run-on into the system must be prevented unless the collection system has sufficient capacity to contain along with volume required for containers; and		40 CFR 264.175(b)(4) *OAC* 3745-55-75(B)(4)	X	X	See above.
	• Spilled or leaked waste and accumulated precipitation must be removed from the sump or collection area in a timely manner as or necessary to prevent overflow.		40 CFR 264.175(b)(5) *OAC* 3745-55-75(B)(5)	X	X	Any hazardous waste released will be recovered immediately. Any collected precipitation will be removed and discharged through the appropriate treatment system.
Storage of ignitable or reactive waste in containers	Containers holding ignitable or reactive waste must be located at least fifteen meters (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	X	X	No hazardous waste will be stored within 50 ft of the DOE property line.
Storage of incompatible waste in containers	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)	X	X	Incompatible wastes will not be placed in the same container.
	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)	X	X	Incompatible wastes will not be placed in the same container.
Design and operation of a hazardous waste facility (e.g., storage areas)	Facilities must be designed, constructed, maintained, and operated to minimize the possibility of a fire, explosion, or any unplanned sudden or nonsudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water which could threaten human health or the environment.	Construction or setup of a RCRA hazardous waste facility—**applicable**	40 CFR 264.31 *OAC* 3745-54-31	X	X	The storage of hazardous waste will be done to prevent releases and protect workers, the environment, and the public. These storage areas will be configured based on the type of waste being managed and the anticipated duration of the storage.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Design and operation of a hazardous waste facility (e.g., storage areas) *Required equipment* (continued)	All facilities shall be equipped with the following:		40 CFR 264.32 *OAC* 3745-54-32	X	X	Areas where hazardous wastes are stored will have appropriate fire extinguishers. Water spray and communications devices will be provided as appropriate based on the location of the storage area.
	• 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)	X	X	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)	X	X	See above.
	• 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)	X	X	See above.
	• 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)	X	X	See above.
Hazardous waste facility – security system	Must prevent the unknowing entry, and minimize the possibility for the unauthorized entry, of persons or livestock onto the active portion of this facility.	Operation of a RCRA hazardous waste facility—**applicable**	40 CFR 264.14(a) *OAC* 3745-54-14(A)	X	X	Existing site security measures will continue to be maintained to prevent unauthorized entry into areas that store hazardous waste.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Hazardous waste facility – security system (continued)	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(1) *OAC* 3745-54-14(A)(1)		X	Existing site security measures will continue to be maintained to prevent unauthorized entry into areas that store hazardous waste.
	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(2) *OAC* 3745-54-14(A)(2)		X	Existing site security measures will continue to be maintained to prevent unauthorized entry into areas that store hazardous waste.
	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)	X	X	Existing site security measures will continue to be maintained to prevent unauthorized entry into areas that store hazardous waste.
	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)	X	X	Warning signs conforming to the visibility and specific warning requirements will be placed. The warning signs will read "Danger – Unauthorized Personnel Keep Out." The number and locations of signs will be based on the location and configuration of the storage area but will ensure that the warning is visible at the entrances to the storage areas and other locations based on possible approaches to the storage areas.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Hazardous waste facility – general inspection requirements	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 that ensures that the problem does not lead to an environmental or human health hazard.	Operation of a RCRA hazardous waste facility—**applicable**	40 CFR 264.15 (a) and (c) *OAC* 3745-54-15 (A) and (C)	X	X	Storage areas will be inspected periodically to ensure all control systems and security provisions are functioning properly.
Hazardous waste facility – 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	X	X	Only qualified personnel trained from existing modules will be involved in hazardous waste operations.
Hazardous waste facility – testing and maintenance of equipment	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.	Operation of a RCRA hazardous waste facility—**applicable**	40 CFR 264.33 *OAC* 3745-54-33	X	X	All equipment provided at hazardous waste storage areas will be inspected and maintained.
Hazardous waste facility – 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)	X	X	The handling of hazardous waste will be done to prevent releases and protect workers, the environment, and the public. Those involved in the storage of hazardous wastes and inspections of hazardous waste storage areas will have access to communication equipment. Depending on the location where hazardous waste is being handled and facility status, this may include access to the site-wide communication system, cell phones, or radios.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Hazardous waste facility – access to communications or alarm system (continued)	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)	X	X	There will always be more than one person on-site and access to the PSS will always be available.
Hazardous waste facility – 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	X	X	The storage of hazardous waste will be done to prevent releases and protect workers, the environment, and the public. These storage areas will be configured based on the type of waste being managed and the anticipated duration of the storage.
Hazardous waste facility – 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)	X	X	Existing site response protocols will be maintained to respond to unplanned releases. Incidental releases will be cleaned up immediately. Formal emergency response will only be implemented if the release threatens on-site personnel or has the ability to have off-site impact.
	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)	X	X	Existing site response protocols will be maintained to respond to unplanned releases. Incidental releases will be cleaned up immediately. Formal emergency response will only be implemented if the release threatens on-site personnel or has the ability to have off-site impact.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Hazardous waste facility – 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	X	X	Existing site response protocols will be maintained to respond to unplanned releases. Incidental releases will be cleaned up immediately. Formal emergency response will only be implemented if the release threatens on-site personnel or has the ability to have off-site impact.
Hazardous waste facility – 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	X	X	There will always be more than one person on site with access to the PSS. The PSS and their support will be thoroughly familiar with the facility's contingency plan, 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, the PSS has the authority to commit the resources needed to implement the contingency plan.
Hazardous waste facility – 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	X	X	Existing site response protocols will be maintained to respond to unplanned releases. Incidental releases will be cleaned up immediately. Formal emergency response will only be implemented if the release threatens on-site personnel or has the ability to have off-site impact.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Temporary storage or treatment of hazardous waste in waste piles – applicability	*OAC* 3745-56-50 to 3745-56-59 applies to owners and operators of facilities that store or treat hazardous waste in piles, except as *OAC* 3745-54-01 provides otherwise.	Storage of RCRA hazardous waste in a waste pile—**applicable**	40 *CFR* 264.250(a) *OAC* 3745-56-50(A)	X	X	N/A. No hazardous waste piles will be generated during demolition activities.
	OAC 3745-56-50 to 3745-56-59 does not apply to owners or operators of waste piles that are closed with wastes left in place. Such waste piles are subject to regulation as landfills under *OAC* 3745-57-02 to 3745-57-17.		40 *CFR* 264.250(b) *OAC* 3745-56-50(B)	X	X	See above.
	Owner or operator of any waste pile that is inside or under a structure that provides protection from precipitation so that neither run-off nor leachate is generated is not subject to regulation under *OAC* 3745-56-51 or *OAC* 3745-54-90 to 3745-54-101, provided that: • Liquids or materials containing free liquids are not placed in the pile; and • Pile is protected from surface water run-on by the structure or in some other manner; and • Pile is designed and operated to control dispersal of the waste by wind, where necessary, by means other than wetting; and Pile will not generate leachate through decomposition or other reactions.		40 *CFR* 264.250(c) *OAC* 3745-56-50(C)	X	X	See above.
Temporary storage or treatment of hazardous waste in waste piles – design and operating requirements	A waste pile (except for an existing portion of a waste pile) must have:	Storage of RCRA hazardous waste in a waste pile—**applicable**	40 *CFR* 264.251(a) *OAC* 3745-56-51(A)	X	X	See above.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Temporary storage or treatment of hazardous waste in waste piles – design and operating requirements (continued)	(1) A liner that is designed, constructed, and installed to prevent any migration of wastes out of the pile into the adjacent subsurface soil or groundwater or surface water at any time during the active life (including the closure period) of the waste pile. The liner may be constructed of materials that may allow waste to migrate into the liner itself (but not into the adjacent subsurface soil or groundwater or surface water) during the active life of the facility. The liner must be:		40 *CFR* 264.251(a)(1) *OAC* 3745-56-51 (A)(1)	X	X	See above.
	Constructed of materials that have appropriate chemical properties and sufficient strength and thickness to prevent failure due to pressure gradients (including static head and external hydrogeologic forces), physical contact with the waste or leachate to which they are exposed, climate conditions, the stress of installation, and the stress of daily operation; and		40 *CFR* 264.251 (a)(1)(i) *OAC* 3745-56-51 (A)(1)(a)	X	X	See above.
	Placed upon a foundation or base capable of providing support to the liner and resistance to pressure gradients above and below the liner to prevent failure of liner due to settlement, compression, or uplift; and		40 *CFR* 264.251 (a)(1)(ii) *OAC* 3745-56-51 (A)(1)(b)	X	X	See above.
	Installed to cover all surrounding earth likely to be in contact with the waste or leachate; and		40 *CFR* 264.251 (a)(1)(iii) *OAC* 3745-56-51 (A)(1)(c)	X	X	See above.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Temporary storage or treatment of hazardous waste in waste piles – design and operating requirements (continued)	(2) A leachate collection and removal system immediately above the liner that is designed, constructed, maintained, and operated to collect and remove leachate from the pile. Design and operating conditions will be specified to ensure that the leachate depth over the liner does not exceed 30 cm (1 ft). The leachate collection and removal system must be:		40 *CFR* 264.251(a)(2) *OAC* 3745-56-51 (A)(2)	X	X	See above.
	Constructed of materials that are: (i) chemically resistant to waste managed in the pile and the leachate expected to be generated; and (ii) of sufficient strength and thickness to prevent collapse under the pressures exerted by overlaying wastes, waste cover materials, and by any equipment used at the pile; and		40 *CFR* 264.251 (a)(2)(i) *OAC* 3745-56-51 (A)(2)(a)	X	X	See above.
	Designed and operated to function without clogging through the scheduled closure of the waste pile.		40 *CFR* 264.251 (a)(2)(ii) *OAC* 3745-56-51 (A)(2)(b)	X	X	See above.
	The owner or operator will be exempted from the requirements of *OAC* 3745-56-51(A) if the Director finds, based on a demonstration by the owner or operator, that alternate design and operating practices, together with location characteristics, will prevent the migration of any hazardous constituents into the groundwater or surface water at any future time. In deciding whether to grant an exemption, the Director will consider the factors listed in *OAC* 3745-56-51 (B)(1) through (4).		40 *CFR* 264.251(b) *OAC* 3745-56-51(B)	X	X	See above.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Temporary storage or treatment of hazardous waste in waste piles – design and operating requirements (continued)	The owner or operator of each new waste pile unit, each lateral expansion of a waste pile unit, and each replacement of an existing waste pile unit must install two or more liners and a leachate collection and removal system above and between such liners.		40 *CFR* 264.251(c) *OAC* 3745-56-51(C)	X	X	See above.
	The liner system must include:		40 *CFR* 264.251 (c)(1)(i)(A) *OAC* 3745-56-51 (C)(1)(a)(i)	X	X	See above.
	A top liner designed and constructed of materials (e.g., a geomembrane) to prevent the migration of hazardous constituents into such liner during the active life and postclosure care period; and			X	X	See above.
	A composite bottom liner consisting of at least two components. The upper component must be designed and constructed of materials (e.g., a geomembrane) to prevent the migration of hazardous constituents into this component during the active life and postclosure care period. The lower component must be designed and constructed of materials to minimize migration of hazardous constituents if a breach in the upper component were to occur. Lower component must be constructed of at least 3 ft (91.0 cm) of compacted soil material with a hydraulic conductivity of no more than 1×10^{-7} cm/s.		40 *CFR* 264.251 (c)(1)(i)(B) *OAC* 3745-56-51 (C)(1)(a)(ii)	X	X	See above.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Temporary storage or treatment of hazardous waste in waste piles – design and operating requirements (continued)	The liners must comply with paragraphs (A)(1)(a), (A)(1)(b), and (A)(1)(c) of *OAC* 3745-56-51.		40 *CFR* 264.251 (c)(1)(ii) *OAC* 3745-56-51 (C)(1)(b)	X	X	See above.
	The leachate collection and removal system immediately above the top liner must be designed, constructed, operated, and maintained to collect and remove leachate from the waste pile during the active life and postclosure care period. Design and operating conditions will be specified to ensure that the leachate depth over the liner does not exceed 30 cm (1 ft). The leachate collection and removal system must comply with *OAC* 3745-56-51(C)(3)(c) and (C)(3)(d).		40 *CFR* 264.251(c)(2) *OAC* 3745-56-51 (C)(2)	X	X	See above.
	The leachate collection and removal system between the liners, and immediately above the bottom composite liner in the case of multiple leachate collection and removal systems, is also a leak detection system. This leak detection 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. The requirements for a leak detection system in this paragraph are satisfied by installation of a system that is, at a minimum:		40 *CFR* 264.251(c)(3) *OAC* 3745-56-51 (C)(3)	X	X	See above.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Temporary storage or treatment of hazardous waste in waste piles – design and operating requirements (continued)	Constructed with a bottom slope of 1 percent or more;		40 *CFR* 264.251 (c)(3)(i) *OAC* 3745-56-51 (C)(3)(a)	X	X	See above.
	Constructed of granular drainage materials with a hydraulic conductivity of 1×10^{-2} cm/s or more and a thickness of 12 in. (30.5 cm) or more; or constructed of synthetic or geonet drainage materials with a transmissivity of 3×10^{-5} m^2/s or more;		40 *CFR* 264.251 (c)(3)(ii) *OAC* 3745-56-51 (C)(3)(b)	X	X	See above.
	Constructed of materials that are chemically resistant to the waste managed in the waste pile and the leachate expected to be generated, and of sufficient strength and thickness to prevent collapse under the pressures exerted by overlying wastes, waste cover materials, and equipment used at the waste pile;		40 *CFR* 264.251 (c)(3)(iii) *OAC* 3745-56-51 (C)(3)(c)	X	X	See above.
	Designed and operated to minimize clogging during the active life and postclosure period; and		40 *CFR* 264.251 (c)(3)(iv) *OAC* 3745-56-51 (C)(3)(d)	X	X	See above.
	Constructed with sumps and liquid removal methods of sufficient size to collect and remove liquids from sump and prevent liquids from backing up into drainage layer. Each unit must have its own sump(s). Design of each sump and removal system must provide a method for measuring and recording volume of liquids present in sump and of liquids removed.		40 *CFR* 264.251 (c)(3)(v) *OAC* 3745-56-51 (C)(3)(e)	X	X	See above.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Temporary storage or treatment of hazardous waste in waste piles – design and operating requirements (continued)	The owner or operator must collect and remove pumpable liquids in the leak detection system sumps to minimize the head on the bottom liner.		40 *CFR* 264.251(c)(4) *OAC* 3745-56-51 (C)(4)	X	X	See above.
	The owner or operator of a leak detection system that is not located completely above the seasonal high water table must demonstrate that the operation of the leak detection system will not be adversely affected by the presence of groundwater.		40 *CFR* 264.251(c)(5) *OAC* 3745-56-51 (C)(5)	X	X	See above.
	The Director may approve alternative design or operating practices if the owner or operator demonstrates that such design and operating practices, together with location characteristics: (1) will prevent the migration of any hazardous constituent into the groundwater or surface water at least as effectively as the liners and leachate collection and removal systems specified in this rule; and (2) will allow detection of leaks of hazardous constituents through the top liner at least as effectively.		40 *CFR* 264.251(d) *OAC* 3745-56-51(D)	X	X	See above.
	The owner or operator must design, construct, operate, and maintain a run-on control system capable of preventing flow onto the active portion of the pile during peak discharge from at least a 25-year storm.		40 *CFR* 264.251(g) *OAC* 3745-56-51(G)	X	X	See above.
	The owner or operator must design, construct, operate, and maintain a run-off management system to collect and control at least the water volume resulting from a 24-hour, 25-year storm.		40 *CFR* 264.251(h) *OAC* 3745-56-51(H)	X	X	See above.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Temporary storage or treatment of hazardous waste in waste piles – design and operating requirements (continued)	Collection and holding facilities (e.g., tanks or basins) associated with run-on and run-off control systems must be emptied or otherwise managed expeditiously after storms to maintain design capacity of the system.		40 *CFR* 264.251(i) *OAC* 3745-56-51(I)	X	X	See above.
	If the pile contains any particulate matter which may be subject to wind dispersal, the owner or operator must cover or otherwise manage the pile to control wind dispersal.		40 *CFR* 264.251(j) *OAC* 3745-56-51(J)	X	X	See above.
Temporary storage or treatment of hazardous waste in waste piles – action leakage rate	The Director will approve an action leakage rate for waste piles subject to OAC 3745-56-51(C) or (D). The action leakage rate is the maximum design flow rate that the leak detection system can remove without the fluid head on the bottom liner exceeding 1 ft. The action leakage rate must include an adequate safety margin to allow for uncertainties in the design (e.g., slope, hydraulic conductivity, thickness of drainage material), construction, operation, and location of the leak detection system, waste and leachate characteristics, likelihood and amounts of other sources of liquids in the leak detection system, and proposed response actions (e.g., the action leakage rate must consider decreases in the flow capacity of the system over time resulting from siltation and clogging, rib layover and creep of synthetic components of the system, overburden pressures, etc.).	Storage of RCRA hazardous waste in a waste pile—**applicable**	40 *CFR* 264.252(a) *OAC* 3745-56-52(A)	X	X	See above.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Temporary storage or treatment of hazardous waste in waste piles – action leakage rate (continued)	To determine if the action leakage rate has been exceeded, the owner or operator must convert the weekly flow rate from the monitoring data obtained under paragraph (C) of *OAC* 3745-56-54 to an average daily flow rate (gal/acre/day) for each sump. Unless the Director approves a different calculation, the average daily flow rate for each sump must be calculated weekly during the active life and closure period.		40 *CFR* 264.252(b) *OAC* 3745-56-52(B)	X	X	See above.
Temporary storage or treatment of hazardous waste in waste piles – response actions	The owner or operator of waste pile units subject to paragraph (C) or (D) of *OAC* 3745-56-51 must have an approved response action plan before receipt of waste. The response action plan must set forth the actions to be taken if the action leakage rate has been exceeded. At a minimum, the response action plan must describe the actions specified in *OAC* 3745-56-53(B).	Storage of RCRA hazardous waste in a waste pile—**applicable**	40 *CFR* 264.253(a) *OAC* 3745-56-53(A)	X	X	See above.
	If the flow rate into the leak detection system exceeds the action leakage rate for any sump, owner or operator must:		40 *CFR* 264.253 (b)(1) – (6) *OAC* 3745-56-53 (B)(1) – (6)	X	X	See above.
	Notify the director in writing of the exceedance within 7 days of the determination;			X	X	See above.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Temporary storage or treatment of hazardous waste in waste piles – response actions (continued)	Submit a preliminary written assessment to the Director within 14 days of the determination, as to the amount of liquids, likely sources of liquids, possible location, size, and cause of any leaks, and short-term actions taken and planned;			X	X	See above.
	Determine to the extent practicable the location, size, and cause of any leak;			X	X	See above.
	Determine 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;			X	X	See above.
	Determine any other short-term and long-term actions to be taken to mitigate or stop any leaks; and			X	X	See above.
	Within 30 days after notification that the action leakage rate has been exceeded, submit to the Director the results of the analyses specified in paragraphs (B)(3), (B)(4), and (B)(5) of this rule, the results of actions taken, and actions planned. Monthly thereafter, as long as the flow rate in the leak detection system exceeds the action leakage rate, the owner or operator must submit a report summarizing the results of any remedial actions taken and actions planned.			X	X	See above.
	To make the leak and/or remediation determinations in *OAC* 3745-56-53(B)(3), (B)(4), and (B)(5), the owner or operator must:		40 *CFR* 264.253(c)(1)(i) – (iii) *OAC* 3745-56-53 (C)(1)(a) – (c)	X	X	See above.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Temporary storage or treatment of hazardous waste in waste piles – response actions (continued)	Assess the source of liquids and amounts of liquids by source;			X	X	See above.
	Conduct fingerprint, hazardous constituent, or other analyses of 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			X	X	See above.
	Assess the seriousness of any leaks in terms of potential for escaping into the environment; or			X	X	See above.
	Document why such assessments are not needed.		40 *CFR* 264.253(c)(2) *OAC* 3745-56-53 (C)(2)	X	X	See above.
Temporary storage or treatment of hazardous waste in waste piles – monitoring and inspections	During construction or installation, liners and cover systems (e.g., membranes, sheets, or coatings) must be inspected for uniformity, damage, and imperfections (e.g., holes, cracks, thin spots, or foreign materials). Immediately after construction or installation:	Storage of RCRA hazardous waste in a waste pile—**applicable**	40 *CFR* 264.254(a) *OAC* 3745-56-54(A)	X	X	See above.
	Synthetic liners and covers must be inspected to ensure tight seams and joints and the absence of tears, punctures, or blisters; and		40 *CFR* 264.254(a)(1) *OAC* 3745-56-54 (A)(1)	X	X	See above.
	Soil-based and admixed liners and covers must be inspected for imperfections including lenses, cracks, channels, root holes, or other structural nonuniformities that may cause an increase in the permeability of the liner or cover.		40 *CFR* 264.254(a)(2) *OAC* 3745-56-54 (A)(2)	X	X	See above.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Temporary storage or treatment of hazardous waste in waste piles – monitoring and inspections (continued)	While a waste pile is in operation, it must be inspected weekly and after storms to detect evidence of any of the following:		40 *CFR* 264.254(b) *OAC* 3745-56-54(B)	X	X	See above.
	Deterioration, malfunctions, or improper operation of run-on and run-off control systems; and		40 *CFR* 264.254(b)(1) *OAC* 3745-56-54 (B)(1)	X	X	See above.
	Proper functioning of wind dispersal control systems, where present; and		40 *CFR* 264.254(b)(2) *OAC* 3745-56-54 (B)(2)	X	X	See above.
	The presence of leachate in and proper functioning of leachate collection and removal systems, where present.		40 *CFR* 264.254(b)(3) *OAC* 3745-56-54 (B)(3)	X	X	See above.
	An owner or operator required to have a leak detection system under *OAC* 3745-56-51(C) must record the amount of liquids removed from each leak detection system sump at least once each week during the active life and closure period.		40 *CFR* 264.254(c) *OAC* 3745-56-54(C)	X	X	See above.
Temporary storage or treatment of hazardous waste in waste piles – special requirements for ignitable or reactive waste	Ignitable or reactive waste shall not be placed in a waste pile unless the waste and the waste pile satisfy all applicable requirements of *OAC* 3745-270, and:	Storage of RCRA hazardous waste in a waste pile—**applicable**	40 *CFR* 264.256 *OAC* 3745-56-56	X	X	See above.
	Addition of the waste to an existing pile results in waste or mixture no longer meeting the definition of ignitable or reactive waste under *OAC* 3745-51-21 or 3745-51-23 and complies with *OAC* 3745-54-17(B); or		40 *CFR* 264.256(a) *OAC* 3745-56-56(A)	X	X	See above.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Temporary storage or treatment of hazardous waste in waste piles – special requirements for ignitable or reactive waste (continued)	The waste is managed in such a way that it is protected from any material or conditions which may cause it to ignite or react.		40 *CFR* 264.256(b) *OAC* 3745-56-56(B)	X	X	See above.
Temporary storage or treatment of hazardous waste in waste piles – special requirements for incompatible waste	Incompatible wastes, or incompatible wastes and materials (see the appendix to *OAC* 3745-55-99 for examples), shall not be placed in the same pile, unless *OAC* 3745-54-17(B) is complied with.	Storage of RCRA hazardous waste in a waste pile—**applicable**	40 *CFR* 264.257(a) *OAC* 3745-56-57(A)	X	X	See above.
	A pile of hazardous waste that is incompatible with any waste or other material stored nearby in other containers, piles, open tanks, or surface impoundments shall be separated from the other materials, or protected from them by means of a dike, berm, wall or other device.		40 *CFR* 264.257(b) *OAC* 3745-56-57(B)	X	X	See above.
	Hazardous waste shall not be piled on the same base where incompatible wastes or materials were previously piled unless the base has been decontaminated sufficiently to ensure compliance with *OAC* 3745-54-17(B).		40 *CFR* 264.257(c) *OAC* 3745-56-57(C)	X	X	See above.
Temporary storage or treatment of hazardous waste in waste piles – closure and postclosure care	At closure, the owner or operator must remove or decontaminate all waste residues, contaminated containment system components (liners, etc.), contaminated subsoils, and structures and equipment contaminated with waste and leachate, and manage them as hazardous waste unless *OAC* 3745-51-03(D) applies.	Storage of RCRA hazardous waste in a waste pile—**applicable**	40 *CFR* 264.258(a) *OAC* 3745-56-58(A)	X	X	See above.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Temporary storage or treatment of hazardous waste in waste piles – closure and postclosure care (continued)	If, after removing or decontaminating all residues and making all reasonable efforts to effect removal or decontamination of contaminated components, subsoils, structures, and equipment as required in paragraph (A) of this rule, the owner or operator finds that not all contaminated subsoils can be practicably removed or decontaminated, he must close the facility and perform postclosure care in accordance *OAC* 3745-57-10.		40 *CFR* 264.258(b) *OAC* 3745-56-58(B)	X	X	See above.
	The owner or operator of a waste pile that does not comply with the liner requirements of *OAC* 3745-56-51(A)(1) and is not exempt from them in accordance with *OAC* 3745-56-50(C) or *OAC* 3745-56-51(B) must:		40 *CFR* 264.258(c)(1) *OAC* 3745-56-58 (C)(1)	X	X	See above.
	Include in the closure plan for the pile in accordance with *OAC* 3745-55-12 both a plan for complying with paragraph (A) of this rule and a contingent plan for complying with paragraph (B) of this rule in case not all contaminated subsoils can be practicably removed at closure; and		40 *CFR* 264.258 (c)(1)(i) *OAC* 3745-56-58 (C)(1)(a)	X	X	See above.
	Prepare a contingent postclosure plan in accordance with *OAC* 3745-55-18 for complying with paragraph (B) of this rule in case not all contaminated subsoils can be practicably removed at closure.		40 *CFR* 264.258 (c)(1)(ii) *OAC* 3745-56-58 C)(1)(b)	X	X	See above.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Temporary storage or treatment of hazardous waste in waste piles – closure and postclosure care (continued)	Cost estimates calculated in accordance with *OAC* 3745-55-42 and 3745-55-44 for closure and postclosure care of a pile subject to this paragraph must include the cost of complying with the contingent closure plan and the contingent postclosure plan but are not required to include the cost of expected closure under paragraph (A) of this rule.		40 *CFR* 264.258(c)(2) *OAC* 3745-56-58 (C)(2)	X	X	See above.
Temporary storage of RCRA remediation waste in a staging pile	May be temporarily stored (including mixing, sizing, blending, or other similar physical operations intended to prepare the wastes for subsequent management or treatment) at a facility provided that the staging pile will be designed to:	Accumulation of nonflowing hazardous remediation waste (or remediation waste otherwise subject to LDRs) as defined in 40 *CFR* 260.10—**applicable**	40 *CFR* 264.554(d)(1) *OAC* 3745-57-74	X	X	See above.
	Is located within the contiguous property under the control of the owner/operator where the wastes to be managed in the staging pile originated. Staging piles must be designated by the director.		40 *CFR* 264.554(a) *OAC* 3745-57-74(A)		X	See above.
	Staging piles may be used to store hazardous remediation waste (or remediation waste otherwise subject to LDRs) if the standards and design criteria are followed that the director has designated for that staging pile.		40 *CFR* 264.554(b) *OAC* 3745-57-74(B)		X	See above.
	Knowledge of the waste pile must be sufficient to establish the required standards		40 *CFR* 264.554(c) *OAC* 3745-57-74(C)		X	See above.
	Facilitate a reliable, effective and protective remedy;		40 *CFR* 264.554 (d)(1)(i) *OAC* 3745-57-74 (D)(1)(a)	X	X	See above.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Temporary storage of RCRA remediation waste in a staging pile (continued)	Prevent or minimize releases of hazardous wastes and constituents into the environment, and minimize or adequately control cross-media transfer, as necessary, to protect human health and the environment (e.g., through the use of liners, covers, run on/run off controls, as appropriate).		40 *CFR* 264.554 (d)(1)(ii) *OAC* 3745-57-74 (D)(1)(b)	X	X	See above.
	The staging pile must not operate for more than 2 years, except when the director grants an operating term extension. The 2-year limit, or other operating term specified by the director in the permit, closure plan, or order, is measured from the first time remediation waste is placed into a staging pile. Must maintain a record of the date when remediation waste is first placed into the staging pile for the life of the permit, closure plan, or order, or for 3 years, whichever is longer.		40 *CFR* 264.554(d)(1)(iii) *OAC* 3745-57-74(D)(1)(c)		X	See above.
	In setting the design standards for staging piles, the director will consider the following factors: • Length of time the pile will be in operation; • Volumes of wastes you intend to store in the pile; • Physical and chemical characteristics of the wastes to be stored in the unit; • Potential for releases from the unit; • Hydrogeological and other relevant environmental conditions at the facility that may influence		40 *CFR* 264.554(d)(2) *OAC* 3745-57-74(D)(2)		X	See above.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
	the migration of any potential releases; and					
	Potential for human and environmental exposure to potential releases from the unit.					
Temporary storage of RCRA remediation waste in a staging pile (continued)	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)		X	See above.
	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)			
	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)		X	See above.
	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)	X	X	See above.
	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)	X	X	See above.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Temporary storage of RCRA remediation waste in a staging pile (continued)	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)	X	X	See above.
	Placing hazardous remediation wastes into a staging pile does not constitute land disposal of hazardous waste or create a unit that is subject to the minimum technological requirements of Section 3004(o) of RCRA.	Placement of hazardous remediation wastes into a staging pile—**applicable**	40 *CFR* 264.554(g) *OAC* 3745-57-74(G)		X	See above.
	A staging pile may operate for up to 2 years after hazardous remediation waste is first placed into the pile.		40 *CFR* 264.554(h) *OAC* 3745-57-74(H)		X	See above.
	The director may grant one operating term extension of up to 180 days beyond the operating term limit allowed under 40 *CFR* 264.554(h) [*OAC* 3745-57-74(H)] if he determines that continued operation of the staging pile will not pose a threat to human health and the environment; and that it is necessary to ensure timely and efficient implementation of remedial actions at the facility. The director may, as a condition of the extension, specify further standards and design criteria, as necessary, to ensure protection of human health and the environment.		40 *CFR* 264.554(i) *OAC* 3745-57-74(I)		X	See above.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
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 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)	X	X	The X-326 demolition is an open-air demolition activity that will generate debris piles necessitating outdoor management. Demolition waste will be managed as PCB remediation waste and will be managed in compliance with the storage and processing described in this document. The controls as described in this document will ensure no migration of PCBs.
	The facilities shall meet the following criteria:		40 *CFR* 761.65(b)(1)	X	X	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)	X	X	See above.
	Adequate floor that has continuous curbing with a minimum 6-in.-high curb. Floor and curb must provide containment volume equal to at least two times the internal volume of the largest PCB article or container or 25% 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)	X	X	See above.
	No drain valves, floor drains, expansion joints, sewer lines, or other openings that would permit liquids to flow from the curbed area;		40 *CFR* 761.65 (b)(1)(iii)	X	X	See above.
	Floors and curbing constructed of Portland cement, concrete, or a continuous, smooth, nonporous surface as defined in §761.3 that prevents or minimizes penetration of PCBs; and		40 *CFR* 761.65 (b)(1)(iv)	X	X	See above.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
	Not located at a site below the 100-year flood water elevation.		40 *CFR* 761.65 (b)(1)(v)	X	X	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) to (iv)	X	X	See above.
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)	X	X	Containers that store PCBs and PCB items at concentrations ≥ 50 ppm will be labeled appropriately.
	Storage area must be properly marked as required by 40 CFR 761.40(a)(10).		40 CFR 761.65(c)(3)	X	X	D&D debris will be managed as PCB remediation waste and will be managed in compliance with alternative storage and processing approaches described in the DDP.
	Any leaking PCB items and their contents shall be transferred immediately to a properly marked nonleaking container(s).		40 CFR 761.65(c)(5)	X	X	Any PCB article, article container, or equipment that is found to be leaking will be immediately controlled, and liquids will be drained and transferred to a nonleaking container(s). There are no PCB articles or waste containers included in the scope of the demolition,
	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)	X	X	All container(s) used to store PCBs will be nonleaking and will be chemically compatible with the material being stored. All appropriate DOT regulations will be followed should off-site disposal be implemented for regulated PCB items. There are no PCB articles or waste

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
						containers included in the scope of the demolition.
Temporary storage of PCB waste in containers (continued)	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)	X	X	D&D debris will be managed as PCB remediation waste and will be managed in compliance with alternative storage and processing approaches. Controls will be in place to minimize migration from the D&D project footprint and to prevent any impacts beyond the PORTS property boundary.
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)	X	X	D&D debris will be managed as PCB remediation waste and will be managed in compliance with alternative storage and processing approaches. Controls, as described in this DDP, will be in place to minimize PCB migration from the D&D project footprint and to prevent any impacts beyond the PORTS property boundary.
Temporary storage of bulk 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 run-off control systems, in 40 CFR 761.65(c)(9).	Storage of bulk PCB remediation waste or PCB bulk product waste at cleanup site or site of generation—**applicable**	40 CFR 761.65 (c)(9)(i)	X	X	D&D debris will be managed as PCB remediation waste and will be managed in compliance with alternative storage and processing approaches. Controls, as described in this DDP, will ensure there is no spread of PCB contamination.
	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)	X	X	See above.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
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)	X	X	PCB waste will be stored in a manner that prevents the migration of PCB contamination and is in compliance. Although not expected to be present, any liquid PCB wastes encountered will be stored in nonleaking containers of acceptable quality.
	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 substantive requirements pertaining to nuclear criticality safety.		40 CFR 761.65 (c)(6)(i)(C)	X	X	Storage and disposal of PCB/radioactive waste will be evaluated as appropriate by Nuclear Criticality Safety to ensure safe storage.
Temporary staging and storage of LLW	Shall not be readily capable of detonation, explosive decomposition, reaction at anticipated pressures and temperatures, or explosive reaction with water.	Management and storage of LLW at a DOE facility—**TBC**	DOE M 435.1-1 (IV)(N)(1)	X	X	The debris from this demolition is characterized as LLW/PCB remediation waste. Demolition debris is not readily capable of detonation, explosive decomposition, reaction at anticipated pressures and temperatures, or explosive reaction with water.
	Shall be stored in a location and manner that protects the integrity of waste for the expected time of storage.		DOE M 435.1-1 (IV)(N)(3)	X	X	Storage of LLW will be conducted to ensure the waste remains unaffected by storage location.
	Staging of LLW shall be for the purpose of accumulation of such quantities of waste as necessary to facilitate transportation, treatment, and disposal.		DOE M 435.1-1 (IV)(N)(7)	X	X	LLW will be staged to support efficient on-site or off-site transportation and disposal.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
		Treatment/Disposal				
Disposal of RCRA-prohibited hazardous waste in a land-based unit	May be land disposed only if it meets the applicable requirements in the table "Treatment Standards for Hazardous Waste" at 40 CFR 268.40 (*OAC* 3745-270-40) before land disposal. The table lists either "total waste" standards, "waste-extract" standards, or "technology-specific" standards [as detailed further in 40 CFR 268.42 (*OAC* 3745-270-42)].	Land disposal, as defined in 40 *CFR* 268.2, of RCRA prohibited waste [as listed in 40 *CFR* 268.20 to .39 (*OAC* 3745-270-20 to -39)] —**applicable**	40 CFR 268.40(a) *OAC* 3745-270-40(A) 40 CFR 268.30 to 268.40 *OAC* 3745-270-30 to -40 40 CFR 268.42 *OAC* 3745-270-42	X	X	If encountered, newly generated hazardous waste generated during demolition activities under this at- and below-grade DDP will be shipped to an off-site disposal facility in accordance with disposal facility WAC (and applicable treatment standards). Treatment for specific waste streams may be conducted on-site or off-site. Treatment standards expressed as specified technology will be implemented. Treatment of hazardous waste on-site will meet the substantive requirements of a RCRA treatment permit which include Generator Standards (*OAC* 3745-52); General Facility Standards for New Facilities (*OAC* 3745-54); and Use and Management of Containers (*OAC 3745-55).*
	For characteristic wastes (D001 – D043) that are subject to the treatment standards, all underlying hazardous constituents must meet the UTSs specified in 40 CFR 268.48 (*OAC* 3745-27048).	Land disposal of restricted RCRA characteristic wastes (D001-D043) that are not managed in a wastewater treatment unit that is regulated under the CWA, that is CWA equivalent, or that is injected into a Class I nonhazardous injection well—**applicable**	40 CFR 268.40(e) *OAC* 3745-270-40(E) 40 CFR 268.48 *OAC* 3745-270-48	X	X	If encountered, newly generated hazardous waste generated during demolition activities under this at- and below-grade DDP will be shipped to an off-site disposal facility in accordance with disposal facility WAC (and applicable treatment standards).

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Disposal of RCRA-prohibited hazardous waste in a land-based unit (continued)	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)	X	X	If encountered, newly generated hazardous waste generated during demolition activities under this at- and below-grade DDP will be shipped to an off-site disposal facility in accordance with disposal facility WAC (and applicable treatment standards).
Debris	May be land disposed if treated prior to disposal as provided under the "Alternative Treatment Standards for Hazardous Debris" in 40 CFR 268.45(a)(1)-(5) [*OAC* 3745-270-45(A)(1)-(5)] unless it is determined under 40 CFR 261.3(f)(2) [*OAC* 3745-51-03(F)(2)] that the debris is no longer contaminated with hazardous waste <u>or</u> the debris is treated to the waste specific treatment standard provided in 40 CFR 268.40 (*OAC* 3745-270-40) for the waste contaminating the debris.	Land disposal, as defined in 40 CFR 268.2 (*OAC* 3745-270-02), of RCRA-restricted hazardous debris—**applicable**	40 CFR 268.45(a) *OAC* 3745-270-45(A)	X	X	If encountered, hazardous debris and soils generated during demolition are generated within an established AOC and relate to that generated during demolition. Debris with F001 TCE contamination will be removed and managed as hazardous waste in accordance with ARARs and the AOC and disposed of in the OSWDF in accordance with the WAC or shipped off-site to an appropriately permitted off-site disposal facility.
	The hazardous debris must be treated for each "contaminant subject to treatment," which must be determined in accordance with 40 CFR 268.45(b) [*OAC* 3745-270-45(B)].		40 CFR 268.45(b) *OAC* 3745-270-45(B)	X	X	See above.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Disposal of RCRA-prohibited hazardous waste in a land-based unit (continued) *Soils*	May be land disposed if treated prior to disposal according to alternative treatment standards of 40 CFR 268.49(c) [*OAC* 3745-270-49(C)] or according to the UTSs specified in 40 CFR 268.48 (*OAC* 3745-270-48) applicable to the listed hazardous waste and/or applicable characteristic of hazardous waste if the soil is characteristic.	Land disposal, as defined in 40 CFR 268.2 (*OAC* 3745-270-02), of RCRA-restricted hazardous soils—**applicable**	40 CFR 268.49 (b) and (c) *OAC* 3745-270-49 (B) and (C)	X	X	If encountered, hazardous debris and soils generated during demolition are generated within an established AOC and relate to that generated during demolition. Debris with F001 TCE contamination will be removed and managed as hazardous waste in accordance with ARARs and the AOC and disposed of in the OSWDF in accordance with the WAC or shipped off-site to an appropriately permitted off-site disposal facility.
Variance from a treatment standard for RCRA-restricted hazardous wastes	A variance from a treatment standard may be approved if: • It is not physically possible to treat the waste to the level specified in the treatment standard, or by the method specified as the treatment standard; or • It is inappropriate to require the waste to be treated to the level specified in the treatment standard or by the method specified as the treatment standard even through such treatment is technically possible. *NOTE:* Variance approval will be granted through the D&D DFF&O document approval process and included in the appropriate D&D DFF&O document.	Generation of a RCRA hazardous waste requiring treatment prior to land disposal—**applicable**	40 *CFR* 268.44 *OAC* 3745-270-44	X	X	N/A. Deactivation activities have removed segregatable materials with higher hazardous constituent content from the former above-grade building. It is not anticipated that any materials with higher hazardous constituent content will be generated from the demolition of the remaining at- and below-grade structures.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Disposal of treated hazardous debris	Debris treated by one of the specified extraction or destruction technologies on Table 1 of this section and which no longer exhibits a characteristic is not a hazardous waste and need not be managed in RCRA subtitle C facility. Hazardous debris contaminated with listed waste that is treated by an immobilization technology must be managed in a RCRA subtitle C facility.	Treated debris contaminated with RCRA-listed or characteristic waste—**applicable**	40 CFR 268.45(c) *OAC* 3745-270-45(C)	X	X	Waste will be disposed of in the OSWDF provided it can meet the WAC. All requirements associated with the OSWDF CAMU designation will be met. Other wastes not meeting OSWDF WAC will be disposed of at an appropriately licensed and permitted disposal facility.
Disposal of hazardous debris treatment residues	Except as provided in 268.45(d)(2) and (d)(4) [*OAC* 3745-270-45(D)(2) and (D)(4)], treatment residues must be separated from the treated debris using simple physical or mechanical means, and such residues are subject to the waste-specific treatment standards for the waste contaminating the debris. Layers of debris removed by spalling are hazardous debris that remains subject to treatment standards.	Residues from the treatment of hazardous debris—**applicable**	40 CFR 268.45 (d)(1) – (5) *OAC* 3745-270-45 (D)(1) – (5)	X	X	Waste will be disposed of in the OSWDF provided it can meet the WAC. All requirements associated with the OSWDF CAMU designation will be met. Other wastes not meeting OSWDF WAC will be disposed of at an appropriately licensed and permitted disposal facility.
Prohibition of dilution to meet LDRs	Except as provided under 40 CFR 268.3(b) [*OAC* 3745-270-03(B)], must not in any way dilute a restricted waste or the residual from treatment of a restricted waste as a substitute for adequate treatment to achieve compliance with LDR levels.	Land disposal, as defined in 40 CFR 268.2 (*OAC* 3745-270-02), of RCRA-restricted hazardous soils—**applicable**	40 CFR 268.3(a) *OAC* 3745-270-03(A)	X	X	Dilution will not be a substitute for treatment.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Disposal requirements for particular RCRA waste forms and types	Must not be placed in a landfill unless the waste and the landfill meet applicable provisions of 40 CFR 268 and: The resulting waste, mixture, or dissolution of material no longer is reactive or ignitable.	Disposal of ignitable or reactive RCRA waste—**applicable**	40 CFR 264.312(a) *OAC* 3745-57-12(A)		X	Waste will be disposed of in the OSWDF provided it can meet the WAC. All requirements associated with the OSWDF CAMU designation will be met. Other wastes not meeting OSWDF WAC will be disposed of at an appropriately licensed and permitted disposal facility.
	40 CFR 264.17(b) [*OAC* 3745-54-17(B)] is complied with.				X	See above.
	May be landfilled without meeting 40 CFR 264.312(a) [*OAC* 3745-57-12(A)], provided wastes are disposed of in such a way that they are protected from any materials or conditions which may cause them to ignite; Must be disposed of in nonleaking containers which are carefully handled and placed to avoid heat, sparks, rupture, or any other condition that might cause ignition of the wastes;	Disposal of ignitable or reactive RCRA waste [except for prohibited wastes which remain subject to treatment standards in 40 CFR 268.40 *et seq*.]—**applicable**	40 CFR 264.312(b) *OAC* 3745-57-12(B)		X	Waste will be disposed of in the OSWDF provided it can meet the WAC. All requirements associated with the OSWDF CAMU designation will be met. Other wastes not meeting OSWDF WAC will be disposed of at an appropriately licensed and permitted disposal facility.
	Must be covered daily with soil or other noncombustible material to minimize the potential of ignition;				X	See above.
	Must not be disposed of in cells that contain or will contain other wastes which may generate heat sufficient to cause ignition of the waste; and,				X	See above.
	Must not be placed into a cell unless 40 CFR 264.17(b) [*OAC* 3745-54-17(B)] is complied with.	Disposal of incompatible wastes in a RCRA landfill—**applicable**	40 CFR 264.313 *OAC* 3745-57-13		X	See above.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Disposal of bulk or containerized hazardous liquids	The placement of bulk or noncontainerized liquid hazardous waste or hazardous waste containing free liquids (whether or not sorbents have been added) in any landfill is prohibited.	Placement of bulk or containerized hazardous waste liquids in a landfill—**applicable**	40 CFR 264.314(a) *OAC* 3745-57-14(A)		X	Bulk or containerized hazardous liquids do not meet OSWDF WAC and if generated will be disposed of at an appropriately licensed and permitted disposal facility.
	Must use the Paint Filter Liquids Test to demonstrate the absence or presence of free liquids in either a containerized or a bulk waste.		40 CFR 264.314(b) *OAC* 3745-57-14(B)		X	See above.
	Containers holding free liquids must not be placed in a landfill, unless:		40 CFR 264.314(c) *OAC* 3745-57-14(C)		X	See above.
	• All free-standing liquid has been removed by decanting, or other methods; or has been mixed with sorbent or solidified so that free-standing liquid is no longer observed; or has been otherwise eliminated; or		40 CFR 264.314(c)(1) *OAC* 3745-57-14(C)(1)		X	See above.
	• Container is very small, such as an ampule; or		40 CFR 264.314(c)(2) *OAC* 3745-57-14(C)(2)		X	See above.
	• Container is a lab pack as defined in 40 CFR 264.316 [*OAC* 3745-57-16] and is disposed of in accordance with 40 CFR 264.316 [*OAC* 3745-57-16].		40 CFR 264.314(c)(4) *OAC* 3745-57-14(C)(4)		X	See above.
	Sorbents used to treat free liquids to be disposed of in landfills must be nonbiodegradable as described in 40 CFR 264.314(d)(1) [*OAC* 3745-57-14(D)(1)].		40 CFR 264.314(d) *OAC* 3745-57-14(D)		X	See above.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Disposal of bulk or containerized hazardous liquids (continued)	The placement of any liquid which is not a hazardous waste in a landfill is prohibited unless it is demonstrated that the only reasonably available alternative is placement in a landfill or unlined surface impoundment which contains or may contain hazardous waste and such placement will not present a risk of contamination of any underground source of drinking water.		40 CFR 264.314(e) *OAC* 3745-57-14(E)		X	See above.
	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.		40 CFR 264.315 *OAC* 3745-57-15		X	See above.
	Small containers of hazardous waste in overpacked drums (lab packs) may be placed in a landfill if the requirements of this section are met.		40 CFR 264.316 *OAC* 3745-57-16		X	See above.
Disposal of hazardous wastes F020, F021, F022, F023, F026, and F027 listed wastes	Disposal of F020, F021, F022, F023, F026, and F027 wastes in a hazardous waste landfill is not permitted unless comply with the substantive requirements for waste management of 40 *CFR* 264.317 [*OAC* 3745-57-17].	Disposal of hazardous wastes F020, F021, F022, F023, F026, and F027—**applicable**	40 *CFR* 264.317 *OAC* 3745-57-17		X	N/A. F020, F021, F022, F023, F025, or F027 wastes will not be generated during demolition activities.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Treatment and disposal of ignitable, reactive, or incompatible RCRA wastes	Must take precautions to prevent accidental ignition or reaction of waste, and waste must be separated and protected from sources of ignition or reaction.	Operation of a RCRA facility that treats, stores, or disposes of ignitable, reactive, or incompatible wastes—**applicable**	40 CFR 264.17(a) *OAC* 3745-54-17(A)		X	Any treatment facilities will be designed and operated to prevent accidental ignition or reaction. Compliance approach to be provided in a treatment facility design.
	Must take precautions to prevent reactions that: • Generate extreme heat, pressure, fire or explosion, or violent reactions		40 CFR 264.17(b) *OAC* 3745-54-17(B)		X	See above.
	• Produce uncontrolled toxic mists, fumes, dusts, or gases in sufficient quantities to threaten human health or the environment				X	See above.
	• Produce uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or explosions				X	See above.
	• Damage the structural integrity of the device or facility				X	See above.
	• Through other like means threaten human health or the environment.				X	See above.
Pretreatment standards for discharges to a permitted wastewater treatment unit	Pollutants introduced to POTWs shall not pass through POTWs or interfere with the operation or performance of the POTW. Substances listed in *OAC* 3745-3-04(B) shall not be introduced into a POTW.	Discharge of wastewater containing pollutants to a POTW—**relevant and appropriate**	*OAC* 3745-3-04	X		Discharges of wastewater and stormwater will be treated and discharged in compliance with an effective NPDES Permit. Discharges will be effectively treated to meet applicable effluent limits and will not interfere with treatment plant performance. Discharges to a POTW will not occur.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Pretreatment standards for discharges to a permitted wastewater treatment unit (continued)	Must notify POTW immediately of all discharges that could cause problems to the POTW, including any slug loading, in accordance with *OAC* 3745-3-05.		*OAC* 3745-3-05	X		See above.
	Industrial users are subject to national categorical pretreatment standards under 40 CFR 403.6 and to the general requirements listed in *OAC* 3745-3-09 regarding the interpretation and application of pretreatment standards.		*OAC* 3745-3-09	X		See above.
Disposal of wastewaters containing RCRA hazardous constituents in a CWA wastewater treatment unit	Disposal is not prohibited if the wastes are managed in a treatment system which subsequently discharges to waters of the U.S. under the CWA unless the wastes are subject to a specified method of treatment other than DEACT in 40 CFR 268.40 (*OAC* 3745-270-40) or are D003 reactive cyanide.	Disposal of RCRA-restricted hazardous wastes that are hazardous only because they exhibit a hazardous characteristic and are not otherwise prohibited under 40 CFR Part 268—**applicable**	40 CFR 268.1(c)(4)(i) *OAC* 3745-270-01 (C)(4)	X	X	See above.
General duty to mitigate for discharge of wastewater from water treatment system	Take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of effluent standards which has a reasonable likelihood of adversely affecting human health or the environment.	Discharge of pollutants to surface waters—**applicable**	40 CFR 122.41(d) ORC 6111.04(C)		X	Discharges of wastewater and stormwater will be treated and discharged in compliance with an effective NPDES Permit. Discharges will be effectively treated to meet applicable effluent limits
Operation and maintenance of treatment system	Properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) installed or used to achieve compliance with the effluent standards. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures.	Discharge of pollutants to surface waters—**applicable**	40 CFR 122.41(e) *OAC* 3745-33-08(A)(8)		X	Discharges of wastewater and stormwater will be in compliance with an effective NPDES Permit which includes requirements for operation and maintenance.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Disposal of wastewaters in a CWA wastewater treatment unit	No entity shall cause pollution or place or cause to be placed any sewage, sludge, sludge materials, industrial waste, or other wastes in a location where they cause pollution of any waters of the state.	Discharge of contaminants to waters of the state—**applicable**	ORC 6111.04	X	X	Discharges of wastewater and stormwater will be treated and discharged in compliance with an effective NPDES Permit. Discharges will be effectively treated to meet applicable effluent limits.
	No person shall violate or fail to perform any duty imposed by sections 6111.01 to 6111.08 of the Revised Code or violate any order, rule, or term or condition of a permit issued or adopted by the director of environmental protection pursuant to those sections.		ORC 6111.07	X	X	See above.
Treatment and disposal of ignitable, reactive, or incompatible RCRA wastes	Must take precautions to prevent accidental ignition or reaction of waste, and waste must be separated and protected from sources of ignition or reaction.	Operation of a RCRA facility that treats or stores ignitable, reactive, or incompatible wastes—**applicable**	40 CFR 264.17(a) *OAC* 3745-54-17(A)	X		Precautions will be taken when managing ignitable, reactive, or incompatible wastes. Preferential actions will focus on rendering the waste nonignitable or nonreactive. No smoking or open flames will be allowed in areas where ignitable or reactive wastes are stored. Incompatible wastes will be separated by spill containment devices or other physical barriers.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Treatment and disposal of ignitable, reactive, or incompatible RCRA wastes (continued)	Must take precautions to prevent reactions that: • Generate extreme heat, pressure, fire or explosion, or violent reactions; • Produce uncontrolled toxic mists, fumes, dusts, or gases in sufficient quantities to threaten human health or the environment; • Produce uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or explosions; • Damage the structural integrity of the device or facility; and Through other like means threaten human health or the environment.		40 CFR 264.17(b) *OAC* 3745-54-17(B)	X		See above.
Disposal of solid wastes	Except as provided in paragraph (D) of *OAC* 3745-27-02, no person shall establish or modify a solid WD facility without meeting the substantive criteria as follows:	Management and disposal of solid waste—**applicable**	*OAC* 3745-27-02(A)	X	X	Any solid waste that is required to be disposed of off-site will be disposed of at an appropriately licensed and permitted sanitary landfill.
	Disposal of solid wastes shall only be by the following methods or combination thereof:		*OAC* 3745-27-05(A)	X	X	See above.
	• Disposal at a licensed sanitary landfill facility		*OAC* 3745-27-05(A)(1)	X	X	See above.
	• Incinerating at a licensed incinerator		*OAC* 3745-27-05(A)(2)	X	X	Solid wastes will not be incinerated. Liquid PCB wastes are not anticipated to be present during this demolition. However, if encountered, liquid PCB wastes will be managed in accordance with TSCA ARARs.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Disposal of solid wastes (continued)	• Composting at a licensed composting facility		*OAC* 3745-27-05(A)(3)	X	X	Solid wastes will not be composted.
	• Alternative disposal methods either as engineered fill or land application, provided use will not create a nuisance or harm human health or the environment and is capable of complying with other applicable laws.		*OAC* 3745-27-05(A)(4)	X	X	Any solid waste that is required to be disposed of off-site will be disposed of at an appropriately licensed and permitted sanitary landfill.
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)	X	X	Solid waste will be stored to prevent a nuisance and protect human health and the environment.
	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 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)	X	X	Open dumping of solid waste will not occur. Any solid waste disposed of off-site will be disposed of at an appropriately licensed and permitted sanitary landfill.
Treatment of LLW	Waste treatment to provide more stable waste forms and to improve the long-term performance of an LLW disposal facility shall be implemented as necessary to meet performance objectives of the disposal facility.	Generation of LLW for disposal at a DOE LLW disposal facility—**TBC**	DOE M 435.1-1 (IV)(O)	X	X	Demolition debris will be placed in the OSWDF pursuant to the requirements of the OSWDF IMPP. LLW that does not meet OSWDF WAC will be treated on-site or off-site to meet WAC.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Treatment of uranium-bearing LLW	Such wastes shall be properly conditioned so that the generation and escape of biogenic gases will not cause the emission or dose limits in paragraph 4.h.(1) of DOE Order 458.1 to be exceeded and that biodegradation within the facility will not result in premature structural failure.	Placement of potentially biodegradable contaminated wastes in a long-term management facility—**TBC**	DOE Order 458.1 (h)(1)(d)(3)		X	Demolition debris will be placed in the OSWDF pursuant to the requirements of the OSWDF IMPP. LLW that does not meet OSWDF WAC will be treated on-site or off-site to meet WAC.
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 Manual 435.1-1 (IV)(G)(1)(d)(1)		X	See above.
Land disposal of radioactive waste – waste classification and characteristics	The following waste characteristics are minimum requirements for all classes of waste and are intended to facilitate handling at the disposal site and provide protection of health and safety of personnel at the disposal site.	Land disposal of radioactive waste in a licensed radioactive waste landfill—**relevant and appropriate**	*OAC* 3701:1-54-10(B)		X	See above.
	Waste must not be packaged for disposal in cardboard or fiberboard boxes.		*OAC* 3701:1-54-10 (B)(1)		X	See above.
	Liquid waste must be solidified or packaged in sufficient absorbent material to absorb twice the volume of the liquid.		*OAC* 3701:1-54-10 (B)(2)		X	See above.
	Solid waste containing liquid shall contain as little free standing and noncorrosive liquid as is reasonably achievable, but in no case shall the liquid exceed 1% of the volume.		*OAC* 3701:1-54-10 (B)(3)		X	See above.
	Waste must not be readily capable of detonation or of explosive decomposition or reaction at normal pressures and temperatures, or of explosive reaction with water.		*OAC* 3701:1-54-10 (B)(4)		X	See above.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Land disposal of radioactive waste – waste classification and characteristics (continued)	Waste must not contain or be capable of generating quantities of toxic gases, vapors, or fumes harmful to persons transporting, handling, or disposing of the waste. This does not apply to radioactive gaseous waste packaged in accordance with paragraph (B)(7) of this rule.		*OAC* 3701:1-54-10 (B)(5)		X	See above.
	Waste must not be pyrophoric. Pyrophoric materials contained in waste shall be treated, prepared, and packaged to be nonflammable.		*OAC* 3701:1-54-10 (B)(6)		X	See above.
	The requirements in this rule are intended to provide stability of the waste. Stability is intended to ensure that the waste does not structurally degrade and affect overall stability of the site through slumping, collapse, or other failure of the disposal unit and thereby lead to water infiltration. Stability is also a factor in limiting exposure to an inadvertent intruder, since it provides a recognizable and nondispersible waste.		*OAC* 3701:1-54-10 (B)(9)		X	See above.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Land disposal of radioactive waste – waste classification and characteristics (continued)	Waste must have structural stability. A structurally stable waste form will generally maintain its physical dimensions and its form, under the expected disposal conditions such as weight of overburden and compaction equipment, presence of moisture, and microbial activity, and internal factors such as radiation effects and chemical changes. Structural stability can be provided by the waste form itself, processing the waste to a stable form, or placing the waste in a disposal container or structure that provides stability after disposal.		*OAC* 3701:1-54-10 (B)(9)(a)		X	See above.
	Notwithstanding provisions in *OAC* 3701:1-54-10 (B)(2) and (3), liquid wastes, or wastes containing liquid, must be converted into a form that contains as little free standing and noncorrosive liquid as is reasonably achievable, but in no case shall the liquid exceed 1% of the volume of the waste when the waste is in a disposal container designed to ensure stability, or 0.5% of the volume of the waste for waste processed to a stable form.		*OAC* 3701:1-54-10 (B)(9)(b)		X	See above.
Disposal of solid LLW at DOE facilities	Shall meet waste acceptance requirements before it is transferred to the receiving facility.	Generation of LLW for disposal at a DOE facility—**TBC**	DOE M 435.1-1 (IV)(J)(2)	X	X	DOE facilities will include the OSWDF and the NNSS or other appropriately licensed facilities. All wastes will meet the appropriate WAC. For waste transferred to the OSWDF, compliance is addressed in the WAC Implementation Plan.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Disposal of refrigeration equipment	With the exception of the substitutes in the end uses listed in 40 CFR 82.154(a)(1)(i) – (vi), no person maintaining, servicing, repairing, or disposing of appliances may knowingly vent or otherwise release into the environment any refrigerant or substitute from such appliances.	Appliances that contain Class I or II substances used as a refrigerant—**applicable**	40 CFR 82.154(a)(1)	X	X	Refrigerants and refrigeration equipment are not expected to be generated during this demolition project. Waste will be disposed of in the OSWDF based on compliance with OSWDF WAC in accordance with the WAC Implementation Plan. Other wastes will be disposed of at an appropriately licensed and permitted disposal facility. Refrigerants will be sent to appropriate facilities for reclamation or incineration.
	De minimis releases associated with good faith attempts to recycle or recover refrigerants are not subject to this prohibition.		40 *CFR* 82.154(a)(2)	X	X	See above.
	No person may dispose of such appliances, except for small appliances, MVACs, and MVAC-like appliances, without: • Observing the required practices set forth in 40 CFR 82.156, and Using equipment that is certified for that type of appliance pursuant to 40 CFR 82.158.		40 CFR 82.154(b)	X	X	See above.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Disposal of ACM waste (e.g., transite siding, pipe lagging, insulation, ceiling tiles)	All ACM waste must be deposited as soon as practicable at a WD site operated in accordance with Section 61.154 [*OAC* 3745-20-06] or a site that converts RACM and ACM waste into nonasbestos (asbestos free) material according to the 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) and (2) *OAC* 3745-20-05(A)	X		ACM waste may be stored and/or staged until disposal in the OSWDF, provided it meets OSWDF WAC. Off-site disposal of ACM waste, if necessary, will be accomplished when sufficient quantities exist for efficient off-site disposal and will meet disposal facility WAC.
	May use an alternative emission control and waste treatment method that will control asbestos emissions equivalent to currently required methods, 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)	X	X	Emission controls including wetting and/or the application of fixatives will be in place to ensure there are no visible emissions.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Exclusions for disposal or reuse of construction and demolition debris, or "clean hard fill" [as defined in *OAC* 3745-400-01(E)]	Construction and demolition debris facility requirements do not apply to construction and demolition debris or clean hard fill used in one or more of the following ways: • Any construction site where construction debris and trees and brush removed in clearing the construction site are used as fill material on the site where the materials are generated or removed; • Any site where clean hard fill is used, either alone or in conjunction with clean soil, sand, gravel, or other clean aggregates, in legitimate fill operations; • Any site where debris is not disposed, such as where debris is reused or recycled in a beneficial manner, or stored for a temporary period remaining unchanged and retrievable.	Use of construction and demolition debris or clean hard fill at a site—**applicable**	*OAC* 3745-400-03	X	X	Construction and demolition debris meeting the definition of clean hard fill may be used in the construction of the OSWDF or on the plant site for erosion control or as fill material.
Disposal of construction and demolition debris	Shall be disposed of only in an authorized construction and demolition debris facility or solid WD facility; by means of open burning if permitted as provided in *OAC* 3745-19; or by other methods provided such methods are demonstrated to be capable of disposing without creating a nuisance or health hazard, without causing water pollution, and without violating any regulations under Chapters 3745, 3704 or 3734.	Disposal of construction and demolition debris—**applicable**	*OAC* 3745-400-04 (A) and (B)	X	X	Construction and demolition debris will be disposed of in the OSWDF based on compliance with the OSWDF WAC in accordance with the WAC Implementation Plan. Construction and demolition debris meeting the definition of clean hard fill may be used in the construction of the OSWDF or on the plant site for erosion control or as fill material.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Disposal of construction and demolition debris as "clean hard fill"	Clean hard fill (does not include materials contaminated with hazardous, solid, or infectious waste) consisting of reinforced or nonreinforced concrete, asphalt concrete, brick (includes but is not limited to refractory brick and mortar), block, tile, or stone shall be managed in one or more of the following ways: • Recycled into usable construction material; • Disposed in construction and demolition debris or other waste facilities; • Used in legitimate fill operations for construction purposes or to bring the site up to consistent grade, on the site of generation, or on a site other than the site of generation, pursuant to paragraph (C) of *OAC* 3745-400-05.	Use of clean hard fill to bring a construction site up to consistent grade—**applicable**	*OAC* 3745-400-05(A)	X	X	See above.
	Clean hard fill may be stored for a period of less than 2 years. "Stored" means held in a manner remaining retrievable and substantially unchanged. Clean hard fill piled adjacent to a construction materials processing facility shall not be considered stored for more than 2 years if the pile is active, i.e., if clean hard fill material is added to and removed from the pile within a 2-year period.		*OAC* 3745-400-05(B)	X	X	Clean hard fill will not be stored for longer than 2 years if there is continuous waste placement. If not, clean hard fill may be stored for longer than 2 years. If so, it will be stored so it is unchanged and retrievable, will not become a nuisance, and will be protective of human health and the environment. Construction and demolition debris generated which meets the definition of clean hard fill for which no use is identified will be disposed of in the OSWDF based on compliance with the OSWDF WAC and in accordance with the WAC Implementation Plan.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Performance-based disposal of PCB remediation waste	Shall be disposed according to 40 CFR 761.60(a) or (e), or decontaminated in accordance with 40 CFR 761.79.	Disposal of liquid PCB remediation waste—**applicable**	40 CFR 761.61(b)(1)	X	X	While not expected to be generated during this demolition project, all liquid PCB wastes will be sent for off-site incineration.
	May dispose by one of the following methods: • In a high-temperature incinerator under 40 CFR 761.70(b); • By an alternate disposal method under 40 CFR 761.60(e); • In a chemical waste landfill under 40 CFR 761.75; • In a facility under 40 CFR 761.77; or • Through decontamination in accordance with 40 CFR 761.79.	Disposal of nonliquid PCB remediation waste (as defined in 40 CFR 761.3)—**applicable**	40 CFR 761.61(b)(2) 40 CFR 761.61 (b)(2)(i) 40 CFR 761.61 (b)(2)(ii)	X	X	Demolition debris is characterized as PCB remediation wastes and will be disposed of in the OSWDF based on compliance with the OSWDF WAC and in accordance with the WAC Implementation Plan. The OSWDF has been constructed to meet the siting and design requirements of a chemical waste landfill pursuant to 40 CFR 761.75
Risk-based disposal of PCB remediation waste	May dispose of in a manner other than prescribed in 40 CFR 761.61(a) or (b) if the method will not pose an unreasonable risk of injury to health or the environment.	Disposal of PCB remediation waste—**applicable**	40 CFR 761.61(c)	X	X	See above.
Disposal of PCB decontamination waste and residues	Shall be disposed of at their existing PCB concentration unless otherwise specified in 40 CFR 761.79(g).	PCB decontamination waste and residues for disposal—**applicable**	40 CFR 761.79(g)	X	X	While not anticipated to be generated in this demolition project, liquid PCB wastes with concentrations above 50 ppm will be sent for off-site incineration. Wastewater with PCB content would be collected and treated using the site modular wastewater treatment systems.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Disposal of PCB liquids (e.g., from drained electrical equipment)	Must be disposed of in an incinerator that complies with 40 CFR 761.70, except:	PCB liquids at concentrations ≥ 50 ppm—**applicable**	40 CFR 761.60(a)	X	X	See above.
	For mineral oil dielectric fluid, may be disposed in a high efficiency boiler according to 40 CFR 761.71(a).	PCB liquids at concentrations ≥ 50 ppm and < 500 ppm—**applicable**	40 CFR 761.60(a)(1)	X	X	See above.
	For liquids other than mineral oil dielectric fluid, may be disposed in a high efficiency boiler according to 40 CFR 761.71(b).		40 CFR 761.60(a)(2)	X	X	See above.
Disposal of PCB-contaminated precipitation, condensation, or leachate	May be disposed in a chemical waste landfill that complies with 40 CFR 761.75 if:	PCB liquids at concentrations ≥ 50 ppm from incidental sources and associated with PCB articles or nonliquid PCB wastes—**applicable**	40 CFR 761.60(a)(3)	X	X	See above.
	• Disposal does not violate 40 CFR 268.32(a) or 268.42(a)(1); and		40 CFR 761.60 (a)(3)(i)	X	X	See above.
	• Liquids do not exceed 500 ppm and are not ignitable waste as described in 40 CFR 761.75(b)(8)(iii).		40 CFR 761.60 (a)(3)(ii)	X	X	See above.
Disposal of PCB transformers	Shall be disposed of in either: • An incinerator that complies with 40 CFR 761.70, or • 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.	PCB-contaminated electrical equipment (including transformers that contain PCBs at concentrations of ≥ 50 ppm and < 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)	X	X	N/A. No PCB transformers are included in the demolition scope.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Performance-based disposal of PCB bulk product waste	May dispose of by one of the following:	Disposal of PCB bulk product waste as defined in 40 CFR 761.3—**applicable**	40 CFR 761.62(a)	X	X	Any PCB bulk product waste generated during demolition activities will be stored in compliance with ARARs for disposal in the OSWDF (chemical waste land fill) provided it meets WAC.
	• In an incinerator under Section 761.70;		40 CFR 761.62(a)(1)	X	X	See above.
	• In a chemical waste landfill under Section 761.75;		40 CFR 761.62(a)(2)	X	X	See above.
	In a hazardous waste landfill under Section 3004 or Section 3006 of RCRA;		40 CFR 761.62(a)(3)	X	X	See above.
	Under alternate disposal under Section 761.60(e);		40 CFR 761.62(a)(4)	X	X	See above.
	In accordance with decontamination provisions of Section 761.79; or,		40 CFR 761.62(a)(5)	X	X	See above.
	In accordance with thermal decontamination provisions of Section 761.79(e)(6) for metal surfaces in contact with PCBs.		40 CFR 761.62(a)(6)	X	X	See above.
Risk-based disposal of PCB bulk product waste	May dispose of in a manner other than that prescribed in 40 CFR 761.62(a) if the method will not pose an unreasonable risk of injury to health or the environment.	Disposal of PCB bulk product waste as defined in 40 CFR 761.3—**applicable**	40 CFR 761.62(c)	X	X	Any PCB bulk product waste generated during demolition activities will be stored in compliance with ARARs for disposal in the OSWDF provided it meets WAC.
Disposal of PCB bulk product waste in solid waste landfill	May dispose of the following in a municipal or non-municipal non-hazardous waste landfill:	Disposal of non-liquid PCB bulk product waste listed in 40 CFR 761.62(b)(1)—**applicable**	40 CFR 761.62(b)(1)	X	X	Any PCB bulk product waste generated during demolition activities will be stored in compliance with ARARs for disposal in the OSWDF provided it meets WAC.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Disposal of PCB bulk product waste in solid waste landfill (continued)	• Plastics (such as plastic insulation from wire or cable; radio, television and computer casings; vehicle parts; or furniture laminates); preformed or molded rubber parts and components; applied dried paints, varnishes, waxes or other similar coatings or sealants; caulking; Galbestos; non-liquid building demolition debris; or non-liquid PCB bulk product waste from the shredding of automobiles or household appliances from which PCB small capacitors have been removed (shredder fluff), and		40 CFR 761.62 (b)(1)(i)	X	X	See above.
	Other PCB bulk product waste, sampled in accordance with the protocols set out in subpart R of 40 CFR Part 761, that leaches PCBs at < 10 µg/L of water measured using a procedure used to simulate leachate generation.		40 CFR 761.62 (b)(1)(ii)	X	X	See above.
	• May dispose of in a municipal or non-municipal nonhazardous waste landfill if:	PCB bulk product waste not meeting conditions of 40 CFR 761.62(b)(1) (e.g., paper/felt gaskets contaminated by liquid PCBs)—**applicable**	40 CFR 761.62(b)(2)	X	X	See above.
	• The PCB bulk product waste is segregated from organic liquids disposed of in the landfill, and		40 CFR 761.62 (b)(2)(i)	X	X	See above.
	• Leachate is collected from the landfill and monitored for PCBs.		40 CFR 761.62 (b)(2)(ii)	X	X	See above.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Disposal of fluorescent light ballasts	Must be disposed of in a TSCA disposal facility as bulk product waste under 40 CFR 761.62 or in accordance with the decontamination provisions of 40 CFR 761.79.	Generation for disposal of fluorescent light ballasts containing PCBs in the potting material—**applicable**	40 CFR 761.60 (b)(6)(iii)	X	X	PCB fluorescent light ballasts will be disposed of in the OSWDF based on compliance with the OSWDF WAC in accordance with the WAC Implementation Plan.
	Must remove all free-flowing liquid from the electrical equipment and dispose of the removed liquid in accordance with 40 CFR 761.60(a), and	Generation of PCB-contaminated electrical equipment (as defined in 40 CFR 761.3) for disposal—**applicable**	40 CFR 761.60(b)(4)	X	X	PCB contaminated electrical equipment will be disposed of in the OSWDF based on compliance with the OSWDF WAC in accordance with the WAC Implementation Plan.
	Dispose of by one of the following methods: • In a facility managed as a municipal solid waste or nonmunicipal nonhazardous waste facility; • In an industrial furnace operating in compliance with 40 CFR 761.72; or • In a disposal facility under 40 CFR 761.60.	Drained PCB-contaminated electrical equipment, including any residual liquids—**applicable**	40 CFR 761.60 (b)(6)(ii)(A)	X	X	See above.
Disposal of PCB capacitors	Any person must assume that a capacitor manufactured prior to July 2, 1979, whose PCB concentration is not established, contains ≥ 500 ppm PCBs. If the date of manufacture is unknown, any person must assume the capacitor contains ≥ 500 ppm PCBs.	Generation of PCB capacitors with ≥ 500 ppm PCBs for disposal—**applicable**	40 CFR 761.2(a)(4)	X	X	N/A. No PCB-contaminated capacitors are included in the scope of the demolition.
	Shall comply with all requirements of 40 CFR 761.60 unless it is known from label or nameplate information, manufacturer's literature, or chemical analysis that capacitor does not contain PCBs.		40 CFR 761.60 (b)(2)(i)	X	X	See above.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Disposal of PCB capacitors (continued)	Shall dispose of in accordance with either of the following: • Disposal in an incinerator that complies with 40 CFR 761.70; or • Disposal in a chemical waste landfill that complies with 40 CFR 761.75.	Generation of PCB capacitors with ≥ 500 ppm PCBs for disposal—**applicable**	40 CFR 761.60 (b)(2)(iii)	X	X	See above.
	Shall dispose of in one of the following disposal facilities approved under 40 CFR 761.60: • Incinerator under 40 CFR 761.70; • Chemical waste landfill under 40 CFR 761.75; • High-efficiency boiler under 40 CFR 761.71; or • Scrap metal recovery oven or smelter under 40 CFR 761.72.	Disposal of large capacitors that contain ≥ 50 ppm but < 500 ppm PCBs—**applicable**	40 CFR 761.60 (b)(4)(ii)	X	X	See above.
	May dispose of in municipal solid waste landfill.	Generation of PCB small capacitors (as defined in 40 CFR 761.3) for disposal—**applicable**	40 CFR 761.60 (b)(2)(ii)	X	X	See above.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Disposal of PCB-contaminated articles	Must remove all free-flowing liquid from the article, disposing of the liquid in compliance with the requirements of 40 CFR 761.60(a)(2) or (a)(3), and	Generation of PCB-contaminated articles (as defined in 40 CFR 761.3) for disposal—**applicable**	40 CFR 761.60 (b)(6)(ii)	X	X	PCB-contaminated articles will be disposed of in the OSWDF based on compliance with the OSWDF WAC and in accordance with the WAC Implementation Plan.
	Dispose of by one of the following methods: • In accordance with the decontamination provisions at 40 CFR 761.79; • In a facility managed as a municipal solid waste or nonmunicipal nonhazardous waste facility; • In an industrial furnace operating in compliance with 40 CFR 761.72; or • In a disposal facility under 40 CFR 761.60.	Disposal of PCB-contaminated articles with no free-flowing liquid—**applicable**	40 CFR 761.60 (b)(6)(ii) (A) thru (D)	X	X	See above.
			Closure			
Closure performance standard for RCRA hazardous waste management units	Must close the facility in a manner that: Minimizes the need for further maintenance; and	Closure of a RCRA hazardous waste management unit—**applicable**	40 *CFR* 264.111(a) *OAC* 3745-55-11(A)	X	X	N/A. No hazardous waste management units will be closed during demolition activities.
	Controls, minimizes or eliminates, to the extent necessary to protect human health and environment, postclosure escape of hazardous waste, hazardous constituents, contaminated run off or hazardous waste decomposition products to ground or surface waters or to the atmosphere.		40 *CFR* 264.111(b) *OAC* 3745-55-11(B)	X	X	See above.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Closure performance standard for RCRA hazardous waste management units (continued)	Complies with the substantive closure requirements of 40 CFR 264 [*OAC* 3745-54 to 3745-57 and 3745-205] for the particular type of facility, including but not limited to the requirements of Sections 264.178 (container storage area) [*OAC* 3745-55-78], 264.197 (tanks) [*OAC* 3745-55-97], 264.310 (landfills) [*OAC* 3745-57-10], and 264.554 (remediation waste piles) [*OAC* 3745-56-58].		40 *CFR* 264.111(c) *OAC* 3745-55-11(C)	X	X	See above.
	During closure periods, all contaminated equipment, structures, and soils must be properly disposed or decontaminated.		40 *CFR* 264.114 *OAC* 3745-55-14	X	X	See above.
Postclosure care of RCRA hazardous waste management unit	Postclosure care in accordance with the substantive requirements of *OAC* 3745-55-17(A)(1) must begin after closure and continue for at least 30 years after that date. The Director may shorten or extend the postclosure period as indicated to protect human health and the environment.	Closure of a RCRA hazardous WD unit—**applicable**	40 *CFR* 264.117 (a)(1) and (2) *OAC* 3745-55-17 (A)(1) and (2)	X	X	See above.
Closure of a RCRA container storage unit	Must remove all hazardous waste and residues from containment system. Remaining containers, liners, bases and soil containing or contaminated with hazardous waste or residues must be decontaminated or removed.	Closure of a RCRA hazardous waste container storage area—**applicable**	40 *CFR* 264.178 *OAC* 3745-55-78	X	X	N/A. No hazardous waste storage areas will be closed during demolition activities.
Closure of a RCRA remediation waste staging pile	Must be closed by removing or decontaminating all remediation waste, contaminated containment system components, and structures and equipment contaminated with waste and leachate.	Closure of a remediation waste staging pile located in a previously contaminated area—**applicable**	40 *CFR* 264.554(j)(1) *OAC* 3745-57-74 (J)(1)	X	X	N/A. No hazardous waste piles will be generated during demolition.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Closure of a RCRA remediation waste staging pile (continued)	Must decontaminate contaminated subsoils in a manner that will protect human health and the environment.	Closure of a remediation waste staging pile located in a previously contaminated area—**applicable**	40 *CFR* 264.554(j)(2) *OAC* 3745-57-74 (J)(2)	X	X	See above.
	Must be closed according to substantive requirements in 40 *CFR* 264.258(a) and 264.111 or 265.258(a) and 265.111 [*OAC* 3745-56-58(A) and 3745-55-11 or 3745-67-58 and 3745-66-11].	Closure of a remediation waste staging pile located in an uncontaminated area—**applicable**	40 *CFR* 264.554(k) *OAC* 3745-57-74(K)	X	X	See above.
Closure of RCRA hazardous waste tanks	At closure, remove all hazardous waste and hazardous waste residues from tanks, discharge control equipment, and discharge confinement structures.	Management of RCRA hazardous waste in tanks—**applicable**	40 *CFR* 264.197(a) *OAC* 3745-55-97(A)	X	X	N/A. No RCRA hazardous waste tanks are present.
	If all contaminated contents cannot be removed, must consider the tank system a landfill and close the facility and perform postclosure care in accordance with the landfill closure requirements of 40 *CFR* 264.310 (*OAC* 3745-57-10).		40 *CFR* 264.197(b) *OAC* 3745-55-97(B)	X	X	See above.
Closure of TSCA storage facility (i.e., storage areas established under this action)	Must close in a manner that eliminates the potential for post-closure releases of PCBs that may present an unreasonable risk to human health or the environment.	Closure of a TSCA storage facility—**applicable**	40 CFR 761.65(e)(1)	X	X	N/A. No TSCA storage areas will undergo closure as part of this demolition.
	Must remove or decontaminate PCB waste residues and contaminated containment system components, equipment, structures, and soils during closure in accordance with the levels specified in the PCB Spills Cleanup Policy in subpart G of 40 CFR 761.		40 CFR 761.65 (e)(1)(iv)	X	X	See above.
	A TSCA/RCRA storage facility closed under RCRA is exempt from the TSCA closure requirements of 40 CFR 761.65(e).	Closure of TSCA/RCRA storage facility—**applicable**	40 CFR 761.65(e)(3)	X	X	See above.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
			Transportation[b]			
Transportation of hazardous waste on site	The generator manifesting requirements of 40 CFR 262.20 to 262.32(b) [*OAC* 3745-52-20 to 3745-52-23 and 3745-52-32(B)] do not apply. Generator or transporter must comply with the requirements set forth in 40 CFR 263.30 and 263.31 [*OAC* 3745-53-30 and 3745-53-31] in the event of a discharge of hazardous waste on a private or public right-of-way.	Transportation of hazardous wastes on a public or private right-of-way within or along the border of contiguous property under the control of the same person, even if such contiguous property is divided by public or private right-of-way—**applicable**	40 CFR 262.20(f) *OAC* 3745-52-20(F)	X	X	Hazardous waste (paint, oil, rags soaked with either, etc.) may be transported on site. Manifesting is not required for on-site transportation.
	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,* LPP-0021/R3].[b]	Transport of hazardous materials on the PORTS site—**TBC**	DOE Order 460.1C (4)(b)	X	X	Where DOT hazardous material regulations are not required to be met, DOE transportation requirements will be met for hazardous materials traveling on site.
Transportation of radioactive waste	Shall be packed and transported in accordance with the substantive requirements of DOE Order 460.1C (*Packaging and Transportation Safety*) and DOE Order 460.2A (*Departmental Materials Transportation and Packaging Management*).	Preparation of shipment of radioactive waste—**TBC**	DOE M 435.1-1 (I)(1)(E)(11)	X	X	The cited regulations and standards apply to off-site transportation activities.
	To the extent practicable, the volume of waste and number of shipments shall be minimized.		DOE M 435.1-1 (III)(L)(2) DOE M 435.1-1 (IV)(L)(2)	X	X	Pollution prevention techniques will be implemented throughout remedy implementation to ensure waste volumes and associated waste shipments are minimized.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Transportation of PCB wastes off-site	Must comply with the manifesting provisions at 40 CFR 761.207 through 218.	Relinquishment of control over PCB wastes by transporting or offering for transport—**applicable**	40 CFR 761.207(a)	X	X	Transportation of wastes off-site will comply with all applicable DOE and DOT requirements.
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, Section 262.32 [*OAC* 3745-52-32] for marking, Section 262.33 [*OAC* 3745-52-33] for placarding, Section 262.40 and 262.41(a) [*OAC* 3745-52-40 and 3745-52-41(A)] for record keeping requirements, and Section 262.12 [*OAC* 3745-52-12] to obtain EPA ID number.	Preparation of RCRA hazardous waste for transport off-site—**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	X	X	See above.
Transportation of universal waste off-site	Off-site shipments of universal waste by a large quantity handler of universal waste shall be made in accordance with 40 *CFR* 273.38 [*OAC* 3745-273-38].	Preparation of universal waste for transport off-site—**applicable**	40 CFR 273.38(c) *OAC* 3745-273-38(C)	X	X	See above.
	Off-site shipments to a foreign destination must comply with requirements applicable to a primary exporter in *OAC* 3745-52-10, 3745-52-53, 3745-52-56 and 3745-52-57 and export waste only upon consent of the receiving country and in conformance with the EPA "Acknowledgement of Consent" as defined in *OAC* 3745-52-50 to 3745-52-57. A copy of the consent must be provided to the transporter.		40 *CFR* 273.40 *OAC* 3745-273.40	X	X	N/A. No universal waste shall be exported out of the country.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
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 transport off-site—**applicable**	40 CFR 279.24 *OAC* 3745-279-24	X	X	Transportation of wastes off-site will comply with all applicable DOE and DOT requirements.
Transportation of ACM waste off-site	For ACM waste to be transported off the facility site, label containers or wrapped materials with the name of the waste generator and location at which the waste was generated.	Preparation for transport of ACM waste off-site—**applicable**	40 CFR 61.150 (a)(1)(v) *OAC* 3745-20-05 (C)(1)	X	X	See above.
	Mark vehicles used to transport ACM waste during the loading and unloading of waste so that the signs are visible. The markings must conform to the requirements of 40 CFR 61.149(d)(1)(i), (ii), and (iii).		40 CFR 61.150(c) *OAC* 3745-20-05(E)	X	X	See above.
Transportation of hazardous materials off-site	Any person who, under contract with a department or agency of the Federal government, transports "in commerce," or causes to be transported, or shipped, a hazardous material, shall be subject to and must comply with all applicable provisions of the HMTA and HMR at 49 CFR 171 – 180 related to marking, labeling, placarding, etc.	Preparation for transport or shipment "in commerce" of a hazardous material—**applicable**	49 CFR 171.1(c)	X	X	See above

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Release of beryllium-contaminated equipment or other items	Must clean beryllium-contaminated equipment or other items to the lowest contamination level practicable, not to exceed the levels established in 10 CFR 850.31(b) and (c) and label them before release.	Release of beryllium-contaminated equipment or other items to general public or another DOE facility—**applicable**	10 CFR 850.31(a)		X	No plans to release to public.
	Before being released to the general public or another DOE facility, ensure that the removable contamination level of equipment and item surfaces does not exceed the higher of 0.2 µg/100 cm^2 or the concentration level of beryllium in soil at the point or release, whichever is greater;		10 CFR 850.31(b)(1)		X	See above.
	Ensure equipment or item is labeled in accordance with 10 CFR 850.38(b); and		10 CFR 850.31(b)(2)		X	See above.
	Release is conditioned on the recipient's commitment to implement controls that will prevent foreseeable beryllium exposure.		10 CFR 850.31(b)(3)		X	See above.
	Before being released to another facility performing work with beryllium, must ensure that removal contamination level of equipment and other item surfaces does not exceed 3 µg/100 cm^2;	Release of beryllium-contaminated equipment or other items to another facility performing work with beryllium—**applicable**	10 CFR 850.31(c)(1)		X	See above.
	Ensure equipment or item is labeled in accordance with 10 CFR 850.38(b); and		10 CFR 850.31(c)(2)		X	See above.
	Enclose or place in sealed, impermeable bags or containers to prevent the release of beryllium dust during handling or transportation.		10 CFR 850.31(c)(3)		X	See above.

Table A.3. Action-specific ARARs (Continued)

Action	Requirements Summary[a]	Prerequisite	Citation	PB ROD	WD ROD	Compliance Strategy for the X-326 At- and Below-grade DDP
Disposal of beryllium-containing waste or beryllium-contaminated equipment and other items	Must control the generation of beryllium-containing waste or beryllium-contaminated equipment and other items through the application of waste minimization principles.	Generation of beryllium-containing waste or beryllium-contaminated equipment and other items—**applicable**	10 CFR 850.32(a)		X	Contamination control during demolition will be used to prevent the spread of beryllium contamination.
	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.		10 CFR 850.32(b)		X	Beryllium-contaminated waste will be appropriately containerized.

Notes:
[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.
[b]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 be relevant and appropriate under the ARARs process.

D&D 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* (Ohio EPA 2012).
OSWDF IMPP = *On-Site Waste Disposal Facility (OSWDF) Impacted Material Placement Plan (IMPP), Final Design, Portsmouth Gaseous Diffusion Plant, Decontamination and Decommissioning Project, Piketon, Ohio* (DOE 2023a).
OSWDF O&M Plan = *On-Site Waste Disposal Facility (OSWDF) Operations and Maintenance Plan, Final Design, Portsmouth Gaseous Diffusion Plant, Decontamination and Decommissioning Project, Piketon, Ohio* (DOE 2023b).
PB ROD = *Record of Decision for the Process Buildings and Complex Facilities Decontamination and Decommissioning Evaluation Project at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (DOE 2015a).
WAC Implementation Plan = *Waste Acceptance Criteria Implementation Plan for the On-site Waste Disposal Facility at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (DOE 2020).
WD ROD = *Record of Decision for the Site-wide Waste Disposition Evaluation Project at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (DOE 2015b).

Table A.1.4. Action-specific ARARs (Continued)

ACM = asbestos-containing material
ALARA = as low as reasonably achievable
AOC = area of contamination
ARAR = applicable or relevant and appropriate requirement
CAMU = corrective action management unit
CFR = Code of Federal Regulations
CMBST = combustion
COC = contaminant of concern
CWA = Clean Water Act of 1972
D&D = decontamination and decommissioning
DDP = demolition design plan
DEACT = deactivation to remove the hazardous characteristic of a waste due to its ignitability, corrosivity, and/or reactivity
DOE = U.S. Department of Energy
DOE M = DOE Manual
DOT = U.S. Department of Transportation
EDE = effective dose equivalent
EPA = U.S. Environmental Protection Agency
HMR = Hazardous Materials Regulations
HMTA = Hazardous Materials Transportation Act of 1975
ID = identification
LDR = land disposal restriction
LLW = low-level (radioactive) waste
LPP = LATA/Parallax Portsmouth, LLC
mSv = millisievert
MVAC = motor vehicle air conditioning
NACE = National Association of Engineers
N/A = not applicable
NNSS = Nevada National Security Site
NPDES = National Pollutant Discharge Elimination System
OAC = Ohio Administrative Code
Ohio EPA = Ohio Environmental Protection Agency
OSWDF = On-site Waste Disposal Facility
PCB = polychlorinated biphenyl
POLYM = polymerization
PORTS = Portsmouth Gaseous Diffusion Plant
POTW = publicly owned treatment works
PSS = Plant Shift Superintendent
RACM = regulated asbestos-containing material
ORC = Ohio Revised Code
RCRA = Resource Conservation and Recovery Act of 1976, as amended
RORGS = recovery of organics
TBC = to-be-considered (guidance)
TCE = trichloroethene
TED = total effective dose
TSCA = Toxic Substances Control Act of 1976
UST = underground storage tank
UTS = Universal Treatment Standard
VOC = volatile organic compound
WAC = waste acceptance criteria
WD = waste disposition

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REFERENCES

DOE 2023a, *On-Site Waste Disposal Facility (OSWDF) Impacted Material Placement Plan (IMPP), Final Design, Portsmouth Gaseous Diffusion Plant, Decontamination and Decommissioning Project, Piketon, Ohio*, DOE/PPPO/03-0344&D4, U.S. Department of Energy, Piketon, Ohio, April.

DOE 2023b, *On-Site Waste Disposal Facility (OSWDF) Operations and Maintenance Plan, Final Design, Portsmouth Gaseous Diffusion Plant, Decontamination and Decommissioning Project, Piketon, Ohio*, DOE/PPPO/03-0701&D5, U.S. Department of Energy, Piketon, Ohio, April.

DOE 2020, *Waste Acceptance Criteria Implementation Plan for the On-site Waste Disposal Facility at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio*, DOE/PPPO/03-0728&D3, U.S. Department of Energy, Piketon, Ohio, April.

DOE 2015a, *Record of Decision for the Process Buildings and Complex Facilities Decontamination and Decommissioning Evaluation Project at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio*, DOE/PPPO/03-0425&D2, U.S. Department of Energy, Piketon, Ohio, July.

DOE 2015b, *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, Ohio, 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*, Ohio Environmental Protection Agency, Columbus, Ohio, July 16.

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APPENDIX B: SUPPORTING INFORMATION FOR THE X-326 PROCESS BUILDING AT- AND BELOW-GRADE DEMOLITION DESIGN

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FIGURES

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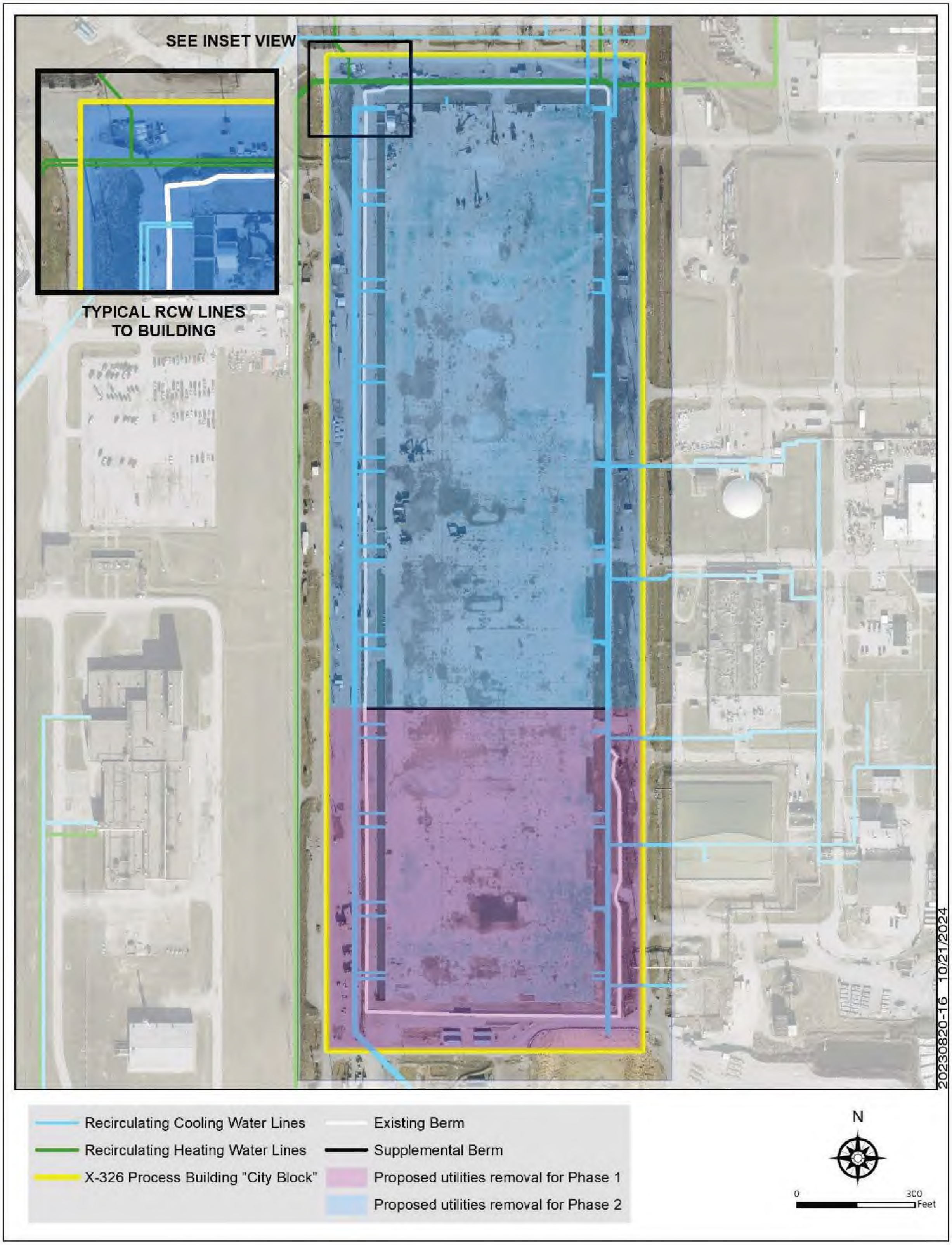

Figure B.1. Underground Utilities – Recirculating Cooling Water Lines

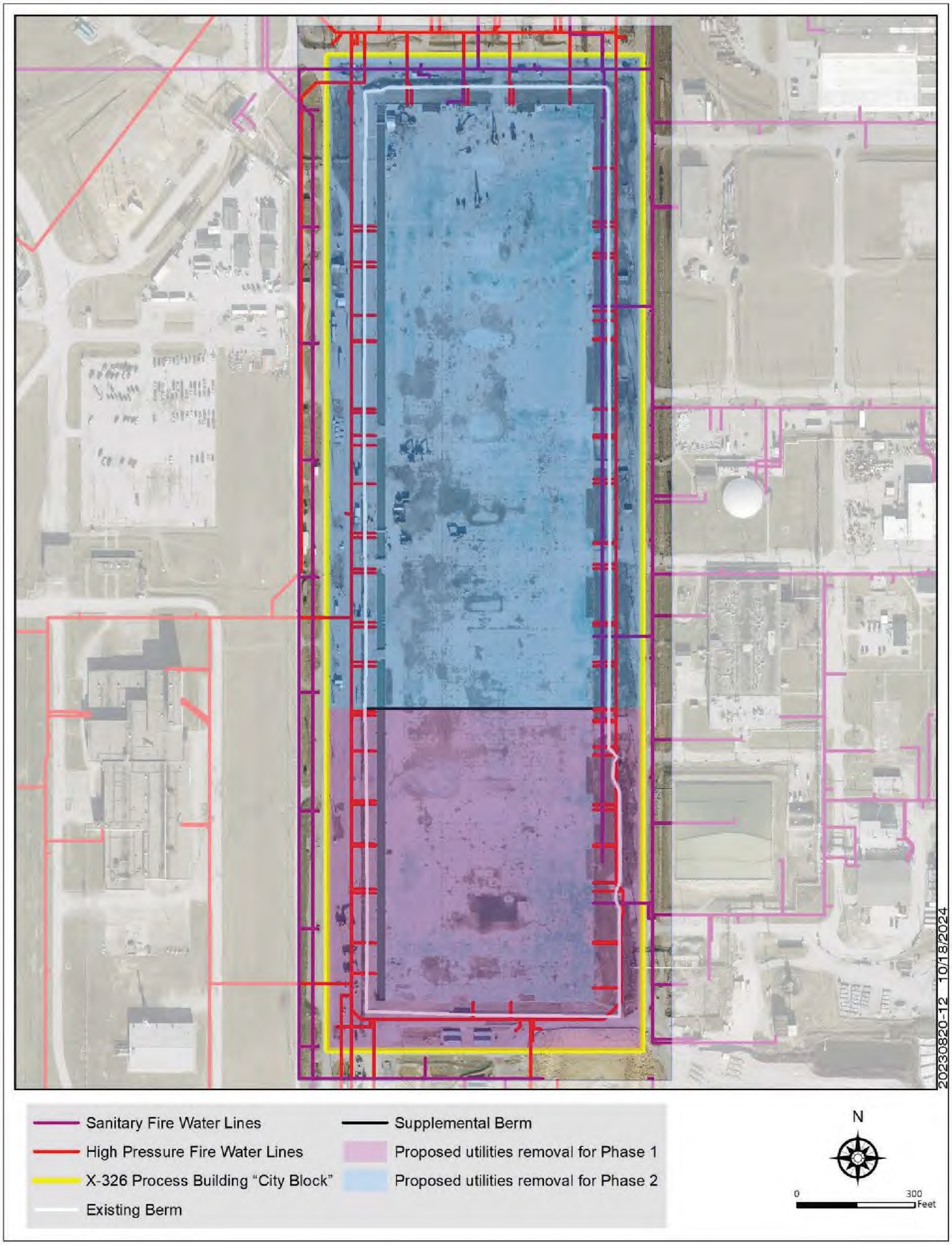

Figure B.2. Underground Utilities – Fire Water Lines

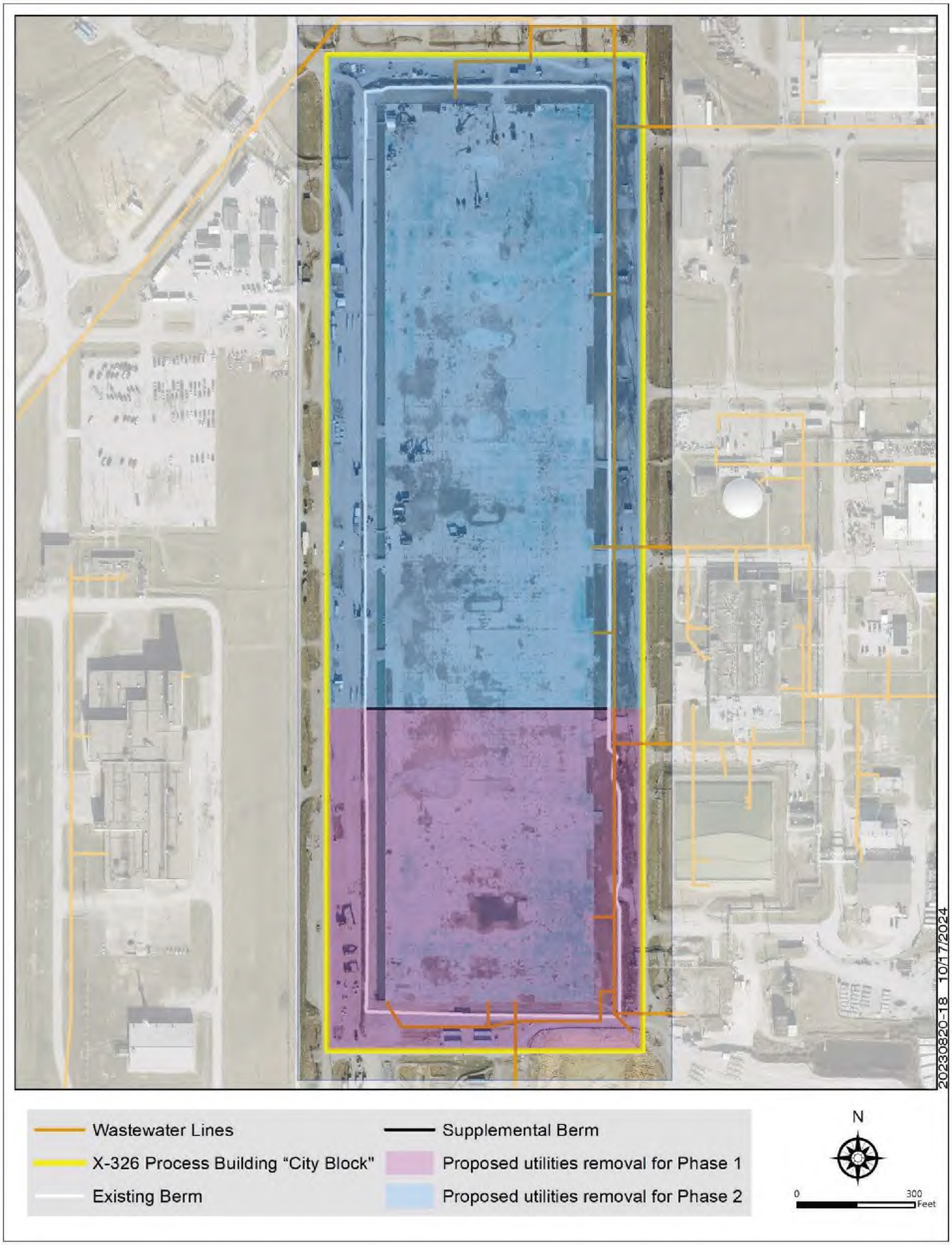

Figure B.3. Underground Utilities – Sanitary Sewer Lines

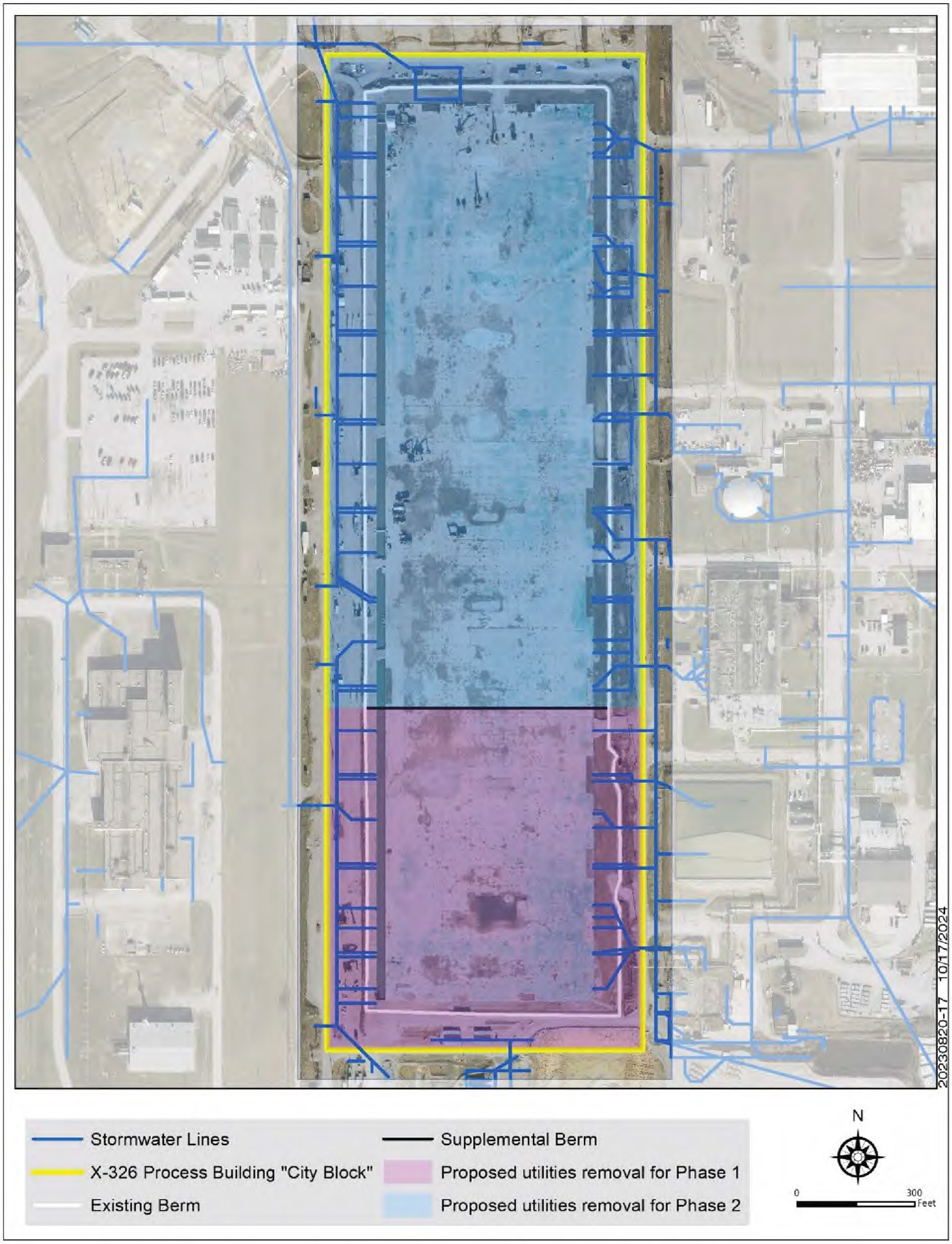

Figure B.4. Underground Utilities – Stormwater and Drain Lines

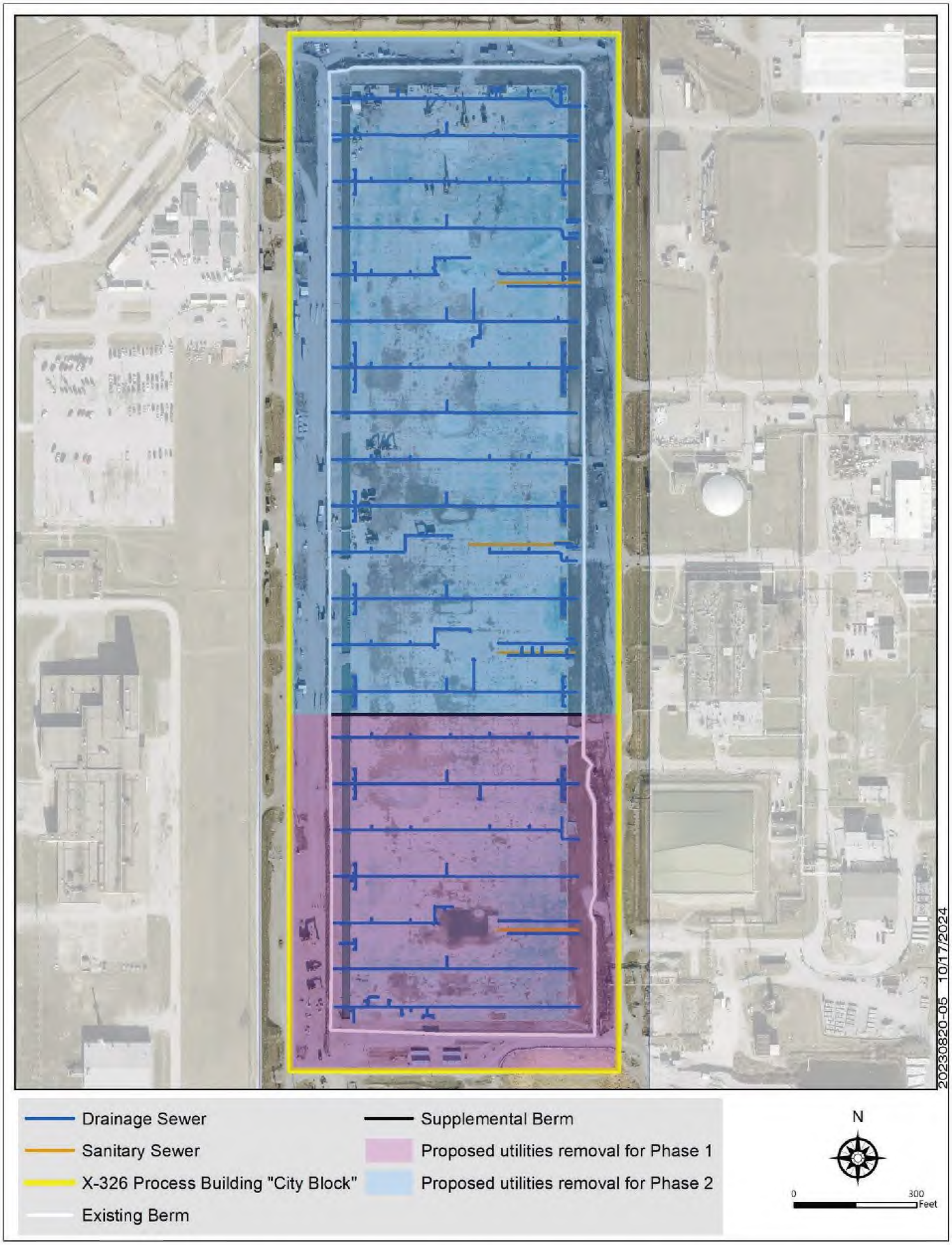

Figure B.5. Underground Utilities – Drain Lines Under the Concrete Slab

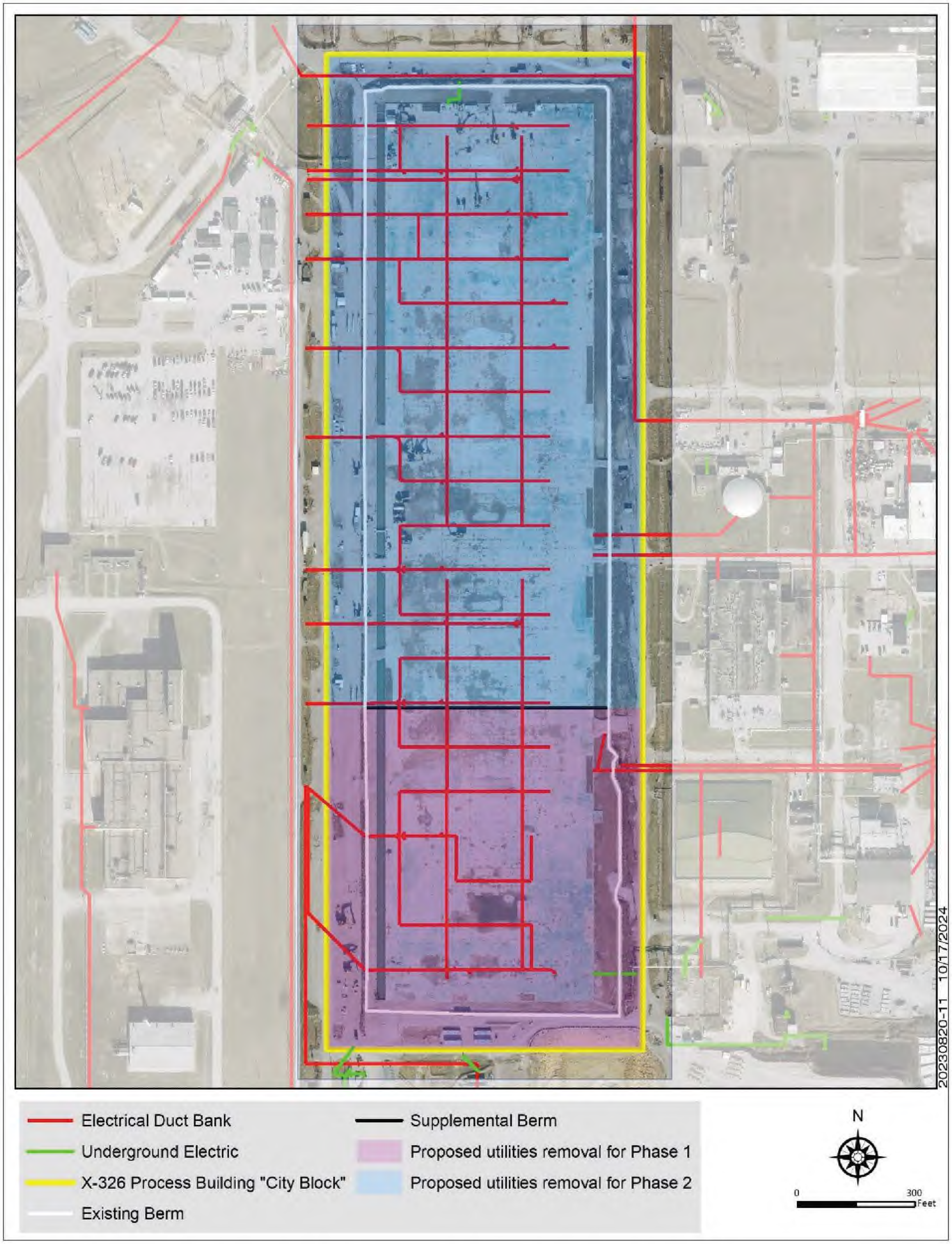

Figure B.6. Underground Utilities – Electrical Duct Banks

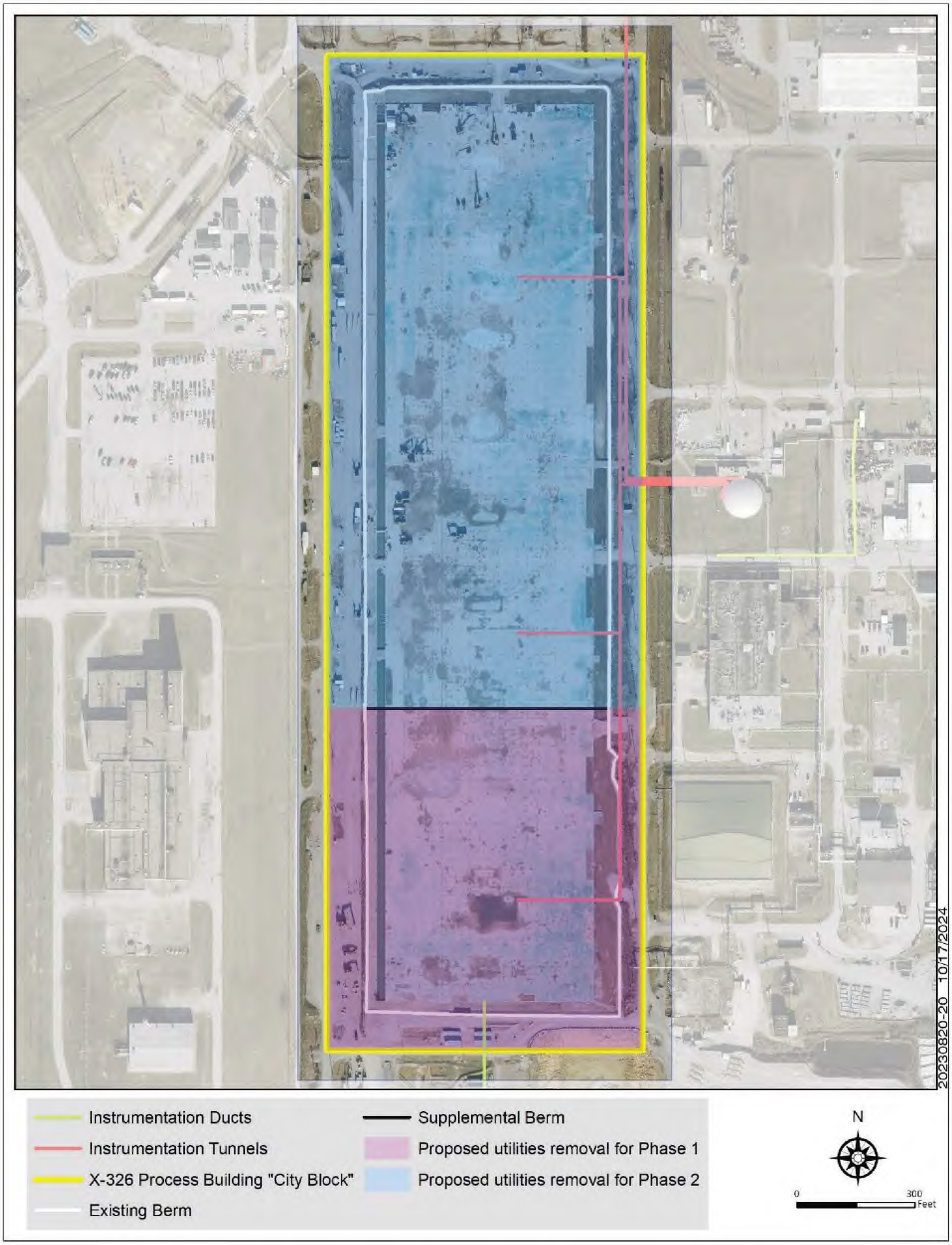

Figure B.7. Underground Structures – Instrumentation Tunnels

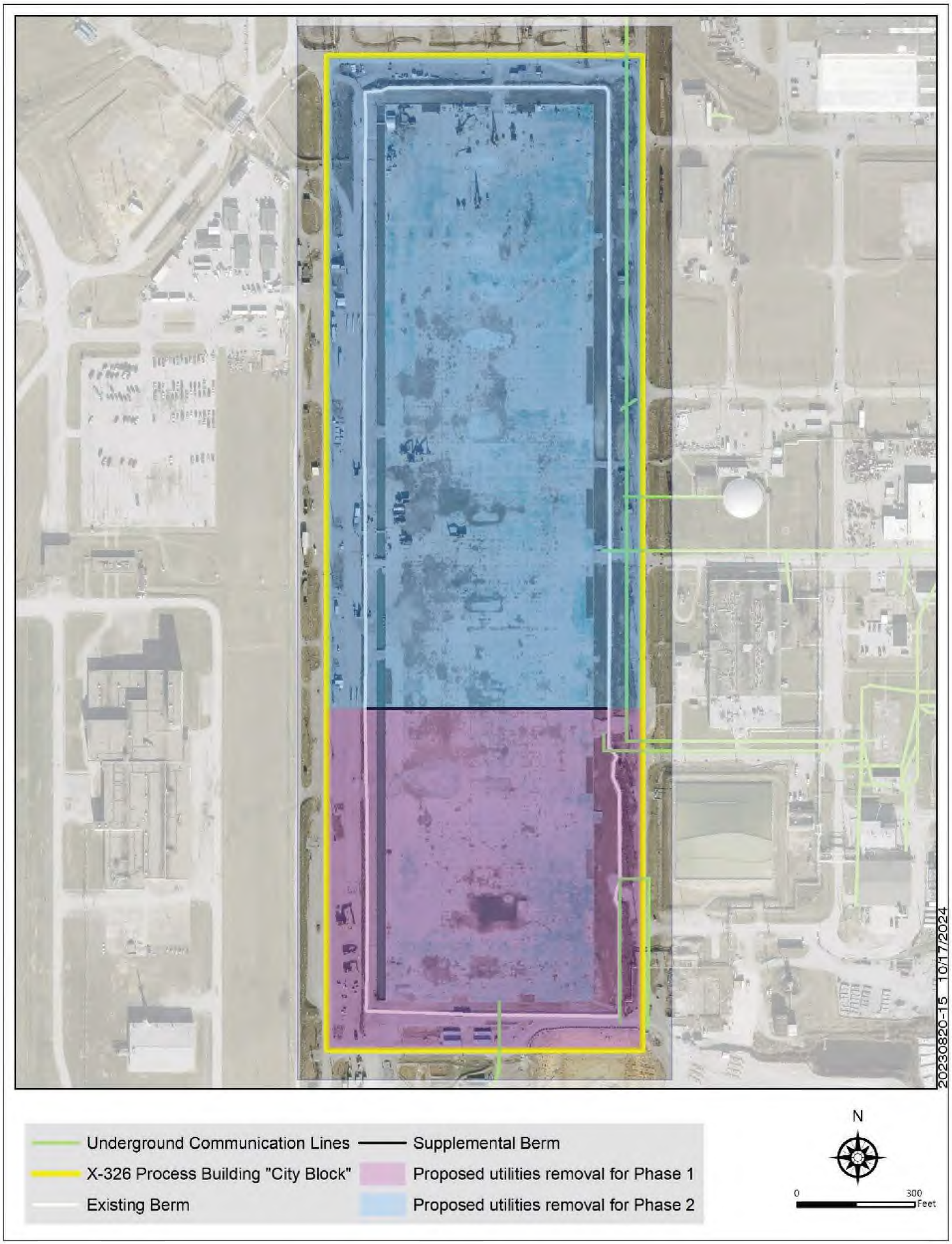

Figure B.8. Underground Utilities – Communication Lines

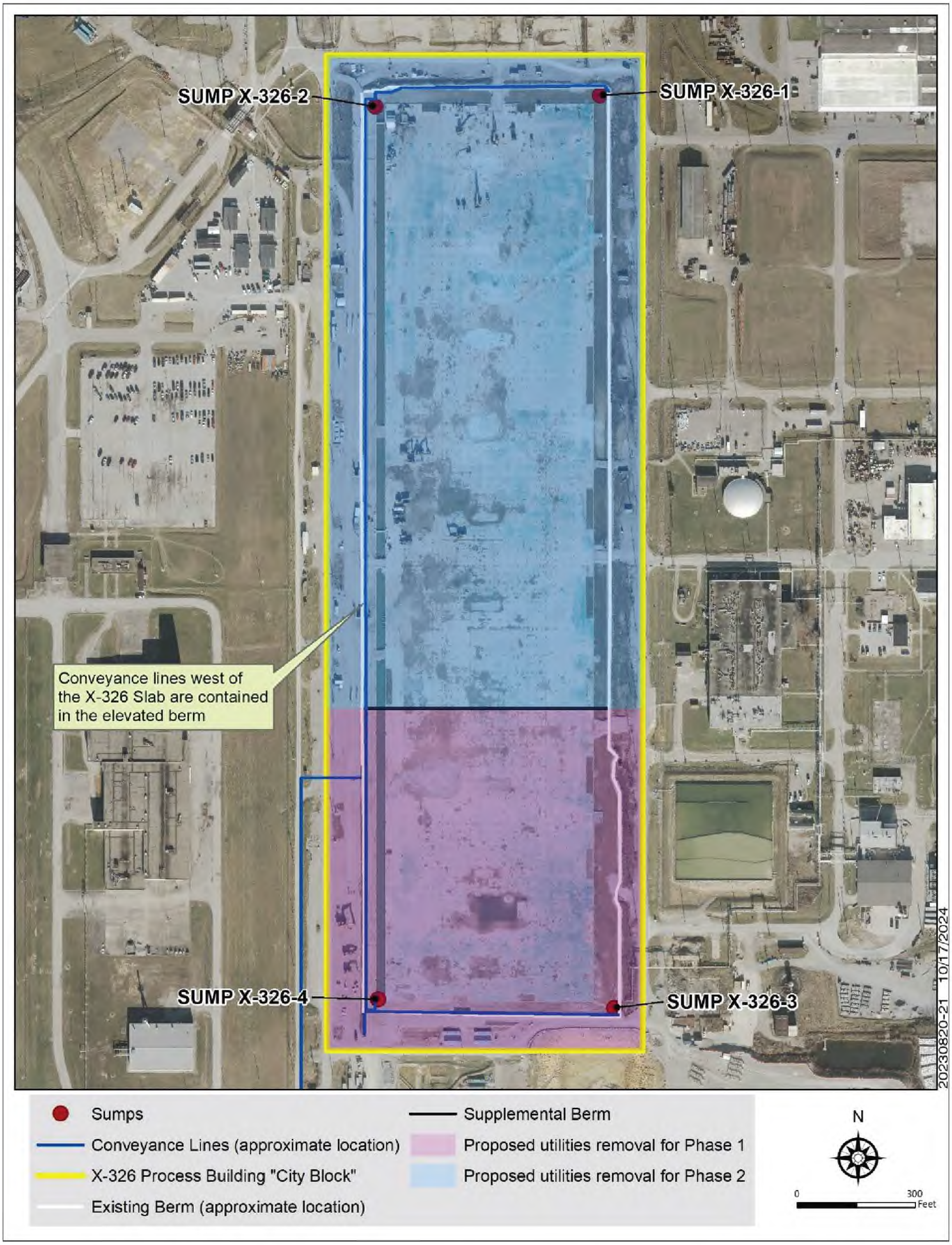

Figure B.9. Impacted Water Conveyance Lines to the X-622-1 Water Treatment Facility

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APPENDIX C: DEMOLITION SUPPORT DESIGNS

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CONTENTS

Page

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This appendix provides engineering design information that supports the demolition plans for the remaining at- and below-grade structures of the former X-326 Process Building.

The following attachments are included in this appendix:

- Attachment C.1: Phase 1 – Southern Slab Area
- Attachment C.2: Phase 2 – Northern Slab Area

Phase 1 – Southern Slab Area (SSA)
The engineering designs referenced in Attachment C.1 are part of the integrated engineering designs that address the scope of work for Phase 1 (the SSA) of the demolition plans for the remaining at- and below-grade structures of the former X-326 Process Building and other closely associated remedial action activities currently underway (soil excavation under the *5-Unit Groundwater Plume Area Excavation Work Plan at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* [5-Unit Excavation Work Plan] and demolition of the at- and below-grade components of the X-626 Recirculating Cooling Water Complex under the *Demolition Design Plan for At- and Below-Grade Components of the X-626 Recirculating Cooling Water Complex at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* [X-626 DDP]). Table C.1.1 identifies eight drawings previously submitted as part of the 5-Unit Excavation Work Plan, which contains content related to the *At- and Below-grade Demolition Design Plan for the X-326 Process Building at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (X-326 At- and Below-grade DDP) for the SSA demolition (See also Appendix B, *Design Drawings*, of the 5-Unit Excavation Work Plan). Table C.1.2 identifies two drawings previously submitted as part of the X-626 DDP, which contain content related to the X-326 At- and Below-grade DDP for the SSA demolition (See also Appendix A, *X-626 RCW Complex Excavation Design,* of the X-626 DDP).

Phase 2 – Northern Slab Area (NSA)
Attachment C.2 provides the engineering design package that addresses the scope of work for Phase 2 (the NSA) of the demolition plans for the remaining at- and below-grade structures of the former X-326 Process Building. The design content herein for Phase 2 is submitted for concurrence.

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ATTACHMENT C.1: PHASE 1 – SOUTHERN SLAB AREA

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Table C.1.1 lists the drawings initially published in the 5-Unit Excavation Work Plan that have SSA demolition content. These drawings have been previously reviewed and concurred with and are included here for reference only.

Table C.1.1. Phase 1 – Southern Slab Area (5-Unit Excavation Work Plan Drawings with X-326 Slab Demolition Content)

Sheet	Drawing No.	Drawing Title
1	X-900-C-33482	PHASE 5 DEBRIS REMOVAL PLAN
2	X-900-C-33483	PHASE 5 OVERBURDEN EXCAVATION PLAN
3	X-900-C-33484	PHASE 5 ENGINEERED FILL EXCAVATION PLAN
4	X-900-C-33485	PHASE 6 DEBRIS REMOVAL PLAN
5	X-900-C-33486	PHASE 6 EXCAVATION (X-326 DEFERRED UNIT) AND BACKFILL PLAN
6	X-900-C-34352.10	PHASE 5 EXCAVATION DEWATERING PLAN
7	X-900-C-34352.20	PHASE 6 EXCAVATION DEWATERING PLAN
8	X-900-C-34352.30	PHASE 5 EXCAVATION DEWATERING DETAILS

Note:
These drawings are found in Appendix B, *Design Drawings*, of the 5-Unit Excavation Work Plan.

Table C.1.2 lists the drawings initially published in the X-626 DDP with both X-626 slab demolition content and SSA demolition content. These drawings have been previously reviewed and concurred with and are included here for reference only.

Table C.1.2. Phase 1 – Southern Slab Area (X-626 DDP with X-326 Slab Demolition Content)

Sheet	Drawing No.	Drawing Title
1	X-626-2-C-34836.10	BERM RELOCATION DETAILS
2	X-626-2-C-34836.20	BASEMENT DEMOLITION DETAILS

Note:
These drawings are found in Appendix A, *X-626 RCW Complex Excavation Design*, of the X-626 DDP.

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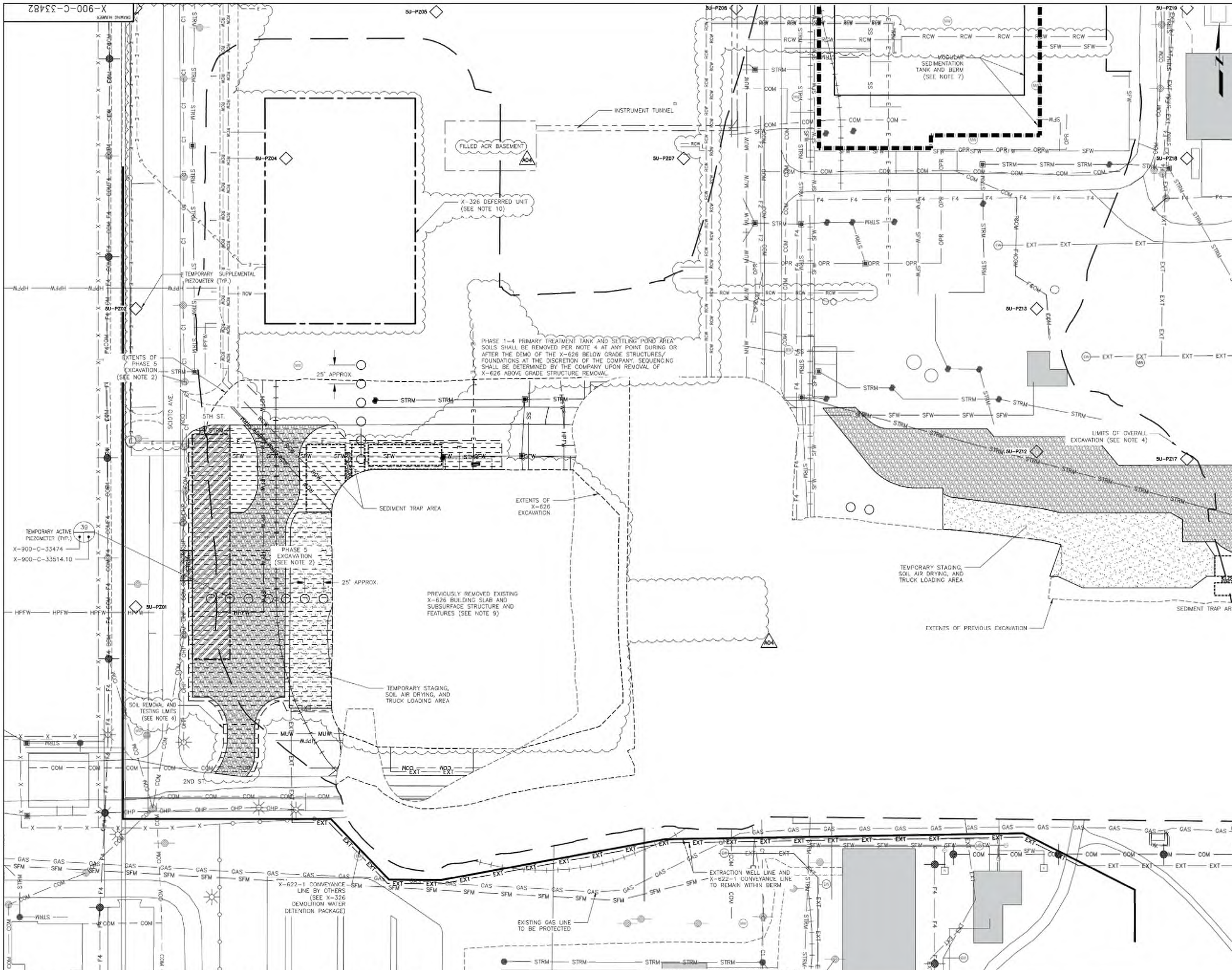

PLAN NOTES:

1. REFER TO THE NOTES ON DRAWING X-900-C-33525.
2. REFER TO THE EXCAVATION PLAN ON THE FOLLOWING DRAWING. THE INTENT OF THIS DRAWING IS TO ILLUSTRATE/IDENTIFY THE SITE PREPARATIONS REQUIRED TO COMPLETE THE PHASE 5 EXCAVATION. THESE ACTIVITIES INCLUDE, BUT ARE NOT LIMITED TO, THE REMOVAL OR RECONFIGURATION OF PIEZOMETERS, STAGING AREAS FOR DEBRIS FROM ABOVE GRADE STRUCTURES GENERATED FROM PREVIOUS X-626 DEMOLITION, AND DEWATERING EQUIPMENT, AS WELL AS THE SOIL REMOVAL AREAS AND CRITERIA PER NOTE 4 BELOW. THE SEQUENCE OF THESE ACTIVITIES SHALL BE DETERMINED BY THE COMPANY. ACTIVITIES TO BE PERFORMED BY OTHERS WITH THE PHASE 5 SITE PREPARATION ACTIVITIES INCLUDE, BUT ARE NOT LIMITED TO, THE REMOVAL AND RESET OF AIR MONITORING EQUIPMENT, SUPPORT FACILITIES, AND OTHER EQUIPMENT IN AND AROUND THE PHASE 5 EXCAVATION LIMITS.
3. ALL FEATURES IN THIS DRAWING CAN BE FOUND IN THE LEGEND ON DRAWING X-900-A-33472.
4. ONE FOOT OF NATIVE SOIL SHALL BE SCRAPED AWAY FROM SEDIMENT TRAPS, CONDITIONING AREAS, LOADING AREAS, PRIMARY TREATMENT TANK AREAS, AND/OR SETTLING TANK AREAS WEST OF THE PREVIOUS PHASE 4 EXCAVATION FOOTPRINT. THIS MATERIAL SHALL BE SENT TO OSWDF PRIOR TO EXCAVATING AND BACKFILLING OVERBURDEN MATERIAL. ONE FOOT OF NATIVE SOIL SHALL BE SCRAPED AWAY AND CONFIRMATION SAMPLING SHALL BE PERFORMED FOR MATERIAL FROM ALL SEDIMENT TRAPS, CONDITIONING AREAS, LOADING AREAS, PRIMARY TREATMENT TANK AREAS, AND/OR SETTLING TANK AREAS OUTSIDE OF THE LIMITS OF THE OVERALL EXCAVATION.
5. NOTE HAS BEEN REMOVED.
6. NOTE HAS BEEN REMOVED.
7. ISOLATE THE MODULAR SEDIMENTATION TANK AND ASSOCIATED PIPING THAT IS TO BE RECONFIGURED UNDER THIS PHASE TO SUPPORT DEWATERING. FOR ALL OTHER PIPING TO BE ABANDONED AND REMOVED, FIRST CAPTURE/EVACUATE IMPACTED WATER FOR TREATMENT.
8. THESE DRAWINGS ARE MEANT TO CONVEY THE PHASED SITE PREPARATION AND EXCAVATION OF THE 5-UNIT GROUNDWATER PLUME. PROPOSED FEATURES FOR SUPPORTING THE EXCAVATION MAY NOT REFLECT AS-BUILT CONDITIONS ON THE SITE AT THE BEGINNING OR DURING THE CURRENT PHASE.
9. FOR THE DEMOLITION OF X-626 SLAB AND BELOW GRADE FEATURES SEE THE X-626 SLAB AND BELOW GRADE DEMOLITION DESIGN PACKAGE.
10. THE MATERIAL TO BE EXCAVATED IN THIS PHASE IS CONSIDERED X-326 DEFERRED UNIT MATERIAL. THE PORTS OSWDF IS THE PRIMARY DISPOSAL FACILITY FOR WAC COMPLIANT DEFERRED UNIT SOILS. SOIL THAT DOES NOT MEET THE PORTS OSWDF WAC WILL BE REMOVED IN ACCORDANCE WITH APPROVED PORTS PROCEDURES, POLICIES, AND PLANS.

EQUIPMENT TO BE REMOVED/RECONFIGURED

FEATURE	DRAWING NUMBERS/DRAWING PACKAGE
PRIMARY TREATMENT TANKS	X-900-C-34352.10
ACTIVE EXCAVATION PUMPS 3 AND 4 SKID UNITS	X-900-C-34352.10; X-900-C-34352.20
PIEZOMETERS	X-900-C-33482 TO X-900-C-33505
SUPPORT FACILITIES, TRAILERS, CONEXES, ETC.	X-900 5-UNIT PHASE 5 SITE PREPARATION DESIGN PACKAGE
AIR MONITORING, ARRANGEMENT/POWER SUPPLIES ETC.	X-900 5-UNIT PHASE 5 SITE PREPARATION DESIGN PACKAGE

BASE DOCUMENT: X-900-C-33482, REVISION A

ARCADIS U.S., INC.
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AUTOCAD

REFERENCE DRAWINGS	OPEN CHANGES	REV	REVISION DESCRIPTION	DWN	ENG	DESIGN MANAGER	DATE
X-900-A-33472		A04	CFC PER ECR-E6325-60; INCORPORATES REVISION A03	CAL	KAJ	WAYNE E. HACKER	10/24/2023
		A	CFC PER ESO E6325	WRB	NNB	WAYNE E. HACKER	01/28/2020

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P.O. BOX 548 PIKETON, OHIO 45661

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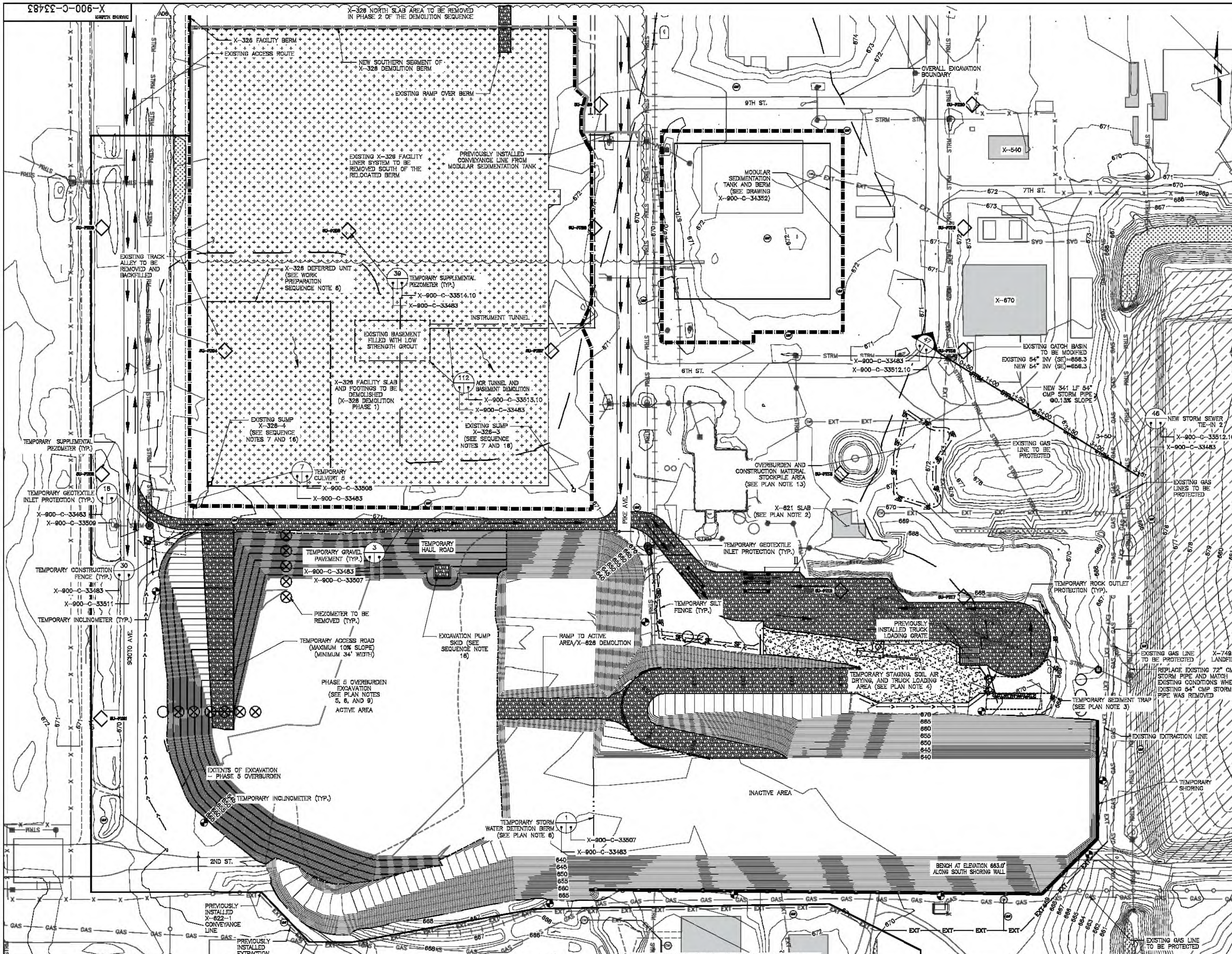
CONTRACT	DEAC3010CC40017	
DRAWN BY	R. J. HANSEN	01/07/20
CHECKED BY	J. V. ALLEN	01/07/20
MM/RED	Z. A. CLARK	01/07/20
DESIGN MANAGER	W.E. HACKER	01/28/2020
SCALE	1" = 40'	

PORTSMOUTH GASEOUS DIFFUSION PLANT
D & D PROJECT
5-UNIT (X-900)
GROUNDWATER PLUME EXCAVATION
PHASE 5 DEBRIS REMOVAL PLAN

FACILITY: X-900 DRAWING NUMBER: X-900-C-33482 REV: A04



PLAN NOTES:

1. REFER TO THE NOTES ON DRAWING X-900-C-33525.
2. X-621 WILL BE DEMOLISHED BY OTHERS IN COORDINATION WITH THE REMOVAL OF THE COAL STOCKPILE IN FUTURE PHASES.
3. THE SEDIMENT TRAP SHALL DISCHARGE STORM RUNOFF TO INACTIVE AREA DIRECTLY SOUTH OF THE SEDIMENT TRAP.
4. THIS AREA IS FOR CONSTRUCTION VEHICLES ONLY (NO ON ROAD HAUL TRUCKS) SINCE ENGINEERED FILL MATERIAL WILL BE PRESENT. SLOPE AREA TO DRAIN TO STORM WATER COLLECTION SUMP THAT WILL BE TREATED FOR SEDIMENT BEFORE BEING PUMPED TO THE WATER TREATMENT SYSTEM.
5. OVERBURDEN EXCAVATED DURING THIS PHASE MAY BE PLACED CONCURRENTLY WITH EXCAVATION ACTIVITIES AS BACKFILL AS SHOWN ON DRAWING X-900-C-33486 REFER TO THE FOLLOWING EXCAVATION PHASE FOR BACKFILL LOCATION AND GRADING. TEMPORARY STORM WATER DETENTION BERMS SHALL BE INSTALLED (PER DETAIL 1, DRAWING X-900-C-33507) AS THE PHASE 5 EXCAVATION PROGRESSES TO LIMIT THE ACTIVE WORKING DRAINAGE AREA TO 6.0 ACRES AT ALL TIMES.
6. SOUTHERN SECTION OF BERM MAY BE REMOVED AS BACKFILLING OPERATIONS BEGIN BERM SHALL REMAIN UNTIL BACKFILL OPERATIONS REACH DETENTION BERM TOP ELEVATIONS IMMEDIATELY ADJACENT TO THE BERM.
7. THE PORTS OSWDF IS THE PRIMARY DISPOSAL FACILITY FOR WAC COMPLIANT ENGINEERED FILL SOILS. SOIL THAT DOES NOT MEET THE PORTS OSWDF WAC WILL BE REMOVED IN ACCORDANCE WITH APPROVED PORTS PROCEDURES, POLICIES, AND PLANS.
8. NOTE HAS BEEN REMOVED.
9. ENGINEERED FILL EXCAVATION MUST PROGRESS, TO SOME EXTENT, CONCURRENT WITH OVERBURDEN EXCAVATION IN THIS PHASE TO MAKE SPACE FOR THE OVERBURDEN BACKFILL FOOTPRINT THAT WILL BE GENERATED DURING THIS EXCAVATION (I.E. THE CONTRACTOR WILL NOT BE ABLE TO REMOVE ALL OVERBURDEN MATERIAL, BACKFILL, AND THEN COME BACK TO EXCAVATE ALL ENGINEERED FILL DUE TO SPACE CONSTRAINTS).
10. ALL FEATURES IN THIS DRAWING CAN BE FOUND IN THE LEGEND ON DRAWING X-900-A-33472.
11. NOTE HAS BEEN REMOVED.
12. NOTE HAS BEEN REMOVED.
13. COMPANY MAY MODIFY THE STOCKPILE AREAS AS DETERMINED NECESSARY IN THE FIELD.
14. ALL TRAFFIC TO AND FROM THE EAST LOADOUT AREA SHALL ONLY UTILIZE PIKE AVENUE.

PHASE 5 AND X-326 WORK PREPARATION SEQUENCE NOTES:

1. NOTE HAS BEEN REMOVED.
2. NOTE HAS BEEN REMOVED.
3. NOTE HAS BEEN REMOVED.
4. NOTE HAS BEEN REMOVED.
5. NOTE HAS BEEN REMOVED.
6. NOTE HAS BEEN REMOVED.
7. NOTE HAS BEEN REMOVED.
8. NOTE HAS BEEN REMOVED. A06
9. CONSTRUCT NEW EAST-WEST ACCESS ROUTE TO PROVIDE ACCESS FOR NEW TRUCK LOADOUT AREA.
10. CONSTRUCT PHASE 5 RAMP TO NEW SOIL CONDITIONING AREA.
11. RELOCATE PUG MILL AND OTHER SOIL CONDITIONING ITEMS TO SOUTHEAST AREA OF FORM X-326 SLAB.
12. COMPLETE NORTH LOADOUT AREA INSTALLATION.
13. THE X-326 SLAB AND OTHER SUBSURFACE CONCRETE STRUCTURES SHALL BE DEMOLISHED (SIZE-REDUCED) AND DISPOSED OF AS DIRECTED BY THE COMPANY THE AREA SHALL BE BACKFILLED WITH IMPORTED FILL TO REACH APPROXIMATE X-326 FACILITY SLAB GRADES TO PROVIDE THE SURFACE THAT WILL BE USED FOR THE PHASE 5-PHASE 13 SOIL CONDITIONING AREA.
14. THE X-326 SLAB IS SUPPORTED BY DEEP FOUNDATION PIERS AT EVERY X-326 COLUMN. CONTRACTOR SHALL DEMO THE FOUNDATION PIERS COMPLETELY. THE DEMOLISHED SLAB SUBGRADE AREA SHALL BE GRADED TO DRAIN TOWARDS THE X-326-3 AND X-326-4 SUMPS.
15. THESE DRAWINGS ARE MEANT TO CONVEY THE PHASED SITE PREPARATION AND EXCAVATION OF THE 5-UNIT GROUNDWATER PLUME. PROPOSED FEATURES FOR SUPPORTING THE EXCAVATION MAY NOT REFLECT AS-BUILT CONDITIONS ON THE SITE AT THE BEGINNING OR DURING THE CURRENT PHASE.
16. SEE DRAWING X-900-C-34352.10 FOR THE PHASE 5 DEWATERING PLAN AND LAYOUT.
17. CONVEY WATER FROM THE SOUTHERN X-326 SUMPS TO C-TRAIN UNTIL DEMOLITION ACTIVITIES RESULT IN SIGNIFICANT SOIL DISTURBANCE AS DETERMINED BY THE COMPANY. THEN CONVEY WATER FROM THE X-326 SUMPS TO D-TRAIN VIA THE MODULAR SEDIMENTATION TANK.
18. THE MATERIAL TO BE EXCAVATED IN THIS PHASE IS CONSIDERED X-326 DEFERRED UNIT MATERIAL. THE PORTS OSWDF IS THE PRIMARY DISPOSAL FACILITY FOR WAC COMPLIANT DEFERRED UNIT SOILS. SOIL THAT DOES NOT MEET THE PORTS OSWDF WAC WILL BE REMOVED IN ACCORDANCE WITH APPROVED PORTS PROCEDURES, POLICIES, AND PLANS.

EXCAVATION - PHASE 5 EARTHWORK QUANTITIES (CY)	
ENGINEERED FILL (NON-DEFERRED UNIT)*	43,600
ENGINEERED FILL (DEFERRED UNIT)*	–
OVERBURDEN**	210,400
PHASE 5 TOTAL	254,000
TOTAL EXCAVATION***	664,400
IMPORTED CLAY COVER MATERIAL	27,600

*ENGINEERED FILL MATERIAL TO BE HAULED TO OSWDF AFTER CONFIRMATION THAT MATERIAL MEETS THE SITE'S WAC. MATERIAL THAT DOES NOT MEET THE PORTS OSWDF WAC WILL BE REMOVED IN ACCORDANCE WITH APPROVED PORTS PROCEDURES, POLICIES, AND PLANS.
**MATERIAL TO BE BACKFILLED INTO PREVIOUSLY EXCAVATED AREAS
***THIS IS THE TOTAL EXCAVATION VOLUME THROUGH THE CURRENT PHASE

NOTE: THE VOLUMES LISTED ABOVE EXCLUDE THE EMPTY SPACE CAUSED BY THE SUBGRADE STRUCTURES, WHICH AMOUNTS TO 16,500 CY.

ARCADIS U.S., INC.
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BASE DOCUMENT: X-900-C-33483, REVISION A

SECTION & DETAIL KEY: NUMBER OF SECTION OR DETAIL; DRAWING ON WHICH SECTION OR DETAIL IS TAKEN; DRAWING ON WHICH SECTION OR DETAIL IS SHOWN

REFERENCE DRAWINGS	OPEN CHANGES	REV	REVISION DESCRIPTION	DWN	ENG	DESIGN MANAGER	DATE
X-900-A-33472		A06	CFC PER ECR-E6325-61; INCORP. A05	WKB	KAJ	WAYNE HACKER	02/05/2024
		A	CFC PER ESO E6325	WKB	NNB	WAYNE E. HACKER	01/28/2020

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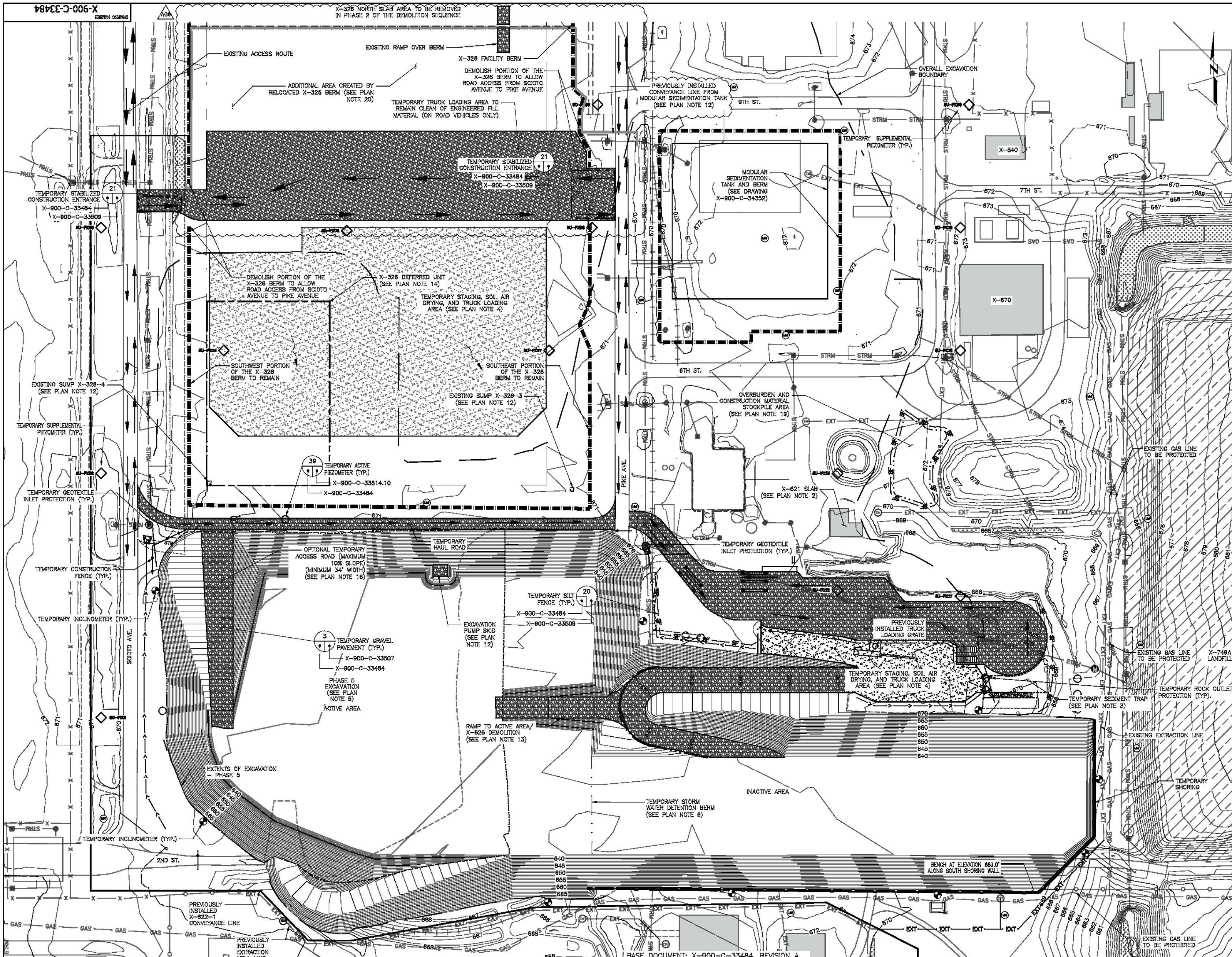
CONTRACT	DEAC3010CC40017
DRAWN BY R. J. HANSEN	01/07/20
CHECKED BY J. V. ALLEN	01/07/20
MM/RED Z. A. CLARK	01/07/20
DESIGN MANAGER W.E. HACKER	01/28/2020
SCALE	1"= 60'

PORTSMOUTH GASEOUS DIFFUSION PLANT
D & D PROJECT

5-UNIT (X-900)
GROUNDWATER PLUME EXCAVATION

PHASE 5 OVERBURDEN EXCAVATION PLAN

FACILITY X-900 | DRAWING NUMBER X-900-C-33483 | REV A06



BASE DOCUMENT: X-900-C-33484, REVISION A

PLAN NOTES:

1. REFER TO THE NOTES ON DRAWING X-900-C-33525.
2. X-621 WILL BE DEMOLISHED BY OTHERS IN COORDINATION WITH THE REMOVAL OF THE COAL STOCKPILE IN FUTURE PHASES.
3. THE SEDIMENT TRAP SHALL DISCHARGE STORM RUNOFF TO INACTIVE AREA DIRECTLY SOUTH OF THE SEDIMENT TRAP.
4. THIS AREA IS FOR CONSTRUCTION VEHICLES ONLY (NO ON ROAD HAUL TRUCKS) SINCE ENGINEERED FILL MATERIAL WILL BE PRESENT. SLOPE AREA TO DRAIN TO STORM WATER COLLECTION SUMP THAT WILL BE TREATED FOR SEDIMENT BEFORE BEING PUMPED TO THE WATER TREATMENT SYSTEM.
5. OVERBURDEN EXCAVATED DURING THIS PHASE MAY BE PLACED CONCURRENTLY WITH EXCAVATION ACTIVITIES AS BACKFILL AS SHOWN ON DRAWING X-900-C-33486. REFER TO THE FOLLOWING EXCAVATION PHASE FOR BACKFILL LOCATION AND GRADING. TEMPORARY STORM WATER DETENTION BERMS SHALL BE INSTALLED (PER DETAIL 1, DRAWING X-900-C-33507) AS THE PHASE 5 EXCAVATION PROGRESSES TO LIMIT THE ACTIVE WORKING DRAINAGE AREA TO 6.0 ACRES AT ALL TIMES.
6. SOUTHERN SECTION OF BERM MAY BE REMOVED AS BACKFILLING OPERATIONS BEGIN. BERM SHALL REMAIN UNTIL BACKFILL OPERATIONS REACH DETENTION BERM TOP ELEVATIONS IMMEDIATELY ADJACENT TO THE BERM.
7. THE PORTS OSWDF IS THE PRIMARY DISPOSAL FACILITY FOR WAC COMPLIANT ENGINEERED FILL SOILS. SOIL THAT DOES NOT MEET THE PORTS OSWDF WAC WILL BE REMOVED IN ACCORDANCE WITH APPROVED PORTS PROCEDURES, POLICIES, AND PLANS.
8. NOTE HAS BEEN REMOVED.
9. ENGINEERED FILL EXCAVATION MUST PROGRESS, TO SOME EXTENT, WITH OVERBURDEN EXCAVATION IN THIS PHASE TO MAKE SPACE FOR THE OVERBURDEN BACKFILL FOOTPRINT THAT WILL BE GENERATED DURING THIS EXCAVATION (I.E. THE CONTRACTOR WILL NOT BE ABLE TO REMOVE ALL OVERBURDEN MATERIAL, BACKFILL, AND THEN COME BACK TO EXCAVATE ALL ENGINEERED FILL DUE TO SPACE CONSTRAINTS).
10. ALL FEATURES IN THIS DRAWING CAN BE FOUND IN THE LEGEND ON DRAWING X-900-A-33472.
11. NOTE HAS BEEN REMOVED.
12. SEE DRAWING X-900-C-34352.10 FOR THE PHASE 5 DEWATERING PLAN AND LAYOUT.
13. THESE DRAWINGS ARE MEANT TO CONVEY THE PHASED SITE PREPARATION AND EXCAVATION OF THE 5-UNIT GROUNDWATER PLUME. PROPOSED FEATURES FOR SUPPORTING THE EXCAVATION AND DEMOLITION OF THE X-626 FACILITY AND UTILITIES MAY NOT REFLECT AS-BUILT CONDITIONS ON THE SITE AT THE BEGINNING OR DURING THE CURRENT PHASE.
14. THE MATERIAL TO BE EXCAVATED IN THIS PHASE IS CONSIDERED X-326 DEFERRED UNIT MATERIAL. THE PORTS OSWDF IS THE PRIMARY DISPOSAL FACILITY FOR WAC COMPLIANT DEFERRED UNIT SOILS. SOIL THAT DOES NOT MEET THE PORTS OSWDF WAC WILL BE REMOVED IN ACCORDANCE WITH APPROVED PORTS PROCEDURES, POLICIES, AND PLANS.
15. ALL TRAFFIC TO AND FROM THE EAST LOADOUT AREA SHALL UTILIZE PIKE AVENUE.
16. THE COMPANY SHALL DECIDE IF TEMPORARY ACCESS RAMP IS NECESSARY AS THE EXCAVATION PROGRESSES TO THE WEST.
17. THE BERM MOUND SHALL BE RETAINED WHERE NEEDED FOR RUNON/RUNOFF CONTROLS AS NECESSARY AND AT THE DISCRETION OF THE COMPANY.
18. ALL TRAFFIC TO AND FROM THE EAST LOADOUT AREA SHALL ONLY UTILIZE PIKE AVENUE.
19. COMPANY MAY MODIFY THE STOCKPILE AREAS AS DETERMINED NECESSARY IN THE FIELD.
20. THE DESIGN LOCATIONS OF SOIL CONDITIONING AND TRUCK LOADOUT OPERATIONS MAY BE FIELD ADJUSTED AT THE DISCRETION OF THE COMPANY. THE AREA BETWEEN THE DESIGN TRUCK LOADOUT AREA AND THE RELOCATED X-326 BERM MAY BE USED FOR ADDITIONAL SOIL CONDITIONING, TRUCK LOADING, OR OTHER USES AT THE DISCRETION OF THE COMPANY.
21. RAMP OVER BERM MAY BE INSTALLED PER DETAIL 111 ON DRAWING X-900-C-33513 LOCATIONS DETERMINED NECESSARY IN THE FIELD AT THE DISCRETION OF THE COMPANY.

PHASE 5 AND X-326 WORK PREPARATION SEQUENCE NOTES: A06

2. IMPORTED FILL SHALL BE USED AS NECESSARY TO DEVELOP A SUITABLE WORKING SURFACE UPON DEMOLITION OF SLAB.
3. CONSTRUCT NEW EAST-WEST ACCESS ROUTE TO PROVIDE ACCESS FOR NEW TRUCK LOADOUT AREA.
4. CONSTRUCT PHASE 5 RAMP TO NEW SOIL CONDITIONING AREA.
5. RELOCATE PUG MILL AND OTHER SOIL CONDITIONING ITEMS TO SOUTHEAST AREA OF FORMER X-326 SLAB.
6. COMPLETE NORTH LOADOUT AREA INSTALLATION.

EXCAVATION – PHASE 5 EARTHWORK QUANTITIES (CY)	
ENGINEERED FILL (NON-DEFERRED UNIT)*	43,600
ENGINEERED FILL (DEFERRED UNIT)*	–
OVERBURDEN**	210,400
PHASE 5 TOTAL	254,000
TOTAL EXCAVATION***	664,400
IMPORTED CLAY COVER MATERIAL	27,600

*ENGINEERED FILL MATERIAL TO BE HAULED TO OSWDF AFTER CONFIRMATION THAT MATERIAL MEETS THE SITE'S WAC. MATERIAL THAT DOES NOT MEET THE PORTS OSWDF WAC WILL BE REMOVED IN ACCORDANCE WITH APPROVED PORTS PROCEDURES, POLICIES, AND PLANS.
**MATERIAL TO BE BACKFILLED INTO PREVIOUSLY EXCAVATED AREAS
***THIS IS THE TOTAL EXCAVATION VOLUME THROUGH THE CURRENT PHASE

NOTE: THE VOLUMES LISTED ABOVE EXCLUDE THE EMPTY SPACE CAUSED BY THE SUBGRADE STRUCTURES, WHICH AMOUNTS TO 16,500 CY.

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NUMBER OF SECTION OR DETAIL
DRAWING ON WHICH SECTION OR DETAIL IS TAKEN
DRAWING ON WHICH SECTION OR DETAIL IS SHOWN
SECTION & DETAIL KEY

REFERENCE DRAWINGS	OPEN CHANGES	REV	REVISION DESCRIPTION	DWN	ENG	DESIGN MANAGER	DATE
X-900-A-33472							
		A06	CFC PER ECR-E6325-61; INCORPORATES REVISION A05	WKB	KAJ	WAYNE HACKER	02/05/2024
		A	CFC PER ESO E6325	WKB	NNB	WAYNE E. HACKER	01/28/2020

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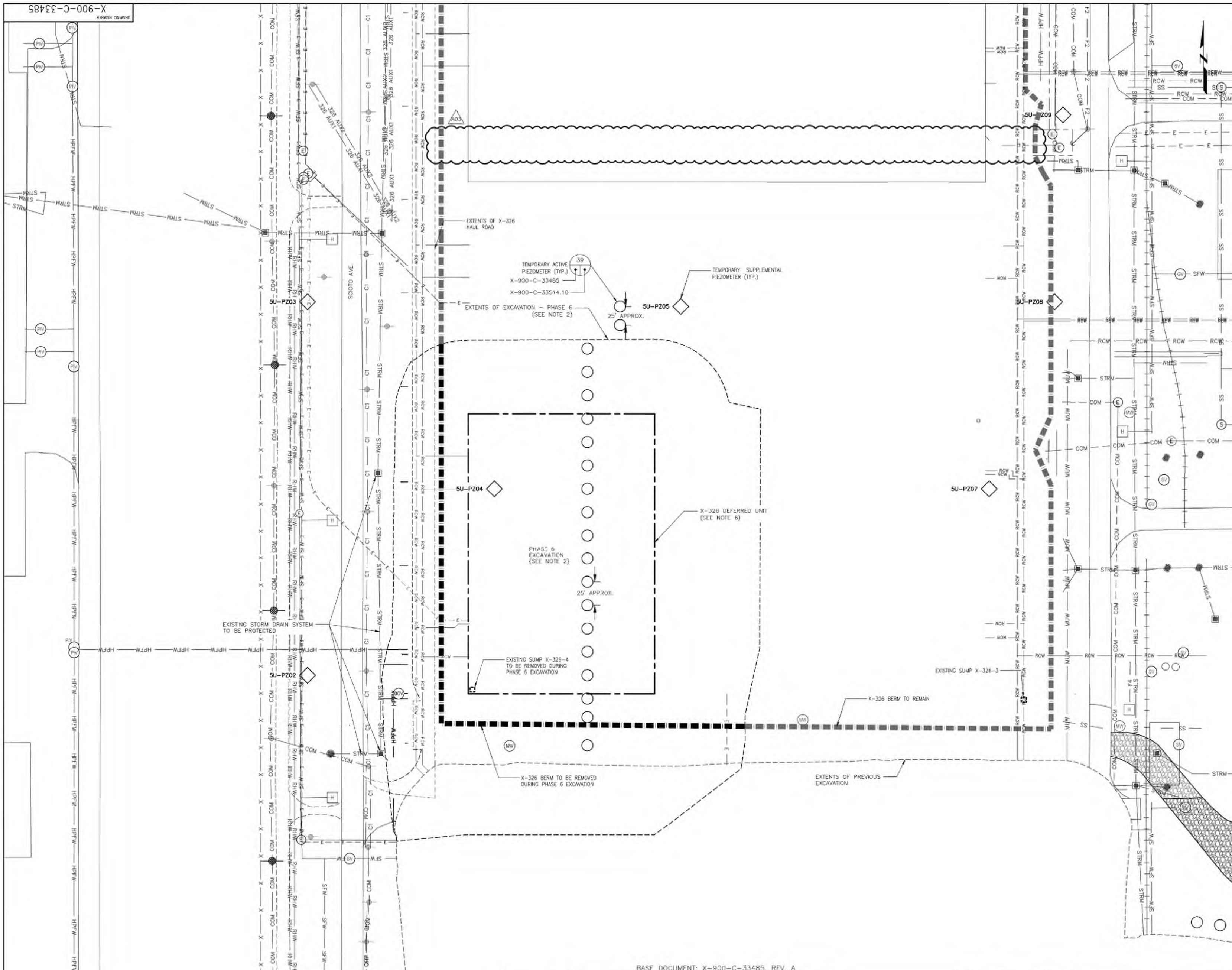
DRAWN BY R. J. HANSEN 01/07/20
CHECKED BY J. V. ALLEN 01/07/20
MM/RED Z. A. CLARK 01/07/20
DESIGN MANAGER W.E. HACKER 01/28/2020
SCALE 1"= 60'

PORTSMOUTH GASEOUS DIFFUSION PLANT
D & D PROJECT

5-UNIT (X-900)
GROUNDWATER PLUME EXCAVATION

PHASE 5 ENGINEERED FILL EXCAVATION PLAN

FACILITY X-900 | DRAWING NUMBER X-900-C-33484 | REV A06



PLAN NOTES:

1. REFER TO THE NOTES ON DRAWING X-900-C-33525 INCLUDING THE DEFERRED UNIT NOTES.
2. REFER TO THE EXCAVATION PLAN ON THE FOLLOWING DRAWING FOR THE EXCAVATION DESIGN. THE INTENT OF THIS DRAWING IS TO ILLUSTRATE THE DEBRIS FROM THE ABANDONED EXISTING INFRASTRUCTURE THAT WILL NEED TO BE REMOVED PRIOR TO OR DURING THIS PHASE OF EXCAVATION.
3. ALL FEATURES IN THIS DRAWING CAN BE FOUND IN THE LEGEND ON DRAWING X-900-A-33472.
4. THESE DRAWINGS ARE MEANT TO CONVEY THE PHASED SITE PREPARATION AND EXCAVATION OF THE 5-UNIT GROUNDWATER PLUME. PROPOSED FEATURES FOR SUPPORTING THE EXCAVATION MAY NOT REFLECT AS-BUILT CONDITIONS ON THE SITE AT THE BEGINNING OR DURING THE CURRENT PHASE.
5. THE SOUTHWEST PORTION OF THE X-326 BERM AND THE X-326-4 SUMP SHALL BE DEMOLISHED AS THE PHASE 6 EXCAVATION PROGRESSES. AFTER DEMOLITION OF THE X-326-4 SUMP REGRADE AREA TO DRAIN STORM RUNOFF TOWARDS THE X-326-3 SUMP.
6. THE MATERIAL TO BE EXCAVATED IN THIS PHASE IS CONSIDERED X-326 DEFERRED UNIT MATERIAL. THE PORTS OSWDF IS THE PRIMARY DISPOSAL FACILITY FOR WAC COMPLIANT DEFERRED UNIT SOILS. SOIL THAT DOES NOT MEET THE PORTS OSWDF WAC WILL BE REMOVED IN ACCORDANCE WITH APPROVED PORTS PROCEDURES, POLICIES, AND PLANS.

ARCADIS U.S., INC.
126 N. JEFFERSON STREET
SUITE 400
MILWAUKEE, WI 53202

AUTOCAD

BASE DOCUMENT: X-900-C-33485, REV. A

REFERENCE DRAWINGS	OPEN CHANGES	REV	REVISION DESCRIPTION	DWN	ENG	DESIGN MANAGER	DATE
X-900-A-33472							
		A03	CFC PER ECR-E6325-61; INCORPORATES REVISION A02	WKB	KAJ	WAYNE BAKER	02/05/2024
		A	CFC PER ESO E6325	WKB	NNB	WAYNE E. HACKER	01/28/2020

Fluor-BWXT | Portsmouth
P.O. BOX 548 PIKETON, OHIO 45661

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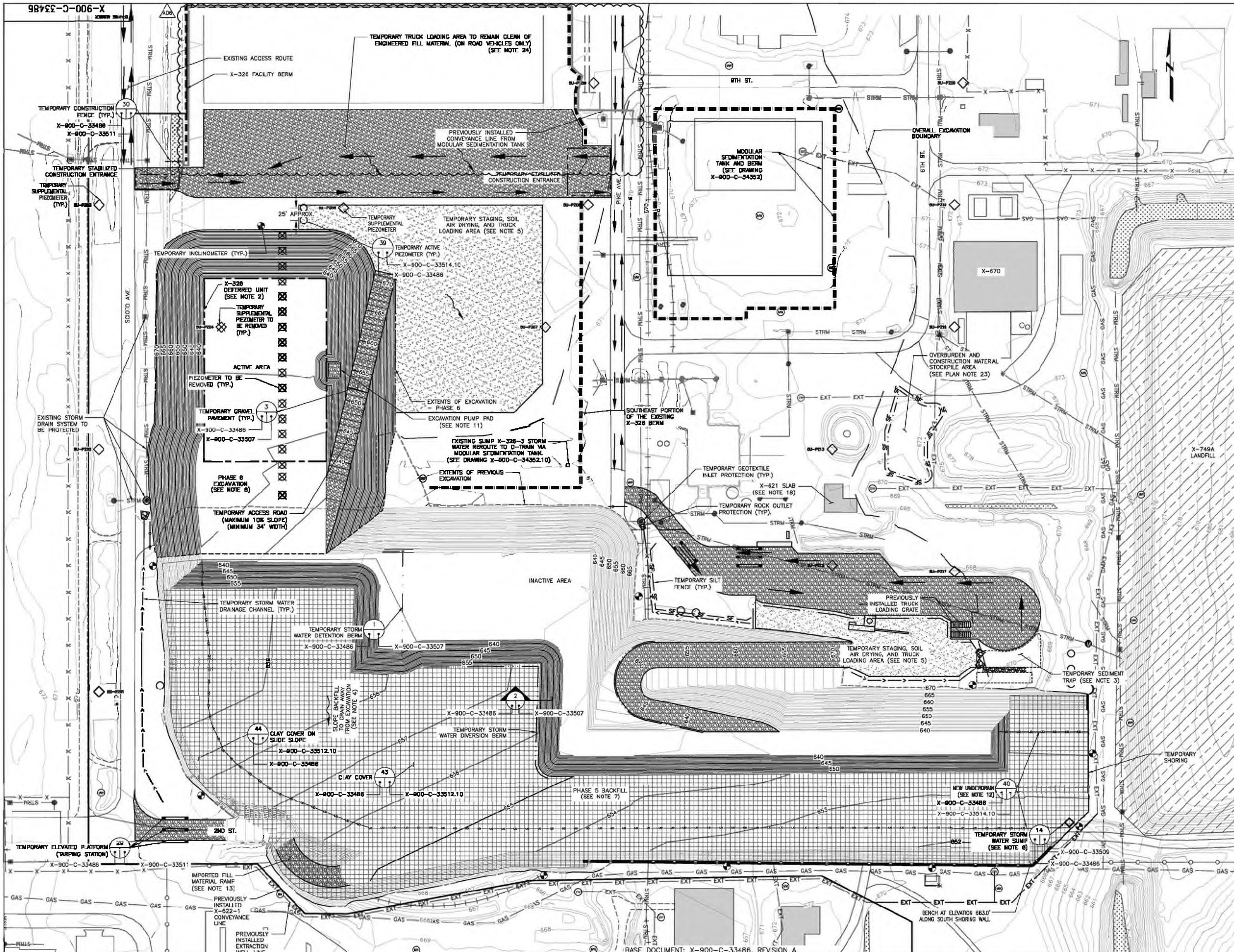
CONTRACT	DEAC3010CC40017
DRAWN BY R. J. HANSEN	01/07/20
CHECKED BY J. V. ALLEN	01/07/20
MM/RED Z. A. CLARK	01/07/20
DESIGN MANAGER W.E. HACKER	01/28/2020
SCALE	1"= 40'

PORTSMOUTH GASEOUS DIFFUSION PLANT
D & D PROJECT

5-UNIT (X-900)
GROUNDWATER PLUME EXCAVATION

PHASE 6 DEBRIS REMOVAL PLAN

FACILITY	DRAWING NUMBER	REV
X-900	X-900-C-33485	A03



PLAN NOTES:

1. REFER TO THE NOTES ON DRAWING X-900-C-33525.
2. THE MATERIAL TO BE EXCAVATED IN THIS PHASE IS CONSIDERED X-326 DEFERRED UNIT MATERIAL. THE PORTS OSWDF IS THE PRIMARY DISPOSAL FACILITY FOR WAC COMPLIANT DEFERRED UNIT SOILS. SOIL THAT DOES NOT MEET THE PORTS OSWDF WAC WILL BE REMOVED IN ACCORDANCE WITH APPROVED PORTS PROCEDURES, POLICIES, AND PLANS.
3. THE SEDIMENT TRAP SHALL DISCHARGE STORM RUNOFF TO INACTIVE AREA DIRECTLY SOUTH OF THE SEDIMENT TRAP.
4. THE OVERBURDEN BACKFILL SHALL BE SLOPED TO DRAIN RUNOFF TO THE BACKFILL SUMP AS SHOWN ON THE PLANS. THE BACKFILL SUMP SHALL BE PUMPED TO THE SEDIMENT BASIN SO RUNOFF CAN BE TREATED FOR TSS.
5. THIS AREA IS FOR CONSTRUCTION VEHICLES ONLY (NO ON ROAD HAUL TRUCKS) SINCE ENGINEERED FILL MATERIAL WILL BE PRESENT. SLOPE AREA TO DRAIN TO STORM WATER COLLECTION SUMP THAT WILL BE TREATED FOR SEDIMENT BEFORE BEING PUMPED TO THE WATER TREATMENT SYSTEM.
6. THE FINAL 2' (MIN.) OF BACKFILL MATERIAL SHALL BE IMPORTED FROM A BORROW SOURCE APPROVED BY THE COMPANY. THIS MATERIAL WOLL ACT AS A TEMPORARY CAP OVER THE UNDERLYING OVERBURDEN BACKFILL MATERIAL. BACKFILL SUMP AND ASSOCIATED CONVEYANCE LINE SHALL NOT BE USED UNTIL THE ENTIRE SURFACE AREA OF THE BACKFILL DRAINING TO THE SUMP HAS RECEIVED THIS CAP AREA.
7. BACKFILL MATERIAL CONSISTS OF OVERBURDEN MATERIAL EXCAVATED DURING THE PHASE 5 EXCAVATION. THIS BACKFILL WILL BE PLACED CONCURRENT WITH PHASE 5 EXCAVATION ACTIVITIES, AND IS NOT SHOWN ON THE PHASE 5 EXCAVATION DRAWING FOR CLARITY.
8. INTERMEDIATE STORM WATER DETENTION BERMS SHALL BE INSTALLED (PER DETAIL 1, DRAWING X-900-C-33507) AS THE PHASE 6 EXCAVATION PROGRESSES TO LIMIT THE ACTIVE WORKING DRAINAGE AREA TO 6.0 ACRES AT ALL TIMES.
9. HAUL TRUCKS SHALL BE CLEANED AT THE TEMPORARY WASH RACK AND DECONTAMINATION PAD WHEN DETERMINED NECESSARY BY THE COMPANY AFTER SAMPLING.
10. ALL FEATURES IN THIS DRAWING CAN BE FOUND IN THE LEGEND ON DRAWING X-900-A-33472.
11. REFER TO THE DEWATERING NOTES ON DRAWING X-900-C-33514.20 FOR DEWATERING REQUIREMENTS DURING EXCAVATION.
12. INSTALL UNDERDRAIN AROUND THE OUTER EXCAVATION PERIMETER TOE OF SLOPE AS EXCAVATION AND BACKFILLING PROGRESSES, CONNECTING SECTIONS OF UNDERDRAINS. INSTALL LATERALS CONNECTING THE PERIMETER UNDERDRAIN WITH THE EXCAVATION SUMPS AS NEEDED. THE LENGTH OF THE PERIMETER UNDERDRAIN SHALL NOT EXCEED 900 LF BETWEEN LATERALS. REFER TO DRAWINGS X-900-C-34352.10 AND X-900-C-34352.20 IN CONJUNCTION WITH UNDERDRAIN PLANNING.
13. HAUL TRUCKS HANDLING 5-UNIT EXCAVATION MATERIAL SHALL NOT TRAVERSE OVER THE BACKFILL SURFACES THAT HAVE RECEIVED THE 2' MINIMUM THICK IMPORTED CLAY MATERIAL. ONLY TRUCKS HAULING THE IMPORTED CLAY MATERIALS SHALL TRAVERSE OVER THIS TEMPORARY CAP. TEMPORARY CONSTRUCTION ROADS SHALL BE INSTALLED AS NECESSARY SO THAT TRUCK TRAFFIC ON THE TEMPORARY CAP DOES NOT DISTURB THE 2' CAP LAYER. TRUCKS MOVING IMPORTED FILL MATERIAL SHALL NOT TRAVERSE OVER 5-UNIT EXCAVATION MATERIAL AND SHALL ENTER AND EXIT THE SITE VIA THE IMPORTED FILL MATERIAL RAMP SHOWN ON THIS DRAWING.
14. BACKFILL ELEVATIONS SHOWN ON THIS SHEET ARE TOP OF OVERBURDEN MATERIAL ELEVATIONS. THIS SURFACE MUST BE RAISED A MINIMUM OF 2' WITH IMPORTED COVER MATERIAL FROM A SOURCE APPROVED BY THE COMPANY AFTER REACHING THE TOP OF THE OVERBURDEN MATERIAL ELEVATIONS SHOWN.
15. CONTRACTOR SHALL STOCKPILE EXCESS OVERBURDEN MATERIAL IN NORTHWEST CORNER OF PREVIOUSLY PLACED OVERBURDEN BACKFILL AND GRADE TO DRAIN TO OPEN EXCAVATION. STOCKPILE MATERIAL CAN BE PLACED IN THE BOTTOM OF THE EXCAVATION AS SPACE IS MADE AVAILABLE DURING THE EXCAVATION.
16. THESE DRAWINGS ARE MEANT TO CONVEY THE PHASED SITE PREPARATION AND EXCAVATION OF THE 5-UNIT GROUNDWATER PLUME. PROPOSED FEATURES FOR SUPPORTING THE EXCAVATION MAY NOT REFLECT AS-BUILT CONDITIONS ON THE SITE AT THE BEGINNING OR DURING THE CURRENT PHASE.
17. NOTE HAS BEEN REMOVED.
18. X-621 WILL BE DEMOLISHED BY OTHERS IN COORDINATION WITH THE REMOVAL OF THE COAL STOCKPILE IN FUTURE PHASES.
19. SEE DRAWING X-900-C-34352.20 FOR THE PHASE 6 DEWATERING PLAN AND LAYOUT.
20. AFTER FULL EXCAVATION OF PHASE 6 DEFERRED UNIT MATERIAL, PUMP SKID AREA SHALL BE CONSTRUCTED WITH CLEAN GENERAL FILL.
21. THE LOWER WALLS AND TIE-BACKS OF THE SHEET PILE WALL SHALL BE BURIED AS THE PHASE 5 BACKFILL PROGRESSES.
22. BACKFILLING IN THE INACTIVE AREA SHALL LEAVE ENOUGH SPACE TO ALLOW VEHICLE TRAFFIC TO STILL NAVIGATE THE BOTTOM OF EXCAVATION AND FACILITATE ACCESS TO FUTURE EXCAVATION PHASES.
23. COMPANY MAY MODIFY THE STOCKPILE AREAS AS DETERMINED NECESSARY IN THE FIELD.
24. TRUCK TARPING STATIONS SHALL BE RELOCATED TO THIS AREA AND INSTALLED PER DETAIL 29 ON DRAWING X-900-C-33511. TRUCK LOADING GRATES SHALL BE RELOCATED TO THIS AREA AND INSTALLED PER DETAIL 4 ON DRAWING X-900-C-33507. INFRASTRUCTURE SHALL BE FIELD LOCATED BASED ON THE CONSTRUCTION NEEDS.

A06

EXCAVATION – PHASE 6 EARTHWORK QUANTITIES (CY)	
ENGINEERED FILL (NON-DEFERRED UNIT)*	96,600
ENGINEERED FILL (DEFERRED UNIT)*	77,900
OVERBURDEN**	–
PHASE 6 TOTAL	174,500
TOTAL EXCAVATION***	838,900

*ENGINEERED FILL MATERIAL TO BE HAULED TO OSWDF AFTER CONFIRMATION THAT MATERIAL MEETS THE SITE'S WAC. MATERIAL THAT DOES NOT MEET THE PORTS OSWDF WAC WILL BE REMOVED IN ACCORDANCE WITH APPROVED PORTS PROCEDURES, POLICIES, AND PLANS.
**MATERIAL TO BE BACKFILLED INTO PREVIOUSLY EXCAVATED AREAS
***THIS IS THE TOTAL EXCAVATION VOLUME THROUGH THE CURRENT PHASE

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SECTION & DETAIL KEY
NUMBER OF SECTION OR DETAIL
DRAWING ON WHICH SECTION OR DETAIL IS SHOWN
DRAWING ON WHICH SECTION OR DETAIL IS TAKEN

REFERENCE DRAWINGS	OPEN CHANGES	REV	REVISION DESCRIPTION	DWN	ENG	DESIGN MANAGER	DATE
X-900-A-33472							
		A06	CFC PER ECR-E6325-61; INCORPORATES REVISION A05	MPA	TAM		
		A	CFC PER ESO E6325	WKB	NNB	WAYNE E. HACKER	01/28/2020

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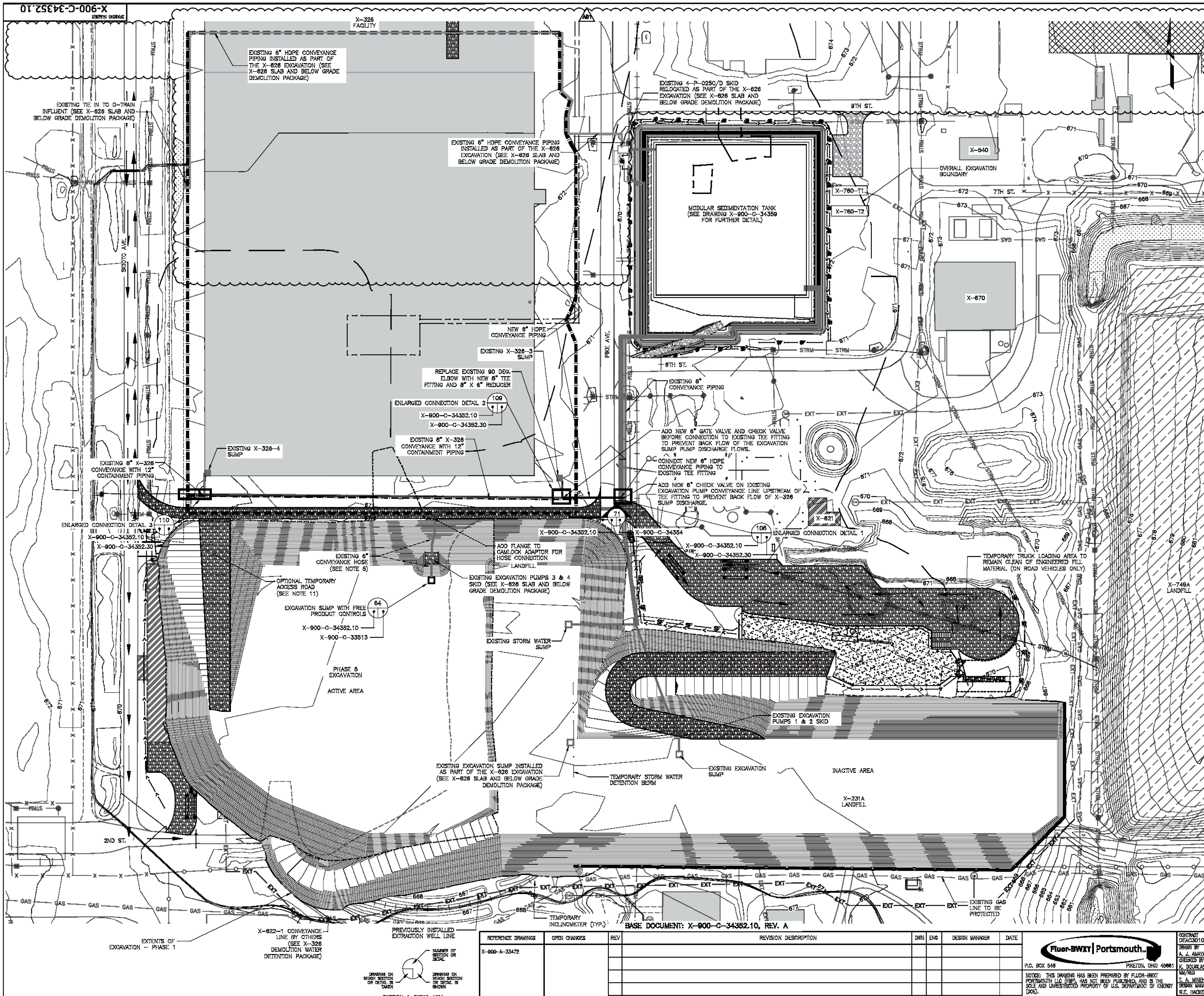
MM/RED Z. A. CLARK	01/07/20
DESIGN MANAGER W.E. HACKER	01/28/2020
SCALE	1"= 60'

PORTSMOUTH GASEOUS DIFFUSION PLANT
D & D PROJECT
5-UNIT (X-900)
GROUNDWATER PLUME EXCAVATION
PHASE 6 EXCAVATION (X-326 DEFERRED UNIT) AND BACKFILL PLAN

FACILITY	DRAWING NUMBER	REV
X-900	X-900-C-33486	A06

X-900-C-34352.10



PLAN NOTES:

1. REFER TO THE NOTES ON DRAWING X-900-C-33525.
2. ALL FEATURES IN THIS DRAWING CAN BE FOUND IN THE LEGEND ON DRAWING X-900-A-33472.
3. REFER TO THE DEWATERING NOTES ON DRAWING X-900-C-33514.20 FOR DEWATERING REQUIREMENTS DURING EXCAVATION.
4. CONTRACTOR WILL PROVIDE PROTECTION FOR THE EXCAVATION SUMP PUMP AND ASSOCIATED PIPING IN THE 5-UNIT (X-900) EXCAVATION FROM THE EXCAVATION MACHINERY IN THE FIELD.
5. SLOPE PIPE BACK TOWARD EXCAVATION SUMP TO DRAIN LINE WHEN PIPELINE IS NOT IN USE.
6. CONTRACTOR SHALL PROVIDE AND INSTALL INSULATION WITH WEATHER JACKET AND HEAT TRACING ON EXPOSED ACTIVE PIPES OUTSIDE OF THE ACTIVE EXCAVATION LIMITS.
7. CONTAINMENT BERM CONTRACTOR SHALL COORDINATE WITH THE CONVEYANCE LINE CONTRACTOR TO ENSURE THAT CONVEYANCE PIPING IS INSTALLED PRIOR TO BERM CONSTRUCTION.
8. CONTRACTOR SHALL FIELD ROUTE THE PIPING AND FIELD LOCATE SUMPS.
9. FIELD ROUTED PIPE SHALL BE PLACED ON GRADE USING BURIAL METHODS PROVIDED ON DRAWINGS X-900-C-34354 AND X-900-C-34355. FOR ROAD CROSSING, PIPE SHALL BE BURIED AND FOLLOW DETAILS 70 AND 71 ON DRAWING X-900-C-34352.
10. FIELD ROUTED PIPE SHALL BE WITHIN +/- 100 FEET OF PIPE LENGTH AS SHOWN ON THIS DRAWING.
11. ALL TRAFFIC TO AND FROM THE EAST LOADOUT AREA SHALL UTILIZE PIKE AVENUE.

DESIGN MANAGER: APPROVAL AND DATE:

ARCADIS U.S., INC.
126 N. JEFFERSON STREET
SUITE 400
MILWAUKEE, WI 53202

AUTOCAD

BASE DOCUMENT: X-900-C-34352.10, REV. A

REFERENCE DRAWINGS	OPEN CHANGES	REV	REVISION DESCRIPTION	DWN	ENG	DESIGN MANAGER	DATE
X-900-A-33472							
		A01	CFC PER ECR-E6325-61	WKB	KAJ	WAYNE HACKER	02/23/2024
		A	~~CFC PER ECR-E6325-60~~	CAL	KAJ	~~WAYNE E. HACKER~~	

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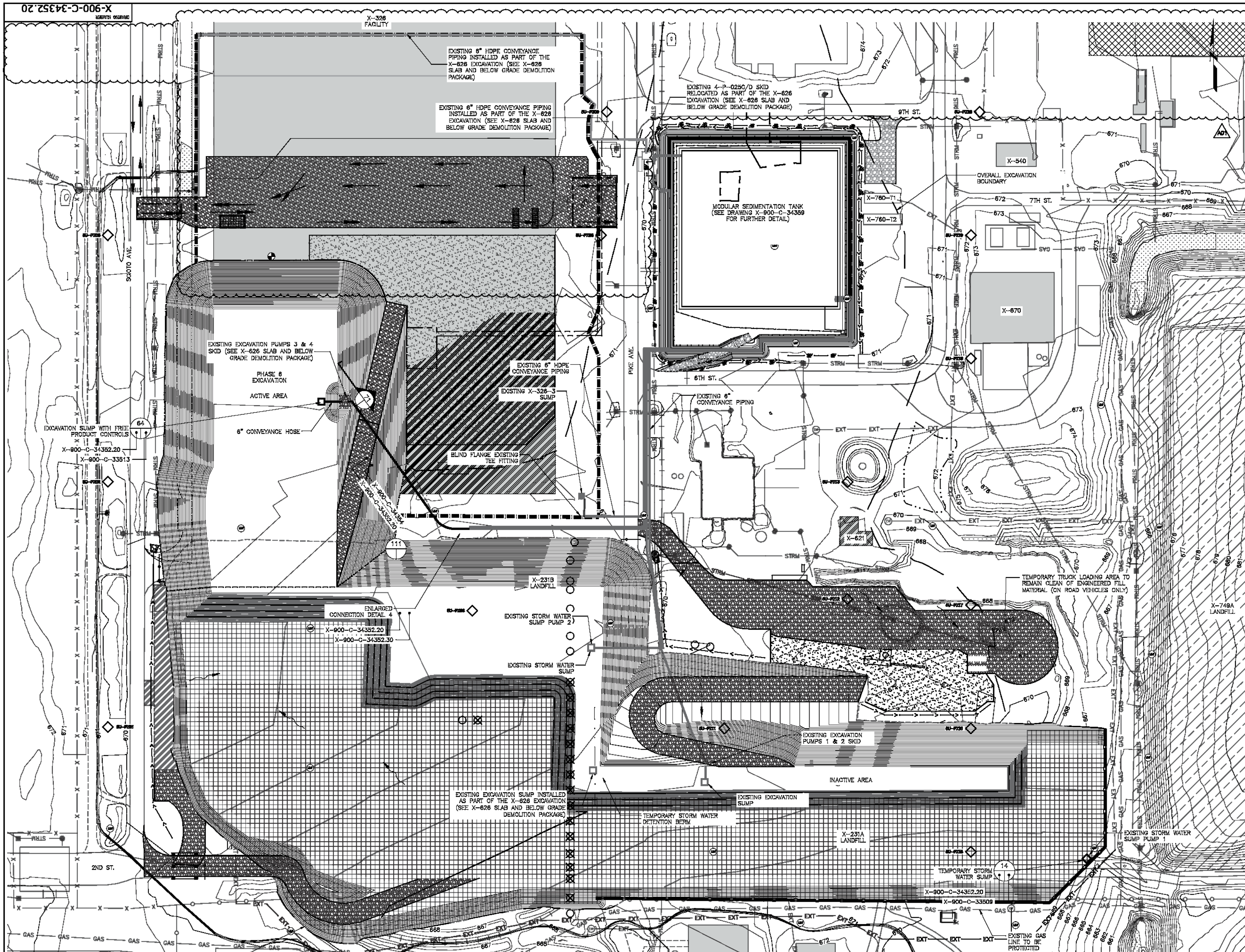
CONTRACT	DEAC3010CC40017
DRAWN BY A. J. AMAYA	9/29/23
CHECKED BY K. DOUGLAS	9/29/23
MM/RED T. A. MINEHARDT	9/29/23
DESIGN MANAGER W.E. HACKER	10/24/2023
SCALE	1"= 60'

PORTSMOUTH GASEOUS DIFFUSION PLANT
D & D PROJECT

5-UNIT (X-900)
GROUNDWATER PLUME EXCAVATION

PHASE 5 EXCAVATION DEWATERING PLAN

FACILITY: X-900 | DRAWING NUMBER: X-900-C-34352.10 | REV: A01



PLAN NOTES:

1. REFER TO THE NOTES ON DRAWING X-900-C-33525.
2. ALL FEATURES IN THIS DRAWING CAN BE FOUND IN THE LEGEND ON DRAWING X-900-A-33472.
3. REFER TO THE DEWATERING NOTES ON DRAWING X-900-C-33514.20 FOR DEWATERING REQUIREMENTS DURING EXCAVATION.
4. CONTRACTOR WILL PROVIDE PROTECTION FOR THE EXCAVATION SUMP PUMP AND ASSOCIATED PIPING IN THE 5-UNIT (X-900) EXCAVATION FROM THE EXCAVATION MACHINERY IN THE FIELD.
5. SLOPE PIPE BACK TOWARD EXCAVATION SUMP TO DRAIN LINE WHEN PIPELINE IS NOT IN USE.
6. CONTRACTOR SHALL PROVIDE AND INSTALL INSULATION WITH WEATHER JACKET AND HEAT TRACING ON EXPOSED ACTIVE PIPES OUTSIDE OF THE ACTIVE EXCAVATION LIMITS.
7. CONTAINMENT BERM CONTRACTOR SHALL COORDINATE WITH THE CONVEYANCE LINE CONTRACTOR TO ENSURE THAT CONVEYANCE PIPING IS INSTALLED PRIOR TO BERM CONSTRUCTION.
8. CONTRACTOR SHALL FIELD ROUTE THE PIPING AND FIELD LOCATE SUMPS.
9. FIELD ROUTED PIPE SHALL BE PLACED ON GRADE USING BURIAL METHODS PROVIDED ON DRAWINGS X-900-C-34354 AND X-900-C-34355. FOR ROAD CROSSING, PIPE SHALL BE BURIED AND FOLLOW DETAILS 70 AND 71 ON DRAWING X-900-C-34352.
10. FIELD ROUTED PIPE SHALL BE WITHIN +/- 100 FEET OF PIPE LENGTH AS SHOWN ON THIS DRAWING.

0 60 FEET

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EXTENTS OF EXCAVATION – PHASE 1

X-622-1 CONVEYANCE LINE BY OTHERS (SEE X-326 DEMOLITION WATER DETENTION PACKAGE)

SECTION & DETAIL KEY: NUMBER OF SECTION OR DETAIL; DRAWING ON WHICH SECTION OR DETAIL IS TAKEN; DRAWING ON WHICH SECTION OR DETAIL IS SHOWN

BASE DOCUMENT: X-900-C-34352.20, REV. A

REFERENCE DRAWINGS	OPEN CHANGES	REV	REVISION DESCRIPTION	DWN	ENG	DESIGN MANAGER	DATE
X-900-A-33472							
		A01	CFC PER ECR-E6325-61	WKB	KAJ	WAYNE HACKER	02/06/2024
		~~A~~	~~CFC PER ECR-E6325-60~~	~~CAL~~	~~KAJ~~	~~WAYNE E. HACKER~~	~~10-24-2023~~

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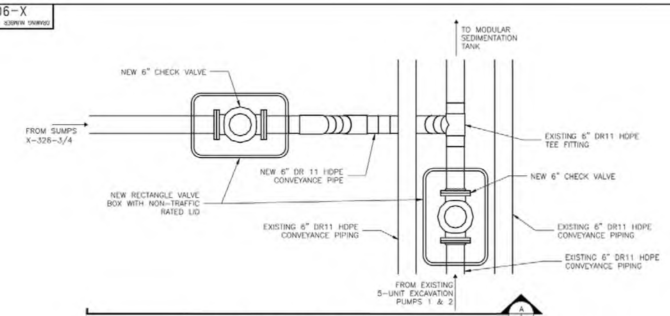
MM/RED T. A. MINEHARDT	9/29/23
DESIGN MANAGER W.E. HACKER	10/24/2023
SCALE 1"= 60'	

PORTSMOUTH GASEOUS DIFFUSION PLANT
D & D PROJECT

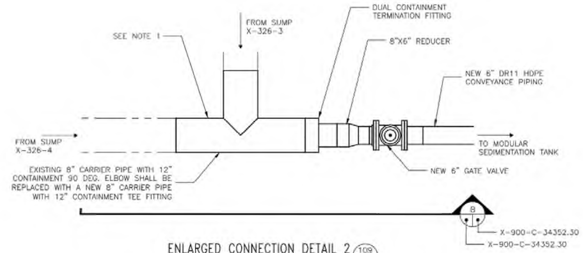
5-UNIT (X-900)
GROUNDWATER PLUME EXCAVATION

PHASE 6 EXCAVATION DEWATERING PLAN

FACILITY	DRAWING NUMBER	REV
X-900	X-900-C-34352.20	A01



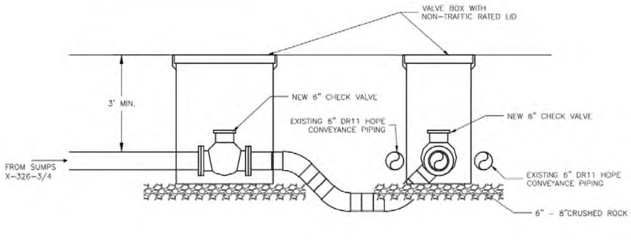
ENLARGED CONNECTION DETAIL 1 (108)
NOT TO SCALE
X-900-C-34352.10 — X-900-C-34352.30



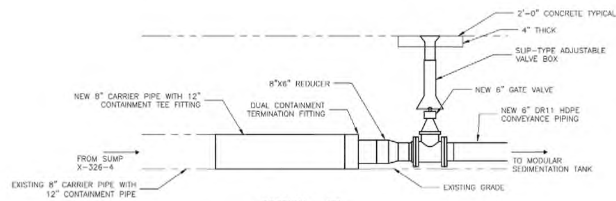
ENLARGED CONNECTION DETAIL 2 (109)
NOT TO SCALE
X-900-C-34352.10 — X-900-C-34352.30

NOTES:
1. FOR PHASE 6 PRIOR TO REMOVAL OF THE X-326-4 SUMP AND CONVEYANCE PIPING, ISOLATE AND DRAIN THE LINE. AFTER THE LINE HAS BEEN CUT AND CAP THE LINE AT THE TEE FITTING.

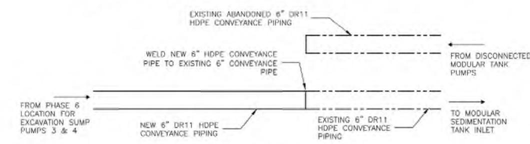
SEQUENCING NOTES:
1. ISOLATE AND DRAIN X-326-3/4 LINE.
2. REPLACE EXISTING 90 DEG. ELBOW AT X-326-3 WITH NEW 8" PIPE WITH 12" CONTAINMENT TEE FITTING.
3. ADD NEW 6" GATE VALVE, NEW 6" CONVEYANCE PIPING, AND NEW 6" CHECK VALVE AS SHOWN ON THE PHASE 5 PLAN VIEW ON DWG. X-900-C-34352.10.
4. NEW 6" GATE VALVE SHALL BE CLOSED.
5. CONFIRM LOCATION OF EXISTING GATE VALVES FROM X-326-3/4 SUMPS TO C-TRAIN.
6. DURING PHASE 5 AFTER X-326 SLAB HAS BEEN DEMOLISHED AND REMOVED, CLOSE EXISTING 8" GATE VALVE TO C-TRAIN.
7. ISOLATE AND DRAIN X-326-3/4 LINE.
8. CUT AND CAP X-326-3/4 LINE AT X-326-4 TEE FITTING AS SHOWN IN DETAIL 110.
9. OPEN NEW 6" GATE VALVE.
10. EXPOSE EXISTING BURIED GATE VALVES FROM X-326-3/4 SUMPS TO C-TRAIN.
11. DISCONNECT 8" PIPING AND BLIND FLANGE EXISTING 8" GATE VALVE FROM X-326-3/4 SUMPS TO C-TRAIN.
12. REMOVE DISCONNECTED 8" PIPE WITH 12" CONTAINMENT FROM 8" GATE VALVE TO X-326-4 TEE FITTING.
13. DURING PHASE 6, ISOLATE AND DRAIN X-326-3/4 LINE.
14. CUT AND CAP 8" PIPE WITH 12" CONTAINMENT AT X-326-3 TEE FITTING.
15. REMOVE SUMP X-326-4 PUMP AND TO THE EXTENT THE BERM IS REMOVED PER DRAWING X-900-C-33485 AND ABANDON IN PLACE WHERE BERM REMAINS.



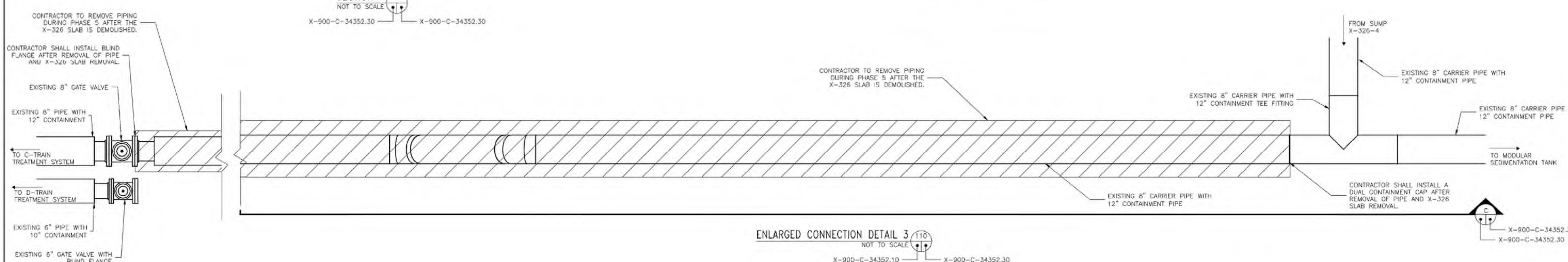
SECTION (A)
NOT TO SCALE
X-900-C-34352.30 — X-900-C-34352.30



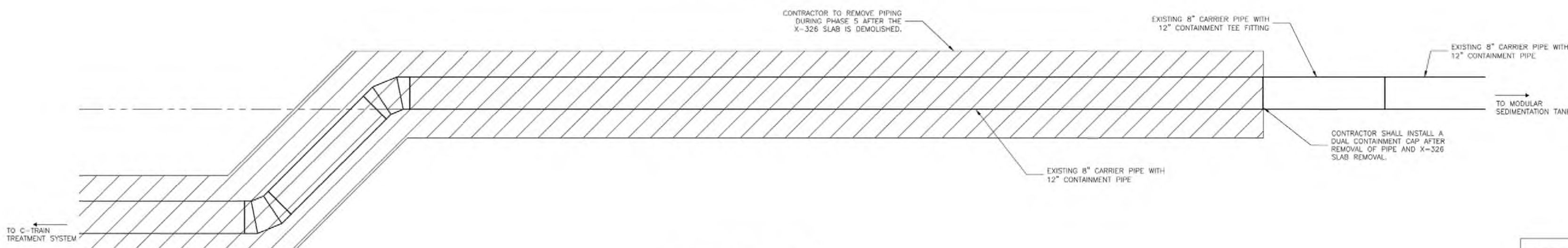
SECTION (B)
NOT TO SCALE
X-900-C-34352.30 — X-900-C-34352.30



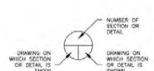
ENLARGED CONNECTION DETAIL 4 (111)
NOT TO SCALE
X-900-C-34352.20 — X-900-C-34352.30



ENLARGED CONNECTION DETAIL 3 (110)
NOT TO SCALE
X-900-C-34352.10 — X-900-C-34352.30



DETAIL 3 PROFILE VIEW (C)
NOT TO SCALE
X-900-C-34352.30 — X-900-C-34352.30



SECTION & DETAIL KEY

ARCADIS U.S., INC.
126 N. JEFFERSON STREET
SUITE 400
MILWAUKEE, WI 53202
AUTOCAD

REFERENCE DRAWINGS	OPEN CHANGES	REV	REVISION DESCRIPTION	DWN	ENG	DESIGN MANAGER	DATE
X-900-A-33472							
		A	CFC PER ECR-E6325-60	CAL	KAJ	WAYNE E. HACKER	10-24-2023

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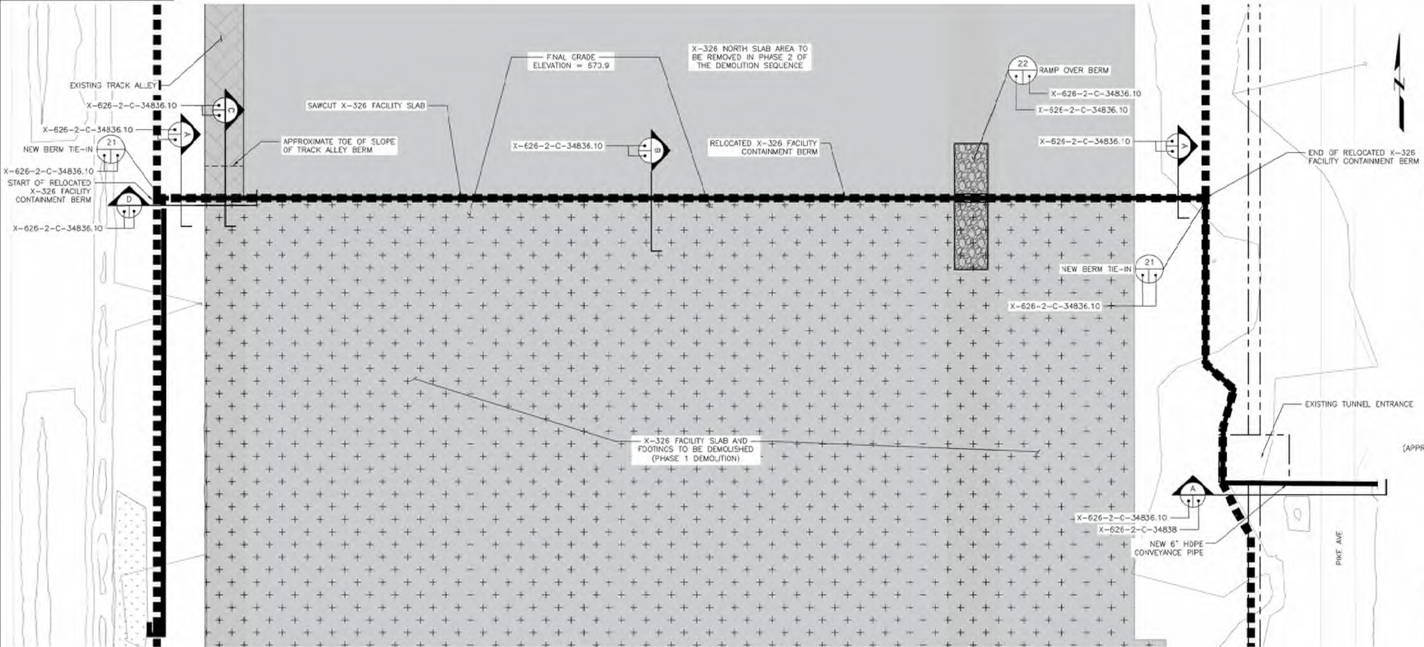
DESIGN MANAGER W.E. HACKER	10/24/2023
SCALE 1"= 60'	

PORTSMOUTH GASEOUS DIFFUSION PLANT
D & D PROJECT
5-UNIT (X-900)
GROUNDWATER PLUME EXCAVATION
PHASE 5 EXCAVATION DEWATERING DETAILS

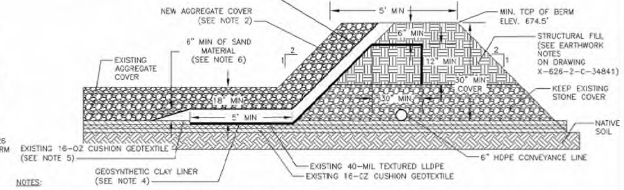
FACILITY	DRAWING NUMBER	REV
X-900	X-900-C-34352.30	A



PLAN VIEW

PHASE 5 AND X-326 WORK PREPARATION SEQUENCE NOTES (ORDER DETERMINED BY THE COMPANY):

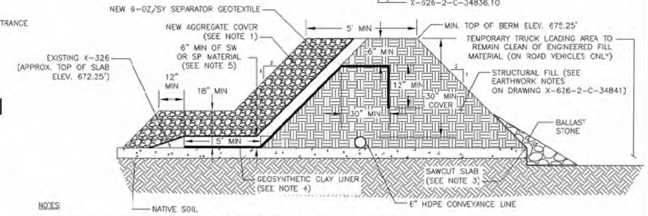
1. INSTALL RELOCATED BERM TO THE NORTH
2. INSTALL/RECONFIGURE CONVEYANCE PIPING TO BE PLACED IN RELOCATED BERM.
3. INSTALL TEMPORARY ACCESS RAMP ACROSS NEW BERM FOR TRANSPORT OF DEMOLISHED CONCRETE.
4. SOUTHERN BERM AND SLAB DEMOLITION
5. DEMOLITION OF THE ACR TUNNEL AND BASEMENT
6. TRANSITION EXISTING X-326 SUMPS FROM PUMPING TO C-TRAIN TO PUMPING TO E-TRAIN VIA THE 2 MG MODULAR TREATMENT TANK AFTER SLAB HAS BEEN REMOVED.
7. BRING AREA BENEATH DEMOLISHED SLAB UP TO GRADE WITH IMPORTED FILL.



NOTES:

1. SCRAPE AWAY EXISTING AGGREGATE SURFACE CAREFULLY TO PREVENT TEARS IN EXISTING GEOMEMBRANE LINER. MATERIAL WILL BE CONTAMINATED AND ANY SAFETY MEASURES AND DISPOSAL METHODS PER THE CONTRACT DOCUMENTS SHALL BE FOLLOWED AS NECESSARY. PLACE SAND COVER OVER THE GCL TO A TOTAL DEPTH OF 6" AND AGGREGATE COVER TO A TOTAL COMBINED DEPTH OF 18" OVER THE ENTIRE LINER FOOTPRINT.
2. STONE LAYER TO CONFORM TO OHIO DOT SPECIFICATION ITEM 411 - STABILIZED CRUSHED AGGREGATE
3. MATERIAL USED IN BERM CONSTRUCTION MAY BE MIXED WITH CONDITIONING ADDITIVE (E.G., CALCIMENT) PRIOR TO REMOVING CONTENTS.
4. A LAYER OF SODIUM BENTONITE APPLIED AT A RATE OF 1.5 LBS/FT² SHALL BE PLACED BETWEEN THE EXISTING LINER SYSTEM AND THE NEW GEOSYNTHETIC CLAY LINER TO ESTABLISH A WATERTIGHT SEAL.
5. THE EXISTING 16-OZ CUSHION GEOTEXTILE SHALL BE REMOVED UNDERNEATH THE 5' RUNOUT OF THE NEW GEOSYNTHETIC CLAY LINER (GCL) TO ENSURE A WATERTIGHT SEAL BETWEEN THE GCL AND THE 40-MIL TEXTURED LLDPE.
6. SAND SHALL BE PLACED TO PROTECT THE GEOSYNTHETIC CLAY LINER AND SHALL BE OF SW OR SP CLASS OF MATERIAL. PROVIDE SAND COVER IN ACCORDANCE WITH ODOT ITEM 703.06.

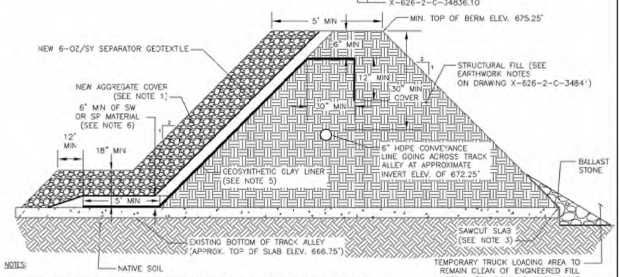
SECTION A
NOT TO SCALE
X-626-2-C-34836.10



NOTES:

1. STONE LAYER TO CONFORM TO OHIO DOT SPECIFICATION ITEM 411 - STABILIZED CRUSHED AGGREGATE.
2. MATERIAL USED IN BERM CONSTRUCTION MAY BE MIXED WITH CONDITIONING ADDITIVE (E.G., CALCIMENT) PRIOR TO REMOVING CONTENTS.
3. ANY CONCRETE DEBRIS FROM SAW CUTTING THE X-326 SLAB SHALL BE CONSIDERED TO BE CONTAMINATED AND SHALL BE DISPOSED OF ACCORDING TO THE PROJECT DOCUMENTS.
4. REPAIR DAMAGED SLAB CONCRETE UNDER THE 5' GEOSYNTHETIC CLAY LINER RUNOUT WITH QUICKRETE PRECISION NON-SHRINK GROUT OR APPROVED EQUAL. CONTRACTOR SHALL ENSURE THAT THE SLAB BENEATH THE BERM AND GEOSYNTHETIC LINER RUNOUT SHALL BE A SMOOTH LEVEL SURFACE SUCH THAT THE GCL CAN MAINTAIN INTIMATE CONTRACT WITH EXISTING/ REPAIRED X-326 SLAB. A LAYER OF SODIUM BENTONITE APPLIED AT A RATE OF 1.5 LBS/FT² SHALL BE PLACED BETWEEN THE X-326 SLAB AND THE NEW GCL TO ESTABLISH A WATERTIGHT SEAL.
5. PROVIDE SAND COVER IN ACCORDANCE WITH ODOT ITEM 703.06.

SECTION B
NOT TO SCALE
X-626-2-C-34836.10

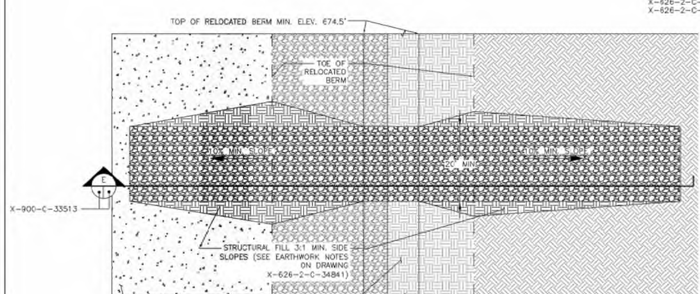


NOTES:

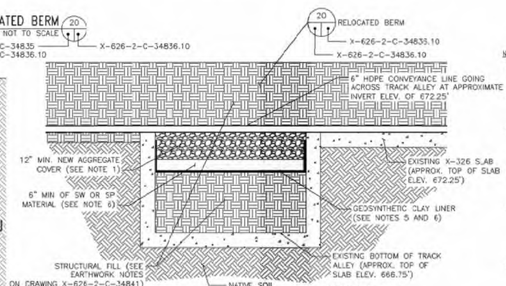
1. STONE LAYER TO CONFORM TO OHIO DOT SPECIFICATION ITEM 411 - STABILIZED CRUSHED AGGREGATE.
2. MATERIAL USED IN BERM CONSTRUCTION MAY BE MIXED WITH CONDITIONING ADDITIVE (E.G., CALCIMENT) PRIOR TO REMOVING CONTENTS.
3. ANY CONCRETE DEBRIS FROM SAW CUTTING THE X-326 SLAB SHALL BE CONSIDERED TO BE CONTAMINATED AND SHALL BE DISPOSED OF ACCORDING TO THE PROJECT DOCUMENTS.
4. REPAIR DAMAGED SLAB CONCRETE UNDER THE 5' GEOSYNTHETIC CLAY LINER RUNOUT WITH QUICKRETE PRECISION NON-SHRINK GROUT OR APPROVED EQUAL.
5. A LAYER OF SODIUM BENTONITE APPLIED AT A RATE OF 1.5 LBS/FT² SHALL BE PLACED BETWEEN THE X-326 SLAB AND THE NEW GCL TO ESTABLISH A WATERTIGHT SEAL.
6. PROVIDE SAND COVER IN ACCORDANCE WITH ODOT ITEM 703.06.

SECTION C
NOT TO SCALE
X-626-2-C-34836.10

RELOCATED BERM 20
NOT TO SCALE
X-626-2-C-34835
X-626-2-C-34836.10



PLAN VIEW



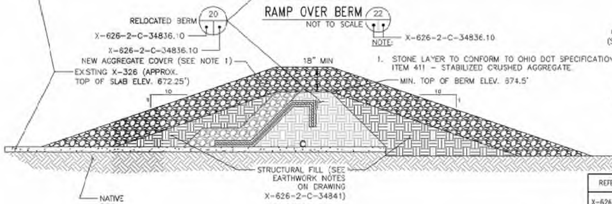
NOTES:

1. STONE LAYER TO CONFORM TO OHIO DOT SPECIFICATION ITEM 411 - STABILIZED CRUSHED AGGREGATE.
2. MATERIAL USED IN BERM CONSTRUCTION MAY BE MIXED WITH CONDITIONING ADDITIVE (E.G., CALCIMENT) PRIOR TO REMOVING CONTENTS.
3. ANY CONCRETE DEBRIS FROM SAW CUTTING THE X-326 SLAB SHALL BE CONSIDERED TO BE CONTAMINATED AND SHALL BE DISPOSED OF ACCORDING TO THE PROJECT DOCUMENTS.
4. REPAIR DAMAGED SLAB CONCRETE UNDER THE 5' GEOSYNTHETIC CLAY LINER RUNOUT WITH QUICKRETE PRECISION NON-SHRINK GROUT OR APPROVED EQUAL.
5. FOLD GEOSYNTHETIC CLAY LINER UP WALL A MIN. 12" AND SEAL WITH BENTONITE. CONTRACTOR SHALL USE HAND TOOLS TO PLACE COVER SAND AND STONE AROUND GEOSYNTHETIC CLAY LINER FOLDS TO ENSURE IT MAINTAINS INTIMATE CONTACT WITH THE CONCRETE OF TRACK ALLEY DURING INSTALLATION.
6. PROVIDE SAND COVER IN ACCORDANCE WITH ODOT ITEM 703.06.

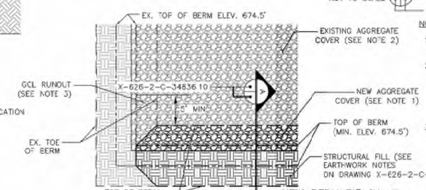
SECTION D
NOT TO SCALE
X-626-2-C-34836.10

RAMP OVER BERM 22
NOT TO SCALE
X-626-2-C-34836.10

1. STONE LAYER TO CONFORM TO OHIO DOT SPECIFICATION ITEM 411 - STABILIZED CRUSHED AGGREGATE.



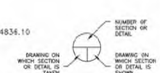
SECTION E
NOT TO SCALE
X-626-2-C-34836.10



NEW BERM TIE-IN 21
NOT TO SCALE
X-626-2-C-34835.10

NOTES:

1. STONE LAYER TO CONFORM TO OHIO DOT SPECIFICATION ITEM 411 - STABILIZED CRUSHED AGGREGATE.
2. SCRAPE AWAY EXISTING AGGREGATE SURFACE CAREFULLY TO PREVENT TEARS IN EXISTING GEOMEMBRANE LINER. MATERIAL WILL BE CONTAMINATED AND ANY SAFETY MEASURES AND DISPOSAL METHODS PER THE CONTRACT DOCUMENTS SHALL BE FOLLOWED AS NECESSARY. PLACE SAND COVER OVER THE GCL TO A DEPTH OF 6" AND AGGREGATE COVER TO A TOTAL COMBINED DEPTH OF 18" OVER THE ENTIRE LINER FOOTPRINT.
3. NEW GCL SHALL OVERLAP THE EXISTING GEOMEMBRANE A MINIMUM OF 5' AND BE COVERED BY A MIN. 6" LAYER OF SAND IN ACCORDANCE WITH ODOT ITEM 703.06.



SECTION & DETAIL KEY

GENERAL NOTE:

1. REFER TO THE NOTES ON X-626-2-C-34840.

ARCADIS U.S., INC.
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MILWAUKEE, WI 53202

REFERENCE DRAWINGS	OPEN CHANGES	REV	REVISION DESCRIPTION	DWN	ENG	DESIGN MANAGER	DATE
X-626-2-A-34828 X-626-2-A-34829		A	CFC PER ECR-E6305-52	CAL	KAJ	WAYNE E. HACKER	3/3/2024

Fluor-BWXT Portsmouth
P.O. BOX 548 PIKETON, OHIO 45661

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CONTRACT DEAC3010CC40017
DRAWN BY M. P. ADAMS 02/02/24
CHECKED BY R. J. HANSEN 02/02/24
WM/RED T. A. MINEHARDT 02/02/24
DESIGN MANAGER W.E. HACKER 3/3/2024
SCALE AS SHOWN

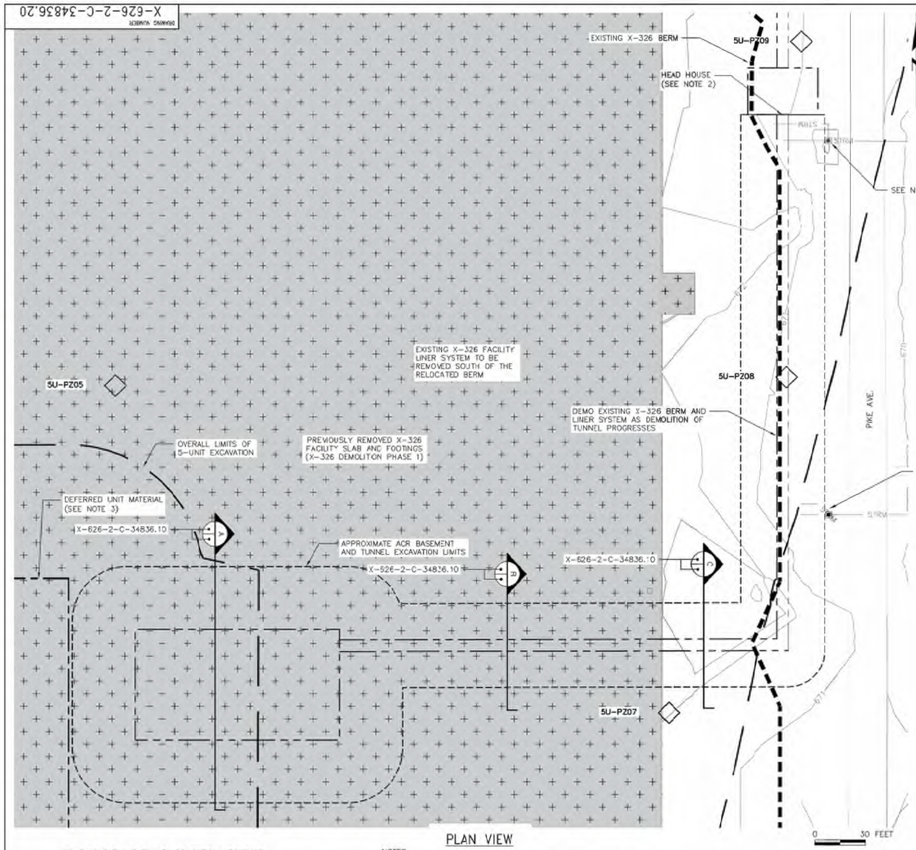
PORTSMOUTH GASEOUS DIFFUSION PLANT
D & D PROJECT

X-626 SLAB AND BELOW GRADE DEMOLITION

BERM RELOCATION DETAILS

FACILITY X-626 | DRAWING NUMBER X-626-2-C-34836.10 | REV A

X-626-2-C-34836.20



PLAN VIEW

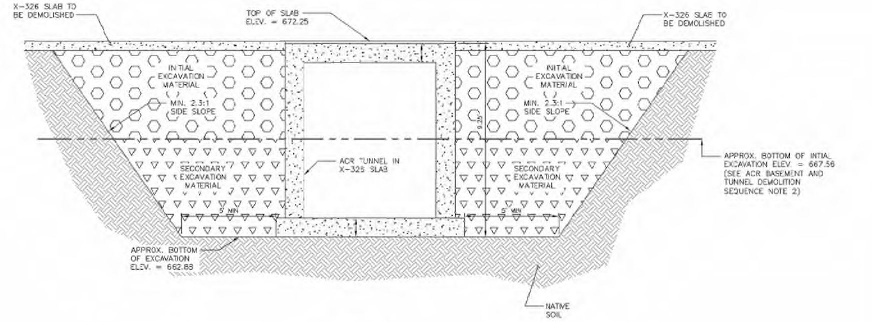
ACR BASEMENT AND TUNNEL DEMOLITION SEQUENCE:

1. DEMOLISH X-326 SLAB IN FOOTPRINT WHERE NOT ALREADY COMPLETED.
2. EXCAVATE MATERIAL DOWN TO MIDDLE ELEVATION OF TUNNEL/ACR #6 BASEMENT (SEE NOTE 4)
3. DEMOLISH/KNOCKDOWN WALLS, COLUMNS, ETC. INWARDS.
4. EXCAVATE MATERIAL DOWN TO BOTTOM OF FOOTING ELEVATION (SEE NOTE 4).
5. REMOVE DEMOLISHED MATERIAL AND DEMOLISH REMAINING WALLS, COLUMNS, FLOOR SLAB, PIERS, AND FOOTINGS.
6. REMOVE REMAINING DEMOLISHED MATERIAL.
7. BACKFILL TO BELOW X-326 SLAB ELEVATIONS WITH IMPORTED FILL. GRADE AREA TO DRAIN STORM WATER TO SOUTHERN X-326 SUMPS.

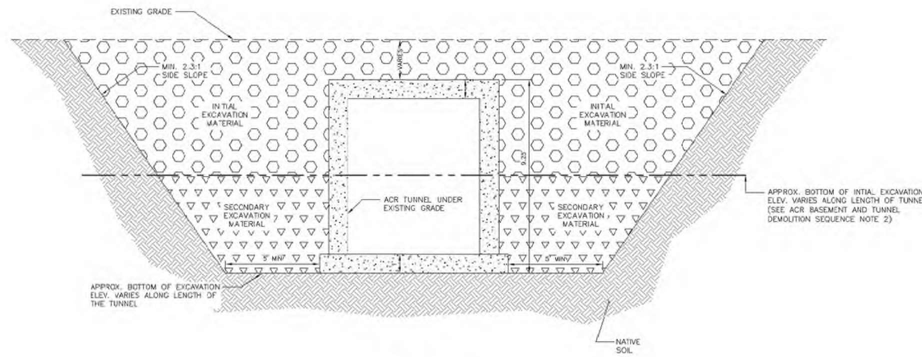
NOTES:

1. EXISTING STORM STRUCTURE AND EAST OUTLET PIPE TO BE PROTECTED.
2. ACR TUNNEL SHALL BE DEMOLISHED UP TO THE PREVIOUSLY INSTALLED BULKHEAD AT THE SOUTHERN ENTRANCE TO THE HEAD HOUSE #6. ABANDONED UTILITIES MAY BE ENCOUNTERED AS THE TUNNEL IS DEMOLISHED AND MAY BE DISPOSED OF AT THE DISCRETION OF THE COMPANY.
3. EXCAVATION OF DEFERRED UNIT MATERIAL SHALL BE AVOIDED. ANY DEFERRED UNIT MATERIAL DISTURBED DURING EXCAVATION ACTIVITIES SHALL BE DISPOSED OF ACCORDING TO THE PROJECT DOCUMENTS.
4. THE SOIL LOCATED OUTSIDE OF THE DEFERRED UNIT AREA MAY BE RE-USED AS BACKFILL OF THE DEMOLITION EXCAVATION.

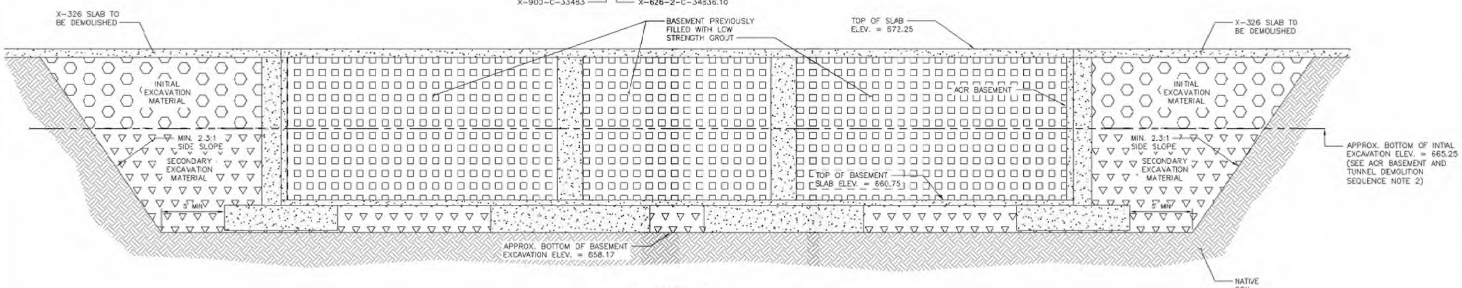
ACR TUNNEL AND BASEMENT DEMOLITION 24
NOT TO SCALE
X-900-C-33483 X-626-2-C-34836.10



SECTION B
NOT TO SCALE
X-626-2-C-34836.10



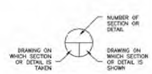
SECTION C
NOT TO SCALE
X-626-2-C-34836.10



SECTION A
NOT TO SCALE
X-626-2-C-34836.10

GENERAL NOTE:

1. REFER TO THE NOTES ON X-626-2-C-34840.



SECTION & DETAIL KEY

REFERENCE DRAWINGS	OPEN CHANGES	REV	REVISION DESCRIPTION	DWN	ENG	DESIGN MANAGER	DATE
X-626-2-A-34828 X-626-2-A-34829							
		A	CFC PER ECR-E6325-52	CAL	KAJ	WAYNE E. HACKER	3/3/2024

ARCADIS U.S., INC.
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Fluor-BWXT | Portsmouth LLC
P.O. BOX 548 PIKETON, OHIO 45661

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CONTRACT DEAC3010CC40017
DRAWN BY M. P. ADAMS 02/02/24
CHECKED BY R. J. HANSEN 02/02/24
MM/RED T. A. MINEHARDT 02/02/24
DESIGN MANAGER W.E. HACKER 3/3/2024
SCALE AS SHOWN

PORTSMOUTH GASEOUS DIFFUSION PLANT
D & D PROJECT

X-626
SLAB AND BELOW GRADE DEMOLITION
BASEMENT DEMOLITION DETAILS

FACILITY X-626
DRAWING NUMBER X-626-2-C-34836.20
REV A

ATTACHMENT C.2: PHASE 2 – NORTHERN SLAB AREA

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Table C.2.1 lists the drawings included in the engineering design package (31 drawings in total).

Table C.2.1. Phase 2 - Northern Slab Area

Sheet	Drawing No.	Drawing Title
1	X-326-A-34858	COVER SHEET
2	X-326-A-34859	DRAWING INDEX, LEGEND, SYMBOLS, REFERENCES, AND ABBREVIATIONS
3	X-326-C-34860	EXISTING CONDITIONS (1 OF 4)
4	X-326-C-34861	EXISTING CONDITIONS (2 OF 4)
5	X-326-C-34862	EXISTING CONDITIONS (3 OF 4)
6	X-326-C-34863	EXISTING CONDITIONS (4 OF 4)
7	X-326-C-34863.10	CONVEYANCE LINE ROUTE OVERVIEW
8	X-326-C-34864	X-326-1 AND X-326-2 CONVEYANCE PLAN
9	X-326-C-34865	SLAB DEMOLITION PLAN
10	X-326-C-34866	SLAB DEMOLITION DETAILS
11	X-326-C-34867	SLAB REMOVAL TYPICAL EXCAVATION SECTIONS
12	X-326-C-34868	SLAB REMOVAL GRADING PLAN
13	X-326-C-34869	LINER REMOVAL GRADING PLAN
14	X-326-C-34870	LINER REMOVAL TYPICAL EXCAVATION SECTIONS
15	X-326-C-34871	BERM REMOVAL GRADING PLAN
16	X-326-C-34872	BERM REMOVAL TYPICAL EXCAVATION SECTIONS
17	X-326-C-34873	BERM REMOVAL EROSION AND SEDIMENT CONTROL PLAN
18	X-326-C-34874	UTILITY REMOVAL PLAN (1 OF 4)
19	X-326-C-34875	UTILITY REMOVAL PLAN (2 OF 4)
20	X-326-C-34876	UTILITY REMOVAL PLAN (3 OF 4)
21	X-326-C-34877	UTILITY REMOVAL PLAN (4 OF 4)
22	X-326-C-34878	POST-UTILITY REMOVAL PLAN
23	X-326-C-34879	FINAL GRADING PLAN
24	X-326-C-34880	FINAL GRADING EROSION AND SEDIMENT CONTROL PLAN
25	X-326-C-34881	CIVIL DETAILS (1 OF 2)
26	X-326-C-34882	CIVIL DETAILS (2 OF 2)
27	X-326-C-34883	X-326-1 AND X-326-2 CONVEYANCE DETAILS
28	X-326-C-34884	CONSTRUCTION NOTES AND SPECIFICATIONS (1 OF 3)
29	X-326-C-34885	CONSTRUCTION NOTES AND SPECIFICATIONS (2 OF 3)
30	X-326-C-34886	CONSTRUCTION NOTES AND SPECIFICATIONS (3 OF 3)
31	X-326-C-34887	CONVEYANCE NOTES

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X-326-A-34858

UNITED STATES DEPARTMENT OF ENERGY

PORTSMOUTH GASEOUS DIFFUSION PLANT
DECONTAMINATION AND DECOMMISSIONING PROJECT
PIKETON, OHIO

OHIO

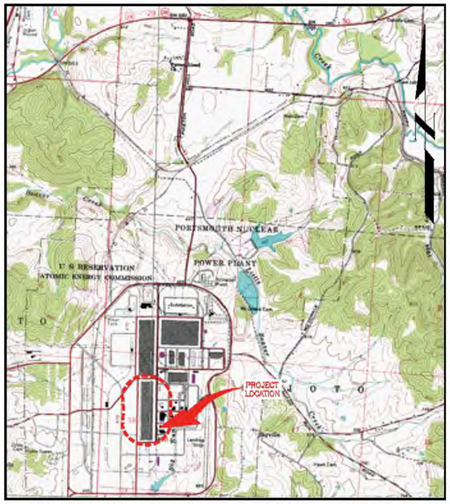
X-326 NORTHERN SLAB AREA
DEMOLITION AND UTILITY REMOVAL
100 PERCENT DESIGN PACKAGE

IMAGE SOURCE: GOOGLE EARTH, 2017

VICINITY MAP

0 6000' 12,000'

GRAPHIC SCALE



REFERENCE: BASE MAP USGS 7.5 MINUTE QUADRANGLE, PIKETON, OHIO, 1961, PHOTOINSPECTED 1979; AND WAVERLY SOUTH, OHIO, 1992

LOCATION MAP

0 2000' 4000'

GRAPHIC SCALE

PREPARED FOR:
UNITED STATES DEPARTMENT OF ENERGY
3930 US ROUTE 23 SOUTH, X-1000
PIKETON, OHIO 45661

PREPARED BY:
ARCADIS U.S., INC.
126 N. JEFFERSON ST.
SUITE 400
MILWAUKEE, WI 53202

UNDER CONTRACT TO:
FLUOR-BWXT PORTSMOUTH LLC
3930 US ROUTE 23 SOUTH
PIKETON, OHIO 45661

ARCADIS U.S., INC.
126 N. JEFFERSON STREET
SUITE 400
MILWAUKEE, WI 53202

AUTOCAD

REFERENCE DRAWINGS	OPEN CHANGES	REV	REVISION DESCRIPTION	DWN	ENG	DESIGN MANAGER	DATE
		d	REVISED 100 PERCENT DESIGN	LTH	TAM	S. B. MURPHY	02/29/24
		c	100 PERCENT DESIGN PACKAGE FOR FBP REVIEW	MPA	TAM	S. B. MURPHY	01/18/24
		b	90 PERCENT DESIGN PACKAGE FOR FBP REVIEW	RJH	TAM	S. B. MURPHY	09/15/23
		a	60 PERCENT DESIGN PACKAGE FOR FBP REVIEW	LTH	TAM	S. B. MURPHY	06/07/23

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DRAWN BY L. T. HOLMGREN	02/29/24
CHECKED BY R. J. HANSEN	02/29/24
MM/RED T. A. MINEHARDT	02/29/24
DESIGN MANAGER S. B. MURPHY	02/29/24
SCALE AS SHOWN	

PORTSMOUTH GASEOUS DIFFUSION PLANT
D & D PROJECT

X-326 NORTHERN SLAB AREA DEMOLITION AND UTILITY REMOVAL

COVER SHEET

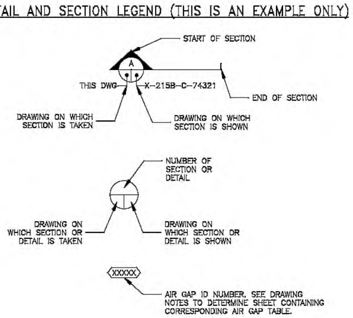
FACILITY	DRAWING NUMBER	REV
X-326	X-326-A-34858	d

X-326-A-34859

DRAWING INDEX

FBP DRAWING NO.	TITLE
X-326-A-34858	COVER SHEET
X-326-A-34859	DRAWING INDEX, LEGEND, SYMBOLS, REFERENCES, AND ABBREVIATIONS
X-326-C-34860	EXISTING CONDITIONS (1 OF 4)
X-326-C-34861	EXISTING CONDITIONS (2 OF 4)
X-326-C-34862	EXISTING CONDITIONS (3 OF 4)
X-326-C-34863	EXISTING CONDITIONS (4 OF 4)
X-326-C-34863.10	CONVEYANCE LINE ROUTE OVERVIEW
X-326-C-34864	X-326-1 AND X-326-2 CONVEYANCE PLAN
X-326-C-34865	SLAB DEMOLITION PLAN
X-326-C-34866	SLAB DEMOLITION DETAILS
X-326-C-34867	SLAB REMOVAL TYPICAL EXCAVATION SECTIONS
X-326-C-34868	SLAB REMOVAL GRADING PLAN
X-326-C-34869	LINER REMOVAL GRADING PLAN
X-326-C-34870	LINER REMOVAL TYPICAL EXCAVATION SECTIONS
X-326-C-34871	BERM REMOVAL GRADING PLAN
X-326-C-34872	BERM REMOVAL TYPICAL EXCAVATION SECTIONS
X-326-C-34873	BERM REMOVAL EROSION AND SEDIMENT CONTROL PLAN
X-326-C-34874	UTILITY REMOVAL PLAN (1 OF 4)
X-326-C-34875	UTILITY REMOVAL PLAN (2 OF 4)
X-326-C-34876	UTILITY REMOVAL PLAN (3 OF 4)
X-326-C-34877	UTILITY REMOVAL PLAN (4 OF 4)
X-326-C-34878	POST-UTILITY REMOVAL PLAN
X-326-C-34879	FINAL GRADING PLAN
X-326-C-34880	FINAL CONDITIONS EROSION AND SEDIMENT CONTROL PLAN
X-326-C-34881	CIVIL DETAILS (1 OF 3)
X-326-C-34881.10	CIVIL DETAILS (2 OF 3)
X-326-C-34882	CIVIL DETAILS (3 OF 3)
X-326-C-34883	X-326-1 AND X-326-2 CONVEYANCE DETAILS
X-326-C-34884	CONSTRUCTION NOTES & SPECIFICATIONS (1 OF 3)
X-326-C-34885	CONSTRUCTION NOTES & SPECIFICATIONS (2 OF 3)
X-326-C-34886	CONSTRUCTION NOTES & SPECIFICATIONS (3 OF 3)
X-326-C-34887	CONVEYANCE NOTES

DETAIL AND SECTION LEGEND (THIS IS AN EXAMPLE ONLY)



ABBREVIATIONS/ACRONYMS

ACR	AREA CONTROL ROOM
AMP	AMPERE
AWG	AMERICAN WIRE GAGE
CS	CARBON STEEL
CIP	CAST-IRON PIPE
CMP	CORRUGATED METAL PIPE
COM	COMMUNICATIONS
DIA	DIAMETER
DWG	DRAWING
E	UNDERGROUND ELECTRICAL
HT	HEIGHT
HPFW	HIGH PRESSURE FIRE WATER
IN	INCHES
KV	KILOVOLT
LF	LINEAR FEET
L	LENGTH
MIN	MINIMUM
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
N.T.S	NOT TO SCALE
ODOT	OHIO DEPARTMENT OF TRANSPORTATION
OEPA	OHIO ENVIRONMENTAL PROTECTION AGENCY
OPR	OVERHEAD PIPE RACK
OHP	OVERHEAD POWER LINE
RCW	RECIRCULATED COOLING WATER
RCWR	RECIRCULATED COOLING WATER RETURN
RCWS	RECIRCULATED COOLING WATER SUPPLY
RECP	ROLLED EROSION CONTROLLED PRODUCT
T	TELEPHONE
TYP.	TYPICAL
UST	UNDERGROUND STORAGE TANK
WWF	WELDING WIRE FABRIC
W	WIDTH

REFERENCE NOTES:

1. EXISTING SITE FEATURES SHOWN ON DRAWINGS HAVE BEEN INTERPRETED FROM THE PRECEDING LIST OF REFERENCE DRAWINGS AND UPDATED WITH INFORMATION FROM THE SOURCES LISTED IN NOTES 2-4 AND NOTE 6.
2. SUPPLEMENTAL FIELD SURVEY FOR SITE FEATURES IN THE VICINITY OF BUILDING X-326 WAS PROVIDED BY THE COMPANY TO ARCADIS ON SEPTEMBER 5, 2018 AND NOVEMBER 28, 2018.
3. ADDITIONAL SITE FEATURES WERE DEVELOPED FROM SITE WALKS CONDUCTED BY ARCADIS AND THE COMPANY ON DECEMBER 12, 2018 AND DECEMBER 17, 2018.
4. ADDITIONAL UNDERGROUND UTILITIES, AND ABOVE GROUND SITE FEATURES WERE PROVIDED BY THE COMPANY TO ARCADIS IN THE CAD FILE TITLED "X-326 FLOOR PLAN OUTLINE-2".
5. SEE SHEET X-326-C-34884 FOR GENERAL NOTES.
6. ADDITIONAL REFERENCE PACKAGES INCLUDE THE 5-UNIT (X-900) GROUNDWATER PLUME EXCAVATION DESIGN, THE X-326 DEMOLITION WATER DETENTION SYSTEM DESIGN, THE X-326 DEMOLITION HAUL ROAD AND TRUCK WASH, THE X-326 DEMOLITION ABOVE GRADE STRUCTURES REMOVAL AND ROUGH GRADE, AND THE X-326 DEMOLITION BELOW GRADE UTILITIES ISOLATIONS AND REMOVAL PACKAGE.

LEGEND

- EXISTING RAILROAD TRACK
- EXISTING BUILDING
- EXISTING SANITARY SEWER MANHOLE
- EXISTING TUNNEL MANHOLE
- EXISTING ELECTRIC HANDHOLE
- EXISTING UTILITY POLE
- EXISTING AIR RELEASE VALVE
- EXISTING GUY WIRE GROUND CONNECTION
- EXISTING ELECTRIC BOX
- EXISTING ROOF DRAIN
- EXISTING POST INDICATOR VALVE
- EXISTING STORM CLEAN OUT
- EXISTING CATHODIC PROTECTION WELL
- EXISTING MONITORING WELL
- EXISTING ELECTRICAL OR COMMUNICATIONS CONDUIT
- EXISTING CAMERA POST WITH CONDUIT
- EXISTING GATE VALVE
- EXISTING ABANDONED TOWER
- NEW ACR TUNNEL BULKHEAD
- EXISTING ACR TUNNEL BULKHEAD
- TEMPORARY GEOTEXTILE INLET PROTECTION
- TEMPORARY ROCK OUTLET PROTECTION
- EXISTING LIMITED AREA FENCE
- COM — EXISTING OVERHEAD COMMUNICATIONS LINE
- F2 — EXISTING OVERHEAD F2 13.8 kV ELECTRIC
- EXISTING SUBGRADE BASEMENT/TUNNEL
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- EXISTING BLOW OFF VALVE
- EXISTING STORM MANHOLE
- EXISTING STORM CATCH BASIN
- NEW STORM CATCH BASIN
- EXISTING HYDRANT
- EXISTING ELECTRIC BOX
- EXISTING ELECTRICAL MANHOLE
- EXISTING MATCHLINE
- PREVIOUSLY DEMOLISHED BUILDING
- PREVIOUSLY DEMOLISHED SLAB
- EXISTING BOLLARD
- EXISTING FOOTING/FOOTING WITH PIER
- EXISTING GATE
- HPFW — EXISTING HIGH PRESSURE FIRE WATER TO BE REMOVED
- RCW — EXISTING RECIRCULATED COOLING WATER TO BE REMOVED
- SFW — EXISTING SANITARY FIRE WATER TO BE REMOVED
- STRM — EXISTING STORM PIPE TO BE REMOVED
- SS — EXISTING SANITARY SEWER TO BE REMOVED
- E — EXISTING UNDERGROUND ELECTRIC TO BE REMOVED
- COM — EXISTING COMMUNICATIONS CABLE TO BE REMOVED
- EXISTING FUEL LINES TO BE REMOVED
- EXISTING SUBGRADE BASEMENT/TUNNEL TO BE REMOVED
- HPFW — EXISTING HIGH PRESSURE FIRE WATER
- RCW — EXISTING RECIRCULATED COOLING WATER
- SFW — EXISTING SANITARY FIRE WATER
- STRM — EXISTING STORM PIPE
- SS — EXISTING SANITARY SEWER
- GRD — EXISTING GROUNDING
- E — EXISTING UNDERGROUND ELECTRIC
- COM — EXISTING COMMUNICATIONS CABLE
- MUW — EXISTING MAKE-UP WATER
- EXISTING X-326 COLUMN LINE (FOR REFERENCE)
- EXISTING DEWATERING PIPE
- EXISTING DEWATERING SUMP
- UTILITY REMOVAL AREA
- LIMITS OF UTILITY REMOVAL
- EXISTING X-326 WATER DETENTION SYSTEM BERM CENTERLINE
- LOD — TEMPORARY LIMITS OF DISTURBANCE
- SF — TEMPORARY SILT FENCE
- 5-UNIT PLUME EXCAVATION LIMITS
- EXISTING LANDFILL
- EXISTING GRAVEL
- EXISTING WETLAND

LIST OF REFERENCE DRAWINGS

FBP DRAWING NO.	REV NO.	UTILITY	TITLE
X-230B-C-33741	A	SANITARY SEWER	5-UNIT (X-900) UTILITY ISOLATION/RE-ROUTES SANITARY SEWER ISOLATION AND RELOCATION LAYOUT
X-215B-89-E	5	ABOVEGROUND ELECTRICAL	ELECTRICAL DISTRIBUTION SYSTEMS PLAN AND PROFILE, PIKE AVE SOUTH SECTION
X-232D-9-M	0	ABOVEGROUND PIPING	OVERHEAD STEAM, COND., NITROGEN, AIR, AND FLOURINE BUILDING TAKEOFF DETAILS – SHEET 1
X-220A-4012-E	6	BASEMENTS AND TUNNELS	CABLE TRAY PLACEMENT PLAN
X-326-9-A	0	BASEMENTS AND TUNNELS	SOUTH HALF GROUND FLOOR PLAN, UNIT X-25-3 THROUGH 7, PURGE AND PRODUCT
X-215B-15.10E	A2	COMMUNICATIONS	COMMUNICATIONS DUCTBANK DETAIL SHEET NO 1
X-215B-15.25E	3	COMMUNICATIONS	COMMUNICATIONS DUCTBANK – PLAN AND PROFILE, 9TH ST TO X-101, X-111A AND INSTRUMENT TUNNEL TO X-345
X-220A-6001-E	1	COMMUNICATIONS	PBX EMERGENCY TELEPHONE CABLE DISTRIBUTION
X-220A-6002-E	5	COMMUNICATIONS	PROCESS TELEPHONE CABLING DISTRIBUTION
X-220A-6031-E	4	COMMUNICATIONS	PUBLIC ADDRESS SYSTEM UPGRADE SYSTEM OVERVIEW
X-220A-6033-E	1	COMMUNICATIONS	PUBLIC ADDRESS SYSTEM UPGRADE CABLE PLANT PACKAGE INSTRUMENT TUNNEL AND DUCTBANK PLAN
DX-761-637-C	3	FENCE/LIGHTING	SITE PLAN W/ LEGEND
X-326-1M	1	STORM AND SANITARY SEWER	PLUMBING KEY PLAN UNDERGROUND DRAINAGE
X-230B-100-C	0	SANITARY SEWER AND FIRE WATER	SS AND SFW PLOT PLAN SEWER AND FIRE WATER SYSTEMS
X-230C-26-C	A01	STORM SEWER	STORM SEWERS – UNIT II – BUILDINGS X-102, X-106, X-300, X-743, X-744, X-750 AND NE 1/4 X-326
X-230C-27-C	A01	STORM SEWER	STORM SEWERS – UNIT II – BUILDINGS X-101, X-626, X-760, X-770, AND SE 1/4 X-326
X-230C-1.1-C	1	STORM SEWER	PLANT STORM DRAIN SYSTEM – MASTER PLAN AND DRAWING INDEX
X-230C-1.6-C	A01	STORM SEWER	PLANT STORM DRAIN SYSTEM – MATCHLINE -1-, MATCHLINE -2-, MATCHLINE -A- AND MATCHLINE -B-
X-230C-25.50C	2	STORM SEWER	STORM SEWER MAIN "J" PLAN AND PROFILE N7441 TO N8400
X-230C-25.51C	2	STORM SEWER	STORM SEWER MAIN "J" PLAN AND PROFILE N8400 TO N9379
X-230C-26.50C	1	STORM SEWER	BUILDING ADDITION – CIVIL UNDERGROUND PIPING PLAN
X-230C-26.51C	1	STORM SEWER	BUILDING ADDITION – CIVIL UNDERGROUND PIPING DETAILS
X-230C-23C	0	STORM SEWER	STORM SEWERS – UNIT II DETAILS – SHEET 3
X-326-2041-E	0	ELECTRICAL	CABLE ROUTING DIAGRAM 1
X-326-2042-E	0	ELECTRICAL	CABLE ROUTING DIAGRAM 2
X-326-3001-E	0	ELECTRICAL	GROUND FLOOR GROUNDING PLAN SHEET NO. 1
X-326-3002-E	0	ELECTRICAL	GROUND FLOOR GROUNDING PLAN SHEET NO. 2
X-326-8008-E	A02	ELECTRICAL	X-326 PROCESS FACILITY DEMOLITION CONSTRUCTION POWER SITE LAYOUT
X-326-8011-E	A03	ELECTRICAL	X-326 PROCESS FACILITY DEMOLITION CONSTRUCTION POWER PUMP POWER DISTRIBUTION
X-220A-6003-E	3	COMMUNICATIONS	PROCESS AND EVACUATION PUBLIC ADDRESS CABLE DISTRIBUTION
X-2230T-203-MP	2	RHW	CIVIL UNDERGROUND PIPING PLAN AND PROFILE SHEET #2
X-2230T-204-MP	2	RHW	CIVIL UNDERGROUND PIPING PLAN AND PROFILE SHEET #3
X-240-A-E-1	A01	CATHODIC PROTECTION	CATHODIC PROTECTION RCW AND FIRE WATER LINES SOUTH HALF OF PROCESS BUILDING X-326 AND PUMPHOUSE X-626 AREA
X-240-A-E-2	0	CATHODIC PROTECTION	CATHODIC PROTECTION RCW AND FIRE WATER LINES SOUTH END OF PROCESS BUILDING X-330 AND NORTH HALF OF PROCESS BUILDING X-326
X-326 1-S	0	N/A	FOUNDATION PLAN NORTH PART
X-326 2-S	0	N/A	FOUNDATION PLAN SOUTH PART
X-326 3-S	0	N/A	FOOTING SCHEDULE AND DETAILS
X-326 4-S	0	N/A	ELEVATOR PIT FOUNDATIONS AND MISCELLANEOUS DETAILS
X-326 5-S	0	N/A	MISCELLANEOUS PLANS AND SECTIONS
X-326 6-S	0	N/A	GROUND FLOOR PLAN AND DETAILS NORTH PART
X-326 7-S	0	N/A	GROUND FLOOR PLAN AND DETAILS SOUTH PART
X-326 8-S	0	N/A	GROUND FLOOR DETAILS
X-326 8A-S	2	N/A	GROUND FLOOR DETAILS
X-326 8B-S	0	N/A	GROUND FLOOR DETAILS
X-326 8C-S	0	N/A	EXTENDED RANGE PRODUCT STATION GROUND FLOOR PLAN
X-326 8G-S	0	N/A	EXTENDED RANGE PRODUCT STATION SCALE PIT DETAILS
X-326 8E-S	1	N/A	EXTENDED RANGE PRODUCT STATION GROUND FLOOR DETAILS
X-326 8F-S	3	N/A	EXTENDED RANGE PRODUCT STATION GROUND FLOOR PLAN
X-326 9-S	0	N/A	COOLANT PIT LUBE OIL AREAS BATTERY ROOMS PLANS SECTIONS AND DETAILS
X-326 11-S	0	N/A	AREA CONTROL ROOM PLANS SECTIONS AND DETAILS
X-326 12-S	0	N/A	AREA CONTROL ROOM PLANS SECTIONS AND DETAILS
X-326 13-S	0	N/A	INSTRUMENTATION TUNNELS
X-215B-88E	9	ELECTRICAL	ELECTRICAL DISTRIBUTION SYSTEMS PLAN AND PROFILE PIKE AVE. "NORTH SECTION"

ARCADIS U.S., INC.
126 N. JEFFERSON STREET
SUITE 400
MILWAUKEE, WI 53202

AUTOCAD

REFERENCE DRAWINGS	OPEN CHANGES	REV	REVISION DESCRIPTION	DWN	ENG	DESIGN MANAGER	DATE
		d	REVISED 100 PERCENT DESIGN	LTH	TAM	S. B. MURPHY	02/29/24
		c	100 PERCENT DESIGN PACKAGE FOR FBP REVIEW	MPA	TAM	S. B. MURPHY	01/16/24
		b	90 PERCENT DESIGN PACKAGE FOR FBP REVIEW	FJH	TAM	S. B. MURPHY	09/15/23
		a	60 PERCENT DESIGN PACKAGE FOR FBP REVIEW	LTH	TAM	S. B. MURPHY	08/07/23

Fluor-BWXT | Portsmouth

P.O. BOX 548 PIKETON, OHIO 45661

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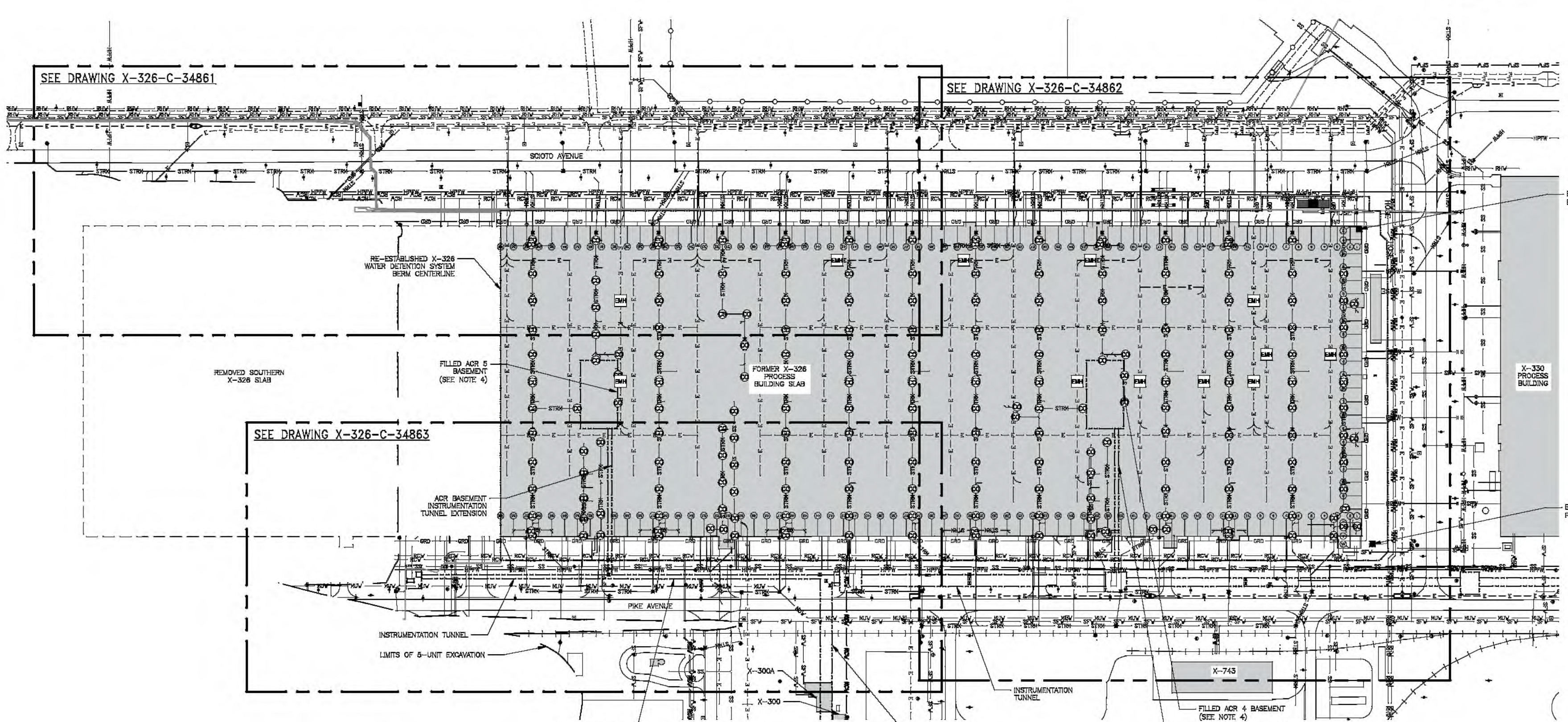
CONTRACT DEAC3010CC40017	
DRAWN BY L. T. HOLMGREN	02/29/24
CHECKED BY R. J. HANSEN	02/29/24
MM/RED T. A. MINEHARDT	02/29/24
DESIGN MANAGER S. B. MURPHY	02/29/24
SCALE NOT TO SCALE	

PORTSMOUTH GASEOUS DIFFUSION PLANT
D & D PROJECT

X-326 NORTHERN SLAB AREA DEMOLITION AND UTILITY REMOVAL
DRAWING INDEX, LEGEND, SYMBOLS, REFERENCES, AND ABBREVIATIONS

FACILITY X-326 | DRAWING NUMBER X-326-A-34859 | REV d

DRAWING NUMBER X-326-C-34860



X-326 PLAN VIEW - OVERALL

0 80 FEET

NOTES:

1. REFER TO DRAWING X-326-A-34859 FOR DRAWING INDEX AND LEGEND. REFER TO DRAWING X-326-C-34884 FOR GENERAL NOTES.
2. EXISTING CONTOURS ARE NOT SHOWN ON THIS DRAWING FOR CLARITY.
3. EXISTING RCW, HPFW, AND RHW LINES HAVE CATHODIC PROTECTION SYSTEMS IN PLACE THAT MUST BE REMOVED ALONG WITH THE UTILITY.
4. ACR BASEMENTS AND INSTRUMENTATION TUNNELS WERE BACKFILLED AS SHOWN IN THE X-326 DEMOLITION AREA CONTROL ROOM (ACR) BASEMENT DEMOLITION DRAWINGS.
5. OVERHEAD ELECTRICAL, AUXILIARY, AND COMMUNICATION LINES ARE NOT SHOWN ON THIS PLAN FOR CLARITY.

ARCADIS U.S., INC.
126 N. JEFFERSON STREET
SUITE 400
MILWAUKEE, WI 53202

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REFERENCE DRAWINGS	OPEN CHANGES	REV	REVISION DESCRIPTION	DWN	ENG	DESIGN MANAGER	DATE
X-326-A-34859							
		d	REVISED 100 PERCENT DESIGN	MPA	TAM	S. B. MURPHY	02/29/24
		c	100 PERCENT DESIGN PACKAGE FOR FBP REVIEW	MPA	TAM	S. B. MURPHY	01/16/24
		b	90 PERCENT DESIGN PACKAGE FOR FBP REVIEW	FJH	TAM	S. B. MURPHY	09/15/23
		a	60 PERCENT DESIGN PACKAGE FOR FBP REVIEW	MPA	TAM	S. B. MURPHY	06/07/23

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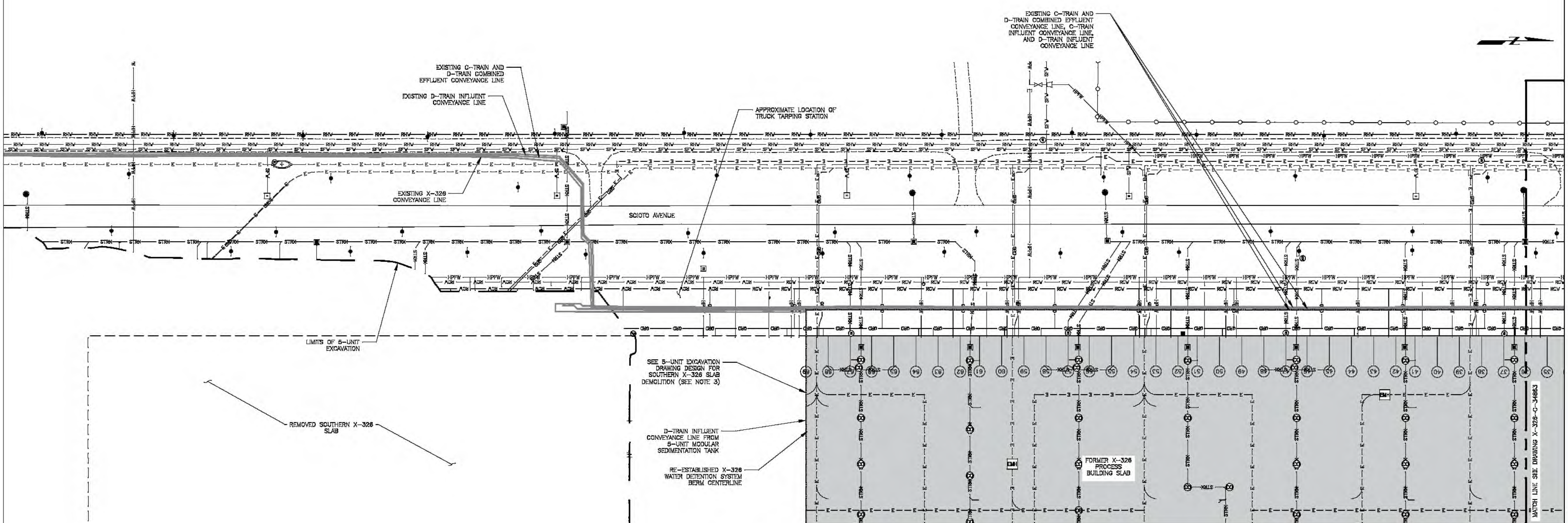
CONTRACT DEAC3010CC40017	
DRAWN BY M. P. ADAMS	02/29/24
CHECKED BY R. J. HANSEN	02/29/24
MM/RED T. A. MINEHARDT	02/29/24
DESIGN MANAGER S. B. MURPHY	02/29/24
SCALE 1"=80'	

PORTSMOUTH GASEOUS DIFFUSION PLANT
D & D PROJECT

X-326 NORTHERN SLAB AREA
DEMOLITION AND UTILITY REMOVAL

EXISTING CONDITIONS (1 OF 4)

FACILITY	DRAWING NUMBER	REV
X-326	X-326-C-34860	d



X-326 PLAN VIEW – WEST

0 40 FEET

NOTES:

1. REFER TO DRAWING X-326-A-34859 FOR DRAWING INDEX AND LEGEND. REFER TO DRAWING X-326-C-34884 FOR GENERAL NOTES.
2. EXISTING CONTOURS ARE NOT SHOWN ON THIS DRAWING FOR CLARITY.
3. REFER TO DRAWING X-900-C-33483 OF THE 5-UNIT (X-900) GROUNDWATER PLUME EXCAVATION DRAWING PACKAGE FOR THE SOUTHERN PORTION OF THE X-326 SLAB AND FOOTINGS REMOVAL.
4. EXISTING RCW, HPFW, AND RHW LINES HAVE CATHODIC PROTECTION SYSTEMS IN PLACE.
5. OVERHEAD ELECTRICAL, AUXILIARY, AND COMMUNICATION LINES ARE NOT SHOWN ON THIS PLAN FOR CLARITY.

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126 N. JEFFERSON STREET
SUITE 400
MILWAUKEE, WI 53202

AUTOCAD

REFERENCE DRAWINGS	OPEN CHANGES	REV	REVISION DESCRIPTION	DWN	ENG	DESIGN MANAGER	DATE
X-326-A-34859							
		d	REVISED 100 PERCENT DESIGN	MPA	TAM	S. B. MURPHY	02/29/24
		c	100 PERCENT DESIGN PACKAGE FOR FBP REVIEW	MPA	TAM	S. B. MURPHY	01/18/24
		b	90 PERCENT DESIGN PACKAGE FOR FBP REVIEW	FJH	TAM	S. B. MURPHY	09/15/23
		a	60 PERCENT DESIGN PACKAGE FOR FBP REVIEW	MPA	TAM	S. B. MURPHY	06/07/23

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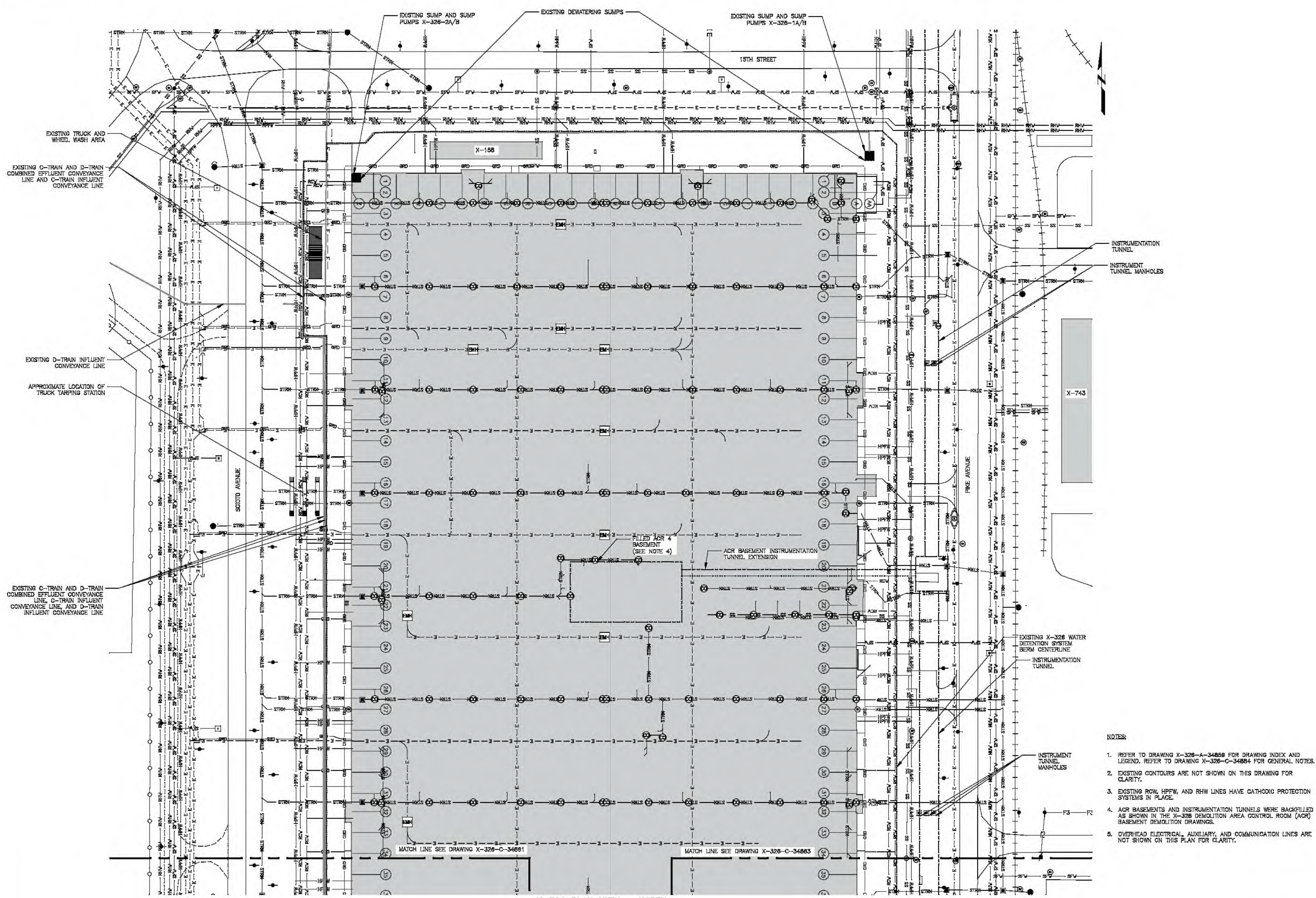
CONTRACT	DEAC3010CC40017	
DRAWN BY	M. P. ADAMS	02/29/24
CHECKED BY	R. J. HANSEN	02/29/24
MM/RED	T. A. MINEHARDT	02/29/24
DESIGN MANAGER	S. B. MURPHY	02/29/24
SCALE	1"=40'	

PORTSMOUTH GASEOUS DIFFUSION PLANT
D & D PROJECT

X-326 NORTHERN SLAB AREA DEMOLITION AND UTILITY REMOVAL

EXISTING CONDITIONS (2 OF 4)

FACILITY	DRAWING NUMBER	REV
X-326	X-326-C-34861	d



X-326-C-34862

X-326 PLAN VIEW - NORTH

0 40 FEET

NOTES:

1. REFER TO DRAWING X-326-A-34859 FOR DRAWING INDEX AND LEGEND. REFER TO DRAWING X-326-C-34864 FOR GENERAL NOTES.
2. EXISTING CONTOURS ARE NOT SHOWN ON THIS DRAWING FOR CLARITY.
3. EXISTING RCW, HPFW, AND RHW LINES HAVE CATHODIC PROTECTION SYSTEMS IN PLACE.
4. ACR BASEMENTS AND INSTRUMENTATION TUNNELS WERE BACKFILLED AS SHOWN IN THE X-326 DEMOLITION AREA CONTROL ROOM (ACR) BASEMENT DEMOLITION DRAWINGS.
5. OVERHEAD ELECTRICAL, AUXILIARY, AND COMMUNICATION LINES ARE NOT SHOWN ON THIS PLAN FOR CLARITY.

ARCADIS U.S., INC.
126 N. JEFFERSON STREET
SUITE 400
MILWAUKEE, WI 53202

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REFERENCE DRAWINGS	OPEN CHANGES	REV	REVISION DESCRIPTION	DWN	ENG	DESIGN MANAGER	DATE
X-326-A-34859							
		d	REVISED 100 PERCENT DESIGN	MPA	TAM	S. B. MURPHY	02/29/24
		c	100 PERCENT DESIGN PACKAGE FOR FBP REVIEW	MPA	TAM	S. B. MURPHY	01/18/24
		b	90 PERCENT DESIGN PACKAGE FOR FBP REVIEW	FJH	TAM	S. B. MURPHY	09/15/23
		a	60 PERCENT DESIGN PACKAGE FOR FBP REVIEW	MPA	TAM	S. B. MURPHY	08/07/23

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CONTRACT DEAC3010CC40017	
DRAWN BY M. P. ADAMS	02/29/24
CHECKED BY R. J. HANSEN	02/29/24
MM/RED T. A. MINEHARDT	02/29/24
DESIGN MANAGER S. B. MURPHY	02/29/24
SCALE 1"=40'	

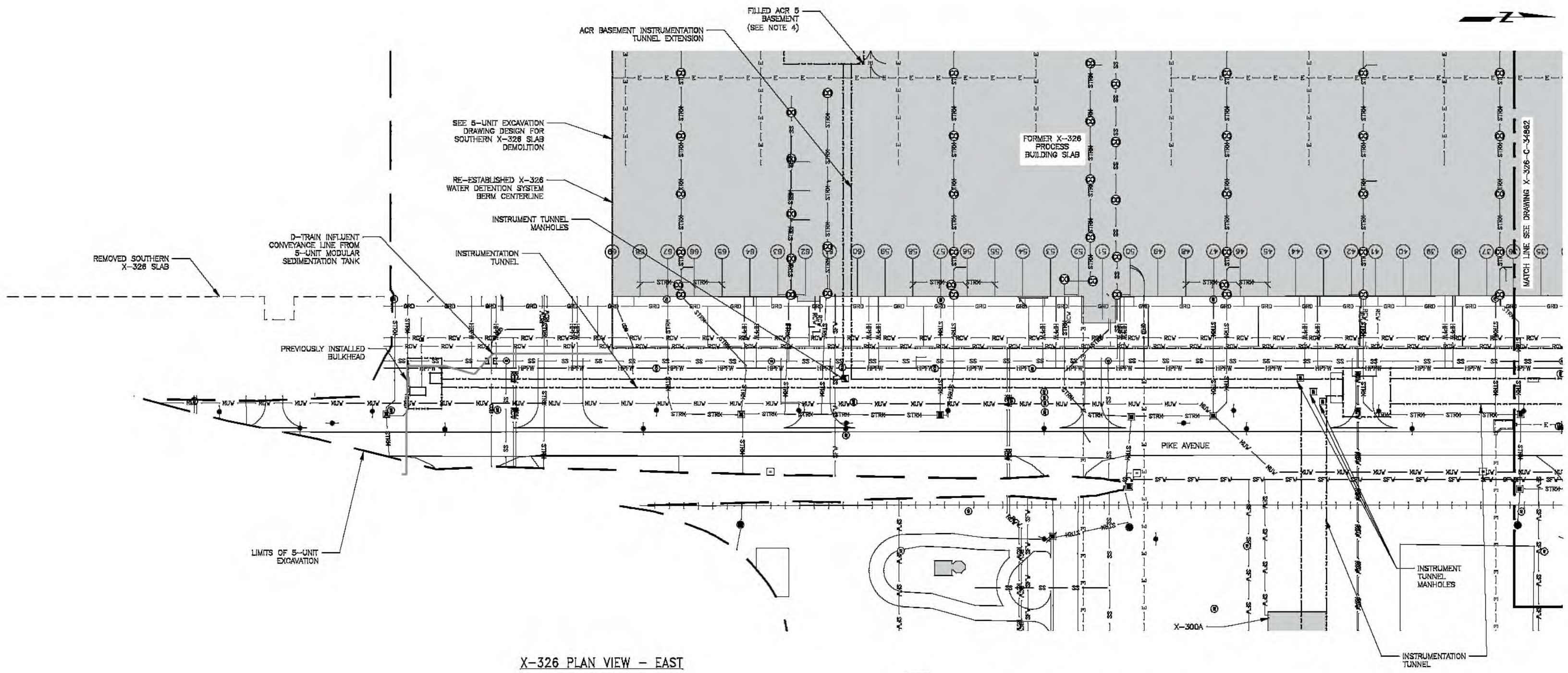
PORTSMOUTH GASEOUS DIFFUSION PLANT
D & D PROJECT

X-326 NORTHERN SLAB AREA
DEMOLITION AND UTILITY REMOVAL

EXISTING CONDITIONS (3 OF 4)

FACILITY	DRAWING NUMBER	REV
X-326	X-326-C-34862	d

DRAWING NUMBER X-326-C-34863



X-326 PLAN VIEW - EAST

0 40 FEET

NOTES:

1. REFER TO DRAWING X-326-A-34859 FOR DRAWING INDEX AND LEGEND. REFER TO DRAWING X-326-C-34884 FOR GENERAL NOTES.
2. EXISTING CONTOURS ARE NOT SHOWN ON THIS DRAWING FOR CLARITY.
3. EXISTING RCW, HPFW, AND RHW LINES HAVE CATHODIC PROTECTION SYSTEMS IN PLACE.
4. ACR BASEMENTS AND INSTRUMENTATION TUNNELS WERE BACKFILLED AS SHOWN IN THE X-326 DEMOLITION AREA CONTROL ROOM (ACR) BASEMENT DEMOLITION DRAWINGS.
5. OVERHEAD ELECTRICAL, AUXILIARY, AND COMMUNICATION LINES ARE NOT SHOWN ON THIS PLAN FOR CLARITY.
6. SEE THE X-326 DEMOLITION BELOW GRADE UTILITIES ISOLATIONS AND REMOVALS DESIGN PACKAGE FOR PREVIOUSLY ISOLATED AND AIR GAPPED UTILITIES AROUND THE X-326 AREA. PREVIOUSLY AIR GAPPED/ISOLATED UTILITIES SHALL BE VERIFIED BY THE CONTRACTOR.

ARCADIS U.S., INC.
126 N. JEFFERSON STREET
SUITE 400
MILWAUKEE, WI 53202

AUTOCAD

REFERENCE DRAWINGS	OPEN CHANGES	REV	REVISION DESCRIPTION	DWN	ENG	DESIGN MANAGER	DATE
X-326-A-34859							
		d	REVISED 100 PERCENT DESIGN	MPA	TAM	S. B. MURPHY	02/29/24
		c	100 PERCENT DESIGN PACKAGE FOR FBP REVIEW	MPA	TAM	S. B. MURPHY	01/18/24
		b	90 PERCENT DESIGN PACKAGE FOR FBP REVIEW	FJH	TAM	S. B. MURPHY	09/15/23
		a	60 PERCENT DESIGN PACKAGE FOR FBP REVIEW	MPA	TAM	S. B. MURPHY	06/07/23

Fluor-BWXT | Portsmouth LLC

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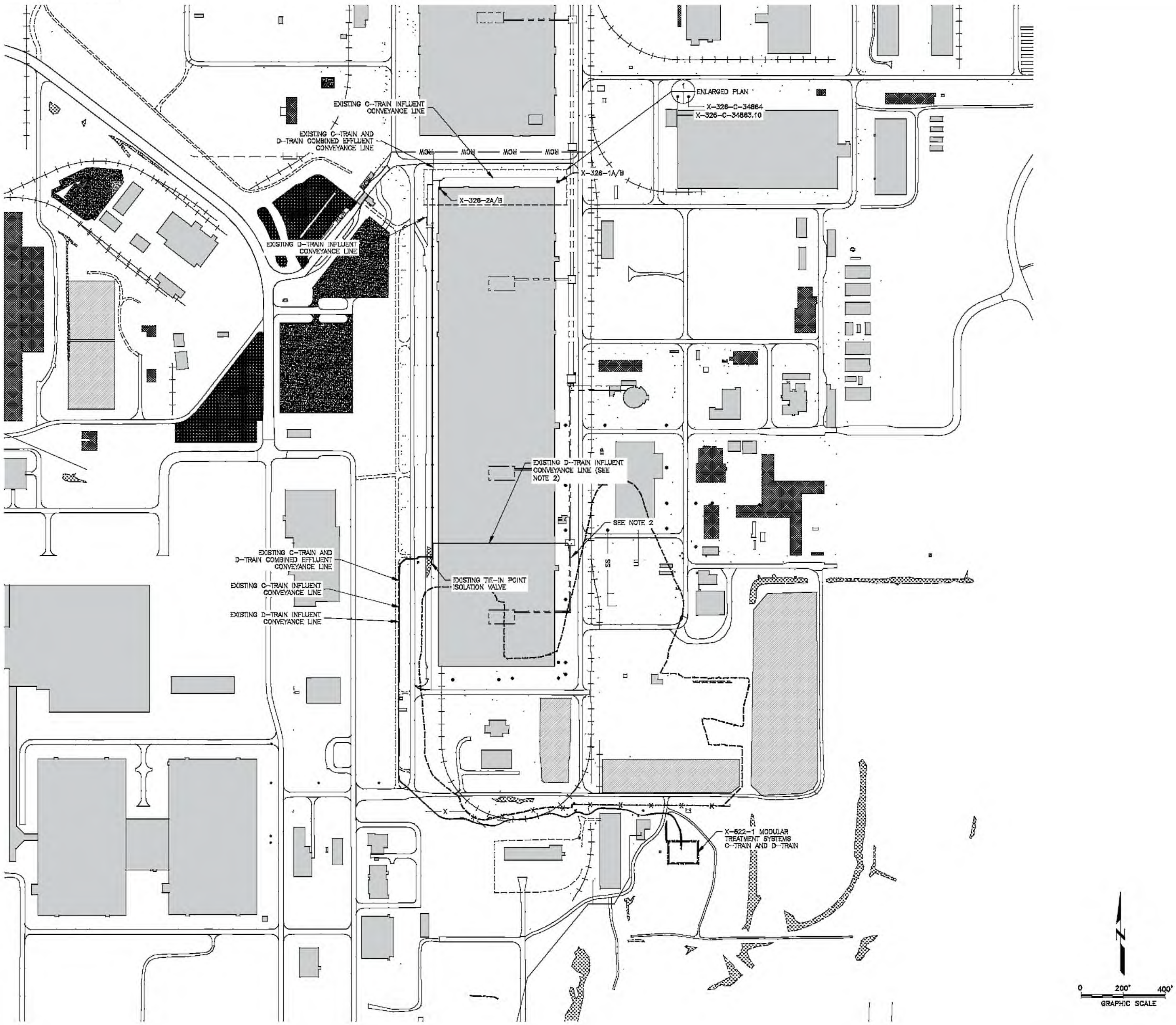
CONTRACT DEAC3010CC40017	
DRAWN BY M. P. ADAMS	02/29/24
CHECKED BY R. J. HANSEN	02/29/24
MM/RED T. A. MINEHARDT	02/29/24
DESIGN MANAGER S. B. MURPHY	02/29/24
SCALE 1"=40'	

PORTSMOUTH GASEOUS DIFFUSION PLANT
D & D PROJECT

X-326 NORTHERN SLAB AREA DEMOLITION AND UTILITY REMOVAL

EXISTING CONDITIONS (4 OF 4)

FACILITY X-326 | DRAWING NUMBER X-326-C-34863 | REV d



NOTES:

1. THE 2-MILLION-GALLON MODULAR SEDIMENTATION TANK IS NOT SHOWN, AS IT WILL BE RELOCATED BY OTHERS, PRIOR TO THE WORK SHOWN IN THIS DRAWING PACKAGE. THE D-TRAIN INFLUENT CONVEYANCE PIPING THAT CROSSES THE X-326 SLAB WILL NO LONGER BE IN SERVICE.
2. ISOLATE THE EXISTING D-TRAIN INFLUENT CONVEYANCE LINE IN THE SOUTH BERM FROM THE EXISTING MODULAR SEDIMENTATION TANK TO THE TIE-IN POINT ON THE WEST SIDE OF THE X-326 SLAB. DRAIN THE LINE AND CUT THE LINE NEAR THE BELOW GRADE TO ABOVE GRADE TRANSITION WEST OF PIKE AVENUE.

0 200' 400'
GRAPHIC SCALE

ARCADIS U.S., INC.
126 N. JEFFERSON STREET
SUITE 400
MILWAUKEE, WI 53202
AUTOCAD

REFERENCE DRAWINGS	OPEN CHANGES	REV	REVISION DESCRIPTION	DWN	ENG	DESIGN MANAGER	DATE
		d	REVISED 100 PERCENT DESIGN	AJA	RAW	S. B. MURPHY	02/29/24
		c	100 PERCENT DESIGN PACKAGE ISSUED FOR FBP REVIEW	AJA	RAW	S. B. MURPHY	01/16/24
		b	90 PERCENT DESIGN PACKAGE ISSUED FOR FBP REVIEW	AJA	RAW	S. B. MURPHY	09/15/23

Fluor-BWXT | Portsmouth LLC

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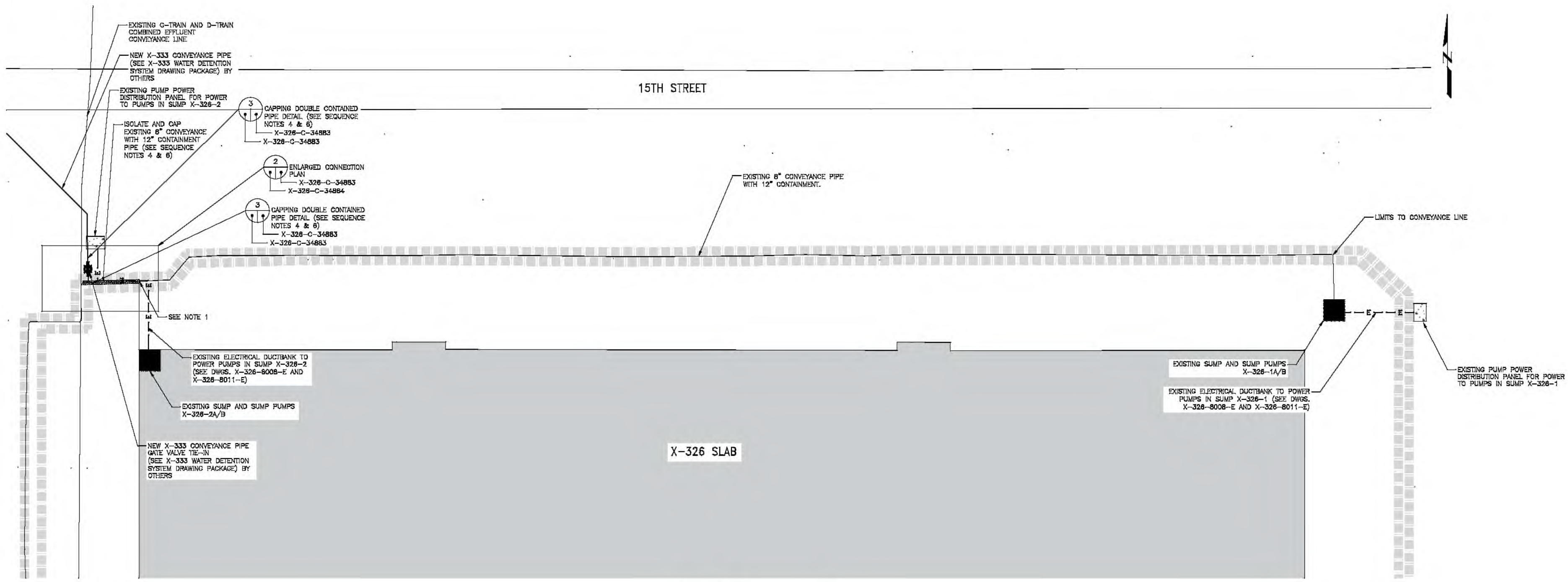
CONTRACT DEAC3010CC40017
DRAWN BY A. J. AMAYA 2/29/2024
CHECKED BY K. DOUGLAS 2/29/2024
MM/RED R. A. WOLFORD 2/29/2024
DESIGN MANAGER S. B. MURPHY 2/29/2024
SCALE 1" = 200'

PORTSMOUTH GASEOUS DIFFUSION PLANT
D & D PROJECT

X-326 NORTHERN SLAB AREA DEMOLITION AND UTILITY REMOVAL

CONVEYANCE LINE ROUTE OVERVIEW

FACILITY X-326
DRAWING NUMBER X-326-C-34863.10
REV d



ENLARGED PLAN 1
1" = 20'
0 20 FEET
X-326-C-34863.10 X-326-C-34864

0 20 FEET

NOTES:
1. ROUTE THE DISCHARGE OF PUMPS X-326-1A/B AND X-326-2A/B TO THE FUTURE LOCATION OF THE MODULAR SEDIMENTATION TANK AS DETERMINED BY THE COMPANY. THE NEW AND FUTURE CONVEYANCE PIPING WILL REQUIRE FROST PROTECTION.
2. THE ELECTRICAL DUCTBANKS SHALL NOT BE CHANGED AND WILL CONTINUE TO SUPPLY POWER TO THE PUMPS X-326-1A/B AND X-326-2A/B, UNLESS DIRECTED BY THE COMPANY. FIELD VERIFY LOCATIONS OF EXISTING ELECTRICAL PANELS AND DUCTBANKS.

SEQUENCING NOTES:

1. THE REMOVAL OF X-326-1 AND X-326-2 SUMPS IN THE OVERALL SEQUENCE OF DEMOLITION AND UTILITY REMOVAL SHALL BE DETERMINED BY THE COMPANY.
2. ISOLATE AND DRAIN EXISTING 8" CONVEYANCE WITH 12" CONTAINMENT PIPE.
3. REFERENCE RADCON/ IMPACTED WATER COLLECTION NOTES ON X-326-C-34887.
4. PER DETAIL 3 ON DWG. X-326-C-34864, CUT AND CAP THE EXISTING 8" CONVEYANCE WITH 12" CONTAINMENT PIPE WEST OF THE X-326-2 TIE-IN LOCATION AND EAST OF THE X-333 CONVEYANCE TIE IN TO THE C-TRAIN INFLUENT LINE.
5. FIELD ROUTE NEW 8" HDPE DR 11 PIPE TO THE FUTURE LOCATION OF THE MODULAR SEDIMENTATION TANK.
6. VISUALLY INSPECT CAP.

NUMBER OF SECTION OR DETAIL.
DRAWING ON WHICH SECTION OR DETAIL IS TAKEN
DRAWING ON WHICH SECTION OR DETAIL IS SHOWN
SECTION & DETAIL KEY

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MILWAUKEE, WI 53202

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REFERENCE DRAWINGS	OPEN CHANGES	REV	REVISION DESCRIPTION	DWN	ENG	DESIGN MANAGER	DATE
X-326-A-34859							
		d	REVISED 100 PERCENT DESIGN	AJA	RAW	S. B. MURPHY	2/29/24
		c	100 PERCENT DESIGN PACKAGE FOR FBP REVIEW	AJA	RAW	S. B. MURPHY	01/16/24
		b	90 PERCENT DESIGN PACKAGE FOR FBP REVIEW	AJA	RAW	S. B. MUPRHY	09/15/23
		a	60 PERCENT DESIGN PACKAGE PER FBP REVIEW	AJA	RAW	S. B. MURPHY	06/07/23

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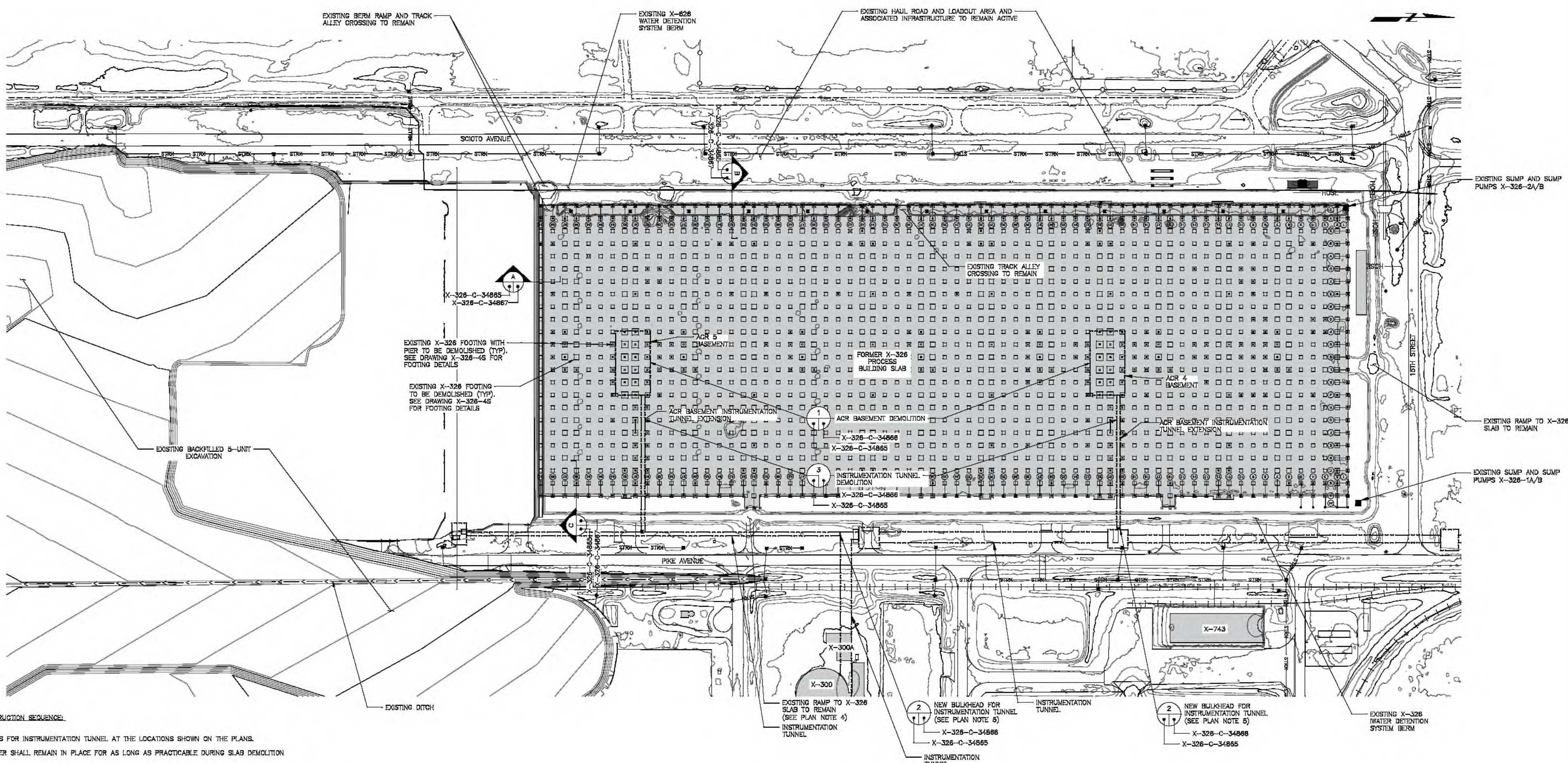
CONTRACT DEAC3010CC40017	
DRAWN BY A. J. AMAYA	2/29/24
CHECKED BY K. DOUGLAS	2/29/24
MM/RED R. A. WOLFORD	2/29/24
DESIGN MANAGER S. B. MURPHY	2/29/24
SCALE 1"= 20'	

PORTSMOUTH GASEOUS DIFFUSION PLANT
D & D PROJECT

X-326 NORTHERN SLAB AREA
DEMOLITION AND UTILITY REMOVAL
X-326-1 AND X-326-2
CONVEYANCE PLAN

FACILITY	DRAWING NUMBER	REV
X-326	X-326-C-34864	d



X-326 SLAB DEMOLITION CONSTRUCTION SEQUENCE:

1. INSTALL THE NEW BULKHEADS FOR INSTRUMENTATION TUNNEL AT THE LOCATIONS SHOWN ON THE PLANS.
2. THE EXISTING BERM AND LINER SHALL REMAIN IN PLACE FOR AS LONG AS PRACTICABLE DURING SLAB DEMOLITION ACTIVITIES.
3. THE X-326 HAUL ROAD AND LOADOUT INFRASTRUCTURE SHALL BE UTILIZED FOR THE LOADOUT OF DEMOLISHED CONCRETE DEBRIS.
4. EXCAVATION SHALL BE PHASED TO MAINTAIN THE X-326-1 AND X-326-2 SUMPS FOR AS LONG AS PRACTICABLE. REMAINING SOIL BENEATH THE DEMOLISHED SLAB SHALL BE GRADED TO DRAIN. SUB-SLAB DEWATERING SHALL BE COORDINATED WITH THE COMPANY.
5. FOOTERS AND PIERS ARE VARIABLE IN DEPTH. THESE ITEMS SHALL BE FULLY EXCAVATED, DEMOLISHED, AND REMOVED AS THEY ARE ENCOUNTERED. FOOTER AND PIER EXCAVATIONS SHALL BE BACKFILLED WITH EXISTING SOIL MATERIAL FROM THE SURROUNDING SUB-SLAB AREAS TO MAINTAIN A SUITABLE WORKING SURFACE AS THE DEMOLITION PROGRESSES.
6. EXCAVATION OF ACR BASEMENTS, HEAD HOUSES, AND TUNNELS SHALL BE CONDUCTED INCREMENTALLY IN LIFTS APPROXIMATELY HALF THE HEIGHT OF THE TOTAL EXCAVATION (EACH LIFT NOT TO EXCEED 10 FEET IN DEPTH). THE WALLS, COLUMNS, AND OTHER BASEMENT AND TUNNEL INFRASTRUCTURE SHALL BE KNOCKED DOWN INWARD TO THE BOTTOM OF THE ACR BASEMENT AT EACH LIFT AND MAY BE PROCESSED FOR REMOVAL UPON REACHING THE FULL DEPTH OF EXCAVATION.
7. EXCAVATION OF ACR TUNNELS SHALL NOT EXTEND BEYOND THE EXTENTS OF THE X-326 SLAB UNTIL THE X-326 LINER AND STONE MATERIAL ARE REMOVED.

PLAN NOTES:

1. REFER TO DRAWING X-326-A-34859 FOR DRAWING INDEX AND LEGEND. REFER TO DRAWING X-326-C-34864 FOR GENERAL NOTES.
2. THE EXISTING CONTOURS SHOWN IN THIS FIGURE WERE GENERATED BY COMBINING THE PROPOSED FINAL GRADES FROM THE 5-UNIT (X-900) GROUNDWATER PLUME EXCAVATION DESIGN DRAWINGS WITH THE 2023 LIDAR PROVIDED BY THE COMPANY.
3. REMAINING UTILITIES ARE NOT SHOWN ON THIS DRAWING FOR CLARITY.
4. NEW BERM CROSSING RAMPS MAY BE ADDED AS DETERMINED NECESSARY BY THE COMPANY, AND EXISTING BERM CROSSING RAMPS MAY BE WIDENED IN ACCORDANCE WITH THE DETAIL ON DRAWING X-326-C-34866.
5. THE COMPANY MAY DETERMINE WHETHER THE BULKHEADS ARE NECESSARY BASED ON FUTURE SITE CONDITIONS.
6. OVERHEAD ELECTRICAL, AUXILIARY, AND COMMUNICATION LINES ARE NOT SHOWN ON THIS PLAN FOR CLARITY.
7. SEE THE X-326 DEMOLITION BELOW GRADE UTILITIES ISOLATIONS AND REMOVALS DESIGN PACKAGE FOR PREVIOUSLY ISOLATED AND AIR GAPPED UTILITIES AROUND THE X-326 AREA. PREVIOUSLY AIR GAPPED/ISOLATED UTILITIES SHALL BE VERIFIED BY THE CONTRACTOR.

0 60 FEET

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REFERENCE DRAWINGS	OPEN CHANGES	REV	REVISION DESCRIPTION	DWN	ENG	DESIGN MANAGER	DATE
X-326-A-34859							
		d	REVISED 100 PERCENT DESIGN	RJH	TAM	S. B. MURPHY	02/29/24
		c	100 PERCENT DESIGN PACKAGE FOR FBP REVIEW	MPA	TAM	S. B. MURPHY	01/18/24
		b	90 PERCENT DESIGN PACKAGE FOR FBP REVIEW	FJH	TAM	S. B. MURPHY	09/15/23
		a	60 PERCENT DESIGN PACKAGE FOR FBP REVIEW	RJH	TAM	S. B. MURPHY	08/07/23

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CONTRACT DEAC3010CC40017
DRAWN BY R. J. HANSEN 02/29/24
CHECKED BY R. A. WOLFORD 02/29/24
MM/RED T. A. MINEHARDT 02/29/24
DESIGN MANAGER S. B. MURPHY 02/29/24
SCALE 1"=60'

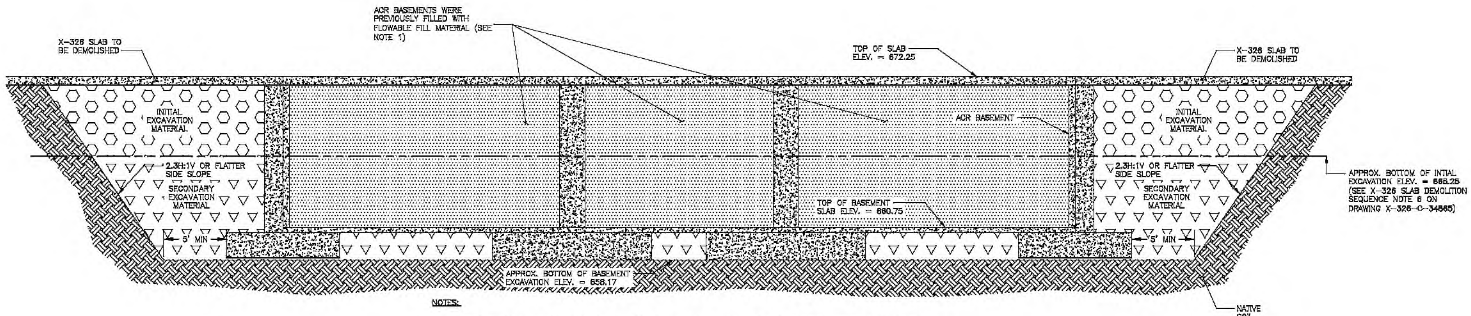
PORTSMOUTH GASEOUS DIFFUSION PLANT
D & D PROJECT

X-326 NORTHERN SLAB AREA
DEMOLITION AND UTILITY REMOVAL

SLAB DEMOLITION PLAN

FACILITY X-326
DRAWING NUMBER X-326-C-34865
REV d

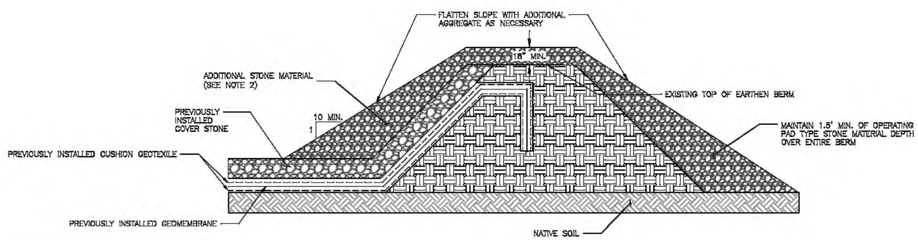
X-326-C-34866



NOTES:

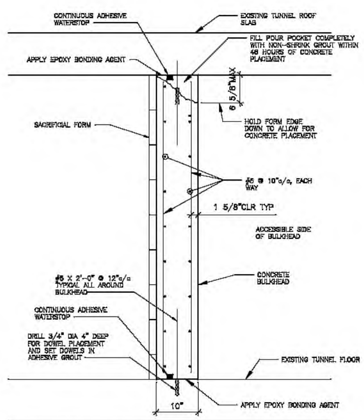
1. REFER TO X-326 DEMOLITION AREA CONTROL ROOM (ACR) BASEMENT DEMOLITION DRAWINGS FOR INSTALLATION DETAILS AND ADDITIONAL INFORMATION (REFER TO DRAWING X-326-8021-S FOR INDEX OF DRAWINGS).
2. REMOVE ALL CONCRETE AND SIZE REDUCE AS DIRECTED BY THE COMPANY.

TYPICAL ACR BASEMENT EXCAVATION (1)
NOT TO SCALE
X-326-C-34865 — X-326-C-34866

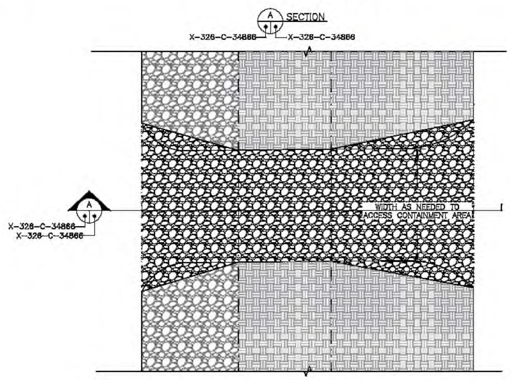


ACR BASEMENT AND TUNNEL DEMOLITION SEQUENCE:

1. DEMOLISH X-326 SLAB IN FOOTPRINT WHERE NOT ALREADY COMPLETED.
2. EXCAVATE MATERIAL DOWN TO MIDDLE ELEVATION OF TUNNEL/BASEMENT.
3. DEMOLISH/KNOCKDOWN WALLS, COLUMNS, ETC. INWARDS.
4. EXCAVATE MATERIAL DOWN TO BOTTOM OF FOOTING ELEVATION.
5. REMOVE DEMOLISHED MATERIAL AND DEMOLISH REMAINING WALLS, COLUMNS, FLOOR SLAB, PIERS, AND FOOTINGS.
6. REMOVE REMAINING DEMOLISHED MATERIAL.
7. BACKFILL TO BELOW X-326 SLAB ELEVATIONS. GRADE AREA TO DRAIN STORM WATER TO SITE DRAINAGE FEATURES WITHIN THE EXCAVATION AREA.



NEW BULKHEAD FOR INSTRUMENTATION TUNNEL (2)
NOT TO SCALE
X-326-C-34865 — X-326-C-34866

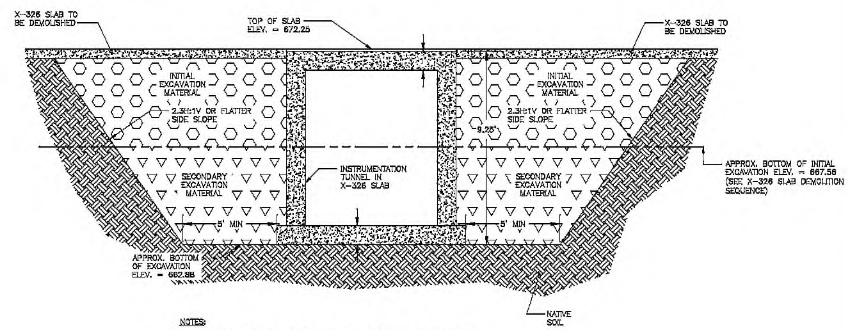


PLAN

NOTES:

1. CONTRACTOR TO INSTALL EQUIPMENT CROSSINGS AS DEEMED NECESSARY BY THE COMPANY TO EXECUTE CONSTRUCTION ACTIVITIES WITHIN BERM FOOTPRINT.
2. STONE LAYER TO CONFORM TO OHIO DOT SPECIFICATION ITEM 411 – STABLIZED CRUSHED AGGREGATE.

TYPICAL BERM EQUIPMENT CROSSING
NOT TO SCALE



NOTES:

1. REMOVE ALL CONCRETE AND SIZE REDUCE AS DIRECTED BY THE COMPANY.

TYPICAL INSTRUMENTATION TUNNEL DEMOLITION (3)
NOT TO SCALE
X-326-C-34865 — X-326-C-34866

NOTES:

1. REFER TO DRAWING X-326 DEMOLITION AREA CONTROL ROOM (ACR) BASEMENT DEMOLITION DRAWINGS.

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REFERENCE DRAWINGS	OPEN CHANGES	REV	REVISION DESCRIPTION	DWN	ENG	DESIGN MANAGER	DATE
X-326-A-34889							
		d	REVISED 100 PERCENT DESIGN	RJH	TAM	S. B. MURPHY	02/29/24
		c	100 PERCENT DESIGN PACKAGE FOR FBP REVIEW	MPA	TAM	S. B. MURPHY	01/18/24
		b	90 PERCENT DESIGN PACKAGE FOR FBP REVIEW	FJH	TAM	S. B. MURPHY	09/15/23
		a	60 PERCENT DESIGN PACKAGE FOR FBP REVIEW	RJH	TAM	S. B. MURPHY	08/07/23

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CONTRACT DEAC3010CC40017
DRAWN BY R. J. HANSEN 02/29/24
CHECKED BY R. A. WOLFORD 02/29/24
MM/RED T. A. MINEHARDT 02/29/24
DESIGN MANAGER S. B. MURPHY 02/29/24
SCALE N/A

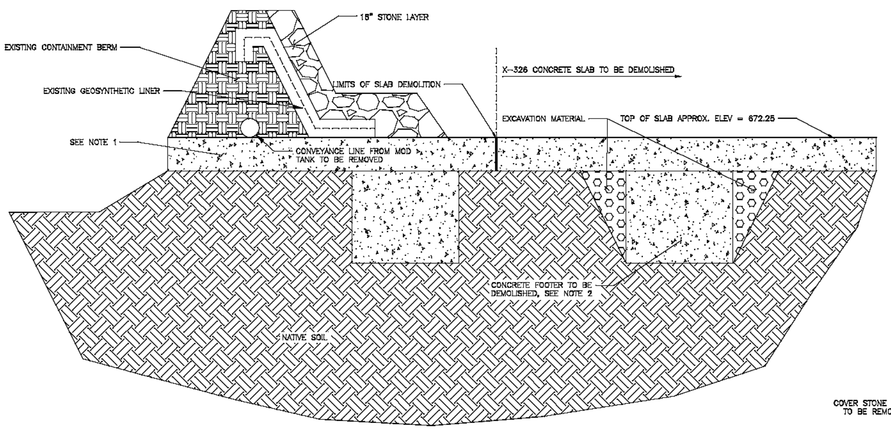
PORTSMOUTH GASEOUS DIFFUSION PLANT
D & D PROJECT

X-326 NORTHERN SLAB AREA
DEMOLITION AND UTILITY REMOVAL

SLAB DEMOLITION DETAILS

FACILITY X-326 | DRAWING NUMBER X-326-C-34866 | REV d

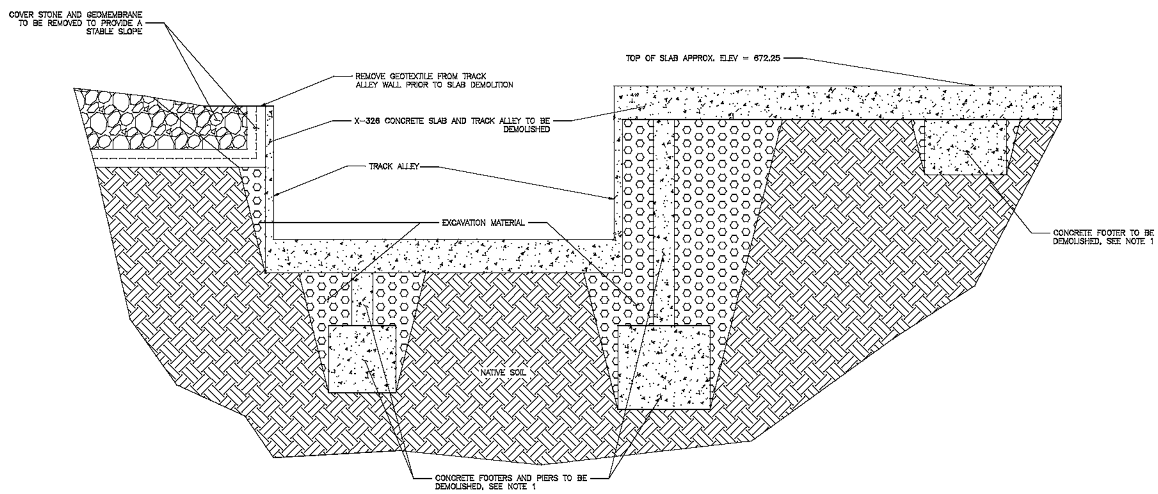
X-326-C-34867



NOTES:

1. CONCRETE SLAB AND FOOTERS UNDERLYING X-326 BERM SHALL REMAIN UNTIL THE GEOSYNTHETIC LINER IS REMOVED.
2. FOOTERS SHOWN ARE FOR ILLUSTRATIVE PURPOSES ONLY. ACTUAL DIMENSIONS OF FOOTERS MAY VARY BY LOCATION WITHIN SLAB, AND SOME FOOTERS MAY ALSO HAVE PIERS.
3. EXISTING CONTAINMENT BERM, SLAB, AND FOOTINGS TO REMAIN IN PLACE UNTIL DIRECTED BY THE COMPANY. REFER TO DRAWING X-326-C-34872 FOR DEMOLITION DETAILS.

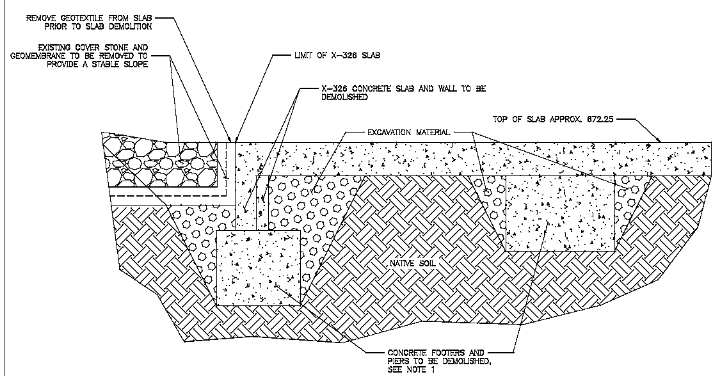
TYPICAL SOUTHERN EXCAVATION SECTION VIEW (A)
NOT TO SCALE
X-326-C-34865 X-326-C-34867



NOTES:

1. FOOTERS SHOWN ARE FOR ILLUSTRATIVE PURPOSES ONLY. ACTUAL DIMENSIONS OF FOOTERS MAY VARY BY LOCATION WITHIN SLAB, AND SOME FOOTERS MAY ALSO HAVE PIERS.
2. STONE COVER SHALL BE SLOPED AWAY FROM THE CONCRETE AT A MINIMUM 2H:1V GRADE.

TRACK ALLEY EXCAVATION SECTION VIEW (B)
NOT TO SCALE
X-326-C-34865 X-326-C-34867



NOTES:

1. FOOTERS SHOWN ARE FOR ILLUSTRATIVE PURPOSES ONLY. ACTUAL DIMENSIONS OF FOOTERS MAY VARY BY LOCATION WITHIN SLAB, AND SOME FOOTERS MAY ALSO HAVE PIERS.
2. STONE COVER SHALL BE SLOPED AWAY FROM THE CONCRETE AT A MINIMUM 2H:1V GRADE.

TYPICAL EASTERN EXCAVATION SECTION VIEW (C)
NOT TO SCALE
X-326-C-34865 X-326-C-34867

PLAN NOTES:

1. REFER TO THE X-326 SLAB DEMOLITION SEQUENCE ON DRAWING X-326-C-34865.
2. REFER TO DRAWING X-326-A-34859 FOR DRAWING INDEX AND LEGEND. FOR GENERAL NOTES, REFER TO DRAWING X-326-C-34884.

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X-326-A-34859							
		d	REVISED 100 PERCENT DESIGN	CAL	TAM	S. B. MURPHY	02/29/24
		c	100 PERCENT DESIGN PACKAGE FOR FBP REVIEW	MPA	TAM	S. B. MURPHY	01/18/24
		b	90 PERCENT DESIGN PACKAGE FOR FBP REVIEW	FJH	TAM	S. B. MURPHY	09/15/23
		a	60 PERCENT DESIGN PACKAGE FOR FBP REVIEW	CJV	TAM	S. B. MURPHY	07/08/23

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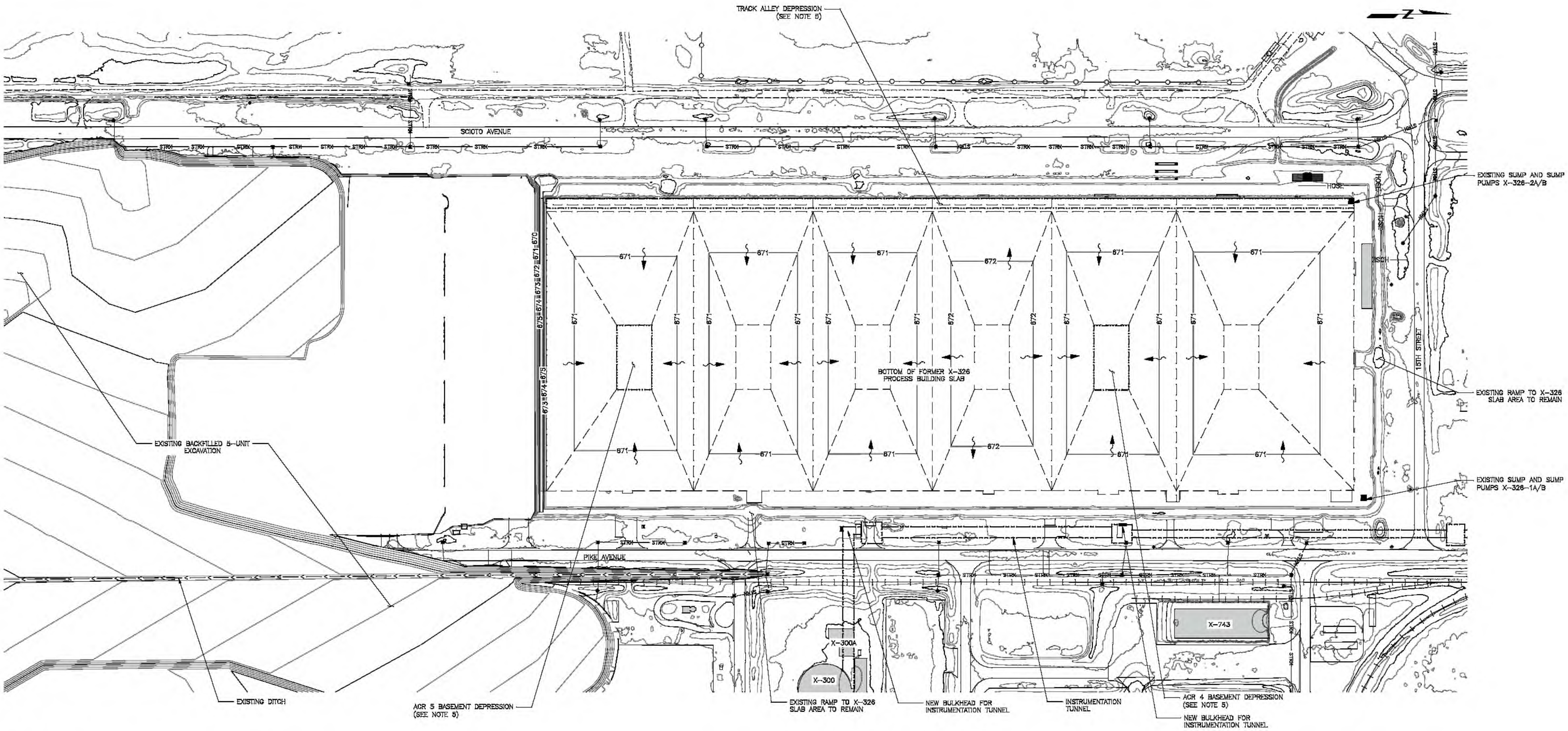
CONTRACT DEAC3010CC40017
DRAWN BY C. A. LUKINS 02/29/24
CHECKED BY R. J. HANSEN 02/29/24
MM/RED T. A. MINEHARDT 02/29/24
DESIGN MANAGER S. B. MURPHY 02/29/24
SCALE N/A

PORTSMOUTH GASEOUS DIFFUSION PLANT
D & D PROJECT

X-326 NORTHERN SLAB AREA
DEMOLITION AND UTILITY REMOVAL
SLAB REMOVAL TYPICAL
EXCAVATION SECTIONS

FACILITY X-326
DRAWING NUMBER X-326-C-34867
REV d

X-326-C-34868



NOTES:

1. REFER TO DRAWING X-326-A-34859 FOR DRAWING INDEX AND LEGEND. REFER TO DRAWING X-326-C-34864 FOR GENERAL NOTES.
2. THE EXISTING CONTOURS SHOWN IN THIS FIGURE WERE GENERATED BY COMBINING THE PROPOSED FINAL GRADES FROM THE 5-UNIT (X-900) GROUNDWATER PLUME EXCAVATION DESIGN DRAWINGS WITH THE 2023 LIDAR PROVIDED BY THE COMPANY.
3. MOST REMAINING UTILITIES ARE NOT SHOWN ON THIS DRAWING FOR CLARITY.
4. BOTTOM OF SLAB ELEVATIONS ARE APPROXIMATE AND MAY BE ADJUSTED IN THE FIELD TO ACCOUNT FOR ACTUAL SITE CONDITIONS AND CONTRACTOR'S PROGRESSION OF WORK.
5. THE SUB-SLAB SHOWN ON THIS DRAWING ARE CONCEPTUAL IN NATURE AND ARE INTENDED TO SHOW THE GENERAL LOCATIONS OF HIGH AND LOW AREAS TO MANAGE STORM WATER RUNOFF DURING SLAB DEMOLITION BASED ON EXISTING LOW AREAS (I.E. ACR BASEMENTS AND TRACK ALLEY). CONTRACTOR MAY ADJUST LOW AREAS AND GRADE BREAKS AS NECESSARY BASED ON ACTUAL SITE CONDITIONS DURING DEMOLITION.
6. TEMPORARY SEDIMENT TRAPS SHALL BE DEWATERED TO THE EXISTING X-326 SUMPS OR AS DIRECTED BY THE COMPANY.
7. EXCAVATION DEWATERING TO BE HANDLED VIA TRASH PUMP THAT IS DIRECTED TO THE EXISTING PUMPS.
8. ALL CONDUIT AND PIPING BENEATH THE SLAB SHALL BE REMOVED AS IT IS ENCOUNTERED AT THE DIRECTION OF THE COMPANY.
9. OVERHEAD ELECTRICAL, AUXILIARY, AND COMMUNICATION LINES ARE NOT SHOWN ON THIS PLAN FOR CLARITY.
10. SEE THE X-326 DEMOLITION BELOW GRADE UTILITIES ISOLATIONS AND REMOVALS DESIGN PACKAGE FOR PREVIOUSLY ISOLATED AND AIR GAPPED UTILITIES AROUND THE X-326 AREA. PREVIOUSLY AIR GAPPED/ISOLATED UTILITIES SHALL BE VERIFIED BY THE CONTRACTOR.

0 60 FEET

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REFERENCE DRAWINGS	OPEN CHANGES	REV	REVISION DESCRIPTION	DWN	ENG	DESIGN MANAGER	DATE
X-326-A-34859							
		d	REVISED 100 PERCENT DESIGN	RJH	TAM	S. B. MURPHY	02/29/24
		c	100 PERCENT DESIGN PACKAGE FOR FBP REVIEW	MPA	TAM	S. B. MURPHY	01/18/24
		b	90 PERCENT DESIGN PACKAGE FOR FBP REVIEW	FJH	TAM	S. B. MURPHY	09/15/23
		a	60 PERCENT DESIGN PACKAGE FOR FBP REVIEW	RJH	TAM	S. B. MURPHY	06/07/23

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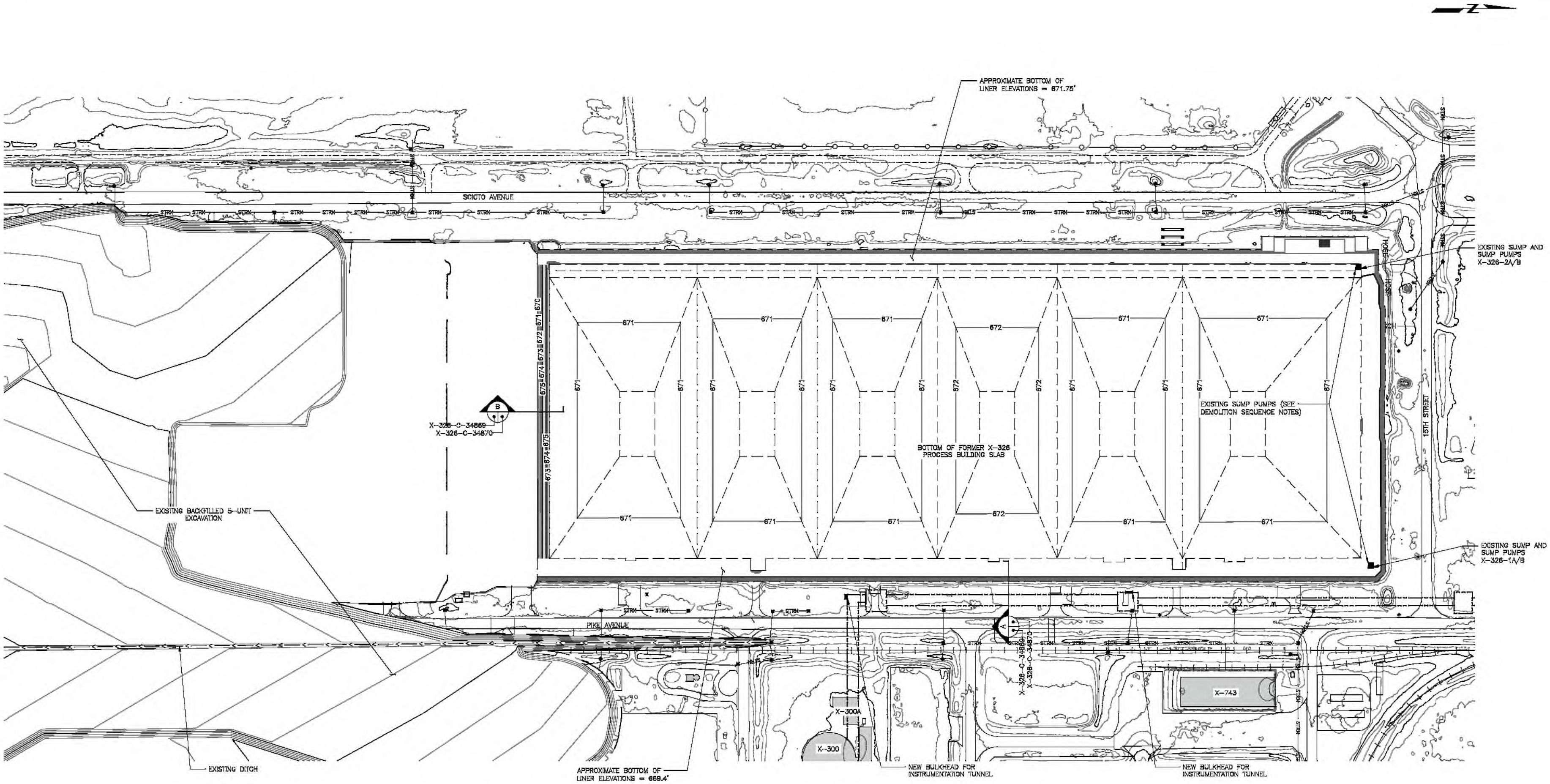
CONTRACT DEAC3010CC40017	
DRAWN BY R. J. HANSEN	02/29/24
CHECKED BY R. A. WOLFORD	02/29/24
MM/RED T. A. MINEHARDT	02/29/24
DESIGN MANAGER S. B. MURPHY	02/29/24
SCALE 1"=60'	

PORTSMOUTH GASEOUS DIFFUSION PLANT
D & D PROJECT

X-326 NORTHERN SLAB AREA
DEMOLITION AND UTILITY REMOVAL

SLAB REMOVAL GRADING PLAN

FACILITY X-326 | DRAWING NUMBER X-326-C-34868 | REV d



DEMOLITION SEQUENCE NOTES:

1. THE EXISTING X-326 SOIL BERM SHALL BE MAINTAINED AS LONG AS PRACTICABLE WHILE THE X-326 FACILITY SLAB IS BEING DEMOLISHED.
2. CONTRACTOR SHALL REMOVE COVER STONE AND UNDERLYING GEOMEMBRANE LINER. THESE MATERIALS SHALL BE PROPERLY DISPOSED OF AT OSWDF OR AS OTHERWISE DIRECTED BY THE COMPANY.
3. THE X-326-1 AND X-326-2 SUMP PUMPS SHALL BE PROTECTED AND REMAIN OPERATIONAL FOR THE DURATION OF LINER REMOVAL.
4. ALL DEMOLITION DEBRIS SHALL BE PROPERLY DISPOSED OF AT OSWDF OR AS OTHERWISE DIRECTED BY THE COMPANY.

PLAN NOTES:

1. REFER TO DRAWING X-326-A-34859 FOR DRAWING INDEX AND LEGEND. FOR GENERAL NOTES, REFER TO DRAWING X-326-C-34864.
2. THE EXISTING CONTOURS SHOWN IN THIS FIGURE WERE GENERATED BY COMBINING THE PROPOSED FINAL GRADES FROM THE 5-UNIT (X-900) GROUNDWATER PLUME EXCAVATION DESIGN DRAWINGS WITH THE 2023 LIDAR PROVIDED BY THE COMPANY.
3. REMAINING UTILITIES ARE NOT SHOWN ON THIS FIGURE FOR CLARITY.
4. THE SUB-SLAB SHOWN ON THIS DRAWING ARE CONCEPTUAL IN NATURE AND ARE INTENDED TO SHOW THE GENERAL LOCATIONS OF HIGH AND LOW AREAS TO MANAGE STORM WATER RUNOFF DURING SLAB DEMOLITION BASED ON EXISTING LOW AREAS (I.E. ACR BASEMENTS AND TRACK ALLEY). CONTRACTOR MAY ADJUST LOW AREAS AND GRADE BREAKS AS NECESSARY BASED ON ACTUAL SITE CONDITIONS DURING DEMOLITION.
5. OVERHEAD ELECTRICAL, AUXILIARY, AND COMMUNICATION LINES ARE NOT SHOWN ON THIS PLAN FOR CLARITY.
6. SEE THE X-326 DEMOLITION BELOW GRADE UTILITIES ISOLATIONS AND REMOVALS DESIGN PACKAGE FOR PREVIOUSLY ISOLATED AND AIR GAPPED UTILITIES AROUND THE X-326 AREA. PREVIOUSLY AIR GAPPED/ISOLATED UTILITIES SHALL BE VERIFIED BY THE CONTRACTOR.

0 80 FEET

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SUITE 400
MILWAUKEE, WI 53202

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X-326-A-34859							
		d	REVISED 100 PRECENT DESIGN	RJH	TAM	S. B. MURPHY	02/29/24
		c	100 PERCENT DESIGN PACKAGE FOR FBP REVIEW	MPA	TAM	S. B. MURPHY	01/18/24
		b	90 PERCENT DESIGN PACKAGE FOR FBP REVIEW	FJH	TAM	S. B. MURPHY	09/15/23
		a	60 PERCENT DESIGN PACKAGE FOR FBP REVIEW	RJH	TAM	S. B. MURPHY	08/07/23

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CHECKED BY R. A. WOLFORD	02/29/24
MM/RED T. A. MINEHARDT	02/29/24
DESIGN MANAGER S. B. MURPHY	02/29/24
SCALE 1"=80'	

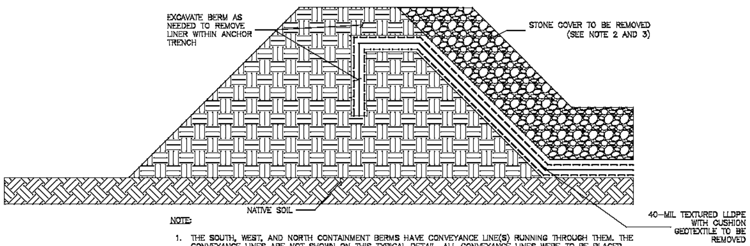
PORTSMOUTH GASEOUS DIFFUSION PLANT
D & D PROJECT

X-326 NORTHERN SLAB AREA
DEMOLITION AND UTILITY REMOVAL

LINER REMOVAL GRADING PLAN

FACILITY	DRAWING NUMBER	REV
X-326	X-326-C-34869	d

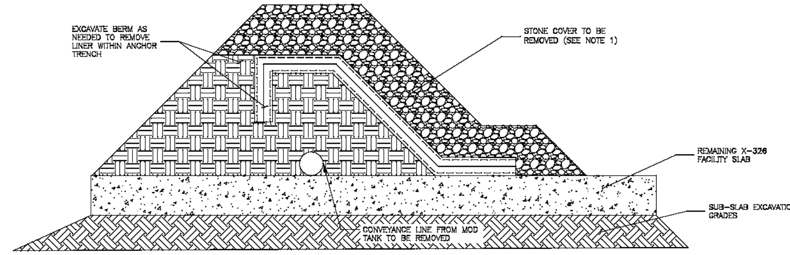
DRAWING NUMBER X-326-C-34870



NOTE:

1. THE SOUTH, WEST, AND NORTH CONTAINMENT BERMS HAVE CONVEYANCE LINE(S) RUNNING THROUGH THEM. THE CONVEYANCE LINES ARE NOT SHOWN ON THIS TYPICAL DETAIL. ALL CONVEYANCE LINES WERE TO BE PLACED BENEATH THE LINER/ANCHOR TRENCH. REFER TO DRAWINGS X-326-C-34874 THROUGH X-326-C-34877 FOR CONVEYANCE ALIGNMENTS."
2. STONE COVER TO BE REMOVED PRIOR TO REMOVING THE LINER.
3. WEST BERM SHALL BE PROTECTED IN PLACE AS LONG AS C-TRAIN AND D-TRAIN ARE IN PLACE AND OPERATIONAL. IF THE WEST BERM REMAINS IN PLACE, GEOMEMBRANE SHALL BE CUT AT THE TOP OF SLOPE. PROTECTIVE STONE SHALL BE REPLACED WITH SOIL BACKFILL TO MAINTAIN FROST PROTECTION.

TYPICAL LINER AND ANCHOR TRENCH REMOVAL EXCAVATION SECTION A
NOT TO SCALE
X-326-C-34869 X-326-C-34870



NOTE:

1. STONE COVER TO BE REMOVED PRIOR TO REMOVING THE LINER.

SOUTHERN LINER AND ANCHOR TRENCH REMOVAL EXCAVATION SECTION B
NOT TO SCALE
X-326-C-34869 X-326-C-34870

ARCADIS U.S., INC.
126 N. JEFFERSON STREET
SUITE 400
MILWAUKEE, WI 53202

AUTOCAD

REFERENCE DRAWINGS	OPEN CHANGES	REV	REVISION DESCRIPTION	DWN	ENG	DESIGN MANAGER	DATE
X-326-A-34869							
		c	REVISED 100 PERCENT DESIGN	FJH	TAM	S. B. MURPHY	02/29/24
		b	100 PERCENT DESIGN PACKAGE FOR FBP REVIEW	MPA	TAM	S. B. MURPHY	01/18/24
		a	90 PERCENT DESIGN PACKAGE FOR FBP REVIEW	FJH	TAM	S. B. MURPHY	09/15/23

Fluor-BWXT | Portsmouth LLC
P.O. BOX 548 PIKETON, OHIO 45661

NOTICE:
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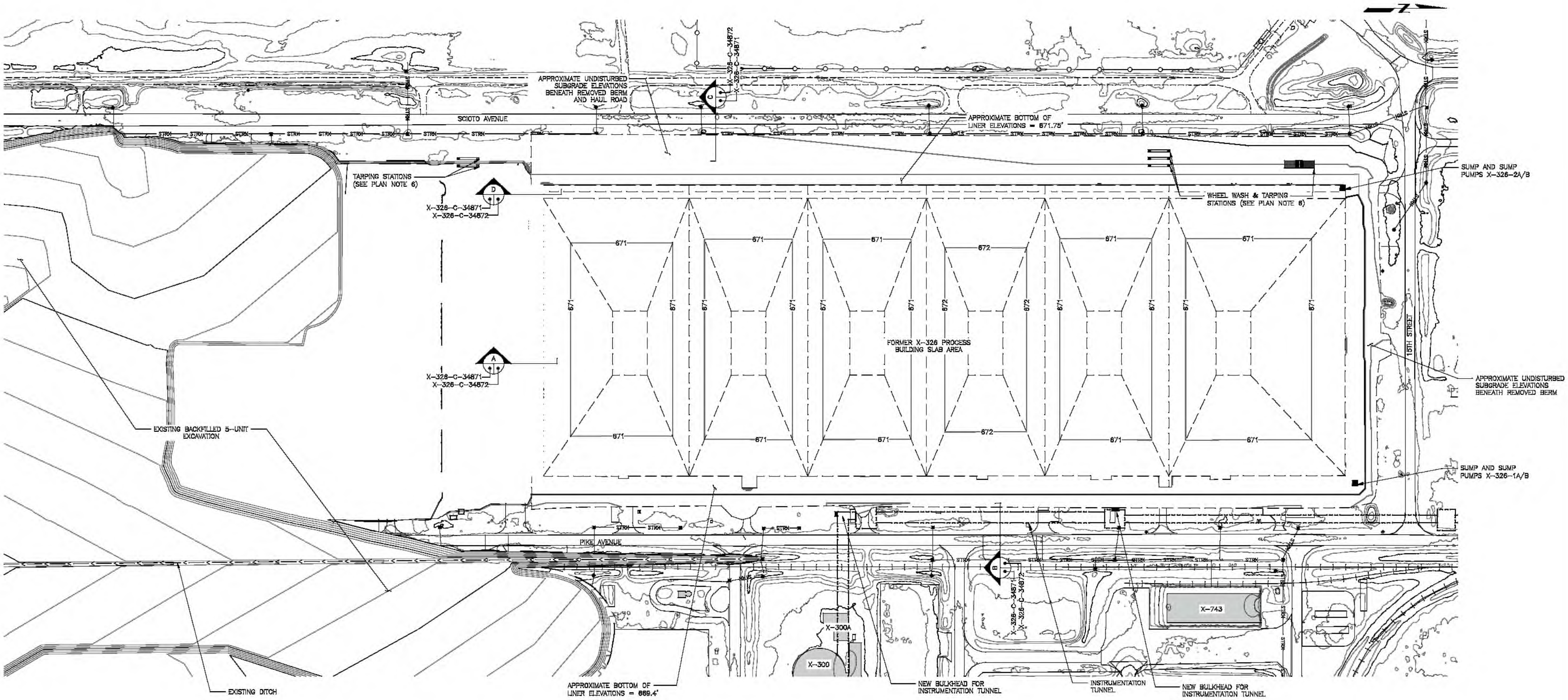
CONTRACT	DEAC3010CC40017	
DRAWN BY	F. J. HAUGHN	02/29/24
CHECKED BY	R. J. HANSEN	02/29/24
MM/RED	T. A. MINEHARDT	02/29/24
DESIGN MANAGER	S. B. MURPHY	02/29/24
SCALE	N/A	

PORTSMOUTH GASEOUS DIFFUSION PLANT
D & D PROJECT

X-326 NORTHERN SLAB AREA
DEMOLITION AND UTILITY REMOVAL
LINER REMOVAL TYPICAL
EXCAVATION SECTIONS

FACILITY	DRAWING NUMBER	REV
X-326	X-326-C-34870	c



PLAN NOTES:

1. FOR GENERAL NOTES, REFER TO DRAWING X-326-C-34864.
2. THE EXISTING CONTOURS SHOWN IN THIS FIGURE WERE GENERATED BY COMBINING THE PROPOSED FINAL GRADES FROM THE 5-UNIT (X-900) GROUNDWATER PLUME EXCAVATION DESIGN DRAWINGS WITH THE 2023 LIDAR PROVIDED BY THE COMPANY.
3. REMAINING UTILITIES ARE NOT SHOWN ON THIS FIGURE FOR CLARITY.
4. BOTTOM OF BERM AND LINER ELEVATIONS ARE APPROXIMATE AND ARE BASED ON THE DESIGN BOTTOM OF BERM AND TOP OF LINER ELEVATIONS AS SHOWN IN THE X-326 DEMOLITION WATER DETENTION SYSTEM DESIGN DRAWINGS. CONTRACTOR SHALL EXCAVATE COVER STONE ABOVE THE GEOSYNTHETIC LINER, REMOVE THE GEOSYNTHETIC LINER, AND EXCAVATE THE REMAINING SOIL BERM MATERIAL UNTIL NATIVE SOILS ARE ENCOUNTERED. ALL SOIL BERM MATERIAL SHALL BE HANDLED AS DIRECTED BY THE COMPANY TO ALLOW FOR DISPOSAL AT OSWDF OR REUSE AS BACKFILL. CONVEYANCE LINES AND OTHER INFRASTRUCTURE WITHIN THE BERM SHALL BE DISPOSED OF AT OSWDF OR AS DIRECTED BY THE COMPANY.
5. THE ELEVATION SHOWN IS THE APPROXIMATE GRADE AFTER THE SLAB AND ALL SLAB FEATURES HAVE BEEN REMOVED.
6. WHEEL WASH & TARPING STATIONS TO BE STAGED OR RELOCATED AS DIRECTED BY THE COMPANY UPON COMPLETION OF THE CONSTRUCTION.
7. OVERHEAD ELECTRICAL, AUXILIARY, AND COMMUNICATION LINES ARE NOT SHOWN ON THIS PLAN FOR CLARITY.
8. SEE THE X-326 DEMOLITION BELOW GRADE UTILITIES ISOLATIONS AND REMOVALS DESIGN PACKAGE FOR PREVIOUSLY ISOLATED AND AIR GAPPED UTILITIES AROUND THE X-326 AREA. PREVIOUSLY AIR GAPPED/ISOLATED UTILITIES SHALL BE VERIFIED BY THE CONTRACTOR.

0 60 FEET

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SUITE 400
MILWAUKEE, WI 53202

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REFERENCE DRAWINGS	OPEN CHANGES	REV	REVISION DESCRIPTION	DWN	ENG	DESIGN MANAGER	DATE
X-326-A-34889							
		d	REVISED 100 PERCENT DESIGN	RJH	TAM	S. B. MURPHY	02/29/24
		c	100 PERCENT DESIGN PACKAGE FOR FBP REVIEW	MPA	TAM	S. B. MURPHY	01/18/24
		b	90 PERCENT DESIGN PACKAGE FOR FBP REVIEW	FJH	TAM	S. B. MURPHY	09/15/23
		a	60 PERCENT DESIGN PACKAGE FOR FBP REVIEW	RJH	TAM	S. B. MURPHY	06/07/23

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CONTRACT DEAC3010CC40017
DRAWN BY R. J. HANSEN 02/29/24
CHECKED BY R. A. WOLFORD 02/29/24
MM/RED T. A. MINEHARDT 02/29/24
DESIGN MANAGER S. B. MURPHY 02/29/24
SCALE 1"=60'

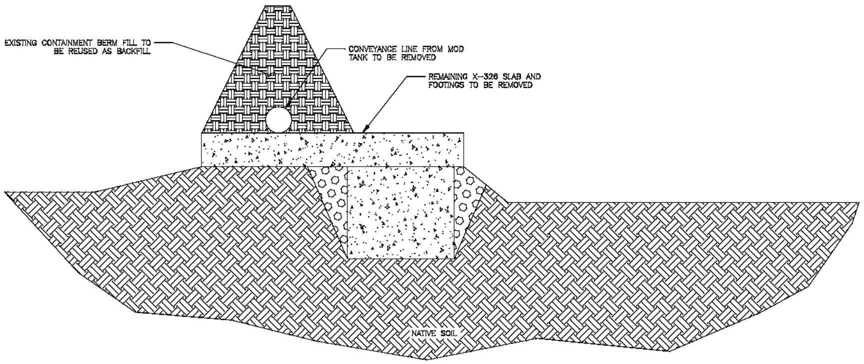
PORTSMOUTH GASEOUS DIFFUSION PLANT
D & D PROJECT

X-326 NORTHERN SLAB AREA
DEMOLITION AND UTILITY REMOVAL

BERM REMOVAL GRADING PLAN

FACILITY X-326 | DRAWING NUMBER X-326-C-34871 | REV d

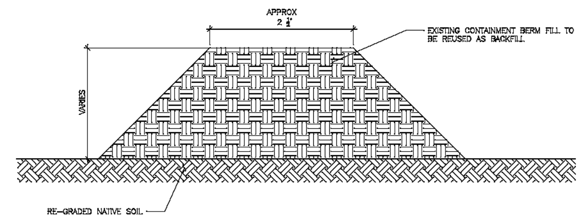
X-326-C-34872



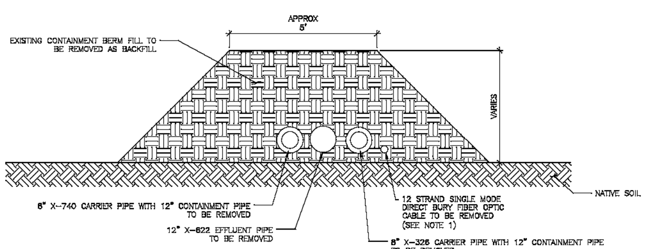
TYPICAL SOUTH BERM REMOVAL EXCAVATION SECTION (A)
NOT TO SCALE
X-326-C-34871 — X-326-C-34872

NOTES:

1. SEE REFERENCE DRAWING X-326-4S FOR EXISTING FOOTING DETAILS.



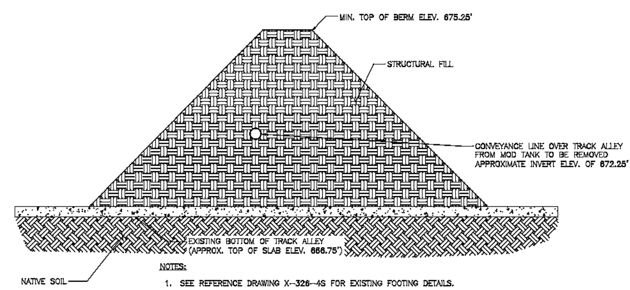
TYPICAL EAST BERM REMOVAL EXCAVATION SECTION (B)
NOT TO SCALE
X-326-C-34871 — X-326-C-34872



NOTES:

1. REFER TO DRAWING X-326-8000-E FROM THE X-326 DEMOLITION WATER DETENTION SYSTEM DESIGN PACKAGE FOR QUANTITY OF CABLES BURIED INSIDE BERM.
2. THE WEST BERM AND ASSOCIATED CONVEYANCE LINES SHALL BE PROTECTED IN PLACE AS LONG AS C-TRAIN AND D-TRAIN ARE OPERATIONAL.

TYPICAL WEST BERM REMOVAL EXCAVATION SECTION (C)
NOT TO SCALE
X-326-C-34871 — X-326-C-34872



NOTES:

1. SEE REFERENCE DRAWING X-326-4S FOR EXISTING FOOTING DETAILS.

TYPICAL TRACK ALLEY BERM REMOVAL EXCAVATION SECTION (D)
NOT TO SCALE
X-326-C-34871 — X-326-C-34872

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MILWAUKEE, WI 53202

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REFERENCE DRAWINGS	OPEN CHANGES	REV	REVISION DESCRIPTION	DWN	ENG	DESIGN MANAGER	DATE
X-326-C-34871							
		c	REVISED 100 PERCENT DESIGN	FJH	TAM	S. B. MURPHY	02/29/24
		b	100 PERCENT DESIGN PACKAGE FOR FBP REVIEW	MPA	TAM	S. B. MURPHY	01/18/24
		a	90 PERCENT DESIGN PACKAGE FOR FBP REVIEW	FJH	TAM	S. B. MURPHY	09/15/23

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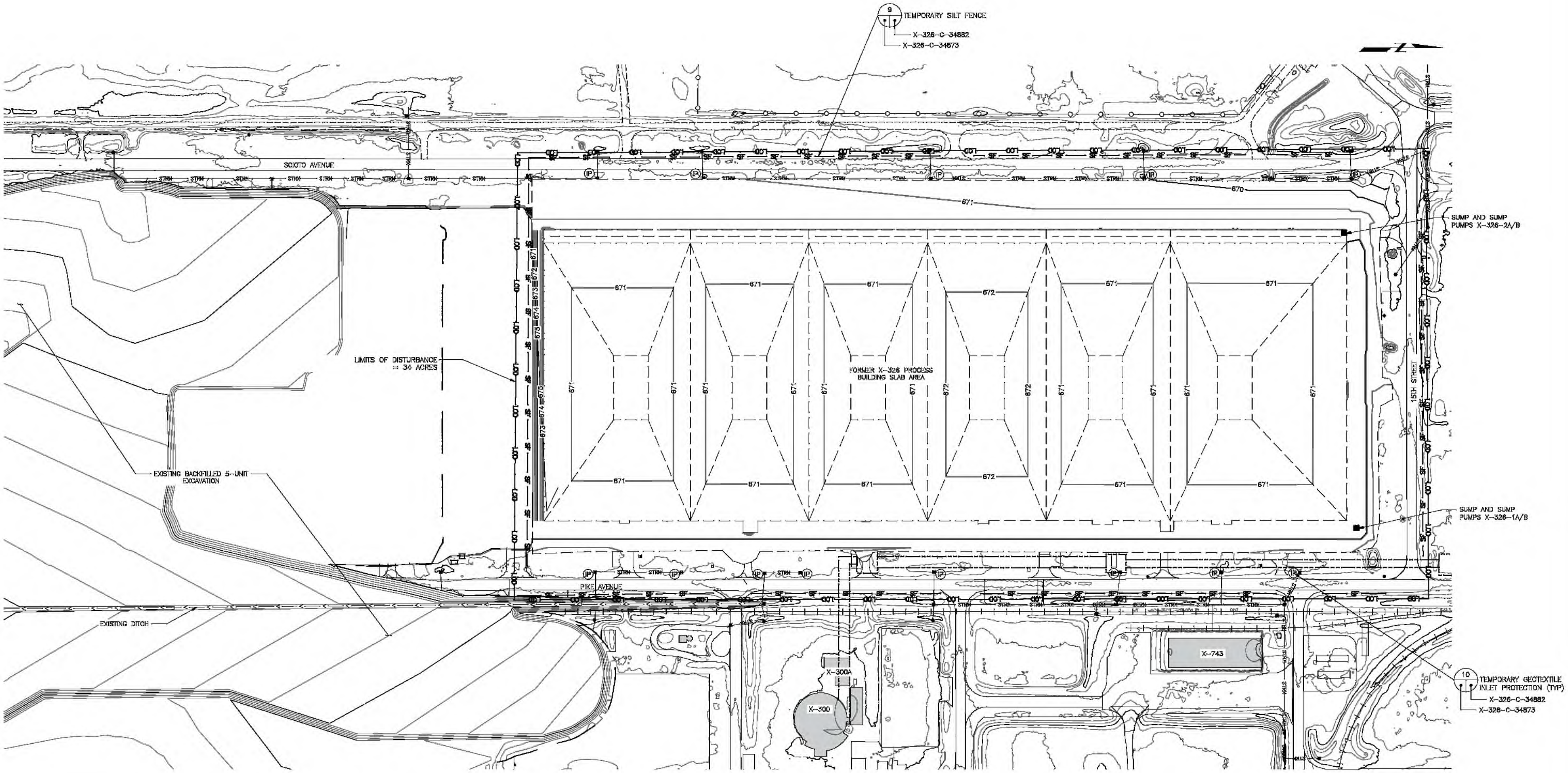
DRAWN BY F. J. HAUGHN	02/29/24
CHECKED BY R. J. HANSEN	02/29/24
MM/RED T. A. MINEHARDT	02/29/24
DESIGN MANAGER S. B. MURPHY	02/29/24
SCALE N/A	

PORTSMOUTH GASEOUS DIFFUSION PLANT
D & D PROJECT

X-326 NORTHERN SLAB AREA
DEMOLITION AND UTILITY REMOVAL
BERM REMOVAL TYPICAL
EXCAVATION SECTIONS

FACILITY	DRAWING NUMBER	REV
X-326	X-326-C-34872	c



NOTES:

1. REFER TO DRAWING X-326-A-34859 FOR DRAWING INDEX AND LEGEND. REFER TO DRAWING X-326-C-34884 FOR GENERAL NOTES
2. THE EXISTING CONTOURS SHOWN IN THIS FIGURE WERE GENERATED BY COMBINING THE PROPOSED FINAL GRADES FROM THE 5-UNIT (X-900) GROUNDWATER PLUME EXCAVATION DESIGN DRAWINGS WITH THE 2023 LIDAR PROVIDED BY THE COMPANY.
3. THE ELEVATION SHOWN IS THE APPROXIMATE GRADE AFTER THE SLAB AND ALL SLAB FEATURES HAVE BEEN REMOVED.
4. OVERHEAD ELECTRICAL, AUXILIARY, AND COMMUNICATION LINES ARE NOT SHOWN ON THIS PLAN FOR CLARITY.
5. SEE THE X-326 DEMOLITION BELOW GRADE UTILITIES ISOLATIONS AND REMOVALS DESIGN PACKAGE FOR PREVIOUSLY ISOLATED AND AIR GAPPED UTILITIES AROUND THE X-326 AREA. PREVIOUSLY AIR GAPPED/ISOLATED UTILITIES SHALL BE VERIFIED BY THE CONTRACTOR.

0 80 FEET

REFERENCE DRAWINGS	OPEN CHANGES	REV	REVISION DESCRIPTION	DWN	ENG	DESIGN MANAGER	DATE
X-326-A-34859							
		d	REVISED 100 PERCENT DESIGN	RJH	TAM	S. B. MURPHY	02/29/24
		c	100 PERCENT DESIGN PACKAGE FOR FBP REVIEW	MPA	TAM	S. B. MURPHY	01/18/24
		b	90 PERCENT DESIGN PACKAGE FOR FBP REVIEW	FJH	TAM	S. B. MURPHY	09/15/23
		a	60 PERCENT DESIGN PACKAGE FOR FBP REVIEW	RJH	TAM	S. B. MURPHY	08/07/23

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CONTRACT	DEAC3010CC40017	
DRAWN BY	R. J. HANSEN	02/29/24
CHECKED BY	R. A. WOLFORD	02/29/24
MM/RED	T. A. MINEHARDT	02/29/24
DESIGN MANAGER	S. B. MURPHY	02/29/24
SCALE	1"=80'	

ARCADIS U.S., INC.
126 N. JEFFERSON STREET
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MILWAUKEE, WI 53202

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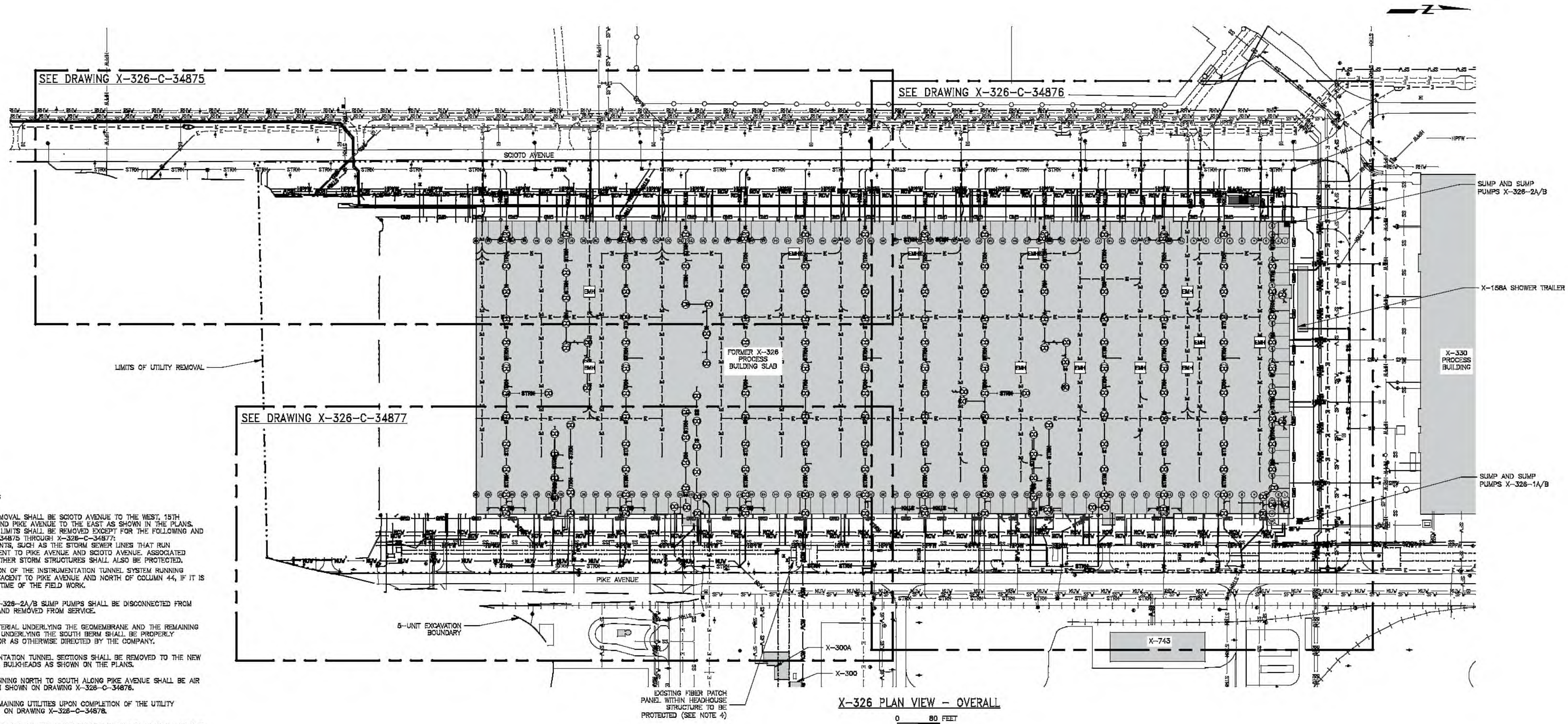
PORTSMOUTH GASEOUS DIFFUSION PLANT D & D PROJECT

X-326 NORTHERN SLAB AREA DEMOLITION AND UTILITY REMOVAL BERM REMOVAL EROSION AND SEDIMENT CONTROL PLAN

FACILITY X-326 | DRAWING NUMBER X-326-C-34873 | REV d

X-326-C-34874
DRAWING NUMBER



X-326 PLAN VIEW - OVERALL

DEMOLITION SEQUENCE NOTES:

1. THE LIMITS OF UTILITY REMOVAL SHALL BE SCIOTO AVENUE TO THE WEST, 15TH STREET TO THE NORTH, AND PIKE AVENUE TO THE EAST AS SHOWN IN THE PLANS. ALL UTILITIES WITHIN THE LIMITS SHALL BE REMOVED EXCEPT FOR THE FOLLOWING AND AS NOTED ON X-326-C-34875 THROUGH X-326-C-34877:
   a. ACTIVE UTILITY SEGMENTS, SUCH AS THE STORM SEWER LINES THAT RUN NORTH-SOUTH ADJACENT TO PIKE AVENUE AND SCIOTO AVENUE. ASSOCIATED CATCH BASINS AND OTHER STORM STRUCTURES SHALL ALSO BE PROTECTED.
   b. THE NORTHERN SECTION OF THE INSTRUMENTATION TUNNEL SYSTEM RUNNING NORTH TO SOUTH ADJACENT TO PIKE AVENUE AND NORTH OF COLUMN 44, IF IT IS STILL ACTIVE AT THE TIME OF THE FIELD WORK.
2. THE X-326-1A/B AND X-326-2A/B SUMP PUMPS SHALL BE DISCONNECTED FROM THE CONVEYANCE LINES AND REMOVED FROM SERVICE.
3. THE REMAINING BERM MATERIAL UNDERLYING THE GEOMEMBRANE AND THE REMAINING SECTION OF X-326 SLAB UNDERLYING THE SOUTH BERM SHALL BE PROPERLY DISPOSED OF AT OSWDF OR AS OTHERWISE DIRECTED BY THE COMPANY.
4. THE REMAINING INSTRUMENTATION TUNNEL SECTIONS SHALL BE REMOVED TO THE NEW INSTRUMENTATION TUNNEL BULKHEADS AS SHOWN ON THE PLANS.
5. THE SANITARY SEWER RUNNING NORTH TO SOUTH ALONG PIKE AVENUE SHALL BE AIR GAPPED AT THE LOCATION SHOWN ON DRAWING X-326-C-34876.
6. A PLAN SHOWING THE REMAINING UTILITIES UPON COMPLETION OF THE UTILITY REMOVAL WORK IS SHOWN ON DRAWING X-326-C-34878.
7. ANY UTILITIES THAT EXTEND BEYOND THE LIMITS DEFINED IN THIS PLAN SHALL BE CUT AND CAPPED IN ACCORDANCE WITH DETAIL 14 ON SHEET X-326-C-34882.

PLAN NOTES:

1. REFER TO DRAWING X-326-A-34859 FOR DRAWING LEGEND. REFER TO DRAWING X-326-C-34884 FOR GENERAL NOTES.
2. EXISTING CONTOURS ARE NOT SHOWN ON THIS DRAWING FOR CLARITY.
3. EXACT LOCATION AND DIMENSIONS OF THE X-158 SHOWER TRAILER TO BE FIELD VERIFIED.
4. FIBER PATCH PANEL LOCATION IS APPROXIMATE AND SHALL BE FIELD VERIFIED. CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS TO PROTECT FIBER PATCH PANEL IN-PLACE. SEE REFERENCE DRAWING X-215B-88E FOR DETAILS.
5. STORM LINES, CONDUITS, AND PIPING BELOW THE BERM MAY HAVE BEEN REMOVED AS PART OF SLAB DEMOLITION ACTIVITIES AND ARE SHOWN FOR REFERENCE PURPOSES ONLY.
6. CONVEYANCE LINES WITHIN THE WEST BERM SHALL BE PROTECTED IN PLACE AS LONG AS C-TRAIN AND D-TRAIN REMAIN ACTIVE.
7. X-326 FACILITY SLAB IS SHOWN FOR REFERENCE PURPOSES ONLY. IT WILL HAVE BEEN DEMOLISHED IN A PREVIOUS PHASE OF CONSTRUCTION.
8. ASBESTOS MAY BE FOUND IN THE RCW PIPES AND ELECTRICAL DUCT BANKS AND SHALL BE HANDLED AND DISPOSED OF IN ACCORDANCE WITH CONTRACT DOCUMENTS.
9. OVERHEAD ELECTRICAL, AUXILIARY AND COMMUNICATION LINES ARE NOT SHOWN ON THIS PLAN FOR CLARITY.
10. SEE THE X-326 DEMOLITION BELOW GRADE UTILITIES ISOLATIONS AND REMOVALS DESIGN PACKAGE FOR PREVIOUSLY ISOLATED AND AIR GAPPED UTILITIES AROUND THE X-326 AREA. PREVIOUSLY AIR GAPPED/ISOLATED UTILITIES SHALL BE VERIFIED BY THE CONTRACTOR.
11. UTILITIES THAT EXIST UNDER LIMITS OF SLAB MAY BE REMOVED DURING FOOTING/SLAB DEMOLITION.

ARCADIS U.S., INC.
126 N. JEFFERSON STREET
SUITE 400
MILWAUKEE, WI 53202
AUTOCAD

REFERENCE DRAWINGS	OPEN CHANGES	REV	REVISION DESCRIPTION	DWN	ENG	DESIGN MANAGER	DATE
X-326-A-34859							
		d	REVISED 100 PERCENT DESIGN	MPA	TAM	S. B. MURPHY	02/29/24
		c	100 PERCENT DESIGN PACKAGE FOR FBP REVIEW	MPA	TAM	S. B. MURPHY	01/18/24
		b	90 PERCENT DESIGN PACKAGE FOR FBP REVIEW	FJH	TAM	S. B. MURPHY	09/15/23
		a	60 PERCENT DESIGN PACKAGE FOR FBP REVIEW	MPA	TAM	S. B. MURPHY	06/07/23

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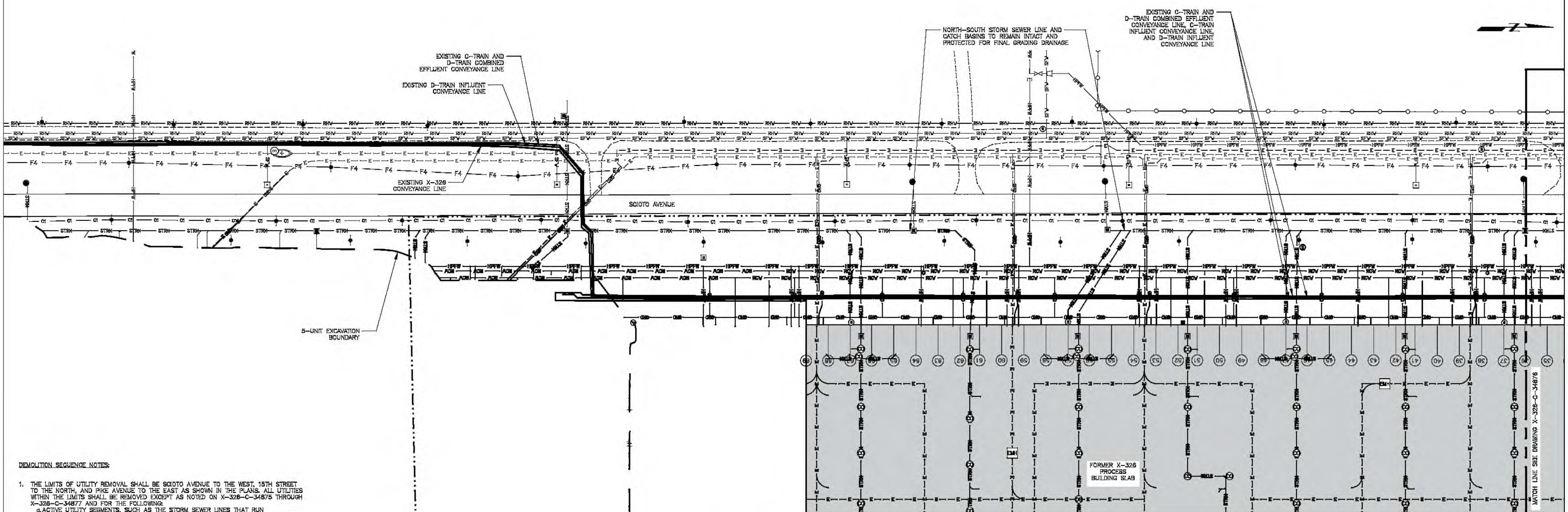
CONTRACT DEAC3010CC40017	
DRAWN BY M. P. ADAMS	02/29/24
CHECKED BY R. J. HANSEN	02/29/24
MM/RED T. A. MINEHARDT	02/29/24
DESIGN MANAGER S. B. MURPHY	02/29/24
SCALE 1"=80'	

PORTSMOUTH GASEOUS DIFFUSION PLANT
D & D PROJECT

X-326 NORTHERN SLAB AREA
DEMOLITION AND UTILITY REMOVAL

UTILITY REMOVAL PLAN (1 OF 4)

FACILITY	DRAWING NUMBER	REV
X-326	X-326-C-34874	d



X-326 PLAN VIEW - WEST

0 40 FEET

DEMOLITION SEQUENCE NOTES:

1. THE LIMITS OF UTILITY REMOVAL SHALL BE SCIOTO AVENUE TO THE WEST, 15TH STREET TO THE NORTH, AND PIKE AVENUE TO THE EAST AS SHOWN IN THE PLANS. ALL UTILITIES WITHIN THE LIMITS SHALL BE REMOVED EXCEPT AS NOTED ON X-326-C-34875 THROUGH X-326-C-34877 AND FOR THE FOLLOWING:
   a. ACTIVE UTILITY SEGMENTS, SUCH AS THE STORM SEWER LINES THAT RUN NORTH-SOUTH ADJACENT TO PIKE AVENUE AND SCIOTO AVENUE. ASSOCIATED CATCH BASINS AND OTHER STORM STRUCTURES SHALL ALSO BE PROTECTED.
   b. THE NORTHERN SECTION OF THE INSTRUMENTATION TUNNEL SYSTEM RUNNING NORTH TO SOUTH ADJACENT TO PIKE AVENUE AND NORTH OF COLUMN 44, IF IT IS STILL ACTIVE AT THE TIME OF THE FIELD WORK.
2. THE X-326-1A/B AND X-326-2A/B SUMP PUMPS SHALL BE DISCONNECTED FROM THE CONVEYANCE LINES AND REMOVED FROM SERVICE.
3. THE REMAINING BERM MATERIAL UNDERLYING THE GEOMEMBRANE AND THE REMAINING SECTION OF X-326 SLAB UNDERLYING THE SOUTH BERM SHALL BE PROPERLY DISPOSED OF AT OSWDF OR AS OTHERWISE DIRECTED BY THE COMPANY.
4. THE REMAINING INSTRUMENTATION TUNNEL SECTIONS SHALL BE REMOVED TO THE NEW INSTRUMENTATION TUNNEL BULKHEADS AS SHOWN ON THE PLANS.
5. THE SANITARY SEWER RUNNING NORTH TO SOUTH ALONG PIKE AVENUE SHALL BE AIR GAPPED AT THE LOCATION SHOWN ON DRAWING X-326-C-34876.
6. A PLAN SHOWING THE REMAINING UTILITIES UPON COMPLETION OF THE UTILITY REMOVAL WORK IS SHOWN ON DRAWING X-326-C-34878.
7. ANY UTILITIES THAT EXTEND BEYOND THE LIMITS DEFINED IN THIS PLAN SHALL BE CUT AND CAPPED IN ACCORDANCE WITH DETAIL 14 ON SHEET X-326-C-34882.

PLAN NOTES:

1. REFER TO DRAWING X-326-A-34859 FOR DRAWING LEGEND. REFER TO DRAWING X-326-C-34884 FOR GENERAL NOTES.
2. EXISTING CONTOURS ARE NOT SHOWN ON THIS DRAWING FOR CLARITY.
3. EXACT LOCATION AND DIMENSIONS OF THE X-158 SHOWER TRAILER TO BE FIELD VERIFIED.
4. FIBER PATCH PANEL LOCATION IS APPROXIMATE AND SHALL BE FIELD VERIFIED. CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS TO PROTECT FIBER PATCH PANEL IN-PLACE. SEE REFERENCE DRAWING X-215B-68E FOR DETAILS.
5. STORM LINES, CONDUITS, AND PIPING BELOW THE BERM MAY HAVE BEEN REMOVED AS PART OF SLAB DEMOLITION ACTIVITIES AND ARE SHOWN FOR REFERENCE PURPOSES ONLY.
6. CONVEYANCE LINES WITHIN THE WEST BERM SHALL BE PROTECTED IN PLACE AS LONG AS C-TRAIN AND D-TRAIN REMAIN ACTIVE.
7. X-326 FACILITY SLAB IS SHOWN FOR REFERENCE PURPOSES ONLY. IT WILL HAVE BEEN DEMOLISHED IN A PREVIOUS PHASE OF CONSTRUCTION.
8. ASBESTOS MAY BE FOUND IN THE RCW PIPES AND ELECTRICAL DUCT BANKS AND SHALL BE HANDLED AND DISPOSED OF IN ACCORDANCE WITH CONTRACT DOCUMENTS.
9. OVERHEAD ELECTRICAL, AUXILIARY AND COMMUNICATION LINES ARE NOT SHOWN ON THIS PLAN FOR CLARITY.
10. SEE THE X-326 DEMOLITION BELOW GRADE UTILITIES ISOLATIONS AND REMOVALS DESIGN PACKAGE FOR PREVIOUSLY ISOLATED AND AIR GAPPED UTILITIES AROUND THE X-326 AREA. PREVIOUSLY AIR GAPPED/ISOLATED UTILITIES SHALL BE VERIFIED BY THE CONTRACTOR.
11. UTILITIES THAT EXIST UNDER LIMITS OF SLAB MAY BE REMOVED DURING FOOTING/SLAB DEMOLITION.

ARCADIS U.S., INC.
126 N. JEFFERSON STREET
SUITE 400
MILWAUKEE, WI 53202

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REFERENCE DRAWINGS	OPEN CHANGES	REV	REVISION DESCRIPTION	DWN	ENG	DESIGN MANAGER	DATE
X-326-A-34859							
		d	REVISED 100 PERCENT DESIGN	MPA	TAM	S. B. MURPHY	02/29/24
		c	100 PERCENT DESIGN PACKAGE FOR FBP REVIEW	MPA	TAM	S. B. MURPHY	01/18/24
		b	90 PERCENT DESIGN PACKAGE FOR FBP REVIEW	FJH	TAM	S. B. MURPHY	09/15/23
		a	60 PERCENT DESIGN PACKAGE FOR FBP REVIEW	MPA	TAM	S. B. MURPHY	08/07/23

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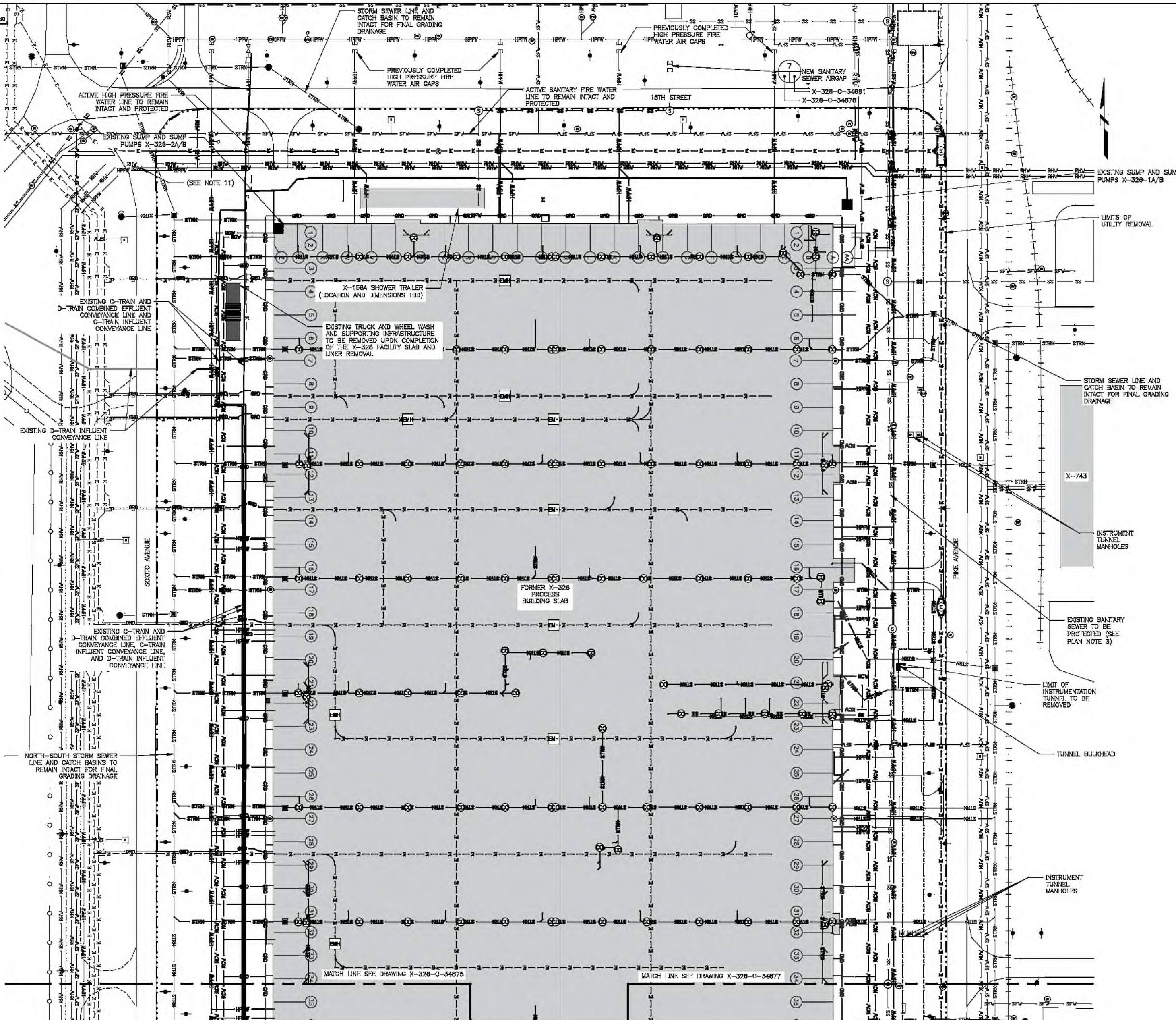
DRAWN BY	M. P. ADAMS	02/29/24
CHECKED BY	R. J. HANSEN	02/29/24
MM/RED	T. A. MINEHARDT	02/29/24
DESIGN MANAGER	S. B. MURPHY	02/29/24
SCALE	1"=40'	

PORTSMOUTH GASEOUS DIFFUSION PLANT
D & D PROJECT

X-326 NORTHERN SLAB AREA
DEMOLITION AND UTILITY REMOVAL

UTILITY REMOVAL PLAN (2 OF 4)

FACILITY	DRAWING NUMBER	REV
X-326	X-326-C-34875	d



X-326 PLAN VIEW - NORTH

0 40 FEET

DEMOLITION SEQUENCE NOTES:

1. THE LIMITS OF UTILITY REMOVAL SHALL BE SCIOTO AVENUE TO THE WEST, 15TH STREET TO THE NORTH, AND PIKE AVENUE TO THE EAST AS SHOWN IN THE PLANS. ALL UTILITIES WITHIN THE LIMITS SHALL BE REMOVED EXCEPT AS NOTED ON X-326-C-34875 THROUGH X-326-C-34877 AND FOR THE FOLLOWING:
   a. ACTIVE UTILITY SEGMENTS, SUCH AS THE STORM SEWER LINES THAT RUN NORTH-SOUTH ADJACENT TO PIKE AVENUE AND SCIOTO AVENUE. ASSOCIATED CATCH BASINS AND OTHER STORM STRUCTURES SHALL ALSO BE PROTECTED.
   b. THE NORTHERN SECTION OF THE INSTRUMENTATION TUNNEL SYSTEM RUNNING NORTH TO SOUTH ADJACENT TO PIKE AVENUE AND NORTH OF COLUMN 44, IF IT IS STILL ACTIVE AT THE TIME OF THE FIELD WORK.
2. THE X-326-1A/B AND X-326-2A/B SUMP PUMPS SHALL BE DISCONNECTED FROM THE CONVEYANCE LINES AND REMOVED FROM SERVICE.
3. THE REMAINING BERM MATERIAL UNDERLYING THE GEOMEMBRANE AND THE REMAINING SECTION OF X-326 SLAB UNDERLYING THE SOUTH BERM SHALL BE PROPERLY DISPOSED OF AT OSWDF OR AS OTHERWISE DIRECTED BY THE COMPANY.
4. THE REMAINING INSTRUMENTATION TUNNEL SECTIONS SHALL BE REMOVED TO THE NEW INSTRUMENTATION TUNNEL BULKHEADS AS SHOWN ON THE PLANS.
5. THE SANITARY SEWER RUNNING NORTH TO SOUTH ALONG PIKE AVENUE SHALL BE AIR GAPPED AT THE LOCATION SHOWN ON DRAWING X-326-C-34876.
6. A PLAN SHOWING THE REMAINING UTILITIES UPON COMPLETION OF THE UTILITY REMOVAL WORK IS SHOWN ON DRAWING X-326-C-34878.
7. ANY UTILITIES THAT EXTEND BEYOND THE LIMITS DEFINED IN THIS PLAN SHALL BE CUT AND CAPPED IN ACCORDANCE WITH DETAIL 14 ON SHEET X-326-C-34882.

PLAN NOTES:

1. REFER TO DRAWING X-326-A-34859 FOR DRAWING LEGEND. REFER TO DRAWING X-326-C-34884 FOR GENERAL NOTES.
2. EXISTING CONTOURS ARE NOT SHOWN ON THIS DRAWING FOR CLARITY.
3. EXACT LOCATION AND DIMENSIONS OF THE X-158 SHOWER TRAILER TO BE FIELD VERIFIED.
4. STORM LINES, CONDUITS, AND PIPING BELOW THE BERM MAY HAVE BEEN REMOVED AS PART OF SLAB DEMOLITION ACTIVITIES AND ARE SHOWN FOR REFERENCE PURPOSES ONLY.
5. CONVEYANCE LINES WITHIN THE WEST BERM SHALL BE PROTECTED IN PLACE AS LONG AS C-TRAIN AND D-TRAIN REMAIN ACTIVE.
6. X-326 FACILITY SLAB IS SHOWN FOR REFERENCE PURPOSES ONLY. IT WILL HAVE BEEN DEMOLISHED IN A PREVIOUS PHASE OF CONSTRUCTION.
7. ASBESTOS MAY BE FOUND IN THE RCW PIPES AND ELECTRICAL DUCT BANKS AND SHALL BE HANDLED AND DISPOSED OF IN ACCORDANCE WITH CONTRACT DOCUMENTS.
8. OVERHEAD ELECTRICAL, AUXILIARY AND COMMUNICATION LINES ARE NOT SHOWN ON THIS PLAN FOR CLARITY.
9. SEE THE X-326 DEMOLITION BELOW GRADE UTILITIES ISOLATIONS AND REMOVALS DESIGN PACKAGE FOR PREVIOUSLY ISOLATED AND AIR GAPPED UTILITIES AROUND THE X-326 AREA. PREVIOUSLY AIR GAPPED/ISOLATED UTILITIES SHALL BE VERIFIED BY THE CONTRACTOR.
10. UTILITIES THAT EXIST UNDER LIMITS OF SLAB MAY BE REMOVED DURING FOOTING/SLAB DEMOLITION.
11. ACTIVE HIGH PRESSURE FIRE WATER LINE TO REMAIN IS ROUTED THROUGH A RHW CARRIER PIPE AT THE APPROXIMATE LOCATION SHOWN IN THE PLANS. CONTRACTOR SHALL EXERCISE CAUTION WHEN REMOVING THE OTHER RHW LINES IN THE VICINITY.

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SUITE 400
MILWAUKEE, WI 53202

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REFERENCE DRAWINGS	OPEN CHANGES	REV	REVISION DESCRIPTION	DWN	ENG	DESIGN MANAGER	DATE
X-326-A-34859							
		d	REVISED 100 PERCENT DESIGN	MPA	TAM	S. B. MURPHY	02/29/24
		c	100 PERCENT DESIGN PACKAGE FOR FBP REVIEW	MPA	TAM	S. B. MURPHY	01/18/24
		b	90 PERCENT DESIGN PACKAGE FOR FBP REVIEW	FJH	TAM	S. B. MURPHY	09/15/23
		a	60 PERCENT DESIGN PACKAGE FOR FBP REVIEW	MPA	TAM	S. B. MURPHY	08/07/23

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CONTRACT	DEAC3010CC40017	
DRAWN BY	M. P. ADAMS	02/29/24
CHECKED BY	R. J. HANSEN	02/29/24
MM/RED	T. A. MINEHARDT	02/29/24
DESIGN MANAGER	S. B. MURPHY	02/29/24
SCALE	1"=40'	

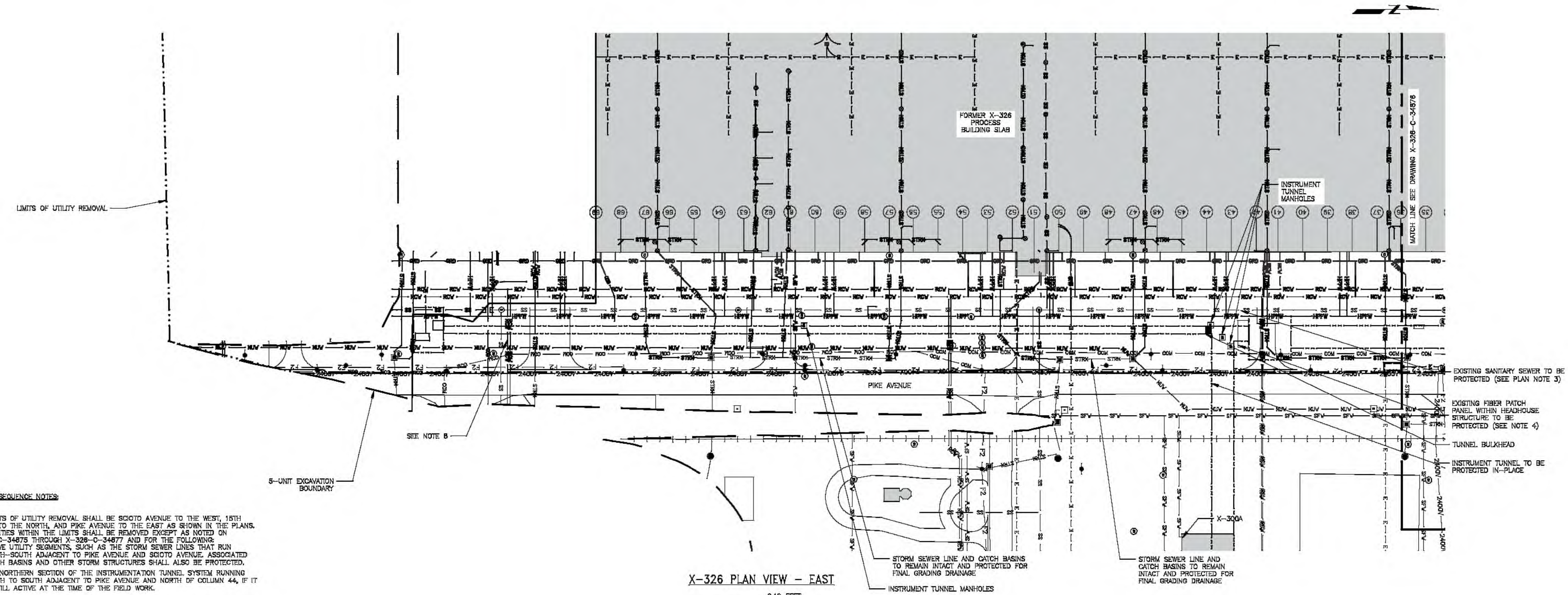
PORTSMOUTH GASEOUS DIFFUSION PLANT
D & D PROJECT

X-326 NORTHERN SLAB AREA
DEMOLITION AND UTILITY REMOVAL

UTILITY REMOVAL PLAN (3 OF 4)

FACILITY	DRAWING NUMBER	REV
X-326	X-326-C-34876	d

DRAWING NUMBER X-326-C-34877



X-326 PLAN VIEW - EAST

0 40 FEET

DEMOLITION SEQUENCE NOTES:

1. THE LIMITS OF UTILITY REMOVAL SHALL BE SCIOTO AVENUE TO THE WEST, 15TH STREET TO THE NORTH, AND PIKE AVENUE TO THE EAST AS SHOWN IN THE PLANS. ALL UTILITIES WITHIN THE LIMITS SHALL BE REMOVED EXCEPT AS NOTED ON X-326-C-34875 THROUGH X-326-C-34877 AND FOR THE FOLLOWING:
   a. ACTIVE UTILITY SEGMENTS, SUCH AS THE STORM SEWER LINES THAT RUN NORTH-SOUTH ADJACENT TO PIKE AVENUE AND SCIOTO AVENUE. ASSOCIATED CATCH BASINS AND OTHER STORM STRUCTURES SHALL ALSO BE PROTECTED.
   b. THE NORTHERN SECTION OF THE INSTRUMENTATION TUNNEL SYSTEM RUNNING NORTH TO SOUTH ADJACENT TO PIKE AVENUE AND NORTH OF COLUMN 44, IF IT IS STILL ACTIVE AT THE TIME OF THE FIELD WORK.
2. THE X-326-1A/B AND X-326-2A/B SUMP PUMPS SHALL BE DISCONNECTED FROM THE CONVEYANCE LINES AND REMOVED FROM SERVICE.
3. THE REMAINING BERM MATERIAL UNDERLYING THE GEOMEMBRANE AND THE REMAINING SECTION OF X-326 SLAB UNDERLYING THE SOUTH BERM SHALL BE PROPERLY DISPOSED OF AT OSWDF OR AS OTHERWISE DIRECTED BY THE COMPANY.
4. THE REMAINING INSTRUMENTATION TUNNEL SECTIONS SHALL BE REMOVED TO THE NEW INSTRUMENTATION TUNNEL BULKHEADS AS SHOWN ON THE PLANS.
5. THE SANITARY SEWER RUNNING NORTH TO SOUTH ALONG PIKE AVENUE SHALL BE AIR GAPPED AT THE LOCATION SHOWN ON DRAWING X-326-C-34876.
6. A PLAN SHOWING THE REMAINING UTILITIES UPON COMPLETION OF THE UTILITY REMOVAL WORK IS SHOWN ON DRAWING X-326-C-34878.
7. ANY UTILITIES THAT EXTEND BEYOND THE LIMITS DEFINED IN THIS PLAN SHALL BE CUT AND CAPPED IN ACCORDANCE WITH DETAIL 14 ON SHEET X-326-C-34882.

PLAN NOTES:

1. REFER TO DRAWING X-326-A-34859 FOR DRAWING LEGEND. REFER TO DRAWING X-326-C-34884 FOR GENERAL NOTES.
2. EXISTING CONTOURS ARE NOT SHOWN ON THIS DRAWING FOR CLARITY.
3. EXACT LOCATION AND DIMENSIONS OF THE X-158 SHOWER TRAILER TO BE FIELD VERIFIED.
4. FIBER PATCH PANEL LOCATION IS APPROXIMATE AND SHALL BE FIELD VERIFIED. CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS TO PROTECT FIBER PATCH PANEL IN-PLACE. SEE REFERENCE DRAWING X-215B-86E FOR DETAILS.
5. STORM LINES, CONDUITS, AND PIPING BELOW THE BERM MAY HAVE BEEN REMOVED AS PART OF SLAB DEMOLITION ACTIVITIES AND ARE SHOWN FOR REFERENCE PURPOSES ONLY.
6. CONVEYANCE LINES WITHIN THE WEST BERM SHALL BE PROTECTED IN PLACE AS LONG AS C-TRAIN AND D-TRAIN REMAIN ACTIVE.
7. X-326 FACILITY SLAB IS SHOWN FOR REFERENCE PURPOSES ONLY. IT WILL HAVE BEEN DEMOLISHED IN A PREVIOUS PHASE OF CONSTRUCTION.
8. ASBESTOS MAY BE FOUND IN THE RCW PIPES AND ELECTRICAL DUCT BANKS AND SHALL BE HANDLED AND DISPOSED OF IN ACCORDANCE WITH CONTRACT DOCUMENTS.
9. OVERHEAD ELECTRICAL, AUXILIARY AND COMMUNICATION LINES ARE NOT SHOWN ON THIS PLAN FOR CLARITY.
10. SEE THE X-326 DEMOLITION BELOW GRADE UTILITIES ISOLATIONS AND REMOVALS DESIGN PACKAGE FOR PREVIOUSLY ISOLATED AND AIR GAPPED UTILITIES AROUND THE X-326 AREA. PREVIOUSLY AIR GAPPED/ISOLATED UTILITIES SHALL BE VERIFIED BY THE CONTRACTOR.
11. UTILITIES THAT EXIST UNDER LIMITS OF SLAB MAY BE REMOVED DURING FOOTING/SLAB DEMOLITION.

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126 N. JEFFERSON STREET
SUITE 400
MILWAUKEE, WI 53202

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REFERENCE DRAWINGS	OPEN CHANGES	REV	REVISION DESCRIPTION	DWN	ENG	DESIGN MANAGER	DATE
X-326-A-34859							
		d	REVISED 100 PERCENT DESIGN	MPA	TAM	S. B. MURPHY	02/29/24
		c	100 PERCENT DESIGN PACKAGE FOR FBP REVIEW	MPA	TAM	S. B. MURPHY	01/18/24
		b	90 PERCENT DESIGN PACKAGE FOR FBP REVIEW	FJH	TAM	S. B. MURPHY	09/15/23
		a	60 PERCENT DESIGN PACKAGE FOR FBP REVIEW	MPA	TAM	S. B. MURPHY	06/07/23

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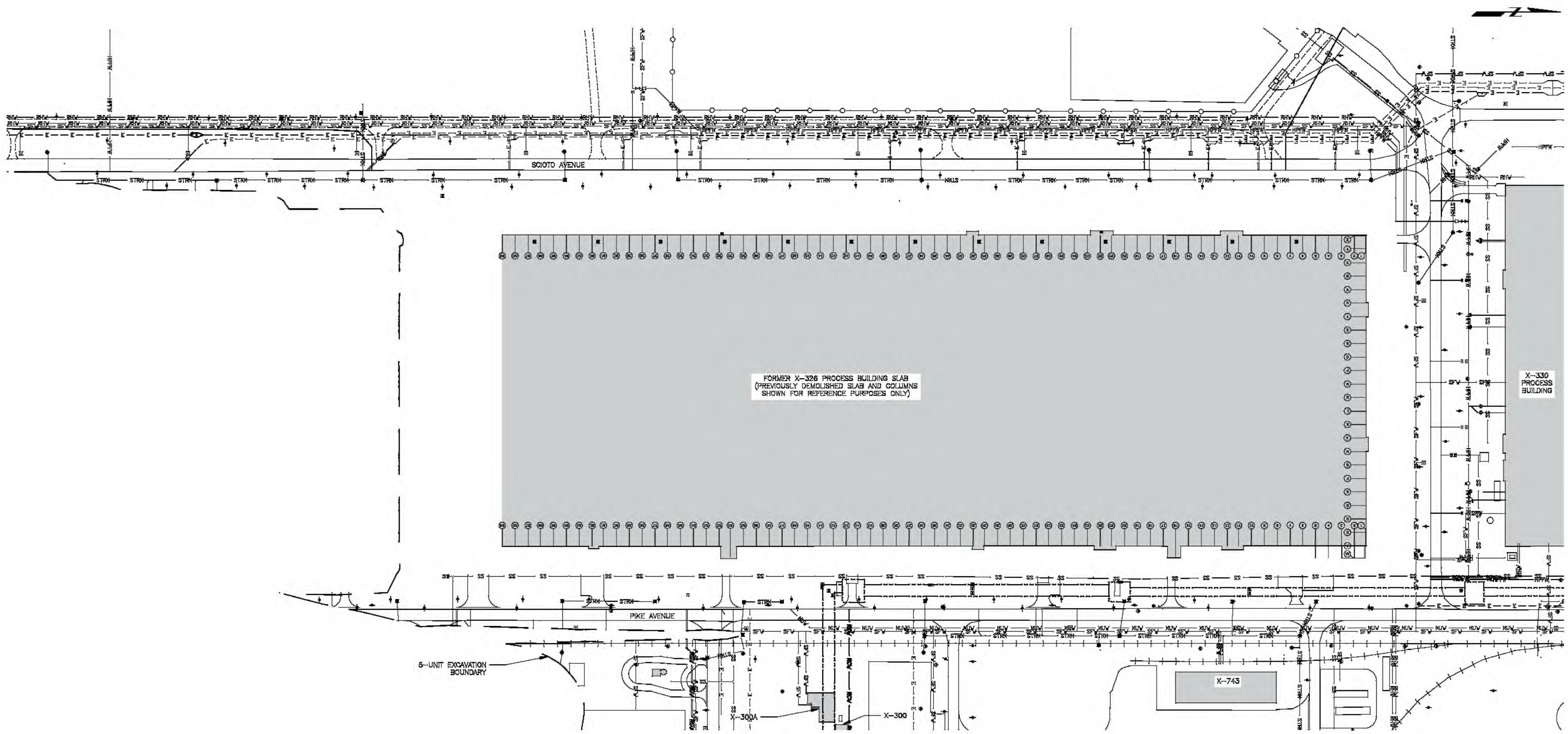
CONTRACT	DEAC3010CC40017	
DRAWN BY	M. P. ADAMS	02/29/24
CHECKED BY	R. J. HANSEN	02/29/24
MM/RED	T. A. MINEHARDT	02/29/24
DESIGN MANAGER	S. B. MURPHY	02/29/24
SCALE	1"=40'	

PORTSMOUTH GASEOUS DIFFUSION PLANT
D & D PROJECT

X-326 NORTHERN SLAB AREA
DEMOLITION AND UTILITY REMOVAL

UTILITY REMOVAL PLAN (4 OF 4)

FACILITY	DRAWING NUMBER	REV
X-326	X-326-C-34877	d



X-326 PLAN VIEW – OVERALL

0 60 FEET

NOTES:

1. REFER TO DRAWING X-326-A-34859 FOR DRAWING LEGEND. REFER TO DRAWING X-326-C-34864 FOR GENERAL NOTES.
2. EXISTING CONTOURS ARE NOT SHOWN ON THIS DRAWING FOR CLARITY.
3. X-326 FACILITY SLAB IS SHOWN FOR REFERENCE PURPOSES ONLY. IT WILL HAVE BEEN DEMOLISHED IN A PREVIOUS PHASE OF CONSTRUCTION.
4. OVERHEAD ELECTRICAL, AUXILIARY AND COMMUNICATION LINES ARE NOT SHOWN ON THIS PLAN FOR CLARITY.

REFERENCE DRAWINGS	OPEN CHANGES	REV	REVISION DESCRIPTION	DWN	ENG	DESIGN MANAGER	DATE
X-326-A-34859							
		d	REVISED 100 PERCENT DESIGN	MPA	TAM	S. B. MURPHY	02/29/24
		c	100 PERCENT DESIGN PACKAGE FOR FBP REVIEW	MPA	TAM	S. B. MURPHY	01/16/24
		b	90 PERCENT DESIGN PACKAGE FOR FBP REVIEW	FJH	TAM	S. B. MURPHY	09/15/23
		a	60 PERCENT DESIGN PACKAGE FOR FBP REVIEW	MPA	TAM	S. B. MURPHY	08/07/23

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SUITE 400
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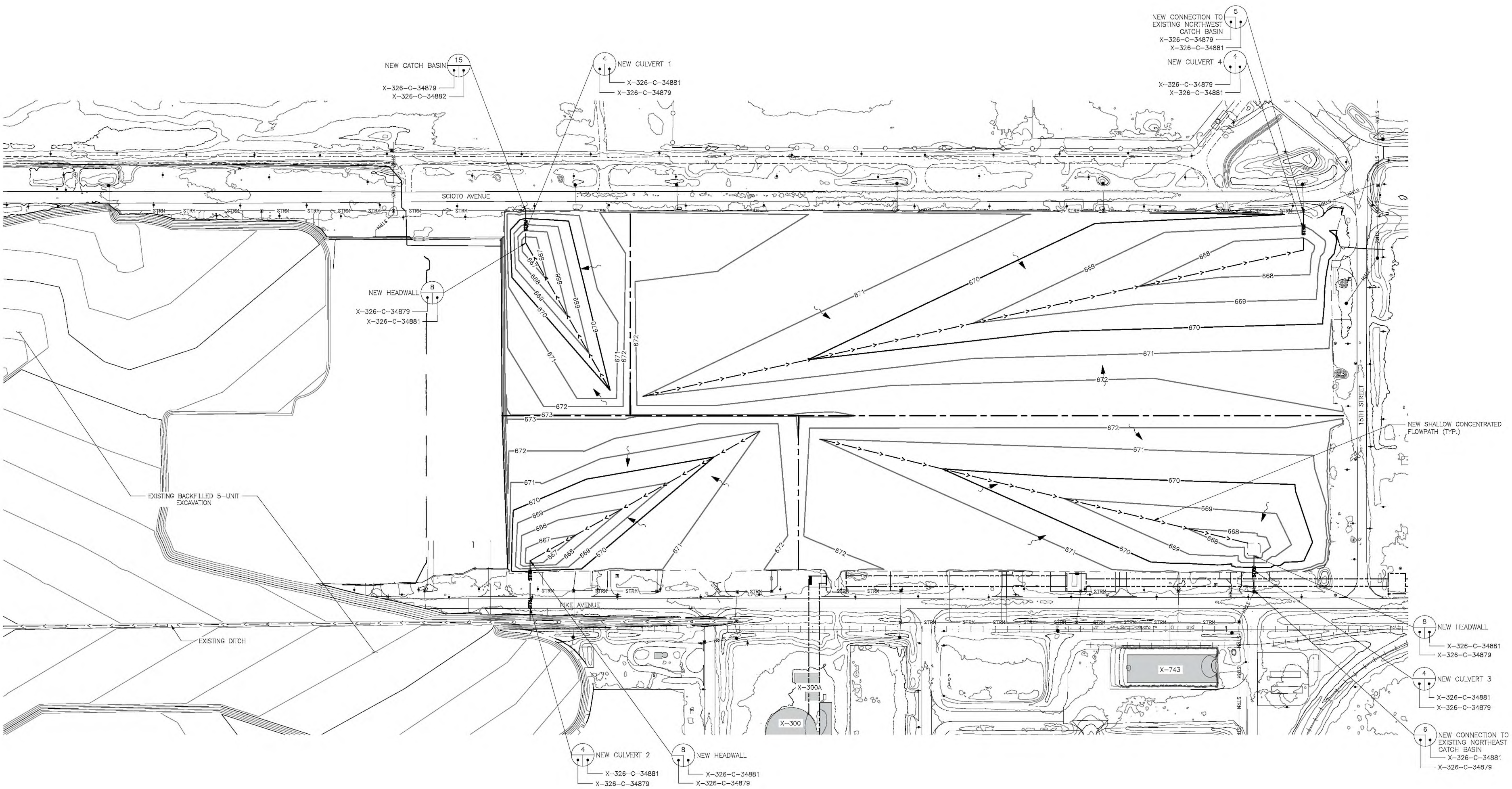
CONTRACT DEAC3010CC40017	
DRAWN BY M. P. ADAMS	02/29/24
CHECKED BY R. J. HANSEN	02/29/24
MM/RED T. A. MINEHARDT	02/29/24
DESIGN MANAGER S. B. MURPHY	02/29/24
SCALE 1"=60'	

PORTSMOUTH GASEOUS DIFFUSION PLANT
D & D PROJECT

X-326 NORTHERN SLAB AREA
DEMOLITION AND UTILITY REMOVAL

POST-UTILITY REMOVAL PLAN

FACILITY	DRAWING NUMBER	REV
X-326	X-326-C-34878	d



NOTES:

1. REFER TO DRAWING X-326-A-34859 FOR DRAWING INDEX AND LEGEND. REFER TO DRAWING X-326-C-34884 FOR GENERAL NOTES
2. THE EXISTING CONTOURS SHOWN IN THIS FIGURE WERE GENERATED BY COMBINING THE PROPOSED FINAL GRADES FROM THE 5-UNIT (X-900) GROUNDWATER PLUME EXCAVATION DESIGN DRAWINGS WITH THE 2023 LIDAR PROVIDED BY THE COMPANY.
3. EXISTING STORM SEWERS THAT RUN NORTH TO SOUTH AROUND THE PERIMETER OF THE EXCAVATION SHALL BE PROTECTED.
4. THE INTENT OF THIS GRADING PLAN IS TO PROMOTE POSITIVE DRAINAGE AND MAINTAIN APPROXIMATELY EQUAL DRAINAGE AREAS TO PRE-DEMOLITION CONDITIONS. CONTRACTOR SHALL MAINTAIN APPROXIMATE DRAINAGE AREAS OUTLINED ABOVE, BUT FINAL GRADES MAY BE FIELD ADJUSTED BASED ON ACTUAL SITE CONDITIONS. ADDITIONAL FILL REQUIRED TO ACHIEVE FINAL GRADE SHALL BE IMPORTED CLEAN FILL.
5. OVERHEAD ELECTRICAL, AUXILIARY AND COMMUNICATION LINES ARE NOT SHOWN ON THIS PLAN FOR CLARITY.

0 80 FEET

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MILWAUKEE, WI 53202

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REFERENCE DRAWINGS	OPEN CHANGES	REV	REVISION DESCRIPTION	DWN	ENG	DESIGN MANAGER	DATE
X-326-A-34859							
		d	REVISED 100 PERCENT DESIGN	RJH	TAM	S. B. MURPHY	02/29/24
		c	100 PERCENT DESIGN PACKAGE FOR FBP REVIEW	MPA	TAM	S. B. MURPHY	01/16/24
		b	90 PERCENT DESIGN PACKAGE FOR FBP REVIEW	FJH	TAM	S. B. MURPHY	09/15/23
		a	60 PERCENT DESIGN PACKAGE FOR FBP REVIEW	RJH	TAM	S. B. MURPHY	06/07/23

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CONTRACT DEAC3010CC40017
DRAWN BY R. J. HANSEN 02/29/24
CHECKED BY R. A. WOLFORD 02/29/24
MM/RED T. A. MINEHARDT 02/29/24
DESIGN MANAGER S. B. MURPHY 02/29/24
SCALE 1"=80'

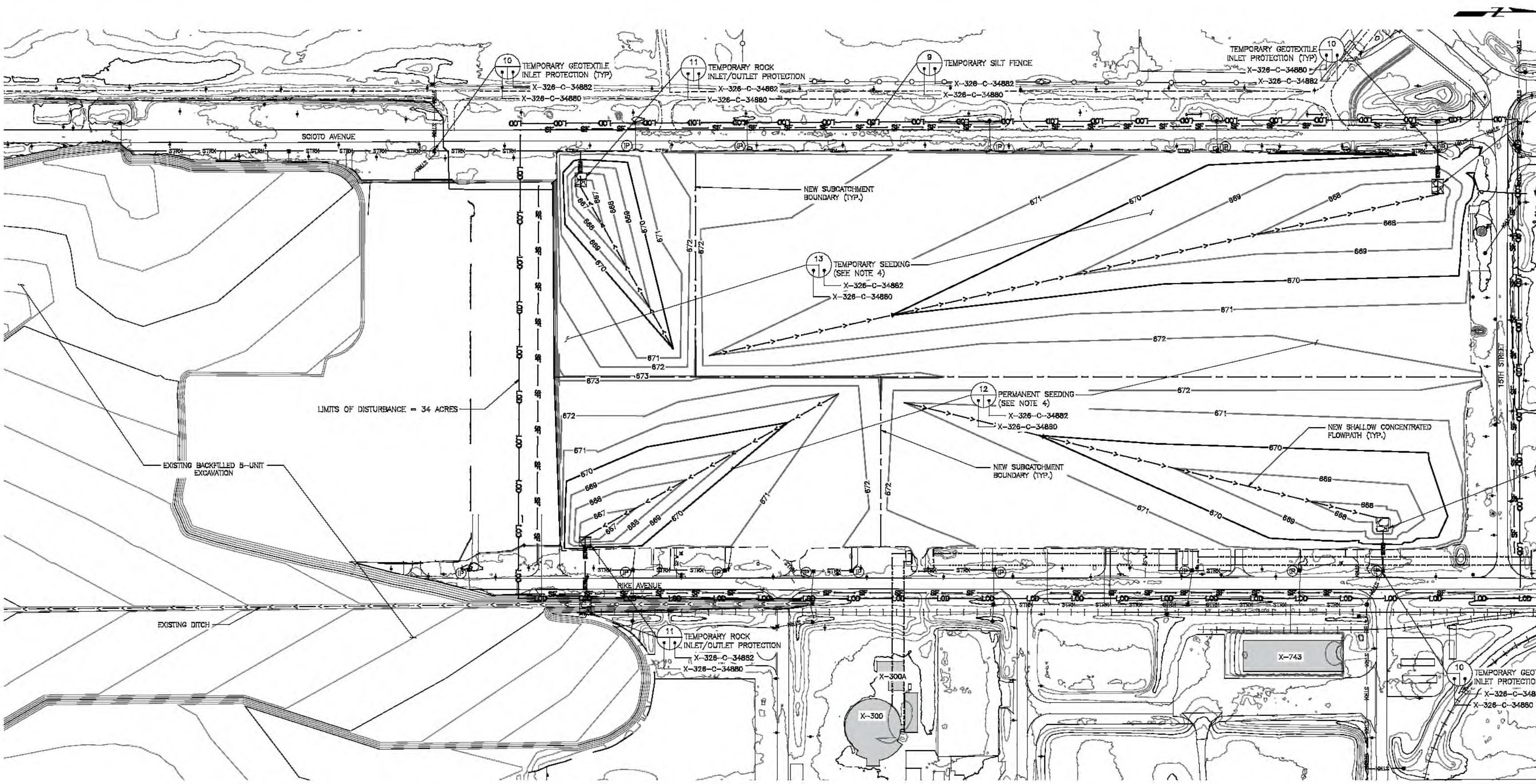
PORTSMOUTH GASEOUS DIFFUSION PLANT
D & D PROJECT

X-326 NORTHERN SLAB AREA
DEMOLITION AND UTILITY REMOVAL

FINAL GRADING PLAN

FACILITY X-326
DRAWING NUMBER X-326-C-34879
REV d

DRAWING NUMBER
X-326-C-34880



NOTES:

1. REFER TO DRAWING X-326-A-34859 FOR DRAWING INDEX AND LEGEND. REFER TO DRAWING X-326-C-34864 FOR GENERAL NOTES
2. THE EXISTING CONTOURS SHOWN IN THIS FIGURE WERE GENERATED BY COMBINING THE PROPOSED FINAL GRADES FROM THE 5-UNIT (X-900) GROUNDWATER PLUME EXCAVATION DESIGN DRAWINGS WITH THE 2023 LIDAR PROVIDED BY THE COMPANY.
3. OVERHEAD ELECTRICAL, AUXILIARY AND COMMUNICATION LINES ARE NOT SHOWN ON THIS PLAN FOR CLARITY.
4. TEMPORARY AND PERMANENT SEEDING ARE BOTH REQUIRED IN THE ENTIRE PROJECT AREA. SEED MIX AND APPLICATION SHALL BE IN ACCORDANCE WITH THEIR RESPECTIVE DETAILS AND THE SURFACE WATER MANAGEMENT AND EROSION NOTES ON X-326-C-34886.

0 80 FEET

REFERENCE DRAWINGS	OPEN CHANGES	REV	REVISION DESCRIPTION	DWN	ENG	DESIGN MANAGER	DATE
X-326-A-34859							
		d	REVISED 100 PERCENT DESIGN	RJH	TAM	S. B. MURPHY	02/29/24
		c	100 PERCENT DESIGN PACKAGE FOR FBP REVIEW	MPA	TAM	S. B. MURPHY	01/18/24
		b	90 PERCENT DESIGN PACKAGE FOR FBP REVIEW	FJH	TAM	S. B. MURPHY	09/15/23
		a	60 PERCENT DESIGN PACKAGE FOR FBP REVIEW	RJH	TAM	S. B. MURPHY	06/07/23

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CONTRACT DEAC3010CC40017
DRAWN BY R. J. HANSEN 02/29/24
CHECKED BY R. A. WOLFORD 02/29/24
MM/RED T. A. MINEHARDT 02/29/24
DESIGN MANAGER S. B. MURPHY 02/29/24
SCALE 1"=80'

ARCADIS U.S., INC.
126 N. JEFFERSON STREET
SUITE 400
MILWAUKEE, WI 53202

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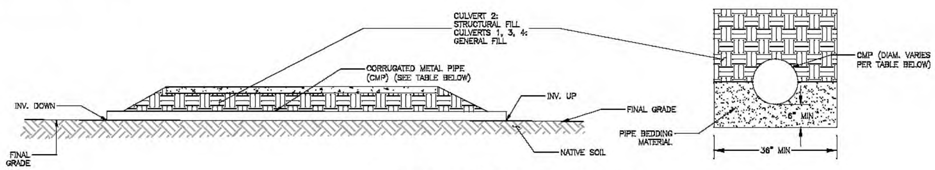
PORTSMOUTH GASEOUS DIFFUSION PLANT
D & D PROJECT

X-326 NORTHERN SLAB AREA DEMOLITION AND UTILITY REMOVAL FINAL CONDITIONS EROSION AND SEDIMENT CONTROL PLAN

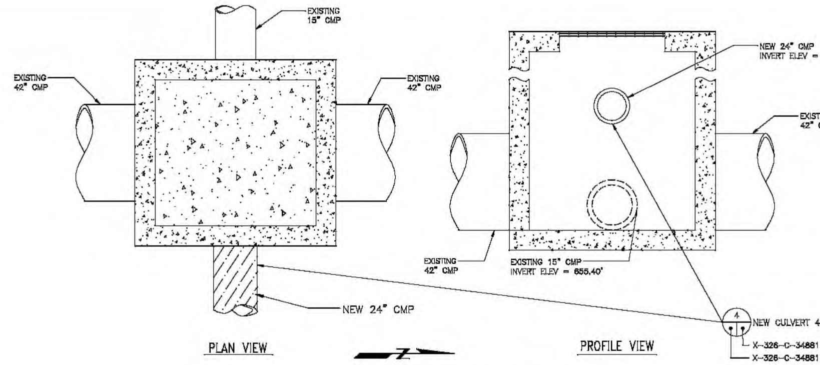
FACILITY X-326
DRAWING NUMBER X-326-C-34880
REV d

X-326-C-34881



CULVERT	DIAMETER (INCHES)	LENGTH (LF)	INV. UP (FT-NAVD88)	INV. DOWN (FT-NAVD88)	SLOPE (FT/FT)
1	12	63	666.00	665.00	0.016
2	15	118	666.00	665.00	0.008
3	15	68	667.50	665.00	0.037
4	24	75	667.00	666.00	0.013

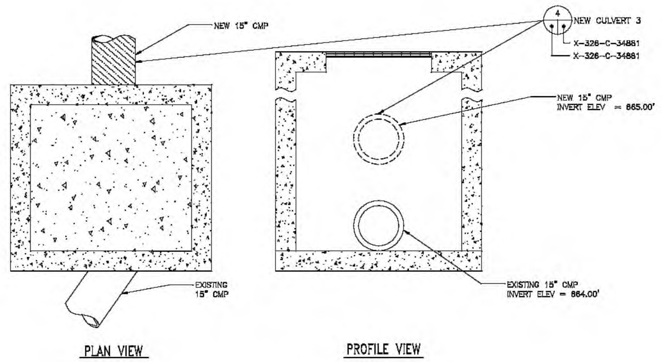
NEW CULVERT (4)
NOT TO SCALE
X-326-C-34879
X-326-C-34881
X-326-C-34882
X-326-C-34881



NEW CONNECTION TO EXISTING NORTHWEST CATCH BASIN (5)
NOT TO SCALE
X-326-C-34879 X-326-C-34881

NOTES:

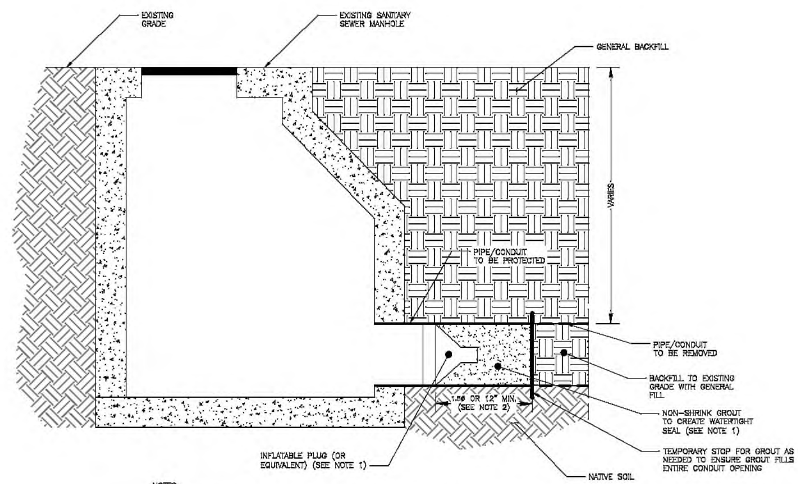
1. ALL PIPE PENETRATIONS SHALL BE SEALED WITH NON-SHRINK GROUT (SEE NON-SHRINK GROUT NOTES ON DRAWING X-326-C-34886).
2. IF THE EXISTING CATCH BASIN HAS CORRODED OR DEGRADED SUCH THAT IT CANNOT BE CORED INTO WITHOUT COMPROMISING THE OVERALL STRUCTURE, REPLACE CATCH BASIN IN-KIND (SEE PRECAST CONCRETE NOTES ON DRAWING X-326-C-34886).



NEW CONNECTION TO EXISTING NORTHEAST CATCH BASIN (6)
NOT TO SCALE
X-326-C-34879 X-326-C-34881

NOTES:

1. ALL PIPE PENETRATIONS SHALL BE SEALED WITH NON-SHRINK GROUT (SEE NON-SHRINK GROUT NOTES ON DRAWING X-326-C-34886).
2. IF THE EXISTING CATCH BASIN HAS CORRODED OR DEGRADED SUCH THAT IT CANNOT BE CORED INTO WITHOUT COMPROMISING THE OVERALL STRUCTURE, REPLACE CATCH BASIN IN-KIND (SEE PRECAST CONCRETE NOTES ON DRAWING X-326-C-34886).



NOTES:

1. INFLATABLE PLUG AND NON-SHRINK GROUT SHALL PROVIDE WATER TIGHT BARRIER. REFER TO NON-SHRINK GROUT SPECIFICATIONS ON DRAWING X-326-C-34886.
2. PIPES/CONDUITS SHALL BE PLUGGED 1.5 TIMES THE PIPE DIAMETER OR 12-INCHES, WHICHEVER IS GREATER, ACROSS THE ENTIRE DIAMETER OF THE PIPE/CONDUIT SUCH THAT A WATER-TIGHT SEAL IS MAINTAINED.

NEW SANITARY SEWER AIRGAP (7)
NOT TO SCALE
X-326-C-34876 X-326-C-34881

ARCADIS U.S., INC.
126 N. JEFFERSON STREET
SUITE 400
MILWAUKEE, WI 53202

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REFERENCE DRAWINGS	OPEN CHANGES	REV	REVISION DESCRIPTION	DWN	ENG	DESIGN MANAGER	DATE
X-326-A-34889							
		c	REVISED 100 PERCENT DESIGN	CAL	TAM	S. B. MURPHY	02/29/24
		b	100 PERCENT DESIGN PACKAGE FOR FBP REVIEW	MPA	TAM	S. B. MURPHY	01/18/24
		a	90 PERCENT DESIGN PACKAGE FOR FBP REVIEW	FJH	TAM	S. B. MURPHY	09/15/23

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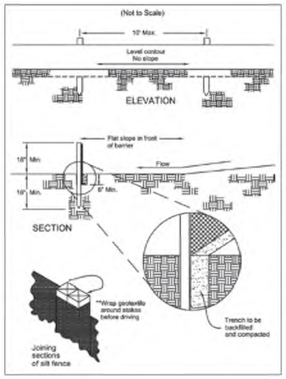
CONTRACT DEAC3010CC40017
DRAWN BY C. A. LUKINS 02/29/24
CHECKED BY R. J. HANSEN 02/29/24
MM/RED T. A. MINEHARDT 02/29/24
DESIGN MANAGER S. B. MURPHY 02/29/24
SCALE N/A

PORTSMOUTH GASEOUS DIFFUSION PLANT
D & D PROJECT
X-326 NORTHERN SLAB AREA
DEMOLITION AND UTILITY REMOVAL
CIVIL DETAILS (1 OF 3)

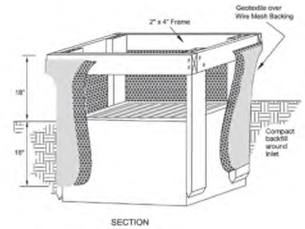
FACILITY X-326
DRAWING NUMBER X-326-C-34881
REV b



NOTES:

1. SEE "TEMPORARY SILT FENCE" NOTES IN "SURFACE WATER MANAGEMENT AND EROSION CONTROL" SPECIFICATION ON DRAWING X-326-C-34886.

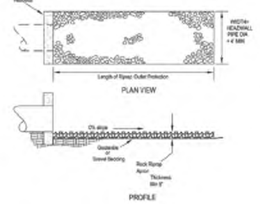
TEMPORARY SILT FENCE (9)
NOT TO SCALE
X-326-C-34873 — X-326-C-34882
X-326-C-34880



NOTES:

1. SEE "TEMPORARY INLET PROTECTION" NOTES IN "SURFACE WATER MANAGEMENT AND EROSION CONTROL" SPECIFICATION ON DRAWING X-326-C-34886.

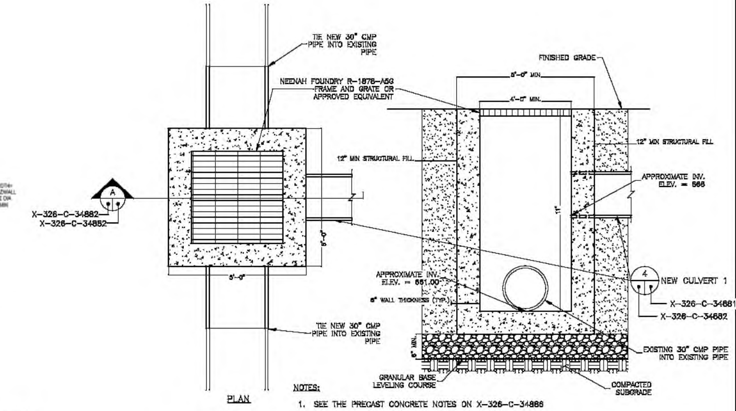
TEMPORARY GEOTEXTILE INLET PROTECTION (10)
NOT TO SCALE
X-326-C-34873 — X-326-C-34882
X-326-C-34880



NOTES:

1. SEE "TEMPORARY ROCK INLET/OUTLET PROTECTION" NOTES IN "SURFACE WATER MANAGEMENT AND EROSION CONTROL" SPECIFICATION ON DRAWING X-326-C-34886.

TEMPORARY ROCK INLET/OUTLET PROTECTION (11)
NOT TO SCALE
X-326-C-34880 — X-326-C-34882



NOTES:

1. SEE THE PRECAST CONCRETE NOTES ON X-326-C-34886

NEW CATCH BASIN (15)
NOT TO SCALE
X-326-C-34879 — X-326-C-34882

SECTION A (15)
NOT TO SCALE
X-326-C-34882 — X-326-C-34882

Seed Mix	Seeding Rate		Notes:
	Lbs./acre	Lbs./1,000 Sq. Feet	
General Use			
Creeping Red Fescue Domestic Ryegrass Kentucky Bluegrass	20-40 10-20 20-40	1/2-1 1/4-1/2 1/2-1	For close mowing & for waterways with <2.0 ft/sec velocity
Tall Fescue	40-50	1-1 1/4	
Turf-type (dwarf) Fescue	90	2 1/4	
Steep Banks or Cut Slopes			
Tall Fescue	40-50	1-1 1/4	
Crown Vetch Tall Fescue	10-20 20-30	1/4-1/2 1/2-3/4	Do not seed later than August
Flat Pea Tall Fescue	20-25 20-30	1/2-3/4 1/2-3/4	Do not seed later than August
Road Ditches and Swales			
Tall Fescue	40-50	1-11/4	
Turf-type (Dwarf) Fescue Kentucky Bluegrass	90 5	2 1/4 0.1	
Lawns			
Kentucky Bluegrass Perennial Ryegrass	100-120	2 2	
Kentucky Bluegrass Creeping Red Fescue	100-120	2 1-1/2	For shaded areas

NOTES:

1. PERMANENT SEED SHALL BE ESTABLISHED ON AREAS THAT ARE AT FINAL GRADE OR WILL NOT BE DISTURBED FOR PERIODS LONGER THAN 12 MONTHS. PERMANENT SEEDING INCLUDES SITE PREPARATION, SEEDBED PREPARATION, PLANTING SEED, MULCH, IRRIGATION AND MAINTENANCE.
2. PERMANENT SEEDING SHALL NOT BE DELAYED ON ANY ONE PORTION OF THE SITE AT FINAL GRADE WHILE CONSTRUCTION ON ANOTHER PORTION OF THE SITE IS BEING COMPLETED. PERMANENT SEEDING SHALL BE COMPLETED IN PHASES, AS NECESSARY.
3. TOPSOIL SHALL BE APPLIED WHERE NEEDED TO ESTABLISH VEGETATION.
4. SEEDING SHOULD BE DONE MARCH 1 TO MAY 31 OR AUGUST 1 TO SEPTEMBER 30 UNLESS OTHERWISE NOTED IN THE TABLE ABOVE.
5. PERMANENT SEEDING SHALL NOT BE CONSIDERED ESTABLISHED FOR AT LEAST 1 FULL YEAR FROM THE TIME OF PLANTING. A MINIMUM OF 70% GROWTH DENSITY, BASED ON VISUAL INSPECTION, MUST EXIST FOR AN ADEQUATE STAND OF PERMANENT GRASS.
6. IF AN INADEQUATE STAND OF PERMANENT GRASS IS DETERMINED BY OWNER, CONTRACTOR SHALL REPAIR BARE AND SPARSE AREAS, FILL GULLIES, RE-FERTILIZE, RE-SEED, AND RE-MULCH AS NECESSARY. CONTRACTOR SHALL IDENTIFY CAUSE OF FAILURE AND PERFORM ADDITIONAL SOIL TESTS AS NEEDED TO ESTABLISH AN ADEQUATE STAND OF PERMANENT GRASS.
7. APPLICATIONS OF TEMPORARY AND PERMANENT SEEDING SHALL INCLUDE MULCH (STRAW, MULCH NETTING, SYNTHETIC BINDERS, OR WOOD-CELLULOSE FIBER) OR HYDROSEEDING. MULCH SHALL BE APPLIED DURING OR IMMEDIATELY AFTER SEEDING. SEEDING MADE DURING OPTIMUM SEEDING DATES ON FAVORABLE, VERY FLAT SOIL CONDITIONS MAY NOT REQUIRE MULCH TO ACHIEVE ADEQUATE STABILIZATION.
8. THE TOPSOIL SHALL CONTAIN BETWEEN 4 PERCENT AND 20 PERCENT ORGANIC MATTER AS DETERMINED BY LOSS ON IGNITION OF SAMPLES OVEN DRIED TO CONSTANT WEIGHT AT 212 °F (100 °C) AND CONSIST OF FERTILE, LOOSE, FRIABLE, AND LOAMY MATERIAL THAT CONTAINS HUMUS MATERIAL. FOR TOPSOIL TO BE CONSIDERED LOAMY, ENSURE THAT THE FRACTION PASSING THE NO. 10 (200) SIEVE DOES NOT CONTAIN MORE THAN 40 PERCENT CLAY.

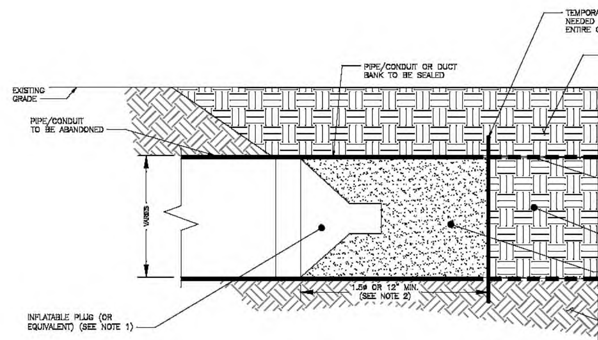
PERMANENT SEEDING (12)
NOT TO SCALE
X-326-C-34880 — X-326-C-34882

Seeding Dates	Species	Lb./1000 ft2	Lb/Acre
March 1 to August 15	Oats Tall Fescue Annual Ryegrass	3 1 1	128 (4 Bushel) 40 40
	Perennial Ryegrass Tall Fescue Annual Ryegrass	1 1 1	40 40 40
	Annual Ryegrass Perennial Ryegrass Creeping Red Fescue Kentucky Bluegrass	1.25 3.25 0.4 0.4	55 142 17 17
	Oats Tall Fescue Annual Ryegrass	3 1 1	128 (3 bushel) 40 40
August 16th to November	Rye Tall Fescue Annual Ryegrass	3 1 1	112 (2 bushel) 40 40
	Wheat Tall Fescue Annual Ryegrass	3 1 1	120 (2 bushel) 40 40
	Perennial Rye Tall Fescue Annual Ryegrass	1 1 1	40 40 40
	Annual Ryegrass Perennial Ryegrass Creeping Red Fescue Kentucky Bluegrass	1.25 3.25 0.4 0.4	40 40 40
November 1 to Feb. 29	Use mulch only or dormant seeding		

NOTES:

1. STRUCTURAL EROSION AND SEDIMENT CONTROL PRACTICES SUCH AS CHANNELS, SEDIMENT BASINS, AND OTHERS SHALL BE INSTALLED AND STABILIZED WITH TEMPORARY SEEDING PRIOR TO GRADING THE REST OF THE CONSTRUCTION SITES.
2. TEMPORARY SEED SHALL BE APPLIED BETWEEN CONSTRUCTION OPERATIONS ON SOILS THAT WILL NOT BE GRADED OR REWORKED FOR 14 DAYS OR GREATER. ESTABLISH TEMPORARY SEEDING WITHIN 7 DAYS ON DISTURBED AREAS THAT ARE IDLE ON THE SITE. PERMANENT SEEDING SHOULD BE APPLIED IF THE AREAS WILL BE IDLE FOR MORE THAN ONE YEAR.
3. TEMPORARY SEEDING SHOULD NOT BE POSTPONED IF IDEAL SEEDBED PREPARATION IS NOT POSSIBLE.
4. TEMPORARY VEGETATION SEEDING RATES SHALL ESTABLISH ADEQUATE STANDS OF VEGETATION, WHICH MAY REQUIRE THE USE OF SOIL AMENDMENTS. BASE RATES FOR LIME AND FERTILIZER SHALL BE USED.
5. SEED SHALL BE APPLIED UNIFORMLY WITH A CYCLONE SPREADER, DRILL, CULTIPACKER SEEDER, OR HYDROSEEDED. WHEN FEASIBLE, SEED THAT HAS BEEN BROADCAST SHALL BE COVERED BY RAKING OR DRAGGING AND THEN LIGHTLY TAMPED INTO PLACE USING A ROLLER OR CULTIPACKER. IF HYDROSEEDING, THE SEED AND FERTILIZER WILL BE MIXED ON-SITE AND THE SEEDING SHALL BE DONE IMMEDIATELY AND WITHOUT INTERUPTION.
6. AREAS FAILING TO ESTABLISH VEGETATIVE COVER ADEQUATE TO PREVENT EROSION SHALL BE RESEEDED AS SOON AS SUCH AREAS ARE IDENTIFIED.
7. SEEDING PERFORMED DURING HOT AND DRY SUMMER MONTHS SHALL BE WATERED AS NECESSARY TO MAINTAIN A HEALTHY STAND OF VEGETATION.
8. APPLICATIONS OF TEMPORARY AND PERMANENT SEEDING SHALL INCLUDE MULCH (STRAW, MULCH NETTING, SYNTHETIC BINDERS, OR WOOD-CELLULOSE FIBER) OR HYDROSEEDING. MULCH SHALL BE APPLIED DURING OR IMMEDIATELY AFTER SEEDING. SEEDING MADE DURING OPTIMUM SEEDING DATES ON FAVORABLE, VERY FLAT SOIL CONDITIONS MAY NOT REQUIRE MULCH TO ACHIEVE ADEQUATE STABILIZATION.

TEMPORARY SEEDING (13)
NOT TO SCALE
X-326-C-34880 — X-326-C-34882



NOTES:

1. CONTRACTOR SHALL PLUG & SEAL EACH PIPE, CONDUIT, OR OTHER SITE FEATURE THAT COULD ALLOW FOR POTENTIAL MIGRATION OF WATER WITHIN THE FUTURE X-326 CONTAINMENT BERM. INFLATABLE PLUG AND NON-SHRINK GROUT SHALL PROVIDE WATER TIGHT BARRIER. REFER TO NON-SHRINK GROUT SPECIFICATIONS ON DRAWING X-326-C-34886.
2. PIPES/CONDUITS SHALL BE PLUGGED 1.5 TIMES THE PIPE DIAMETER OR 12-INCHES, WHICHEVER IS GREATER, ACROSS THE ENTIRE DIAMETER OF THE PIPE/CONDUIT SUCH THAT A WATER-TIGHT SEAL IS MAINTAINED.
3. THIS DETAIL IS APPLICABLE TO ALL PIPE/CONDUIT THAT IS REMOVED BETWEEN THE X-326 FACILITY AND THE LIMITS OF UTILITY REMOVAL. REFER TO DRAWINGS X-326-C-34874 THROUGH X-326-C-34877 FOR THE UTILITY LOCATIONS.

TYPICAL SEALING OF CONDUIT/PIPE AT SEALING LIMIT (14)
NOT TO SCALE
X-326-C-34874 — X-326-C-34882
X-326-C-34875
X-326-C-34876
X-326-C-34877

ARCADIS U.S., INC.
126 N. JEFFERSON STREET
SUITE 400
MILWAUKEE, WI 53202
AUTOCAD

REFERENCE DRAWINGS	OPEN CHANGES	REV	REVISION DESCRIPTION	DWN	ENG	DESIGN MANAGER	DATE
X-326-A-34889							
		c	REVISED 100 PERCENT DESIGN	CAL	TAM	S. B. MURPHY	02/29/24
		b	100 PERCENT DESIGN PACKAGE FOR FBP REVIEW	MPA	TAM	S. B. MURPHY	01/18/24
		a	90 PERCENT DESIGN PACKAGE FOR FBP REVIEW	FJH	TAM	S. B. MURPHY	09/15/23

Fluor-BWXT | Portsmouth
P.O. BOX 548 PIKETON, OHIO 45661

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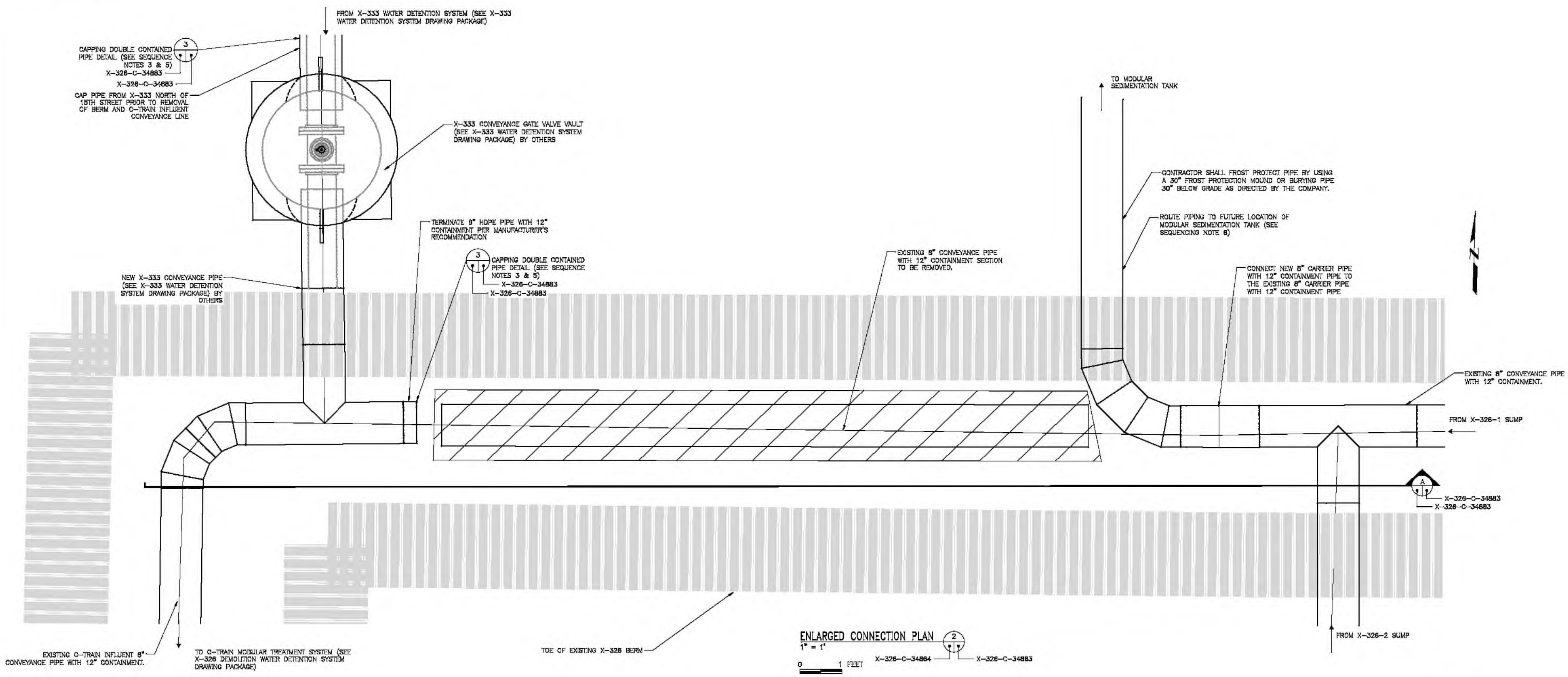
CONTRACT DEAC3010CC40017
DRAWN BY C. A. LUKINS 02/29/24
CHECKED BY R. J. HANSEN 02/29/24
MM/RED T. A. MINEHARDT 02/29/24
DESIGN MANAGER S. B. MURPHY 02/29/24
SCALE N/A

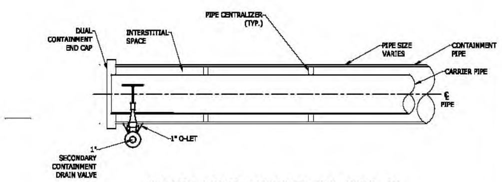
PORTSMOUTH GASEOUS DIFFUSION PLANT
D & D PROJECT
X-326 NORTHERN SLAB AREA
DEMOLITION AND UTILITY REMOVAL
CIVIL DETAILS (3 OF 3)

FACILITY X-326
DRAWING NUMBER X-326-C-34882
REV c

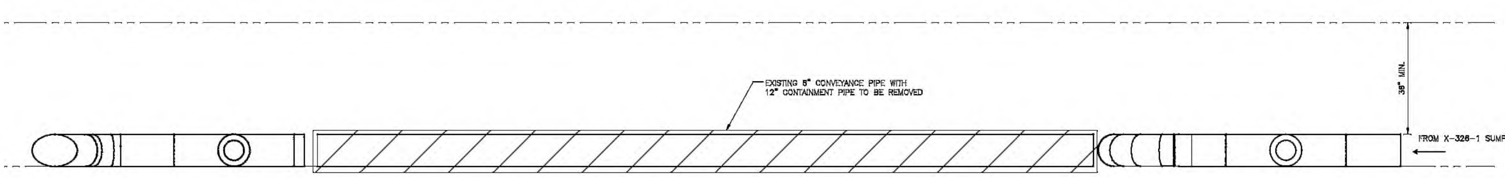
X-326-C-34883



ENLARGED CONNECTION PLAN 2
1" = 1'
0 1 FEET
X-326-C-34884 X-326-C-34883



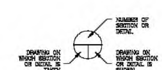
CAPPING DOUBLE CONTAINED PIPE DETAIL 3
NOT TO SCALE
X-326-C-34883 X-326-C-34883



CONNECTION PIPING DETAIL SECTION A
NOT TO SCALE
X-326-C-34883 X-326-C-34883

NOTES:
1. ROUTE THE DISCHARGE OF PUMPS X-326-1 AND X-326-2 TO THE FUTURE LOCATION OF THE MODULAR SEDIMENTATION TANK AS DETERMINED BY THE COMPANY. THE NEW AND FUTURE CONVEYANCE PIPING WILL REQUIRE FROST PROTECTION.

SEQUENCING NOTES:
1. THE REMOVAL OF X-326-1 AND X-326-2 SUMPS IN THE OVERALL SEQUENCE OF DEMOLITION AND UTILITY REMOVAL SHALL BE DETERMINED BY THE COMPANY.
2. ISOLATE AND DRAIN EXISTING 8" CONVEYANCE WITH 12" CONTAINMENT PIPE.
3. PER DETAIL 3 ON DWG. X-326-C-34883, CUT AND CAP THE EXISTING 8" CONVEYANCE WITH 12" CONTAINMENT PIPE WEST OF THE X-326-2 TIE-IN LOCATION AND EAST OF THE X-333 CONVEYANCE TIE IN TO THE C-TRAIN INFLUENT.
4. FIELD ROUTE NEW 8" HDPE DR 11 PIPE TO THE FUTURE LOCATION OF THE MODULAR SEDIMENTATION TANK.
5. VISUALLY INSPECT CAPS.
6. TEST THE NEW 8" PIPING TO FUTURE SEDIMENTATION TANK USING HYDROSTATIC PRESSURE METHOD. SEE CONVEYANCE NOTES ON DWG. X-326-C-34887.



SECTION & DETAIL KEY

ARCADIS U.S., INC.
126 N. JEFFERSON STREET
SUITE 400
MILWAUKEE, WI 53202

REFERENCE DRAWINGS	OPEN CHANGES	REV	REVISION DESCRIPTION	DWN	ENG	DESIGN MANAGER	DATE
X-326-A-34859							
		d	REVISED 100 PERCENT DESIGN	AJA	RAW	S. B. MURPHY	02/29/24
		c	100 PERCENT DESIGN PACKAGE FOR FBP REVIEW	AJA	RAW	S. B. MURPHY	01/18/24
		b	90 PERCENT DESIGN PACKAGE FOR FBP REVIEW	AJA	RAW	S. B. MURPHY	09/15/23
		a	60 PERCENT DESIGN PACKAGE FOR FBP REVIEW	AJA	RAW	S. B. MURPHY	06/07/23

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CONTRACT DEAC3010CC40017
DRAWN BY A. J. AMAYA 2/29/2024
CHECKED BY K. DOUGLAS 2/29/2024
ENG/REVIEW R. A. WOLFORD 2/29/2024
DESIGN MANAGER S. B. MURPHY 2/29/2024
SCALE 1"= 1'

PORTSMOUTH GASEOUS DIFFUSION PLANT
D & D PROJECT

X-326 NORTHERN SLAB AREA
DEMOLITION AND UTILITY REMOVAL
X-326-1 AND X-326-2
CONVEYANCE DETAILS

FACILITY X-326
DRAWING NUMBER X-326-C-34883
REV d

AUTOCAD

X-326-C-34884
DRAWING NUMBER

GENERAL NOTES:

1. IT IS SOLELY THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE PROCEDURES AND SEQUENCE TO INSURE THE SAFETY OF THE WORK AND PERSONNEL DURING CONSTRUCTION.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH THE COMPANY'S CONSTRUCTION SUPERVISOR/CONSTRUCTION ENGINEER FOR RECOMMENDED RELOCATION, PROTECTION, AND CONTROLS.
3. PRECAUTIONS SHALL BE TAKEN TO PROTECT ALL UTILITIES, STRUCTURES, AND EASEMENTS PRESENT ON AND AROUND THE SITE UNLESS OTHERWISE NOTED ON THE PLANS.
4. THE COMPANY SHALL COORDINATE WITH THE UTILITIES FOR RECOMMENDED RELOCATION, PROTECTION, AND CONTROLS.
5. UTILITIES SHOWN ON DRAWINGS ARE FOR REFERENCE PURPOSES ONLY. EXACT FIELD LOCATION OF UTILITIES IS REQUIRED PRIOR TO CONSTRUCTION ACTIVITIES. REFER TO THE 5-UNIT (X-900) GROUNDWATER PLUME EXCAVATION UTILITY ISOLATION AND RE-ROUTE AS-BUILT PACKAGE FOR THE ASSUMED CURRENT CONDITION OF EXISTING UTILITIES AT THE TIME OF CONSTRUCTION. EXISTING SITE FEATURES NOT SPECIFICALLY SHOWN OR INDICATED ON THE DRAWINGS MAY REQUIRE REMOVAL BY CONTRACTOR TO ACCOMMODATE THE WORK. THE REMOVAL OF SUCH FEATURES SHALL NOT BE PERFORMED WITHOUT THE PRIOR APPROVAL OF THE COMPANY.
6. ALL SITE FEATURE LOCATIONS ARE APPROXIMATE LOCATIONS.
7. EXISTING SITE FEATURES WERE PROVIDED BY THE COMPANY TO ARCADIS ON AUGUST 16, 2017 AND OCTOBER 24, 2017 BY EXTERNAL MEDIA AND IN THE SURVEY DATA COLLECTED BY THE COMPANY AND PROVIDED TO ARCADIS ON SEPTEMBER 5, 2018.
8. THE EXISTING INDEX AND INTERMEDIATE CONTOUR LAYERS OUTSIDE OF THE WORK AREA WERE GENERATED FROM A LIDAR FLYOVER PERFORMED BY WOOLPERT INC. IN 2023 FOR THE COMPANY.
9. THE EXISTING CONTOUR (AND ALL ELEVATIONS SHOWN ON THIS PLAN SET) HORIZONTAL DATUM USED IS SPCS OHIO SOUTH NAD83 (HARN) IN UNITS OF SURVEY FEET AND THE VERTICAL DATUM USED IS NAVD88 (GEOID09) IN UNITS OF SURVEY FEET.
10. CONTRACTOR SHALL PROMPTLY, AFTER DISCOVERING, GIVE WRITTEN AND ORAL NOTICE TO THE COMPANY OF DELAYS IN PROJECT SCHEDULE DUE TO EQUIPMENT MALFUNCTION, WEATHER, FLOODING, OR GENERAL FAILURE TO MEET PRODUCTION STANDARDS.
11. THE CONTRACTOR WILL UTILIZE GOOD HOUSEKEEPING PRACTICES TO MAINTAIN A NEAT AND ORDERLY SITE AT ALL TIMES. REFUSE, DEBRIS AND WASTE MATERIALS WILL NOT UNDER ANY CIRCUMSTANCES BE PLACED WITHIN ANY AREA NOT IDENTIFIED FOR SUCH PURPOSE. ALL CONSTRUCTION REFUSE, DEBRIS AND WASTE MATERIALS WILL BE DISPOSED OF PROMPTLY AND PROPERLY.
12. ALL UTILITIES TO BE REMOVED MUST BE CONFIRMED TO BE ABANDONED AND ISOLATED BY THE COMPANY PRIOR TO CONSTRUCTION.
13. THE FOLLOWING LOAD LIMITS APPLY OVER THE EXISTING TUNNELS:

HEIGHT OF EARTH FILL OVER TUNNEL (FT)*	MAXIMUM VEHICLE WHEEL LOAD (POUNDS)	MAXIMUM EQUIPMENT TRACK LOAD (PSI)
0	5000	5.5
1	9000	13
2	13000	20
2.5	16000	20
2.5 – 5	16000	17

*TOP OF TUNNEL AT ELEVATION 669.4'±

14. PROJECT MANAGEMENT TO PERFORM WALK DOWN AFTER CONSTRUCTION IS COMPLETE FOR FINAL ACCEPTANCE/APPROVAL.

SAFETY NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY MEASURES AND PROGRAMS IN CONNECTION WITH THE PROJECT. CONTRACTOR IS RESPONSIBLE FOR THE HEALTH AND SAFETY OF ITS DIRECT EMPLOYEES, SUBCONTRACTORS VENDORS, SUPPLIERS, AND OTHER ON-SITE PARTIES UNDER CONTRACTOR'S DIRECTION.
2. CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE LAWS, ORDINANCES, RULES, REGULATIONS, AND ORDERS OF PUBLIC BODIES HAVING JURISDICTION FOR THE SAFETY OF PERSONS OR PROPERTY OR TO PROTECT THEM FROM DAMAGE, INJURY, OR LOSS, INCLUDING WITHOUT LIMITATION, THE DEPARTMENT OF LABOR SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION PROMULGATED UNDER THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 (PL 91-596) AND UNDER SECTION 107 OF THE CONTRACT WORK HOURS AND SAFETY STANDARDS ACT (PL 91-54) AND AMENDMENTS THERETO.
3. MATERIALS SUBJECT TO HANDLING DURING THE PROJECT MAY CONTAIN HAZARDOUS CONSTITUENTS OR CHEMICALS AND SHALL BE HANDLED IN ACCORDANCE WITH ALL APPLICABLE LAWS AND REGULATIONS.
4. CONTRACTOR SHALL DEVELOP AND IMPLEMENT APPROPRIATE HEALTH AND SAFETY MEASURES FOR ITS EMPLOYEES, SUBCONTRACTORS VENDORS, AND SITE VISITORS, AND FOR THE PROTECTION OF THE ENVIRONMENT AND SURROUNDING COMMUNITY. COMPANY'S HEALTH AND SAFETY PLAN SHALL BE DEVELOPED IN ACCORDANCE WITH ALL APPLICABLE THE COMPANY STANDARDS AND OSHA, FEDERAL, STATE AND LOCAL LAWS AND REGULATIONS, INCLUDING 29 CFR 1910.120 AND 29 CFR 1926.65.

SITE CONTROL NOTES:

1. CONTRACTOR SHALL PROVIDE AND MAINTAIN SITE SECURITY MEASURES TO PREVENT UNAUTHORIZED ENTRY OF PERSONS/VEHICLES INTO THE PROJECT WORK LIMITS DURING BOTH WORKING AND NON-WORKING HOURS (24 HOURS A DAY, SEVEN DAYS A WEEK).
2. CONTRACTOR SHALL COMPLY WITH ALL NOISE ORDINANCES AND MAKE EVERY EFFORT TO MINIMIZE NOISE CAUSED BY CONSTRUCTION OPERATIONS IN COMPLIANCE WITH LAWS AND REGULATIONS.
3. CONTRACTOR SHALL PROVIDE MEANS, METHODS, AND FACILITIES REQUIRED TO CONTROL ODORS, VAPORS, AND DUST GENERATED DURING THE WORK IN ACCORDANCE WITH ALL APPLICABLE LAWS, ORDINANCES, RULES, REGULATIONS AND STANDARDS BY THE COMPANY.
4. THE CONTRACTOR SHALL CLEAN ROADWAYS AS NECESSARY TO MINIMIZE DUST AND OFFSITE SEDIMENT TRANSPORT. ALL SOIL WASHED, DROPPED, SPILLED, OR TRACKED OUTSIDE THE LIMIT OF DISTURBANCE OR ONTO ROADWAYS WILL BE REMOVED IMMEDIATELY.
5. THE CONTRACTOR SHALL WET (INCLUDING BUT NOT LIMITED TO) CONSTRUCTION TRAFFIC ROUTES, ACCESS ROADS, CONSTRUCTION ENTRANCES, STAGING AREAS AND EXPOSED AREAS AS NECESSARY TO MAINTAIN DUST CONTROL.

EARTHWORK NOTES:

PART 1 – GENERAL

1.1 DESCRIPTION

A. SCOPE:
1. GENERAL EARTHWORK.
2. SITE PREPARATION
3. INSTALLATION OF CONSTRUCTION SAFETY FENCING,
4. EXCAVATION
5. DEWATERING
6. STOCKPILING
7. SUBGRADE PREPARATION
8. FILL PLACEMENT.
9. TEMPORARY SHEETING, SHORING AND BRACING

B. COORDINATION:
1. COORDINATION OF SURVEY REQUIREMENTS AS SPECIFIED IN THE SURVEYING NOTES.
2. COORDINATION OF EARTHWORK ACTIVITIES WITH CONTRACTOR'S EROSION AND SEDIMENT CONTROL (ESC) PLAN SPECIFIED IN THE SURFACE WATER MANAGEMENT AND EROSION CONTROL NOTES, SURFACE WATER MANAGEMENT AND EROSION CONTROL AND AS SHOWN ON THE DRAWINGS.

1.2 REFERENCES

A. CONTRACTOR SHALL USE THE MOST RECENT VERSION OF STANDARDS AND CODES, UNLESS NOTED OTHERWISE.

B. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA).

C. CONSTRUCTION AND MATERIAL SPECIFICATIONS, 2016 EDITION (OHIO C&MS). OHIO DEPARTMENT OF TRANSPORTATION (ODOT).

D. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM).
1. ASTM D698 –STANDARD TEST METHODS FOR LABORATORY COMPACTION CHARACTERISTICS OF SOIL USING STANDARD EFFORT (12 400 FT-LBF/FT3 (600 KN-M/M3))
2. ASTM D2487 – STANDARD PRACTICE FOR CLASSIFICATION OF SOILS FOR ENGINEERING PURPOSES (UNIFIED SOIL CLASSIFICATION SYSTEM)
3. ASTM D4318 – STANDARD TEST METHODS FOR LIQUID LIMIT, PLASTIC LIMIT, AND PLASTICITY INDEX OF SOILS
4. ASTM D6913/D6913M – STANDARD TEST METHODS FOR PARTICLE-SIZE DISTRIBUTION (GRADATION) OF SOILS USING SIEVE ANALYSIS
5. ASTM D6938 – STANDARD TEST METHODS FOR IN-PLACE DENSITY AND WATER CONTENT OF SOIL AND SOIL-AGGREGATE BY NUCLEAR METHODS (SHALLOW DEPTH)
6. ASTM D7928 – STANDARD TEST METHOD FOR PARTICLE-SIZE DISTRIBUTION (GRADATION) OF FINE-GRAINED SOILS USING THE SEDIMENTATION (HYDROMETER) ANALYSIS

E. RAINWATER AND LAND DEVELOPMENT, OHIO'S STANDARDS FOR STORM WATER MANAGEMENT LAND DEVELOPMENT AND URBAN STREAM PROTECTION, THIRD EDITION 2006 UPDATED TO INCLUDE ALL NEW MATERIALS, CHANGES, AND CORRECTIONS AS OF 11-6-14 (ODNR STANDARDS). OHIO DEPARTMENT OF NATURAL RESOURCES DIVISION OF SOIL AND WATER CONSERVATION.

F. AUTHORIZATION FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY UNDER THE NPDES. OHIO ENVIRONMENTAL PROTECTION AGENCY (OHIO EPA) 2023. OHIO EPA PERMIT NO. OHC000006 (GENERAL PERMIT).

1.3 SUBMITTALS

A. ACTION SUBMITTALS: SUBMIT THE FOLLOWING:
1. SCHEDULE FOR ACTIVITIES INCLUDED IN EACH SCOPE OF WORK, WITH EQUIPMENT AND RESOURCES IDENTIFIED.
2. LAYOUT OF CONSTRUCTION SITE ACCESS AND TEMPORARY ACCESS ROADS AND HAUL ROADS, CONSTRUCTION SAFETY FENCE, CHAIN-LINK FENCE AND GATES, RADIOLOGICAL CONTROL FENCE, AND TEMPORARY PIPES, IF REQUIRED.
3. PRODUCT DATA:
a. SUBMIT GRADATION ANALYSES AND A PROCTOR TEST REPORTS FOR STRUCTURAL FILL MATERIALS.

B. INFORMATIONAL SUBMITTALS: SUBMIT THE FOLLOWING:
1. VERIFICATION, ACKNOWLEDGEMENT, AND ACCEPTANCE OF THE EXISTING CONDITIONS AND MATERIAL STOCKPILES.
2. EXCAVATION AND DEWATERING MEANS, METHODS, AND TECHNIQUES.
3. EROSION AND SEDIMENTATION CONTROL PLAN, INCLUDING SURFACE WATER MANAGEMENT AND EROSION AND SEDIMENT CONTROL, STOCKPILING BY TYPE OF MATERIAL, STOCKPILE MAINTENANCE, STOCKPILE REMOVAL AND RELOCATION, AND SITE GRADING AND STABILIZATION.
4. INTENDED USE OF CONSTRUCTION LAYDOWN AREA(S) AND ADDITIONAL CONSTRUCTION LAYDOWN AREAS NOT IDENTIFIED ON THE DRAWINGS.
5. MEANS, METHODS, AND TECHNIQUES FOR MATERIAL HANDLING, INCLUDING REMOVAL OF UNSUITABLE SUBGRADE AND VISIBLE ROCK PARTICLES LARGER THAN SPECIFIED, AND FOR FILL, SHALE AND ROCK FILL SPECIFIED IN THIS SECTION.
6. MEANS, METHODS, AND TECHNIQUES FOR INSTALLATION AND REMOVAL OF EXCAVATION AND TRENCH SUPPORTS.
7. MEANS, METHODS, AND TECHNIQUES FOR DUST CONTROL.
8. PLAN AND MEASURES FOR HOT WEATHER WORK AND COLD WEATHER WORK ACTIVITIES AT TEMPERATURES BELOW 32 DEGREES FAHRENHEIT (°F).

1.4 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. PACKING, SHIPPING, HANDLING AND UNLOADING:
1. DELIVER MATERIALS TO THE SITE TO ENSURE UNINTERRUPTED PROGRESS OF THE WORK.

B. STORAGE AND PROTECTION:
1. STORE MATERIALS TO PERMIT EASY ACCESS FOR INSPECTION AND IDENTIFICATION.

C. ACCEPTANCE AT SITE:
1. ALL BOXES, CRATES AND PACKAGES SHALL BE INSPECTED BY CONTRACTOR UPON DELIVERY TO THE SITE.

PART 2 – PRODUCTS

2.1 MATERIALS

A. GENERAL FILL:
1. CL, CL-ML, CH, OR CH-MH MATERIAL IN ACCORDANCE WITH UNIFIED SOIL CLASSIFICATION SYSTEM (USCS) (PER ASTM D2487).

B. STRUCTURAL FILL:
1. TYPE GW, GP, GC, SW, SP, OR SC MATERIAL IN ACCORDANCE WITH USCS.

C. OBTAIN FILL MATERIALS FROM EXCAVATION AND TRENCHING INCLUDED IN THIS CONTRACT. ADDITIONAL MATERIAL, IF REQUIRED, SHALL BE OBTAINED FROM THE ON-SITE STOCKPILES OR ON-SITE BORROW AREAS IDENTIFIED BY THE COMPANY.

D. FILL MATERIALS OBTAINED ON-SITE MAY INCLUDE THREE TYPES OF MATERIALS; RESIDUUM MATERIAL (HEREINAFTER CALLED CLAY), WEATHERED CUYAHOGA FORMATION (HEREINAFTER CALLED WEATHERED SHALE), AND CUYAHOGA FORMATION (HEREINAFTER CALLED UNWEATHERED SHALE).

E. FILL AND BACKFILL MATERIALS SHALL BE FREE OF DEBRIS, FOREIGN OBJECTS, LARGE ROCK FRAGMENTS, ORGANICS, AND DELETERIOUS MATERIALS. VISIBLE ROCK PARTICLES SHALL BE A MAXIMUM DIMENSION OF HALF THE LOOSE LIFT THICKNESS. MATERIAL FOR FILL SHALL CONFORM TO THE REQUIREMENTS LISTED IN THIS SECTION. MATERIALS WITH OTHER USCS CLASSIFICATIONS MAY BE USED UPON APPROVAL OF THE COMPANY.

F. RESIDUUM AND WEATHERED SHALE MATERIALS OBTAINED FROM ON-SITE EXCAVATIONS SHALL BE CONSIDERED NONDURABLE AND MAY BE PLACED AS FILL OR BACKFILL AS SPECIFIED IN THIS SECTION AND THE TRENCH EXCAVATION AND BACKFILL NOTES.

G. OBTAIN WATER FOR MOISTURE CONDITIONING FILL AND FOR DUST CONTROL FROM THE ON SITE WATER FILLING STATIONS SHOWN ON THE DRAWINGS.

H. FURNISH ORANGE HDPE CONSTRUCTION SAFETY FENCE, 4 FEET IN HEIGHT, OPENING SIZE APPROXIMATELY 4 INCHES X 1 INCH, MINIMUM TENSILE STRENGTH OF 300 POUNDS PER FOOT OF WIDTH; OR FENCE OF GALVANIZED STEEL WELDED WIRE FABRIC AS SPECIFIED IN THIS SECTION AND/OR SHOWN ON THE DRAWINGS. POSTS SHALL BE T-SHAPED (T-POST), 1½ INCH X 1½ INCH, MINIMUM 3/16 INCH THICK X 5 FEET LONG, AND MADE OF STEEL, OR AS OTHERWISE AUTHORIZED BY THE COMPANY. PROTECTIVE CAPS SHALL BE PLACED ON THE TOPS OF ALL T POSTS. TO DELINEATE RADIOLOGICAL CONTROL AREAS, INSTALL POSTS, SIGNAGE, AND PROVIDE AND INSTALL YELLOW/MAGENTA ROPE.

I. FURNISH SIGNS FOR CONSTRUCTION SAFETY FENCE IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

J. SIGNS FOR RADIOLOGICAL CONTROL FENCE WILL BE PROVIDED BY THE COMPANY AS SPECIFIED IN THE CONTRACT DOCUMENTS.

2.2 TEMPORARY SHEETING, SHORING AND BRACING

A. THE TYPE OF SHEETING USED, DESIGN, AND METHOD OF INSTALLATION, INCLUDING EMBEDMENT AND BRACING, SHALL BE DETERMINED BY CONTRACTOR AS REQUIRED BY THE CONTRACT DOCUMENTS.

2.3 EQUIPMENT

A. FURNISH EQUIPMENT TO PERFORM EARTHWORK IN ACCORDANCE WITH THIS SECTION.

B. FURNISH HAND COMPACTION EQUIPMENT, SUCH AS WALK-BEHIND PAD-FOOT COMPACTORS, HAND TAMPERS, OR VIBRATORY PLATE COMPACTORS, FOR COMPACTION IN AREAS INACCESSIBLE TO LARGE COMPACTION EQUIPMENT.

C. FURNISH WATER TANK TRUCKS OR WATER WAGONS, WATER STORAGE TANKS, PRESSURE DISTRIBUTORS, OR OTHER EQUIPMENT DESIGNED TO APPLY WATER UNIFORMLY AND IN CONTROLLED QUANTITIES AT VARIABLE SURFACE WIDTHS IN ORDER TO PROVIDE THE REQUIRED IN-PLACE MOISTURE CONTENT AND TO PREVENT DRYING OF SOIL SURFACES IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

PART 3 – EXECUTION

3.1 EXISTING CONDITIONS

A. VERIFY EXISTING GRADES IN ACCORDANCE WITH THE SURVEYING NOTES.

B. PRIOR TO PERFORMING WORK DESCRIBED IN THIS SECTION, INSTALL AND MAINTAIN SURFACE WATER MANAGEMENT AND EROSION AND SEDIMENT CONTROLS IN ACCORDANCE WITH THE SURFACE WATER MANAGEMENT AND EROSION CONTROL NOTES.

C. PERFORM CONSTRUCTION ACTIVITIES IN SUCH A MANNER THAT EQUIPMENT OPERATING IN RADIOLOGICAL CONTROL AREAS DOES NOT OPERATE OUTSIDE OF RADIOLOGICAL CONTROL AREAS. EQUIPMENT OPERATING IN RADIOLOGICAL CONTROL AREAS SHALL BE DECONTAMINATED BY THE CONTRACTOR, RADIOLOGICALLY SURVEYED, AND RELEASED BY THE COMPANY PRIOR TO EXITING RADIOLOGICAL CONTROL AREAS FOR USE IN OTHER AREAS.

D. IF A VERTEBRATE PALEONTOLOGICAL OR ARCHAEOLOGICAL ARTIFACT DISCOVERY IS MADE DURING EXCAVATION, STOP WORK IN THE AREA OF DISCOVERY AND NOTIFY THE COMPANY. WORK IN THE AREA OF DISCOVERY SHALL NOT RESUME UNTIL AUTHORIZED BY THE COMPANY.

E. MANAGE MATERIAL STOCKPILES AS SPECIFIED IN THIS SECTION.

F. IMPLEMENT DUST CONTROL.

3.2 SITE PREPARATION

A. INSTALL CONSTRUCTION SAFETY FENCE, RADIOLOGICAL CONTROL FENCE, AND ASSOCIATED SIGNS AT CONSTRUCTION LIMITS AND LIMITS OF THE RADIOLOGICAL CONTROL AREAS IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. RELOCATE CONSTRUCTION SAFETY FENCE AND RADIOLOGICAL CONTROL FENCE AS REQUIRED TO SUPPORT CONSTRUCTION ACTIVITIES. INSTALL SIGNS AND BARRICADES AROUND TRENCHES, AND EXCAVATED AREAS IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

B. MAINTAIN AND REPAIR CONSTRUCTION SAFETY FENCE, RADIOLOGICAL CONTROL FENCE, AND CHAIN-LINK FENCE AND GATES FOR THE DURATION OF THE CONTRACT WORK. MAINTAIN FENCING TO MINIMIZE VERTICAL SAGGING.

C. PRIOR TO EARTHWORK ACTIVITIES, PERFORM CLEARING, GRUBBING, AND STRIPPING AS NECESSARY.

D. CONSTRUCT THE ACCESS CORRIDORS, PARKING, AND OTHER VEHICLE TRAVEL AREAS IN ACCORDANCE WITH THE DRAWINGS AND THE AGGREGATE BASE NOTES. MAINTAIN AND REPAIR THESE AREAS FOR THE DURATION OF THE CONTRACT.

E. FOR EXCAVATIONS WITHIN 3 FEET OF EXISTING SUBSURFACE STRUCTURES OR UTILITIES TO BE PROTECTED, HAND-EXCAVATE WHERE NECESSARY AND USE SHORING OR OTHER MEANS, METHODS, AND TECHNIQUES. PROTECT STRUCTURES AND UTILITIES DURING EARTHWORK ACTIVITIES AS SHOWN ON THE DRAWINGS AND AS APPROVED BY THE COMPANY.

3.3 EXCAVATION

A. DO NOT REMOVE SOIL FROM THE SITE OR DISPOSE OF SOIL EXCEPT AS AUTHORIZED BY THE COMPANY.

B. STABILIZE DISTURBED AREAS IN ACCORDANCE WITH THE SURFACE WATER MANAGEMENT AND EROSION CONTROL NOTES OR BY PLACING 6" OF AASHTO #57 AGGREGATE OVER BARE SOILS, AS DIRECTED BY THE COMPANY.

C. EXCAVATION FOR TRENCHES IS ADDRESSED IN THE TRENCH EXCAVATION AND BACKFILL NOTES.

3.4 EXCAVATION DEWATERING

A. MANAGE GROUNDWATER AND SURFACE WATER RUNOFF AND RUN-ON IN EXCAVATIONS AND TRENCHES IN ACCORDANCE WITH THE REQUIREMENTS OF THIS SECTION AND THE SURFACE WATER MANAGEMENT AND EROSION CONTROL NOTES.

B. COLLECT WATER THAT ACCUMULATES IN THE SUB-SLAB EXCAVATION IN A SUITABLE SUMP, AND PUMP TO THE X-622-1 AND X-622-2 SUMPS.

C. VERIFY THAT COLLECTED WATER DOES NOT HAVE AN OIL SHEEN PRIOR TO PUMPING. IF SHEEN IS PRESENT, NOTIFY THE COMPANY PRIOR TO PUMPING. IF THE COMPANY DETERMINES THAT OIL IS PRESENT, COLLECT SHEEN WITH ADSORBENT CLOTH OR OTHER MEANS, METHODS, AND TECHNIQUES AS REQUIRED BY THE CONTRACT DOCUMENTS.

D. PREVENT SURFACE WATER RUN-ON FROM ADJACENT AREAS FROM ENTERING EXCAVATIONS AND TRENCHES BY INSTALLING TEMPORARY DIVERSION BERMS OR OTHER SURFACE WATER MANAGEMENT FEATURES IN ACCORDANCE WITH THE SURFACE WATER MANAGEMENT AND EROSION CONTROL NOTES.

3.5 STOCKPILING

A. STOCKPILE MATERIALS FROM CLEARING, GRUBBING, STRIPPING, EXCAVATION, AND TRENCHING ACTIVITIES IN SEPARATE STOCKPILES. DELETERIOUS MATERIALS AND UNSUITABLE SOIL FROM THE ABOVE MENTIONED ACTIVITIES SHALL ALSO BE PLACED IN SEPARATE STOCKPILES. STOCKPILE LOCATIONS SHALL BE WITHIN THE LIMITS OF SILT FENCE AS SHOWN ON DRAWING X-326-C-34880 AND AS DESIGNATED BY THE COMPANY.

B. STOCKPILE OTHER MATERIALS INCLUDING TOPSOIL FROM OFF-SITE SOURCES AT ON-SITE LOCATIONS DESIGNATED BY THE COMPANY. MAINTAIN MATERIAL STOCKPILES IN ACCORDANCE WITH THIS SECTION.

C. PLACE EXCAVATED SOIL IN STOCKPILES WITH STABLE SLOPES. GRADE STOCKPILES TO DRAIN, SEAL THEM BY TRACKING PERPENDICULAR TO THE SLOPE CONTOURS, AND MAINTAIN THEM ON A DAILY BASIS DURING PERIODS WHEN MATERIAL IS TAKEN FROM OR ADDED TO THE STOCKPILES.

D. ENCAPSULATE STOCKPILES WITH APPROVED CRUSTING AGENT OR STABILIZE STOCKPILES IN ACCORDANCE WITH TEMPORARY OR PERMANENT SEEDING AND APPLY MULCH WITHIN TIME FRAMES IDENTIFIED IN THE CONTRACT DOCUMENTS AND UNDER APPLICATION CONDITIONS AS DESCRIBED IN THE ODNR STANDARDS.

3.6 SUBGRADE

A. SUBGRADE SHALL BE FREE OF DEBRIS, FOREIGN OBJECTS, ORGANICS, AND OTHER DELETERIOUS MATERIALS.

B. SUBGRADE FOR ROADS AND CHANNELS IN FILL SECTIONS SHALL BE PLACED AND COMPACTED IN ACCORDANCE WITH THE REQUIREMENTS IN THIS SECTION FOR FILL.

C. IN EXCAVATIONS OR OTHER AREAS WHERE WATER ACCUMULATES, IMPLEMENT MEASURES TO REMOVE THE WATER IN ACCORDANCE WITH THIS SECTION. MAINTAIN THE SUBGRADE FREE OF STANDING WATER AND IN A FIRM CONDITION, WHICH CONFORMS TO THE REQUIREMENTS OF THIS SECTION. MAINTAIN DEWATERED AREAS IN THIS CONDITION UNTIL OVERLYING CONSTRUCTION IS COMPLETE.

3.7 FILL

A. PLACE FILL MATERIAL THAT CONFORMS TO THE MATERIAL REQUIREMENTS OF THIS SECTION. PLACE FILL MATERIAL TO THE LIMITS AND ELEVATIONS SHOWN ON THE DRAWINGS.

B. PLACE FILL MATERIAL ON SURFACES THAT ARE FREE OF DEBRIS, BRANCHES, VEGETATION, MUD, ICE, AND OTHER DELETERIOUS MATERIALS.

C. PLACE FILL MATERIAL IN LOOSE LIFTS WITH A MAXIMUM THICKNESS OF 12 INCHES.

D. CONTINUOUSLY REMOVE VISIBLE ROCK PARTICLES WITH A MAXIMUM DIMENSION LARGER THAN HALF OF THE LOOSE LIFT THICKNESS.

E. PLACE FILL IN HORIZONTAL LIFTS, BENCHING INTO EMBANKMENTS FOR THE FULL LIFT DEPTH.

F. PRIOR TO PLACING A LIFT OF FILL MATERIAL OVER A PREVIOUSLY COMPACTED LIFT, THOROUGHLY SCARIFY THE PREVIOUS LIFT TO A DEPTH OF APPROXIMATELY 2 INCHES BY DISCING, RAKING, OR TRACKING. MOISTURE CONDITION THE PRECEDING LIFT IN ACCORDANCE WITH THIS SECTION IF ITS SURFACE MOISTURE CONTENT IS NOT WITHIN THE RANGE OF ACCEPTABLE MOISTURE CONTENTS SPECIFIED IN THIS SECTION.

G. THE TRAFFICKING OF SCARIFIED SURFACES BY TRUCKS OR OTHER EQUIPMENT, EXCEPT COMPACTION EQUIPMENT AND WATER TRUCKS WHEN NECESSARY, IS NOT PERMITTED.

H. THE MAXIMUM ACCEPTABLE SOIL DRY CLOD SIZE SHALL BE 3 INCHES OR HALF THE THICKNESS OF THE LIFT, WHICHEVER IS LESS. REDUCE CLOD SIZE BY DISCING, RAKING, TRACKING, USING A SOIL STABILIZER, OR OTHER MEANS, METHODS, AND TECHNIQUES.

I. COMPACT GENERAL FILL MATERIAL IN EACH LIFT TO AT LEAST 95 PERCENT OF ITS STANDARD PROCTOR MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D698. IN AREAS UNDER ROADS, COMPACT THE UPPERMOST LIFT OF FILL MATERIAL TO AT LEAST 98 PERCENT OF ITS STANDARD PROCTOR MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D698. COMPACT FILL MATERIAL AT A MOISTURE CONTENT WITHIN ±4 PERCENTAGE POINTS OF THE STANDARD PROCTOR OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM D698.

J. MOISTURE CONDITION THE FILL MATERIAL TO ACHIEVE THE COMPACTION REQUIREMENTS SPECIFIED IN THIS SECTION. DURING WETTING OR DRYING, REGULARLY DISC, RAKE, OR OTHERWISE MIX THE MATERIAL TO THOROUGHLY BLEND THE MOISTURE THROUGHOUT THE LIFT.

K. DO NOT PLACE FILL ON A FROZEN SURFACE, OR PLACE FROZEN FILL. IF FILL PLACEMENT IS NECESSARY IN AREAS WITH FROZEN SURFACES, REMOVE FROZEN MATERIAL PRIOR TO PLACING SUBSEQUENT FILL LIFTS.

L. DO NOT COMPACT FILL MATERIAL AT TEMPERATURES BELOW 32°F UNLESS AUTHORIZED BY THE COMPANY.

M. DO NOT PLACE FILL DURING PERIODS OF SIGNIFICANT PRECIPITATION UNLESS AUTHORIZED BY THE COMPANY.

N. REMOVE, REWORK, OR REPLACE FILL THAT DOES NOT CONFORM TO COMPACTION REQUIREMENTS.

3.8 FIELD QUALITY CONTROL/ACCEPTANCE CRITERIA

A. CONTRACTOR WILL MONITOR MATERIAL STOCKPILES FOR NON-COMPLIANT MATERIALS.

B. CONSTRUCTION QUALITY CONTROL (CQC) SHALL BE PERFORMED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

C. CONTRACTOR SHALL COORDINATE CONSTRUCTION ACTIVITIES THROUGH THE COMPANY TO ACCOMMODATE THE ACTIVITIES REQUIRED OF THE CQC CONTRACTOR.

D. CONTRACTOR SHALL NOTIFY THE COMPANY AT LEAST 7 CALENDAR DAYS PRIOR TO COMMENCEMENT OF EARTHWORK ACTIVITIES IN NEW LOCATIONS.

E. THE CQC CONTRACTOR WILL PERFORM CONFORMANCE TESTING ON MATERIALS TO CONFIRM COMPLIANCE WITH THIS SECTION. CONTRACTOR SHALL PROVIDE EQUIPMENT, SUCH AS SHOVELS, HAND AUGERS, AND BACKHOES, AND LABOR TO OBTAIN CONFORMANCE SAMPLES FROM EXCAVATIONS, STOCKPILES, AND BORROW AREAS. CONFORMANCE TESTING SHALL INCLUDE STANDARD PROCTOR (ASTM D698), PARTICLE SIZE DISTRIBUTION (ASTM D6913 OR D7928), ATTERBERG LIMITS (ASTM D4318) AND USCS CLASSIFICATION (ASTM D2487) AT A MINIMUM FREQUENCY OF ONE TEST PER 10,000 CY OF MATERIAL, BASED ON IN-PLACE COMPACTED VOLUME. A MINIMUM OF 3 PROCTOR TESTS SHALL BE PERFORMED FOR EACH MATERIAL.

F. THE CQC CONTRACTOR WILL OBSERVE AND DOCUMENT PROOF ROLLING OF THE SUBGRADE FOR MASS FILL AREAS, AND INSPECTION OF THE EXCAVATED SUBGRADE UNDER FOUNDATIONS, SLABS ON GRADES AND SITE STRUCTURES. PROOF ROLLING DOCUMENTATION PROVIDED TO THE COMPANY WILL INCLUDE DESCRIPTION OF AREAS THAT PASS PROOF ROLLING AND AREAS THAT FAIL PROOF ROLLING; FOR AREAS THAT FAIL PROOF ROLLING, CONTRACTOR WILL OBSERVE AND DOCUMENT THE CONTRACTOR'S METHOD OF REPAIR FOR THE AREA.

G. THE CQC CONTRACTOR WILL PERFORM PERFORMANCE TESTING ON GENERAL FILL TO CONFIRM COMPLIANCE WITH THIS SECTION. COMPACTION TESTING (ASTM D6938) SHALL BE PERFORMED AT A MINIMUM FREQUENCY OF 1 TEST PER ACRE PER LIFT FOR AREA FILLS, 1 TEST PER 2,500 SF OF LIFT AREA WITHIN THE FOOT PRINT OF FOUNDATIONS, SLABS ON GRADE OR SITE STRUCTURES, AND AT LEAST 1 TEST PER 250 LINEAR FEET ALONG LINEAR FEATURES SUCH AS ROADS, BERMS AND TRENCHES.

H. IF THE CQC CONTRACTOR TESTS INDICATE THAT ANY PORTION OF THE FILL OR SUBGRADE DO NOT CONFORM TO THE REQUIREMENTS OF THIS SECTION, THE CONTRACTOR WILL DELINEATE THE EXTENT OF THE NON-CONFORMING AREA. CONTRACTOR SHALL REWORK THE NONCONFORMING AREA UNTIL IT CONFORMS TO THE REQUIREMENTS OF THIS SECTION.

I. BASIS OF ACCEPTANCE: THE COMPANY WILL APPROVE THE WORK WHEN THE CONTRACTOR HAS THOROUGHLY DEMONSTRATED THAT THE WORK IS COMPLETE AND SATISFACTORY TO THE COMPANY

3.9 TOLERANCES:

A. PERFORM THE EARTHWORK CONSTRUCTION TO WITHIN ±0.1 FEET OF THE ELEVATIONS SHOWN ON THE DRAWINGS.

3.10 SURVEY CONTROL

A. SURVEY THE LOCATIONS, LIMITS, AND ELEVATIONS OF EXCAVATIONS, STOCKPILES, PREPARED SUBGRADE, AND FILL IN ACCORDANCE WITH THE SURVEYING NOTES.

TRENCH EXCAVATION AND BACKFILL NOTES:

PART 1 – GENERAL

1.1 DESCRIPTION

A. SCOPE:
1. WORK IN THIS SECTION INCLUDES TRENCHING AND BACKFILLING AND PLACEMENT OF PIPE AND MANHOLE EMBEDMENT FILL.

1.2 REFERENCES

A. CONTRACTOR SHALL USE THE MOST RECENT VERSION OF STANDARDS AND CODES, UNLESS NOTED OTHERWISE.

B. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA).

C. CONSTRUCTION AND MATERIAL SPECIFICATIONS, 2016 EDITION (OHIO C&MS), OHIO DEPARTMENT OF TRANSPORTATION (ODOT).

D. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM).
1. ASTM D698 –STANDARD TEST METHODS FOR LABORATORY COMPACTION CHARACTERISTICS OF SOIL USING STANDARD EFFORT (12 400 FT-LBF/FT3 (600 KN-M/M3)).
2. ASTM D2487 – STANDARD PRACTICE FOR CLASSIFICATION OF SOILS FOR ENGINEERING PURPOSES (UNIFIED SOIL CLASSIFICATION SYSTEM).
3. ASTM D6913 – STANDARD TEST METHODS FOR PARTICLE-SIZE DISTRIBUTION (GRADATION) OF SOILS USING SIEVE ANALYSIS
4. ASTM D6938 – STANDARD TEST METHODS FOR IN-PLACE DENSITY AND WATER CONTENT OF SOIL AND SOIL-AGGREGATE BY NUCLEAR METHODS (SHALLOW DEPTH)
5. ASTM D7928 – STANDARD TEST METHOD FOR PARTICLE-SIZE DISTRIBUTION (GRADATION) OF FINE-GRAINED SOILS USING THE SEDIMENTATION (HYDROMETER) ANALYSIS

1.3 SUBMITTALS

A. ACTION SUBMITTALS: SUBMIT THE FOLLOWING:
1. PRODUCT DATA:
a. A CATALOGUE CUT SHEET FOR MARKER TAPE.
b. FOR EACH SOURCE OF PIPE AND MANHOLE EMBEDMENT FILL MATERIALS, SUBMIT THE FOLLOWING TO THE COMPANY AT LEAST 14 CALENDAR DAYS PRIOR TO USE:
1) SOURCE OF THE PIPE AND MANHOLE EMBEDMENT FILL MATERIALS.
2) WRITTEN CERTIFICATION FROM THE MANUFACTURER OR SUPPLIER THAT MATERIALS CONFORM TO THE REQUIREMENTS OF THIS SECTION.
3) RESULTS OF TESTING PERFORMED BY THE MANUFACTURER OR SUPPLIER THAT CONFIRM THAT MATERIALS CONFORM TO THE REQUIREMENTS OF THIS SECTION.
4) A 50 POUND REPRESENTATIVE SAMPLE OF THE MATERIAL FROM EACH SOURCE OF MANHOLE AND EMBEDMENT FILL MATERIAL FOR VISUAL EXAMINATION AND CONFORMANCE TESTING.
c. ALTERNATIVE METHODS FOR PIPE INSTALLATION MAY BE CONSIDERED BY THE CONTRACTOR, SUBJECT TO REVIEW AND APPROVAL BY THE COMPANY (INCLUDING DIRECTIONAL DRILLING). FOR ALTERNATIVE METHODS TO BE CONSIDERED A LIST OF EQUIPMENT AND MATERIALS; DESCRIPTION OF CONSTRUCTION MEANS, METHODS, AND TECHNIQUES; AND OTHER DETAILED INFORMATION NECESSARY TO FULLY DESCRIBE THE NEW ALTERNATIVE METHOD(S).

B. INFORMATIONAL SUBMITTALS: SUBMIT THE FOLLOWING:
1. CERTIFICATIONS:
a. TRENCH SHORING AND WALKWAY DESIGN SHALL BE CERTIFIED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF OHIO.
2. QUALITY CONTROL:
a. LIST OF EQUIPMENT AND MATERIALS; DESCRIPTION OF CONSTRUCTION MEANS, METHODS, AND TECHNIQUES; AND OTHER REQUIRED INFORMATION FOR TRENCHING AND BACKFILLING AND PLACEMENT OF PIPE AND MANHOLE EMBEDMENT FILL.

PART 2 – PRODUCTS

2.1 MATERIALS

A. OBTAIN BACKFILL MATERIAL FROM EXCAVATION AND TRENCHING INCLUDED IN THIS CONTRACT. ADDITIONAL MATERIAL, IF REQUIRED, SHALL BE OBTAINED FROM THE ON SITE STOCKPILES OR ON-SITE BORROW AREAS IDENTIFIED BY THE COMPANY.

B. FURNISH NATURAL SAND OR SAND MANUFACTURED FROM STONE FOR PIPE EMBEDMENT FILL MATERIAL. THE PIPE EMBEDMENT FILL MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF OHIO C&MS ITEM 703.11 FOR TYPE 2 STRUCTURAL BACKFILL WITH THE PARTICLE SIZE REQUIREMENTS OF OHIO C&MS ITEM 703.02.A FOR FINE AGGREGATE.

C. PRIOR TO USE, VERIFY WITH THE COMPANY THAT BACKFILL MATERIALS CONFORM TO THE REQUIREMENTS FOR THEIR INTENDED USE.

D. BACKFILL MATERIAL FOR PIPES; ELECTRICAL CONDUIT; AND VALVE HOUSES AND STRUCTURES SHALL CONFORM TO THE MATERIAL REQUIREMENTS FOR FILL SPECIFIED IN THE EARTHWORK NOTES.

E. FURNISH TRENCH SHORING AND WALKWAY MATERIALS, WHERE REQUIRED, IN ACCORDANCE WITH THE CERTIFIED TRENCH SHORING AND WALKWAY DESIGN.

F. OBTAIN CONSTRUCTION WATER FOR MOISTURE CONDITIONING BACKFILL FROM THE ON SITE WATER FILLING STATIONS.

2.2 EQUIPMENT

A. FURNISH EQUIPMENT TO PERFORM TRENCHING AND BACKFILLING AND PIPE AND MANHOLE EMBEDMENT FILL MATERIAL PLACEMENT IN ACCORDANCE WITH THIS SECTION.

PART 3 – EXECUTION

3.1 EXISTING CONDITIONS

A. VERIFY EXISTING GRADES IN ACCORDANCE WITH THE SURVEYING NOTES.

B. IF A VERTEBRATE PALEONTOLOGICAL OR ARCHAEOLOGICAL ARTIFACT DISCOVERY IS MADE DURING TRENCHING, STOP WORK IN THE AREA OF DISCOVERY AND NOTIFY THE COMPANY. WORK IN THE AREA OF DISCOVERY SHALL NOT RESUME UNTIL AUTHORIZED BY THE COMPANY.

C. IDENTIFY AND STAKE EXISTING ABOVE AND BELOW GROUND UTILITIES IN VICINITY OF TRENCHING. STAKING AND/OR MARKING SHALL BE IN ACCORDANCE WITH THE SURVEYING NOTES AND AS APPROVED BY THE COMPANY.

D. PROTECT EXISTING ABOVE AND BELOW GROUND UTILITIES.

E. IN AREAS OF TRENCHING AND BACKFILLING, DO NOT INTERRUPT THE EXISTING UTILITY SERVICE UNLESS AUTHORIZED BY THE COMPANY.

F. DO NOT DAMAGE OR DISTURB PERMANENT SURVEY MONUMENTS, FINISHED CONSTRUCTION AREAS AND STRUCTURES, EXISTING UTILITIES AND STRUCTURES. DAMAGE SHALL BE REPAIRED OR REPLACED TO THE ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE.

G. PERFORM CLEARING, GRUBBING AND STRIPPING IN ACCORDANCE WITH THE CLEARING, GRUBBING, AND STRIPPING NOTES.

H. PRIOR TO PERFORMING WORK DESCRIBED IN THIS SECTION, INSTALL AND MAINTAIN SURFACE WATER MANAGEMENT AND EROSION AND SEDIMENT CONTROLS IN ACCORDANCE WITH THE SURFACE WATER MANAGEMENT AND EROSION CONTROL NOTES.

I. INSTALL CONSTRUCTION SAFETY FENCE IN ACCORDANCE WITH THE EARTHWORK NOTES.

J. STABILIZE DISTURBED AREAS IN ACCORDANCE WITH THE SURFACE WATER MANAGEMENT AND EROSION CONTROL NOTES OR BY PLACING 6" OF AASHTO #57 AGGREGATE OVER BARE SOILS, AS DIRECTED BY THE COMPANY.

K. IMPLEMENT DUST CONTROL.

3.2 TRENCHING

A. TRENCHES FOR INSTALLATION OF PIPES, AND OTHER STRUCTURES SHALL BE TO THE DEPTHS, ELEVATIONS, AND DIMENSIONS SHOWN ON THE DRAWINGS. STOCKPILE EXCESS MATERIAL FROM TRENCHING AT LOCATIONS DESIGNATED BY THE COMPANY. STOCKPILE MATERIALS IN ACCORDANCE WITH THE EARTHWORK NOTES.

B. USE SHORING METHODS ACCEPTED BY THE COMPANY. SHORING SHALL CONFORM TO APPLICABLE LOCAL, STATE, AND FEDERAL REQUIREMENTS, INCLUDING REQUIREMENTS OF ATTACHMENT J-13, AND SHALL BE INSTALLED IN ACCORDANCE WITH THE SHORING AND WALKWAY DESIGN CERTIFIED BY THE OHIO-REGISTERED PROFESSIONAL ENGINEER. PROVIDE APPROPRIATE NON-SKID SURFACE WALKWAYS FOR ACCESS ACROSS OPEN TRENCHES, SUCH AS CONSTRUCTED WOODEN WALKWAYS, CONFORMING TO THE REQUIREMENTS OF ATTACHMENT J-13 AND INSTALLED IN ACCORDANCE WITH THE DESIGN CERTIFIED BY THE OHIO-REGISTERED PROFESSIONAL ENGINEER. STORE SHORING AND WALKWAY MATERIALS ON-SITE PRIOR TO BEGINNING TRENCHING ACTIVITIES. MAINTAIN THE SAFETY AND STABILITY OF EXCAVATIONS AND TRENCHES BY PROPERLY INSTALLING SUPPORTS ACCORDING TO THE CERTIFIED DESIGN AND THE MANUFACTURER'S REQUIREMENTS.

C. PROTECT AND MAINTAIN THE TRENCH BOTTOM. REMOVE ROCK FRAGMENTS OR RAVELED MATERIALS THAT COLLECT ON THE TRENCH BOTTOM. BACKFILL OVER-EXCAVATIONS WITH FILL IN ACCORDANCE WITH THIS SECTION AND THE EARTHWORK NOTES. EXCAVATE UNSUITABLE SOIL ENCOUNTERED AT THE TRENCH BOTTOM AND BACKFILL TO TRENCH BOTTOM ELEVATION WITH FILL IN ACCORDANCE WITH THE EARTHWORK NOTES.

D. WHERE TRENCHES WILL BE EXCAVATED IN FILL AREAS, PERFORM TRENCHING ONLY AFTER FILL HAS REACHED AT LEAST 24 INCHES ABOVE THE TOP OF THE PIPE DESIGN ELEVATION UNLESS OTHERWISE SHOWN ON THE DRAWINGS.

E. EXCAVATE FOR STRUCTURES TO AT LEAST 6 INCHES BELOW FOUNDATION ELEVATIONS AND PLACE AGGREGATE BASE OR BACKFILL TO THE FOUNDATION ELEVATIONS SHOWN ON THE DRAWINGS. AGGREGATE BASE AND FILL SHALL BE IN ACCORDANCE WITH THE AGGREGATE BASE AND EARTHWORK NOTES.

F. FOR PIPE INSTALLATION, LIMIT THE MAXIMUM LENGTH OF OPEN TRENCH TO 200 FEET IN ADVANCE AND 200 FEET BEHIND PIPE UNLESS OTHERWISE AUTHORIZED BY THE COMPANY.

G. CONTINUOUSLY DEWATER TRENCHES WHEN WATER IS PRESENT. PERFORM DEWATERING IN ACCORDANCE WITH THE EARTHWORK NOTES.

H. DO NOT LEAVE THE BOTTOM OF TRENCHES ROUGH OR UNEVEN; SMOOTH OUT THE BOTTOM OF TRENCHES TO THE REQUIRED DESIGN.

3.3 BACKFILLING

A. GENERAL:
1. DO NOT BACKFILL WITH FROZEN OR SATURATED MATERIAL.
2. DO NOT BACKFILL OVER FROZEN, WET, OR SOFT TRENCH BOTTOM OR SIDE SLOPES. REMOVE MATERIALS THAT ARE FROZEN, WET, OR SOFT AS SPECIFIED IN THIS SECTION.
3. DO NOT DISTURB OR DAMAGE PIPING, OR STRUCTURES DURING BACKFILLING; DAMAGED MATERIALS SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.
4. DO NOT USE COMPACTION EQUIPMENT THAT EXERTS GREATER THAN 10 POUNDS PER SQUARE INCH (PSI) GROUND PRESSURE OVER PIPING THAT IS COVERED BY LESS THAN 12 INCHES OF BACKFILL MATERIAL.

B. PLACEMENT OF PIPE EMBEDMENT FILL FOR PIPES:
1. PLACE PIPE EMBEDMENT FILL IN MAXIMUM 6-INCH THICK LOOSE LIFTS AND COMPACT EACH LIFT TO THE ELEVATION OF THE BOTTOM OF THE PIPE.
2. COMPACT EACH LIFT OF PIPE EMBEDMENT FILL WITH A MINIMUM OF FOUR PASSES WITH VIBRATORY HAND COMPACTION EQUIPMENT.
3. GRADE THE PIPE EMBEDMENT FILL TO THE BOTTOM OF THE PIPE DESIGN ELEVATION PRIOR TO PLACING PIPE.
4. PLACE PIPE ON TOP OF THE COMPACTED AND GRADED PIPE EMBEDMENT FILL.
5. PLACE PIPE EMBEDMENT FILL IN MAXIMUM 6-INCH-THICK LOOSE LIFTS TO THE DEPTH SHOWN ON THE DRAWINGS. COMPACT EACH LIFT WITH A MINIMUM OF FOUR PASSES WITH VIBRATORY HAND COMPACTION EQUIPMENT, OR BY OTHER MEANS, METHODS, AND TECHNIQUES SUCH THAT INTIMATE CONTACT WITH THE PIPE IS MAINTAINED.

C. PLACEMENT OF BACKFILL MATERIAL FOR PIPES:
1. AFTER PLACEMENT AND COMPACTION OF PIPE EMBEDMENT FILL TO THE LIMITS SHOWN ON THE DRAWINGS, PLACE BACKFILL MATERIAL IN MAXIMUM 4 INCH THICK LOOSE LIFTS TO A MINIMUM DEPTH OF 12-INCHES ABOVE THE PIPE. AFTER 12-INCHES OF MATERIAL HAS BEEN PLACED ABOVE THE PIPE, PLACE BACKFILL MATERIAL IN MAXIMUM 8 INCH THICK LOOSE LIFTS.
2. COMPACT THE BACKFILL MATERIAL IN EACH LIFT TO THE SPECIFICATIONS FOR FILL MATERIAL SPECIFIED IN THE EARTHWORK NOTES TO A MINIMUM ELEVATION OF 3 FEET ABOVE THE TOP OF PIPE USING A WALK-BEHIND PAD-FOOT COMPACTOR, HAND TAMPER, OR VIBRATORY PLATE COMPACTOR, OR BY OTHER MEANS, METHODS, AND TECHNIQUES.
3. CONSTRUCTION EQUIPMENT SHALL NOT BE ALLOWED OVER THE TOP OF PIPES UNTIL A MINIMUM OF 3 FEET OF BACKFILL MATERIAL HAS BEEN PLACED AND COMPACTED ABOVE THE TOP OF PIPES UNLESS OTHERWISE APPROVED BY THE COMPANY.

D. PLACE MARKER TAPE IN BACKFILL BELOW FINISHED ELEVATION ABOVE UNDERGROUND PIPES, CONTROL CABLES, AND ELECTRICAL CONDUITS AS SHOWN ON THE DRAWINGS. PLACE MARKER TAPE TO THE DEPTH SHOWN ON THE DRAWINGS.

3.4 FIELD QUALITY CONTROL/ACCEPTANCE CRITERIA

A. CQC SHALL BE PERFORMED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

B. CONTRACTOR SHALL COORDINATE CONSTRUCTION ACTIVITIES THROUGH THE COMPANY TO ACCOMMODATE THE ACTIVITIES REQUIRED OF THE CQC CONTRACTOR.

C. CQC CONTRACTOR WILL MONITOR TRENCHING AND BACKFILLING AS SPECIFIED IN THIS SECTION.

D. CQC CONTRACTOR WILL PERFORM PERFORMANCE TESTING ON THE PIPE EMBEDMENT FILL AND BACKFILL PLACEMENT TO CONFIRM COMPLIANCE WITH THIS SECTION. CONTRACTOR SHALL PROVIDE EQUIPMENT, SUCH AS SHOVELS, HAND AUGERS, AND BACKHOES, AND LABOR TO ASSIST CQC CONTRACTOR IN OBTAINING SAMPLES FROM EXCAVATIONS, TRENCHING, STOCKPILES, AND BORROW AREAS. THE PERFORMANCE TESTING TO BE PERFORMED AND TESTING FREQUENCIES SHALL BE IN ACCORDANCE WITH THE EARTHWORK NOTES.

E. CQC CONTRACTOR AND COMPANY WILL REVIEW AND VERIFY AS-BUILT BOTTOM OF TRENCH ELEVATIONS PRIOR TO BACKFILLING.

F. BASIS OF ACCEPTANCE: THE COMPANY WILL APPROVE THE WORK WHEN THE CONTRACTOR HAS THOROUGHLY DEMONSTRATED THAT THE WORK IS COMPLETE AND SATISFACTORY TO THE COMPANY.

3.5 TOLERANCES:

A. TOP OF PIPE AND EMBEDMENT FILL MATERIAL SHALL BE PLACED WITHIN 0.0 TO +0.2 FEET OF THE MINIMUM THICKNESS SHOWN ON THE DRAWINGS.

B. BACKFILL MATERIAL SHALL BE PLACED WITHIN 0.0 TO +0.1 FEET OF THE EXISTING GROUND OR FINISHED ELEVATION SHOWN ON THE DRAWINGS.

3.6 SURVEY CONTROL

A. SURVEY THE LOCATIONS, LIMITS, AND ELEVATIONS OF THE PIPE AND MANHOLE EMBEDMENT FILL AND BACKFILL IN ACCORDANCE WITH THE SURVEYING NOTES.

B. SURVEY THE LOCATIONS, LIMITS, AND ELEVATIONS OF STRUCTURES AND PIPES, INCLUDING INVERT ELEVATIONS, IN ACCORDANCE WITH THE SURVEYING NOTES.

ARCADIS U.S., INC.
126 N. JEFFERSON STREET
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MILWAUKEE, WI 53202

AUTOCAD

REFERENCE DRAWINGS	OPEN CHANGES	REV	REVISION DESCRIPTION	DWN	ENG	DESIGN MANAGER	DATE
X-326-A-34889							
		c	REVISED 100 PERCENT DESIGN	FJH	TAM	S. B. MURPHY	02/29/24
		b	100 PERCENT DESIGN PACKAGE FOR FBP REVIEW	MPA	TAM	S. B. MURPHY	01/16/24
		a	90 PERCENT DESIGN PACKAGE FOR FBP REVIEW	FJH	TAM	S. B. MURPHY	09/15/23

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CONTRACT	DEAC3010CC40017	
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SCALE	N/A	

PORTSMOUTH GASEOUS DIFFUSION PLANT
D & D PROJECT

X-326 NORTHERN SLAB AREA
DEMOLITION AND UTILITY REMOVAL
CONSTRUCTION NOTES AND
SPECIFICATIONS (1 OF 3)

FACILITY	DRAWING NUMBER	REV
X-326	X-326-C-34884	c

X-326-C-34885
DRAWING NUMBER

SURVEYING NOTES:

PART 1 – GENERAL

1.1 DESCRIPTION

A. SCOPE:
1. THIS SECTION INCLUDES SURVEYING, AND LAYOUTS BY THE CONTRACTOR, AND ASSOCIATED REQUIREMENTS.
2. CONTRACTOR SHALL PROVIDE SURVEYING AND LAYOUT SERVICES, AND PROFESSIONAL SERVICES OF THE TYPES INDICATED FOR THE PROJECT, INCLUDING:
a. DEVELOPING AND MAKING ALL DETAIL SURVEYS AND MEASUREMENTS REQUIRED FOR CONSTRUCTION; INCLUDING SLOPE STAKES, BATTER BOARDS, AND ALL OTHER WORKING LINES, ELEVATIONS, AND CUT SHEETS.
b. PROVIDING MATERIALS REQUIRED FOR BENCHMARKS, CONTROL POINTS, GRADE STAKES, STRUCTURE AND PIPELINE ELEVATION STAKES, AND OTHER ITEMS.
c. KEEPING A TRANSIT, THEODOLITE, OR TOTAL STATION (I.E., THEODOLITE WITH ELECTRONIC DISTANCE MEASUREMENT DEVICE); LEVELING INSTRUMENT; AND RELATED IMPLEMENTS SUCH AS SURVEY RODS AND OTHER MEASUREMENT DEVICES, AT THE SITE AT ALL TIMES, AND HAVING A SKILLED INSTRUMENT PERSON AVAILABLE WHEN NECESSARY FOR LAYING OUT THE WORK.
d. BEING SOLELY RESPONSIBLE FOR ALL LOCATIONS, DIMENSIONS AND LEVELS. NO DATA OTHER THAN CHANGE ORDER, WORK CHANGE DIRECTIVE, OR FIELD ORDER SHALL JUSTIFY DEPARTURE FROM DIMENSIONS AND LEVELS REQUIRED BY THE CONTRACT DOCUMENTS.
e. RECTIFYING ALL WORK IMPROPERLY INSTALLED BECAUSE OF NOT MAINTAINING, NOT PROTECTING, OR REMOVING WITHOUT AUTHORIZATION ESTABLISHED REFERENCE POINTS, STAKES, MARKS, AND MONUMENTS.
f. PROVIDING SUCH FACILITIES AND ASSISTANCE NECESSARY FOR THE COMPANY TO CHECK LINES AND GRADE POINTS PLACED BY CONTRACTOR. DO NOT PERFORM EXCAVATION OR EMBANKMENT WORK UNTIL ALL CROSS-SECTIONING NECESSARY FOR DETERMINING PAYMENT QUANTITIES FOR UNIT PRICE WORK HAVE BEEN COMPLETED AND ACCEPTED BY THE COMPANY.
g. ESTABLISHING/LOCATING PERMANENT AND TEMPORARY SURVEY BENCHMARKS AND/OR CONTROLS POINTS.

B. COORDINATION:
1. COORDINATE WITH CONTRACTOR(S) IN ADVANCE OF PERFORMING SURVEY AND LAYOUT ACTIVITIES.

1.2 REFERENCES

A. CONTRACTOR SHALL USE THE MOST RECENT VERSION OF STANDARDS AND CODES, UNLESS NOTED OTHERWISE.

B. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA).

C. NATIONAL GEODETIC SURVEY (NGS) STANDARDS.

1.3 QUALITY ASSURANCE

A. RECORDS MANAGEMENT SHALL BE IN ACCORDANCE WITH CONTRACT DOCUMENTS.

B. CONTRACTOR'S SURVEYOR QUALIFICATIONS:
1. OVERSIGHT FOR SURVEY WORK SHALL BE PROVIDED BY A PROFESSIONAL SURVEYOR LICENSED BY THE STATE OF OHIO. SURVEY WORK SHALL BE IN ACCORDANCE WITH ACCEPTED SURVEYING PRACTICES AND PROVISIONS HEREIN.
2. EACH SURVEYING CREW SHALL BE SUPERVISED BY A PARTY CHIEF WITH AT LEAST 5 YEARS OF EXPERIENCE IN CONSTRUCTION SURVEYING AND SUPERVISION. SURVEYING WORK SHALL BE PERFOREMED UNDER THE DIRECT SUPERVISION OF THE PARTY CHIEF.
3. SURVEYOR SHALL BE A PROFESSIONAL LAND SURVEYOR REGISTERED AND LICENSED IN THE JURISDICTION WHERE THE PROJECT IS LOCATED, OR A PROFESSIONAL ENGINEER REGISTERED AND LICENSED AS A PROFESSIONAL ENGINEER IN THE JURISDICTION WHERE THE PROJECT IS LOCATED AND AUTHORIZED UNDER LAWS AND REGULATIONS TO PRACTICE SURVEYING.

C. RESPONSIBILITIES OF CONTRACTOR'S SURVEYOR:
1. PROVIDING REQUIRED SURVEYING EQUIPMENT, INCLUDING TRANSIT, THEODOLITE, OR TOTAL STATION; LEVEL; STAKES; AND SURVEYING ACCESSORIES.
2. ESTABLISHING REQUIRED LINES AND GRADES FOR CONSTRUCTING ALL FACILITIES, STRUCTURES, PIPELINES, AND SITE IMPROVEMENTS, INCLUDING OUTDOOR ELECTRICAL EQUIPMENT AND FEEDERS.
3. PREPARING AND MAINTAINING PROFESSIONAL-QUALITY, ACCURATE, WELL-ORGANIZED, LEGIBLE NOTES OF ALL MEASUREMENTS AND CALCULATIONS MADE WHILE SURVEYING AND LAYING OUT THE WORK.
4. PRIOR TO BACKFILLING OPERATIONS, SURVEY, LOCATE, AND RECORD ON A COPY OF THE CONTRACT DOCUMENTS ACCURATE REPRESENTATION OF BURIED WORK AND UNDERGROUND FACILITIES PROVIDED AND ENCOUNTERED.
5. LOCATING ON A SITE PLAN OF THE SITE THE ACTUAL LOCATION OF ABOVE-GROUND WORK TO BE INDICATED ON RECORD DOCUMENTS.
6. COMPLYING WITH REQUIREMENTS OF THE CONTRACT DOCUMENTS RELATIVE TO SURVEYING AND RELATED WORK, INCLUDING REQUIREMENTS OF THIS SECTION'S ARTICLES 1.4 AND 3.1.

1.4 SUBMITTALS

A. INFORMATIONAL SUBMITTALS: SUBMIT THE FOLLOWING:
1. CERTIFICATES:
a. SUBMIT CERTIFICATE SIGNED BY PROFESSIONAL ENGINEER OR PROFESSIONAL SURVEYOR, AS APPLICABLE, CERTIFYING THAT ELEVATIONS AND LOCATIONS OF THE WORK COMPLY WITH THE CONTRACT DOCUMENTS. EXPLAIN EACH DEVIATION, IF ANY.
2. SURVEYING:
a. COMPLETE PLAN FOR PERFORMING SURVEY WORK.
b. EXAMPLE OF NEW SURVEY FIELD BOOKS TO BE MAINTAINED BY CONTRACTOR'S SURVEYOR. EXAMPLE SHALL HAVE SUFFICIENT INFORMATION AND DETAIL, INCLUDING EXAMPLE CALCULATIONS AND NOTES, TO DEMONSTRATE THAT FIELD BOOKS WILL BE ORGANIZED AND MAINTAINED IN A PROFESSIONAL MANNER IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
c. SUBMIT ORIGINAL FIELD BOOKS.
d. SUBMIT CERTIFIED SURVEY IN ACCORDANCE WITH THIS SECTION.

1.5 PROJECT RECORDS DOCUMENTS:

A. GENERAL RECORDS:
1. MAINTAIN AT THE SITE A COMPLETE AND ACCURATE LOG OF CONTROL AND SURVEY WORK AS SUCH WORK PROGRESSES.
2. FIELD BOOKS AND RECORDS:
a. SURVEY DATA AND RECORDS SHALL BE IN ACCORDANCE WITH RECOGNIZED PROFESSIONAL SURVEYING STANDARDS, LAWS AND REGULATIONS, AND PREVAILING STANDARDS OF PRACTICE IN THE LOCALITY WHERE THE SITE IS LOCATED.
b. ORIGINAL FIELD NOTES, COMPUTATIONS, AND OTHER SURVEYING DATA SHALL BE RECORDED BY CONTRACTOR'S SURVEYOR IN CONTRACTOR -FURNISHED HARD-BOUND FIELD BOOKS, AND SHALL BE SIGNED AND SEALED BY CONTRACTOR'S SURVEYOR.
c. COMPLETENESS AND ACCURACY OF SURVEY WORK, AND COMPLETENESS AND ACCURACY OF SURVEY RECORDS, INCLUDING FIELD BOOKS, SHALL BE RESPONSIBILITY OF CONTRACTOR.
d. FAILURE TO ORGANIZE AND MAINTAIN SURVEY RECORDS IN AN APPROPRIATE MANNER THAT ALLOWS REASONABLE AND INDEPENDENT VERIFICATION OF CALCULATIONS, AND TO ALLOW IDENTIFICATION OF ELEVATIONS, DIMENSIONS, AND GRADES OF THE WORK, SHALL BE CAUSE FOR REJECTING THE SURVEY RECORDS, INCLUDING FIELD BOOKS.
e. ILLEGIBLE NOTES OR DATA, AND ERASURES ON ANY PAGE OF FIELD BOOKS, ARE UNACCEPTABLE. DO NOT SUBMIT COPIED NOTES OR DATA. CORRECTIONS BY RULING OR LINING OUT ERRORS WILL BE UNACCEPTABLE UNLESS INITIALED BY THE SURVEYOR. VIOLATION OF THESE REQUIREMENTS MAY REQUIRE RE-SURVEYING THE DATA QUESTIONED BY THE COMPANY.
f. MAINTAIN ON-SITE A PLAN SHOWING PERMANENT SURVEY MONUMENTS, PERMANENT AND TEMPORARY BENCHMARKS, AND OTHER SURVEY CONTROL POINTS WITH COORDINATES AND ELEVATIONS, AS APPLICABLE.
g. MAINTAIN ON-SITE AN ACCURATE AND CURRENT SET OF MARKED-UP "RED-LINE" DRAWINGS SHOWING AS-BUILT CONDITIONS. AS-BUILT CONDITIONS SHALL BE MARKED-UP ON "RED-LINE" DRAWINGS WITHIN 14 CALENDAR DAYS OF COMPLETION OF THE RESPECTIVE CONSTRUCTION ACTIVITY AS SPECIFIED IN THE CONTRACT DOCUMENTS.
3. CERTIFIED SURVEY OF SURFACE STRUCTURES:
a. UPON COMPLETION OF FOUNDATION WALLS AND MAJOR SITE IMPROVEMENTS, PREPARE A CERTIFIED SURVEY, SIGNED AND SEALED BY PROFESSIONAL SURVEYOR, SHOWING OR INDICATING DIMENSIONS, LOCATIONS, ANGLES AND ELEVATIONS OF CONSTRUCTION AND LOCATIONS AND ELEVATIONS OF UNDERGROUND FACILITIES INSTALLED AND ENCOUNTERED DURING THE WORK.

1.6 HEALTH AND SAFETY REQUIREMENTS

A. ENVIRONMENTAL HEALTH AND SAFETY/TRAINING REQUIREMENTS SHALL BE IN ACCORDANCE WITH ATTACHMENT J-13 OF THE CONTRACT DOCUMENTS.

PART 2 – PRODUCTS

2.1 MATERIALS AND SURVEY INSTRUMENTS

A. PROVIDE MATERIALS AS REQUIRED TO PROPERLY PERFORM THE SURVEYS, INCLUDING, BUT NOT LIMITED TO, PERSONAL PROTECTIVE EQUIPMENT, SURVEY INSTRUMENTS AND EQUIPMENT, TAPES, RODS, MEASURES, MOUNTS AND TRIPODS, STAKES AND HUBS, NAILS, RIBBONS, BENCHMARKS, OTHER REFERENCE MARKERS, AND OTHER MATERIALS AS REQUIRED.

B. PROVIDE ON-SITE TRANSPORTATION FOR THE SURVEYORS AND SURVEYING CREWS AS APPROVED BY THE CONSTRUCTION MANAGER OR DESIGNEE.

C. SURVEY INSTRUMENTS SHALL BE CAPABLE OF READING TO A PRECISION OF 0.001 FEET AND WITH A SETTING ACCURACY OF ±8 SECONDS.

D. PERFORM MONTHLY CALIBRATION CHECKS OF SURVEY INSTRUMENTS AND MAINTAIN FIELD NOTES DOCUMENTING THE CALIBRATION CHECKS.

PART 3 – EXECUTION

3.1 SURVEYING

A. REFERENCE POINTS:
1. REFER THE GENERAL CONDITIONS, AS MAY BE MODIFIED BY THE SUPPLEMENTARY CONDITIONS, FOR REQUIREMENTS REGARDING REFERENCE POINTS.
2. COMPANY'S ESTABLISHED REFERENCE POINTS THAT ARE DAMAGED OR DESTROYED BY CONTRACTOR WILL BE RE-ESTABLISHED BY COMPANY AT CONTRACTOR'S EXPENSE. COMPANY MAY DEDUCT FROM PAYMENTS OWED CONTRACTOR SUCH AMOUNTS AS SET-OFFS IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
3. FROM COMPANY-ESTABLISHED REFERENCE POINTS, ESTABLISH LINES, GRADES, AND ELEVATIONS NECESSARY TO CONTROL THE WORK. OBTAIN MEASUREMENTS REQUIRED FOR EXECUTING THE WORK TO TOLERANCES SPECIFIED IN THE CONTRACT DOCUMENTS.
4. ESTABLISH, PLACE, AND REPLACE AS REQUIRED, SUCH ADDITIONAL STAKES, MARKERS, AND OTHER REFERENCE POINTS NECESSARY FOR CONTROL, INTERMEDIATE CHECKS, AND GUIDANCE OF CONSTRUCTION OPERATIONS.

B. SURVEYS TO DETERMINE QUANTITIES FOR PAYMENT:
1. FOR EACH APPLICATION FOR PROGRESS PAYMENT, PERFORM SUCH SURVEYS AND COMPUTATIONS NECESSARY TO DETERMINE QUANTITIES OF WORK PERFORMED OR PLACED. PERFORM SURVEYS NECESSARY FOR THE COMPANY TO DETERMINE FINAL QUANTITIES OF WORK IN PLACE.
2. UNLESS WAIVED IN WRITING BY THE COMPANY, PERFORM QUANTITY SURVEYS IN PRESENCE OF THE COMPANY.

C. CONSTRUCTION SURVEYING: COMPLY WITH THE FOLLOWING:
1. ALIGNMENT STAKING: PROVIDE ALIGNMENT STAKES AT 50-FOOT INTERVALS ON TANGENT, AND AT 25-FOOT INTERVALS ON CURVES.
2. SLOPE STAKING: PROVIDE SLOPE STAKING AT 50-FOOT INTERVALS ON TANGENT, AND AT 25-FOOT INTERVALS ON CURVES. RE-STAKE AT EVERY TEN-FOOT DIFFERENCE IN ELEVATION.
3. STRUCTURE: STAKE-OUT STRUCTURES, INCLUDING ELEVATIONS, AND CHECK PRIOR TO AND DURING CONSTRUCTION.
4. PIPELINES: STAKE-OUT PIPELINES INCLUDING ELEVATIONS, AND CHECK PRIOR TO AND DURING CONSTRUCTION.
5. ROADS, DRIVES, AND PAVED AREAS: STAKE-OUT ROADWAY, DRIVEWAY, AND PAVED AREA ELEVATIONS AT 50-FOOT INTERVALS ON TANGENT, AND AT 25-FOOT INTERVALS ON CURVES.
6. CROSS-SECTIONS: PROVIDE ORIGINAL, INTERMEDIATE, AND FINAL STAKING AS REQUIRED, FOR SITE WORK OTHER LOCATIONS AS NECESSARY FOR QUANTITY SURVEYS.
7. EASEMENT STAKING: PROVIDE EASEMENT STAKING AT 50-FOOT INTERVALS ON TANGENT, AND AT 25-FOOT INTERVALS ON CURVES. ALSO PROVIDE WOODEN LATHS WITH FLAGGING AT MAXIMUM INTERVALS OF 100 FEET.
8. RECORD STAKING: PROVIDE PERMANENT STAKE AT EACH BLIND FLANGE AND EACH UTILITY CAP PROVIDED FOR FUTURE CONNECTIONS. STAKES FOR RECORD STAKING SHALL BE MATERIAL ACCEPTABLE TO THE COMPANY.

D. ACCURACY:
1. ESTABLISH CONTRACTOR'S TEMPORARY SURVEY REFERENCES POINTS FOR CONTRACTOR'S USE TO NOT GREATER THAN SECOND-ORDER ACCURACY (E.G., 1:10000). CONSTRUCTION STAKING USED AS A GUIDE FOR THE WORK SHALL BE SET AT NOT GREATER THAN THIRD-ORDER ACCURACY (E.G., 1:5000). BASIS ON WHICH SUCH ORDERS ARE ESTABLISHED SHALL PROVIDE THE ABSOLUTE MARGIN FOR ERROR SPECIFIED BELOW.
2. HORIZONTAL ACCURACY OF EASEMENT STAKING SHALL BE PLUS OR MINUS 0.1 FEET. ACCURACY OF OTHER STAKING SHALL BE PLUS OR MINUS 0.04 FEET HORIZONTALLY AND PLUS OR MINUS 0.02 FEET VERTICALLY.
3. SURVEY CALCULATIONS SHALL INCLUDE AN ERROR ANALYSIS SUFFICIENT TO DEMONSTRATE REQUIRED ACCURACY.

NON-SHRINK GROUT NOTES:

PART 1 – GENERAL

1.1 DESCRIPTION

A. SCOPE:
1. CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, EQUIPMENT, AND INCIDENTALS AS SHOWN, SPECIFIED, AND REQUIRED TO FURNISH AND INSTALL GROUT AND PERFORM GROUTING WORK.

B. COORDINATION:
1. REVIEW INSTALLATION PROCEDURES UNDER THIS AND OTHER SECTIONS AND COORDINATE INSTALLATION OF ITEMS TO BE INSTALLED WITH OR BEFORE GROUTING WORK.

C. APPLICATION AND GROUT MATERIAL:
1. THE FOLLOWING IS A LISTING OF GROUTING APPLICATIONS AND THE CORRESPONDING TYPE OF GROUT MATERIAL TO BE PROVIDED FOR THE ASSOCIATED APPLICATION. UNLESS SHOWN OR INDICATED OTHERWISE IN THE CONTRACT DOCUMENTS, PROVIDE GROUT IN ACCORDANCE WITH THE FOLLOWING:

TABLE 03 60 00-A, GROUT APPLICATIONS AND MATERIAL TYPES

Application	Required Grout Material Type
Applications where grout is indicated on the Drawings	Class I Non-Shrink, unless shown or indicated otherwise

1.2 REFERENCES
A. STANDARDS REFERENCED IN THIS SECTION ARE:
1. ACI 211.1, PRACTICE FOR SELECTING PROPORTIONS FOR NORMAL, HEAVYWEIGHT, AND MASS CONCRETE.
2. ACI 301, STRUCTURAL CONCRETE FOR BUILDINGS.
3. ASTM C33/C33M, SPECIFICATION FOR CONCRETE AGGREGATES.
4. ASTM C109/C109M, TEST METHOD FOR COMPRESSIVE STRENGTH OF HYDRAULIC CEMENT MORTARS (USING 2-IN. OR [50-MM] CUBE SPECIMENS).
5. ASTM C230/C230M, SPECIFICATION FOR FLOW TABLE FOR USE IN TESTS OF HYDRAULIC CEMENT.
6. ASTM C531, TEST METHOD FOR LINEAR SHRINKAGE AND COEFFICIENT OF THERMAL EXPANSION OF CHEMICAL-RESISTANT MORTARS, GROUTS, MONOLITHIC SURFACINGS, AND POLYMER CONCRETES.
7. ASTM C579, TEST METHODS FOR COMPRESSIVE STRENGTH OF CHEMICAL-RESISTANT MORTARS, GROUTS, MONOLITHIC SURFACINGS, AND POLYMER CONCRETES.
8. ASTM C827, TEST METHOD FOR CHANGE IN HEIGHT AT EARLY AGES OF CYLINDRICAL SPECIMENS OF CEMENTITIOUS MIXTURES.
9. ASTM C882/C882M, TEST METHOD FOR BOND STRENGTH OF EPOXY-RESIN SYSTEMS USED WITH CONCRETE BY SLANT SHEAR.
10. ASTM C939, TEST METHOD FOR FLOW OF GROUT FOR PREPLACED-AGGREGATE CONCRETE (FLOW CONE METHOD).
11. ASTM C1107/C1107M, SPECIFICATION FOR PACKAGED DRY, HYDRAULIC-CEMENT GROUT (NONSHRINK).
12. ASTM C1181, TEST METHODS FOR COMPRESSIVE CREEP OF CHEMICAL-RESISTANT POLYMER MACHINERY GROUTS.
13. NSF/ANSI 61, DRINKING WATER SYSTEM COMPONENTS – HEALTH EFFECTS.

1.3 QUALITY ASSURANCE

A. QUALIFICATIONS:
1. GROUT TESTING LABORATORY:
a. INDEPENDENT TESTING LABORATORY EMPLOYED FOR DESIGN AND TESTING OF GROUT MATERIALS AND MIXES SHALL COMPLY WITH THE FOLLOWING TESTING LABORATORY REQUIREMENTS:
1) TESTING AGENCY SHALL BE IN ACCORDANCE WITH ASTM E329 AND ASTM C1077.
2) TESTING LABORATORY SHALL HAVE BEEN INSPECTED AND PASSED WITHIN PREVIOUS TWO YEARS BY CEMENT AND CONCRETE REFERENCE LABORATORY (CCRL) OF NIST FOR: TESTING CONCRETE AGGREGATES, AND FOR PREPARING AND TESTING CONCRETE TRIAL BATCHES WITH OR WITHOUT ADMIXTURES. TESTING LABORATORY SHALL PROVIDE DOCUMENTATION INDICATING HOW DEFICIENCIES, IF ANY, IN MOST RECENT CCRL INSPECTION REPORT WERE CORRECTED.
3) SELECTION OF TESTING LABORATORY IS SUBJECT TO THE COMPANY'S ACCEPTANCE.
4) SUBMIT WRITTEN DESCRIPTION OF PROPOSED CONCRETE TESTING LABORATORY GIVING QUALIFICATIONS OF PERSONNEL, LABORATORY FACILITIES, AND EQUIPMENT, AND OTHER INFORMATION REQUESTED BY THE COMPANY.

2. MANUFACTURER'S FIELD SERVICE TECHNICIAN: WHEN REQUIRED, PROVIDE SERVICES OF MANUFACTURER'S FULL-TIME EMPLOYEE, FACTORY-TRAINED IN HANDLING, USE, AND INSTALLING THE PRODUCTS REQUIRED, WITH AT LEAST FIVE YEARS OF EXPERIENCE IN FIELD APPLICATIONS OF THE PRODUCTS REQUIRED.

B. TRIAL BATCH:
1. EACH GROUT FILL AND CONSTRUCTION JOINT GROUT MIX PROPORTION AND DESIGN SHALL BE VERIFIED BY LABORATORY TRIAL BATCH OR FIELD EXPERIENCE METHODS. COMPLY WITH ACI 211.1 AND SUBMIT TO THE COMPANY A REPORT WITH THE FOLLOWING DATA:
a. COMPLETE IDENTIFICATION OF AGGREGATE SOURCE OF SUPPLY.
b. TESTS OF AGGREGATES FOR COMPLIANCE WITH SPECIFIED REQUIREMENTS.
c. SCALE WEIGHT OF EACH AGGREGATE.
d. ABSORBED WATER IN EACH AGGREGATE.
e. BRAND, TYPE, AND COMPOSITION OF CEMENT.
f. BRAND, TYPE, AND AMOUNT OF EACH ADMIXTURE.
g. AMOUNTS OF WATER USED IN TRIAL MIXES.
h. PROPORTIONS OF EACH MATERIAL PER CUBIC YARD.
i. UNIT WEIGHT AND YIELD PER CUBIC YARD OF TRIAL MIXTURES.
j. MEASURED SLUMP.
k. MEASURED AIR CONTENT.
l. COMPRESSIVE STRENGTH DEVELOPED AT SEVEN DAYS AND 28 DAYS, FROM NOT LESS THAN THREE TEST SPECIMENS CAST FOR EACH SEVEN-DAY AND 28_DAY TEST, AND FOR EACH DESIGN MIX.
2. LABORATORY TRIAL BATCHES: WHEN LABORATORY TRIAL BATCHES ARE USED TO SELECT GROUT PROPORTIONS, PREPARE TEST SPECIMENS AND CONDUCT STRENGTH TESTS AS SPECIFIED IN ACI 301.
3. FIELD EXPERIENCE METHOD: WHEN FIELD EXPERIENCE METHODS ARE USED TO SELECT GROUT PROPORTIONS, ESTABLISH PROPORTIONS AS SPECIFIED IN ACI 301.

1.4 SUBMITTALS

A. ACTION SUBMITTALS: SUBMIT THE FOLLOWING:
1. SHOP DRAWINGS:
a. SCHEDULE OF PROJECT-SPECIFIC GROUT APPLICATIONS, INSTALLATION LOCATIONS, AND THE GROUT TYPE PROPOSED FOR EACH.
b. LIST OF GROUT MATERIALS AND PROPORTIONS FOR THE PROPOSED MIX DESIGNS. INCLUDE DATA SHEETS, TEST RESULTS, CERTIFICATIONS, AND MILL REPORTS TO QUALIFY THE MATERIALS PROPOSED FOR USE IN THE MIX DESIGNS. DO NOT START LABORATORY TRIAL BATCH TESTING UNTIL SUBMITTAL IS APPROVED BY THE COMPANY.
c. TRIAL BATCH REPORTS: SUBMIT LABORATORY TEST REPORTS FOR GROUT MATERIALS AND MIX DESIGN TESTS.
d. ANCILLARY EQUIPMENT TO BE USED FOR BULKHEADS, PLUGS AND GROUT PUMPING AS PROPOSED BY CONTRACTOR.
2. PRODUCT DATA:
a. DATA SHEETS, CERTIFICATIONS, AND MANUFACTURER'S SPECIFICATIONS FOR ALL MATERIALS PROPOSED FOR USE.

B. INFORMATIONAL SUBMITTALS: SUBMIT THE FOLLOWING:
1. MANUFACTURER'S INSTRUCTIONS:
a. SPECIAL INSTRUCTIONS FOR SHIPPING, STORING, PROTECTING, AND HANDLING.
b. INSTALLATION INSTRUCTIONS FOR THE MATERIALS.
2. FIELD QUALITY CONTROL SUBMITTALS:
a. REPORT FIELD TESTING RESULTS FOR EACH REQUIRED TIME PERIOD. (E.G., SEVEN-DAY TESTS, 28-DAY TESTS). SUBMIT WITHIN 24 HOURS AFTER COMPLETION OF ASSOCIATED TEST. EACH TEST REPORT SHALL INCLUDE RESULTS OF ALL TESTING REQUIRED AT TIME OF SAMPLING.
3. SUPPLIER REPORTS:
a. SUBMIT WRITTEN REPORT OF RESULTS OF EACH VISIT TO SITE BY SUPPLIER'S FIELD SERVICE TECHNICIAN, INCLUDING PURPOSE AND TIME OF VISIT, TASKS PERFORMED, AND RESULTS OBTAINED. SUBMIT WITHIN TWO DAYS OF COMPLETION OF VISIT TO THE SITE.
4. QUALIFICATIONS STATEMENTS:
a. TESTING LABORATORY, WHEN NOT SUBMITTED UNDER OTHER SECTIONS.
b. MANUFACTURER, WHEN SUBMITTAL OF QUALIFICATIONS IS REQUIRED BY THE COMPANY.
c. MANUFACTURER'S FIELD SERVICE TECHNICIAN, WHEN SUBMITTAL OF QUALIFICATIONS IS REQUIRED BY THE COMPANY.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

A. STORAGE OF MATERIALS: STORE GROUT MATERIALS IN A DRY LOCATION, PROTECTED FROM WEATHER AND PROTECTED FROM MOISTURE.

PART 2 – PRODUCTS

2.1 NON-SHRINK GROUT MATERIALS

A. GENERAL: NON-SHRINK GROUT SHALL BE A PREPACKAGED, INORGANIC, FLOWABLE, NON-GAS-LIBERATING, NON-METALLIC, CEMENT-BASED GROUT REQUIRING ONLY THE ADDITION OF WATER. MANUFACTURER'S INSTRUCTIONS SHALL BE PRINTED ON EACH BAG OR CONTAINER IN WHICH THE MATERIALS ARE PACKAGED. SPECIFIC FORMULATION FOR EACH TYPE OR CLASS OF NON-SHRINK GROUT SPECIFIED IN THIS SECTION SHALL BE THAT RECOMMENDED BY THE GROUT MANUFACTURER FOR THE PARTICULAR APPLICATION.

B. CLASS I NON-SHRINK GROUT:
1. CLASS I NON-SHRINK GROUTS SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 7,000 PSI. USE GROUT FOR PRECISION GROUTING AND WHERE WATER-TIGHTNESS AND NON-SHRINK RELIABILITY IN BOTH PLASTIC AND HARDENED STATES IS CRITICAL, IN ACCORDANCE WITH TABLE 03 60 00-A IN THIS SECTION.
2. PRODUCTS AND MANUFACTURER: PROVIDE ONE OF THE FOLLOWING:
a. MASTERFLOW 928, BY MASTER BUILDERS, INC.
b. FIVE STAR GROUT, BY FIVE STAR PRODUCTS, INC.
c. HI-FLOW GROUT, BY EUCLID CHEMICAL COMPANY.
d. OR EQUAL.
3. COMPLY WITH ASTM C1107/C1107M, GRADE C AND B (AS MODIFIED BELOW) WHEN TESTED USING AMOUNT OF WATER REQUIRED TO ACHIEVE THE FOLLOWING PROPERTIES:
a. FLUID CONSISTENCY (20 TO 30 SECONDS) SHALL BE IN ACCORDANCE WITH ASTM C939.
b. AT TEMPERATURES OF 45, 73.4, AND 95 DEGREES F.
4. LENGTH CHANGE FROM PLACING TO TIME OF FINAL SET SHALL NOT HAVE SHRINKAGE GREATER THAN THE EXPANSION MEASURED AT THREE OR FOURTEEN DAYS. EXPANSION AT THREE OR FOURTEEN DAYS SHALL NOT EXCEED THE 28-DAY EXPANSION.
5. NON-SHRINK PROPERTY SHALL NOT BE BASED ON CHEMICALLY-GENERATED GAS OR GYPSUM EXPANSION.
6. FLUID GROUT SHALL PASS THROUGH THE FLOW CONE, WITH CONTINUOUS FLOW, ONE HOUR AFTER MIXING.

2.2 CURING MATERIALS

A. CURING MATERIALS SHALL COMPLY WITH THE NOTES BELOW, AND SHALL BE AS RECOMMENDED BY THE MANUFACTURER OF PREPACKAGED GROUTS.
1. ABSORPTIVE COVER: BURLAP CLOTH MADE FROM JUTE OR KENAF, WEIGHING APPROXIMATELY 10 OUNCES PER SQUARE YARD AND COMPLYING WITH AASHTO M 182, CLASS 3.
2. CURING MATS: SHALL BE HEAVY CARPETS OR COTTON MATS, QUILTED AT FOUR INCHES ON CENTERS, AND WEIGHING MINIMUM OF 12 OUNCES PER SQUARE YARD WHEN DRY.
3. MOISTURE-RETAINING COVER: PROVIDE ONE OF THE FOLLOWING, COMPLYING WITH ASTM C171:
a. WATERPROOF PAPER.
b. POLYETHYLENE FILM.
c. WHITE BURLAP POLYETHYLENE SHEET.
4. LIQUID CURING COMPOUND: ASTM C309 TYPE 1_D (WATER RETENTION REQUIREMENTS):
a. PROVIDE FUGITIVE DYE.
b. CURING COMPOUND SHALL BE APPLIED BY ROLLER OR POWER SPRAYER.

PART 3 – EXECUTION

3.1 INSPECTION

A. EXAMINE SUBSTRATE AND CONDITIONS UNDER WHICH GROUTING WILL BE PERFORMED AND NOTIFY THE COMPANY IN WRITING OF UNSATISFACTORY CONDITIONS. DO NOT PROCEED WITH THE WORK UNTIL UNSATISFACTORY CONDITIONS ARE CORRECTED.

3.2 INSTALLATION

A. GENERAL:
1. PLACE GROUT AS SHOWN AND INDICATED, AND IN ACCORDANCE WITH LAWS AND REGULATIONS AND GROUT MANUFACTURER'S INSTRUCTIONS. IF MANUFACTURER'S INSTRUCTIONS CONFLICT WITH THESE NOTES OBTAIN CLARIFICATION OR INTERPRETATION FROM THE COMPANY BEFORE PROCEEDING.
2. CONSISTENCY OF NON-SHRINK GROUTS SHALL BE AS REQUIRED TO COMPLETELY FILL THE SPACE TO BE GROUTED FOR THE PARTICULAR APPLICATION. DO NOT INSTALL GROUT FOR DRY-PACKING WITHOUT APPROVAL OF THE COMPANY. WHEN DRY-PACKING IS APPROVED BY THE COMPANY, DRY-PACK CONSISTENCY SHALL BE SUCH THAT GROUT HAS SUFFICIENT WATER TO ENSURE HYDRATION AND GROUT STRENGTH DEVELOPMENT, AND REMAINS PLASTIC, MOLDABLE, AND THAT DOES NOT FLOW.
3. GROUTING SHALL COMPLY WITH TEMPERATURE AND WEATHER LIMITATIONS BELOW:
a. COLD WEATHER PLACING:
a.1. PROTECT GROUT WORK FROM PHYSICAL DAMAGE OR REDUCED STRENGTH THAT COULD BE CAUSED BY FROST, FREEZING, OR LOW TEMPERATURES, IN COMPLIANCE WITH ACI 306.
a.2. WHEN AIR TEMPERATURE HAS FALLEN TO OR MAY BE EXPECTED TO FALL BELOW 40 DEGREES F, PROVIDE ADEQUATE MEANS TO MAINTAIN TEMPERATURE IN AREA WHERE GROUT IS BEING PLACED BETWEEN 50 DEGREES F AND 70 DEGREES F FOR AT LEAST SEVEN DAYS AFTER PLACING. PROVIDE TEMPORARY HOUSINGS OR COVERINGS INCLUDING TARPAULINS OR PLASTIC FILM. MAINTAIN TEMPORARY HEATING AND PROTECTION AS NECESSARY SO THAT AMBIENT TEMPERATURE DOES NOT FALL MORE THAN 30 DEGREES F IN THE 24 HOURS FOLLOWING THE SEVEN DAY PERIOD. AVOID RAPID DRY OUT OF GROUT DUE TO OVERHEATING, AND AVOID THERMAL SHOCK DUE TO SUDDEN COOLING OR HEATING.
a.3. WHEN AIR TEMPERATURE HAS FALLEN TO OR IS EXPECTED TO FALL BELOW 40 DEGREES F, UNIFORMLY HEAT WATER AND AGGREGATES BEFORE MIXING FOR GROUT AS REQUIRED TO OBTAIN GROUT MIXTURE TEMPERATURE NOT LESS THAN 55 DEGREES F AND NOT MORE THAN 85 DEGREES F AT POINT OF PLACEMENT.
a.4. DO NOT USE FROZEN MATERIALS OR MATERIALS CONTAINING ICE OR SNOW. DO NOT PLACE GROUT ON FROZEN SUBGRADE OR ON SUBGRADE CONTAINING FROZEN MATERIALS. BEFORE PLACING GROUT, VERIFY THAT FORMS, REINFORCING, AND ADJACENT CONCRETE SURFACES ARE ENTIRELY FREE OF FROST, SNOW, AND ICE.
a.5. DO NOT USE SALT OR OTHER MATERIALS CONTAINING ANTIFREEZE AGENTS. DO NOT USE CHEMICAL ACCELERATORS OR SET CONTROL ADMIXTURES UNLESS APPROVED BY ENGINEER AND TESTED IN MIX DESIGN PROPOSED FOR USE.
b. HOT WEATHER PLACING:
b.1. WHEN HOT WEATHER CONDITIONS EXIST THAT WOULD IMPAIR THE QUALITY AND STRENGTH OF GROUT, PLACE GROUT IN COMPLIANCE WITH ACI 305 AND THE CONTRACT DOCUMENTS.
b.2. WHEN AMBIENT AIR TEMPERATURE IS AT OR ABOVE 90 DEGREES F AND RISING, COOL INGREDIENTS BEFORE MIXING GROUT TO MAINTAIN GROUT TEMPERATURE AT TIME OF PLACEMENT BELOW 80 DEGREES F. WHEN AMBIENT AIR TEMPERATURE IS AT OR ABOVE 90 DEGREES F AND FALLING, COOL THE INGREDIENTS BEFORE MIXING GROUT TO MAINTAIN GROUT TEMPERATURE AT TIME OF PLACEMENT BELOW 85 DEGREES F. IN NO CASE SHALL THE GROUT TEMPERATURE AT TIME OF PLACEMENT EXCEED 90 DEGREES F.
b.3. MIXING WATER MAY BE CHILLED, OR CHOPPED ICE MAY BE USED TO CONTROL GROUT TEMPERATURE PROVIDED THE WATER EQUIVALENT OF ICE IS CALCULATED IN TOTAL AMOUNT OF MIXING WATER. IF REQUIRED, REDUCE THE TIME FROM ADDITION OF MIX WATER TO PLACEMENT, OR USE SET-RETARDING ADMIXTURE.
b.4. DO NOT PLACE GROUT AT TEMPERATURE THAT CAUSES DIFFICULTY FROM LOSS OF SLUMP, FLASH SET, OR COLD JOINTS.
b.5. DO NOT USE SET CONTROL ADMIXTURES UNLESS APPROVED BY THE COMPANY IN MIX DESIGN.
b.6. OBTAIN THE COMPANY'S APPROVAL OF SUBSTITUTE METHODS AND MATERIALS PROPOSED FOR USE.
4. CURE GROUT IN ACCORDANCE WITH GROUT MANUFACTURER'S INSTRUCTIONS FOR PREPACKAGED GROUT AND THESE NOTES.
5. UTILIZE NECESSARY BULKHEADS AND PLUGS AS REQUIRED TO HOLD GROUT IN PLACE UNTIL GROUT HAS SET.
6. UTILIZE GROUT PUMP AS NECESSARY TO DELIVER GROUT TO THE PIPES REQUIRING PLUGGING IN A MANNER THAT DOES NOT INTRODUCE AIR VOIDS OR AIR POCKETS WITHIN THE GROUT FILL.

B. GROUT FILL:
1. CURE AND PROTECT GROUT FILL IN ACCORDANCE WITH THE NOTES BELOW.

3.3 CURING AND PROTECTION

A. GENERAL:
1. PROTECT FRESHLY PLACED GROUT FROM PREMATURE DRYING, EXCESSIVE COLD OR HOT TEMPERATURES, AND MAINTAIN WITHOUT DRYING AT RELATIVELY CONSTANT TEMPERATURE FOR PERIOD NECESSARY FOR HYDRATION OF CEMENT AND PROPER HARDENING OF GROUT.
2. START CURING AFTER PLACING AND FINISHING CONCRETE, AS SOON AS FREE MOISTURE HAS DISAPPEARED FROM GROUT SURFACE. KEEP SURFACE CONTINUOUSLY MOIST DURING ENTIRE CURING PERIOD. CURE IN ACCORDANCE WITH ACI 301 PROCEDURES. AVOID RAPID DRYING AT END OF FINAL CURING PERIOD.
3. FOR CURING, USE WATER THAT IS FREE OF IMPURITIES THAT COULD ETCH OR DISCOLOR EXPOSED GROUT SURFACES.
4. CONFINE WATER FOR CURING TO AREA BEING CURED.

B. CURING METHODS: CURING METHODS ARE SPECIFIED BELOW. CURING METHODS TO BE USED ON EACH TYPE OF GROUT SURFACE ARE SPECIFIED ELSEWHERE IN THIS ARTICLE.
1. WATER CURING. CURE BY ONE OF THE FOLLOWING METHODS:
a. KEEP GROUT SURFACE CONTINUOUSLY WET.
b. PONDING OR IMMERSION.
c. CONTINUOUS WATER_FOG SPRAY.
d. COVERING GROUT SURFACE WITH CURING MATS, THOROUGHLY SATURATING MATS WITH WATER, AND KEEPING MATS CONTINUOUSLY WET WITH SPRINKLERS OR POROUS HOSES. PLACE CURING MATS TO COVER GROUT SURFACES AND EDGES WITH FOUR_INCH HORIZONTAL LAP OVER ADJACENT MATS; PROVIDE EIGHT-INCH LAP OVER ADJACENT MATS AT VERTICAL SURFACES. IF NECESSARY, WEIGH DOWN CURING COVER TO MAINTAIN CONTACT WITH GROUT SURFACE.
2. FORM CURING. CURE BY ONE OF THE FOLLOWING METHODS:
a. FORMS SHALL BE MAINTAINED AND LOOSENED DURING CURING PERIOD.
b. IMMEDIATELY AFTER FORMS ARE LOOSENED OR REMOVED, CONTINUE WITH THE REQUIRED CURING METHOD AS APPLICABLE, FOR REMAINDER OF CURING PERIOD.
c. WHERE WOOD FORMS ARE KEPT IN PLACE, APPLY WATER TO KEEP FORMS WET.
3. MOISTURE RETAINING COVER CURING. CURE AS FOLLOWS:
a. COVER GROUT SURFACES WITH THE REQUIRED MOISTURE RETAINING COVER FOR CURING GROUT, PLACED IN WIDEST PRACTICAL WIDTH WITH SIDES AND ENDS LAPPED AT LEAST THREE INCHES AND SEALED USING WATERPROOF TAPE OR ADHESIVE. IMMEDIATELY REPAIR HOLES OR TEARS DURING CURING PERIOD USING COVER MATERIAL AND WATERPROOF TAPE.

C. TEMPERATURE OF GROUT DURING CURING:
1. WHEN AMBIENT TEMPERATURE IS 40 DEGREES F OR LESS, CONTINUOUSLY MAINTAIN GROUT TEMPERATURE BETWEEN 50 DEGREES F AND 70 DEGREES F THROUGHOUT CURING PERIOD. WHEN NECESSARY, BEFORE GROUT PLACING PROVIDE FOR TEMPORARY HEATING, COVERING, INSULATION, OR HOUSING AS REQUIRED TO CONTINUOUSLY MAINTAIN SPECIFIED TEMPERATURES AND MOISTURE CONDITIONS THROUGHOUT GROUT CURING PERIOD. PROVIDE COLD WEATHER PROTECTION IN ACCORDANCE WITH ACI 306.
2. WHEN THE AMBIENT TEMPERATURE IS 80 DEGREES F AND ABOVE, OR DURING OTHER CLIMATIC CONDITIONS THAT WOULD CAUSE TOO-RAPID DRYING OF GROUT, BEFORE STARTING GROUT PLACING, PROVIDE WIND BREAKS AND SHADING AS REQUIRED, AND FOG SPRAYING, WET SPRINKLING, OR MOISTURE RETAINING COVERINGS AS REQUIRED. CONTINUOUSLY PROTECT GROUT THROUGHOUT GROUT CURING PERIOD. PROVIDE HOT WEATHER PROTECTION IN ACCORDANCE WITH ACI 305, UNLESS OTHERWISE SPECIFIED.
3. MAINTAIN GROUT TEMPERATURE AS UNIFORMLY AS POSSIBLE, AND PROTECT FROM RAPID AMBIENT TEMPERATURE CHANGES. AVOID GROUT TEMPERATURE CHANGES THAT EXCEED FIVE DEGREES F IN ONE HOUR AND 50 DEGREES F IN 24-HOUR PERIOD.

D. PROTECTION:
1. DURING CURING PERIOD, PROTECT GROUT FROM DAMAGING MECHANICAL DISTURBANCES INCLUDING LOAD STRESSES, HEAVY SHOCK, EXCESSIVE VIBRATION, AND DAMAGE BY RAIN AND FLOWING WATER. PROTECT FINISHED GROUT SURFACES FROM DAMAGE BY SUBSEQUENT CONSTRUCTION OPERATIONS.

3.4 FIELD QUALITY CONTROL

A. FIELD TESTING SERVICES:
1. CONTRACTOR SHALL EMPLOY AN INDEPENDENT TESTING LABORATORY TO PERFORM FIELD QUALITY CONTROL TESTING FOR GROUT. THE COMPANY WILL DIRECT WHERE SAMPLES ARE TO BE OBTAINED.
2. CONTRACTOR SHALL PROVIDE ALL CURING AND NECESSARY CUBE STORAGE.
3. REFER TO ARTICLE 1.3 OF THIS SECTION FOR REQUIRED TESTING LABORATORY QUALIFICATIONS.

B. QUALITY CONTROL TESTING DURING CONSTRUCTION:
1. GROUT FILL: PERFORM SAMPLING AND TESTING FOR FIELD QUALITY CONTROL DURING GROUT FILL PLACING AS FOLLOWS:
a. SAMPLING FRESH GROUT FILL: ASTM C172.
b. SLUMP: ASTM C143; ONE TEST FOR EACH LOAD OF GROUT AT POINT OF DISCHARGE.
c. AIR CONTENT: ASTM C231; ONE SAMPLE FOR EVERY TWO GROUT LOADS AT POINT OF DISCHARGE, AND WHEN A CHANGE IN THE GROUT IS OBSERVED.
d. COMPRESSION TEST SPECIMENS:
1) IN ACCORDANCE WITH ASTM C109/C109M; MAKE ONE SET OF COMPRESSION CUBES FOR EACH 50 CUBIC YARDS OF GROUT, OR FRACTION THEREOF, OF EACH MIX DESIGN PLACED EACH DAY. EACH SET SHALL BE FOUR STANDARD CUBES, UNLESS OTHERWISE DIRECTED BY THE COMPANY.

C. EVALUATION OF FIELD QUALITY CONTROL TESTS:
1. DO NOT USE GROUT, DELIVERED TO FINAL POINT OF PLACEMENT, HAVING SLUMP OR TOTAL AIR CONTENT THAT DOES NOT COMPLY WITH THE CONTRACT DOCUMENTS.
2. COMPRESSIVE STRENGTH TESTS FOR LABORATORY-CURED CUBES WILL BE ACCEPTABLE IF AVERAGES OF ALL SETS OF THREE CONSECUTIVE COMPRESSIVE STRENGTH TEST RESULTS EQUAL OR EXCEED THE REQUIRED 28-DAY DESIGN COMPRESSIVE STRENGTH OF THE ASSOCIATED TYPE OF GROUT.
3. IF THE COMPRESSIVE STRENGTH TESTS DO NOT COMPLY WITH THE REQUIREMENTS IN THE CONTRACT DOCUMENTS, THE GROUT REPRESENTED BY SUCH TESTS WILL BE CONSIDERED DEFECTIVE AND SHALL BE REMOVED AND REPLACED, OR SUBJECT TO OTHER ACTION REQUIRED BY THE COMPANY, AT CONTRACTOR'S EXPENSE.

D. MANUFACTURER'S SERVICES:
1. MANUFACTURERS OF PROPRIETARY MATERIALS SHALL MAKE AVAILABLE UPON 72 HOURS NOTIFICATION THE SERVICES OF QUALIFIED, FULL TIME EMPLOYEE, EXPERIENCED IN SERVING AS A FIELD SERVICE TECHNICIAN FOR THE PRODUCTS REQUIRED, TO AID IN ASSURING PROPER USE OF PRODUCTS UNDER THE ACTUAL CONDITIONS AT THE SITE.

ARCADIS U.S., INC.
126 N. JEFFERSON STREET
SUITE 400
MILWAUKEE, WI 53202
AUTOCAD

REFERENCE DRAWINGS	OPEN CHANGES	REV	REVISION DESCRIPTION	DWN	ENG	DESIGN MANAGER	DATE
X-326-A-34889							
		c	REVISED 100 PERCENT DESIGN	FJH	TAM	S. B. MURPHY	02/29/24
		b	100 PERCENT DESIGN PACKAGE FOR FBP REVIEW	MPA	TAM	S. B. MURPHY	01/16/24
		a	90 PERCENT DESIGN PACKAGE FOR FBP REVIEW	FJH	TAM	S. B. MURPHY	09/15/23

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PORTSMOUTH GASEOUS DIFFUSION PLANT
D & D PROJECT

X-326 NORTHERN SLAB AREA
DEMOLITION AND UTILITY REMOVAL
CONSTRUCTION NOTES AND
SPECIFICATIONS (2 OF 3)

FACILITY	DRAWING NUMBER	REV
X-326	X-326-C-34885	c

X-326-C-34886
DRAWING NUMBER

SURFACE WATER MANAGEMENT AND EROSION CONTROL NOTES:

PART 1 – GENERAL

1.1 DESCRIPTION

A. SCOPE:
1. WORK IN THIS SECTION INCLUDES MATERIALS, INSTALLATION, MAINTENANCE, AND INSPECTION OF SURFACE WATER MANAGEMENT AND EROSION AND SEDIMENT CONTROL MEASURES.

1.2 REFERENCES

A. CONTRACTOR SHALL USE THE MOST RECENT VERSION OF STANDARDS AND CODES, UNLESS NOTED OTHERWISE.

B. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA).

C. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM).
1. ASTM D4355/D4355M – STANDARD TEST METHOD FOR DETERIORATION OF GEOTEXTILES BY EXPOSURE TO LIGHT, MOISTURE, AND HEAT IN A XENON ARC-TYPE APPARATUS.
2. ASTM D4491/D4491M – STANDARD TEST METHOD FOR WATER PERMEABILITY OF GEOTEXTILES BY PERMITTIVITY.
3. ASTM D4533/D4533M – STANDARD TEST METHOD FOR TRAPEZOID TEARING STRENGTH OF GEOTEXTILES.
4. ASTM D4632/D4632M – STANDARD TEST METHOD FOR GRAB BREAKING LOAD AND ELONGATION OF GEOTEXTILES.
5. ASTM D4751 – STANDARD TEST METHOD FOR DETERMINING APPARENT OPENING SIZE OF A GEOTEXTILE.
6. ASTM D4833/D4833M – STANDARD TEST METHOD FOR INDEX PUNCTURE RESISTANCE OF GEOMEMBRANES AND RELATED PRODUCTS.
7. ASTM D5338 – STANDARD TEST METHOD FOR DETERMINING AEROBIC BIODEGRADATION OF PLASTIC MATERIALS UNDER CONTROLLED COMPOSTING CONDITIONS, INCORPORATING THERMOPHILIC TEMPERATURES.

D. AUTHORIZATION FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY UNDER THE NPDES. OHIO ENVIRONMENTAL PROTECTION AGENCY (OHIO EPA) 2023, OHIO EPA PERMIT NO. OHC000006 (GENERAL PERMIT).

E. CONSTRUCTION AND MATERIAL SPECIFICATIONS, 2016 EDITION (ODOT C&MS). OHIO DEPARTMENT OF TRANSPORTATION (ODOT).

F. RAINWATER AND LAND DEVELOPMENT, OHIO'S STANDARDS FOR STORMWATER MANAGEMENT LAND DEVELOPMENT AND URBAN STREAM PROTECTION, THIRD EDITION 2006 UPDATED TO INCLUDE ALL NEW MATERIALS, CHANGES, AND CORRECTIONS AS OF 11-6-14 (ODNR STANDARDS). OHIO DEPARTMENT OF NATURAL RESOURCES DIVISION OF SOIL AND WATER CONSERVATION.

1.3 SUBMITTALS

A. ACTION SUBMITTALS: SUBMIT THE FOLLOWING:
1. PRODUCT DATA:
a. MANUFACTURER'S PRODUCT DATA AND RECOMMENDED METHODS OF INSTALLATION AND MAINTENANCE FOR PRODUCTS USED FOR SURFACE WATER MANAGEMENT AND EROSION AND SEDIMENT CONTROL MEASURES.
b. CERTIFICATION FROM THE MANUFACTURER THAT THE PRODUCTS CONFORM TO THE REQUIREMENTS OF THIS SECTION.
2. THE COMPANY SHALL REVIEW ALL PRODUCT MATERIAL AT LEAST 14 CALENDAR DAYS PRIOR TO EARTHWORK ACTIVITIES.

PART 2 – PRODUCTS

2.1 GENERAL

A. MATERIALS FOR SURFACE WATER MANAGEMENT AND EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IN ACCORDANCE WITH THIS SECTION AND AS SHOWN ON THE DRAWINGS.

B. EARTHWORK AND FILL MATERIALS SHALL BE IN ACCORDANCE WITH THE EARTHWORK NOTES.

2.2 SILT FENCE

A. FURNISH SILT FENCE MATERIALS IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS.
1. FENCE POSTS SHALL BE A MINIMUM LENGTH OF 32 INCHES, COMPOSED OF NOMINAL DIMENSIONED 2 X 2 INCH HARDWOOD OF SOUND QUALITY. THEY SHALL BE FREE OF KNOTS, SPLITS, AND OTHER VISIBLE IMPERFECTIONS THAT WOULD WEAKEN THE POSTS.
2. SILT FENCE SHALL MEET OR EXCEED THE FOLLOWING MINIMUM CRITERIA SPECIFIED IN ODOT C&MS 712.09 FOR TYPE C GEOTEXTILE.

Minimum criteria for Silt Fence Fabric (ODOT, 2002)		
Minimum Tensile Strength	120 lbs. (535 N)	ASTM D 4632
Maximum Elongation at 60 lbs	50%	ASTM D 4632
Minimum Puncture Strength	50 lbs (220 N)	ASTM D 4833
Minimum Tear Strength	40 lbs (180 N)	ASTM D 4533
Apparent Opening Size	≤ 0.84 mm	ASTM D 4751
Minimum Permittivity	$1X10^{-2}$ sec.$^{-1}$	ASTM D 4491
UV Exposure Strength Retention	70%	ASTM G 4355

B. CONTRACTOR MAY SUBMIT ALTERNATE MATERIALS FOR THIS ITEM FOR REVIEW AND APPROVAL BY THE COMPANY.

2.3 INLET PROTECTION

A. FURNISH INLET PROTECTION MATERIALS IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS.
1. GEOTEXTILE INLET PROTECTION
a. 2-INCH X 4-INCH CONSTRUCTION GRADE LUMBER AND NAILS FOR THE FRAME.
b. WIRE MESH WITH 1/2-INCH OPENINGS OF SUFFICIENT STRENGTH TO SUPPORT GEOTEXTILE SEPARATOR AND STONE.
c. GEOTEXTILE FABRIC WITH AN EQUIVALENT OPENING SIZE (EOS) OF #20 TO #40 SIEVE AND RESISTANT TO SUNLIGHT.

B. CONTRACTOR MAY SUBMIT ALTERNATE MATERIALS FOR THIS ITEM FOR REVIEW AND APPROVAL BY THE COMPANY.

2.4 ROCK OUTLET PROTECTION

A. FURNISH OUTLET PROTECTION MATERIALS IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS.
1. OUTLET PROTECTION SHALL CONSIST OF A RIPRAP LAYER AND AN UNDERLYING GEOTEXTILE SEPARATOR.
2. RIPRAP LAYER SHALL BE ODOT DUMPED ROCK FILL TYPE A, B, C, OR D CONFORMING TO THE REQUIREMENTS OF ODOT C&MS ITEM 703 AND AS SHOWN ON THE DRAWINGS.
3. GEOTEXTILE SEPARATOR SHALL BE A NONWOVEN NEEDLE-PUNCHED GEOTEXTILE THAT HAS A MINIMUM AVERAGE ROLL VALUE WITH 95 PERCENT LOWER CONFIDENCE LIMITS CONFORMING TO OR EXCEEDING THE REQUIRED PROPERTY VALUES SPECIFIED IN THE GEOTEXTILE MATERIAL PROPERTIES TABLE ABOVE.

2.5 STABILIZATION

A. MATERIALS FOR TEMPORARY AND PERMANENT STABILIZATION AND FOR MULCH SHALL BE IN ACCORDANCE WITH ODNR STANDARDS, CONTRACT DOCUMENTS AND UNDER APPLICATION CONDITIONS AS DESCRIBED IN THE ODNR STANDARDS, AND WITHIN THE TIME FRAMES IDENTIFIED IN THE GENERAL PERMIT.

2.6 EQUIPMENT

A. FURNISH EQUIPMENT TO PERFORM SURFACE WATER MANAGEMENT AND EROSION AND SEDIMENT CONTROL MEASURE INSTALLATION AND MAINTENANCE IN ACCORDANCE WITH THIS SECTION.

PART 3 – EXECUTION

3.1 EXISTING CONDITIONS

A. VERIFY EXISTING CONDITIONS IN ACCORDANCE WITH THE SURVEYING NOTES.

B. PERFORM CLEARING, GRUBBING, AND STRIPPING AS NECESSARY.

C. EARTHWORK REQUIRED FOR CONSTRUCTING SURFACE WATER MANAGEMENT AND EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IN ACCORDANCE WITH THE EARTHWORK NOTES.

D. BACKFILL SHALL BE PLACED BY THE CONTRACTOR IN ACCORDANCE WITH EARTHWORK AND TRENCH EXCAVATION AND BACKFILL NOTES.

E. INSTALL SURFACE WATER MANAGEMENT AND EROSION AND SEDIMENT CONTROL MEASURES IN LOCATIONS SHOWN ON THE DRAWINGS IN ACCORDANCE WITH THIS SECTION.

F. GEOTEXTILE REQUIREMENTS FOR CONSTRUCTING SURFACE WATER MANAGEMENT AND EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IN ACCORDANCE WITH THE GEOTEXTILE MATERIAL PROPERTIES TABLE ABOVE AND AS SHOWN ON THE DRAWINGS UNLESS OTHERWISE INDICATED.

G. MAINTAIN AND REPAIR TEMPORARY AND PERMANENT SURFACE WATER MANAGEMENT AND EROSION AND SEDIMENT CONTROL MEASURES AS NEEDED TO ENSURE CONTINUED PERFORMANCE OF THEIR INTENDED FUNCTIONS UNTIL AREAS ARE PERMANENTLY STABILIZED IN ACCORDANCE WITH THIS SECTION.

H. MAINTENANCE FOR SURFACE WATER MANAGEMENT AND EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IN ACCORDANCE WITH THIS SECTION AND SHALL MEET THE SUBSTANTIVE REQUIREMENTS OF THE GENERAL PERMIT AND ODNR STANDARDS.

I. CLEAN, MAINTAIN, REPAIR, AND REPLACE SURFACE WATER MANAGEMENT AND EROSION AND SEDIMENT CONTROL MEASURES FOR THE DURATION OF THE CONTRACT. SEDIMENT THAT IS REMOVED FROM SURFACE WATER MANAGEMENT AND EROSION AND SEDIMENT CONTROL MEASURES SHALL BE PLACED IN A LOCATION APPROVED BY THE COMPANY AND SHALL BE STABILIZED IN ACCORDANCE WITH THIS SECTION.

J. IMPLEMENT DUST CONTROL.

3.2 SILT FENCE

A. INSTALLATION:
1. INSTALL SILT FENCE BEFORE UPSLOPE LAND DISTURBANCE BEGINS.
2. PLACE SILT FENCE AS CLOSE TO THE CONTOUR AS POSSIBLE, SO WATER WILL NOT CONCENTRATE AT LOW POINTS IN THE FENCE AND SO SMALL SWALES OR DEPRESSIONS THAT MAY CARRY CONCENTRATED FLOWS TO THE SILT FENCE ARE DISSIPATED ALONG ITS LENGTH.
3. PLACE SILT FENCE ON THE FLATTEST AREA AVAILABLE.
4. ANGLE THE ENDS OF THE SILT FENCE SLIGHTLY UPSLOPE, SO WATER PONDED BY THE SILT FENCE IS PREVENTED FROM FLOWING AROUND THE ENDS OF THE SILT FENCE.
5. PRESERVE VEGETATION AS MUCH AS POSSIBLE UPSLOPE FROM THE SILT FENCE. REESTABLISH VEGETATION THAT IS REMOVED WITHIN 7 CALENDAR DAYS FROM THE DATE OF INSTALLATION OF THE SILT FENCE.
6. SILT FENCE HEIGHT SHALL BE MINIMUM 16 INCHES ABOVE THE GROUND SURFACE.
7. PLACE SILT FENCE IN A UNIFORMLY CUT TRENCH THAT IS MINIMUM 6 INCHES DEEP.
8. PLACE A MINIMUM OF 8 INCHES OF THE SILT FENCE GEOTEXTILE BELOW THE GROUND SURFACE. PLACE EXCESS MATERIAL ON THE BOTTOM OF THE SILT FENCE TRENCH.
9. BACKFILL THE TRENCH AND COMPACT ON BOTH SIDES OF THE GEOTEXTILE.
10. INSTALL THE SILT FENCE WITH THE POSTS ON THE DOWNSLOPE SIDE OF THE GEOTEXTILE.
11. SPLICE SEAMS BETWEEN SECTIONS OF SILT FENCE TOGETHER ONLY AT SUPPORT POSTS, WITH A MINIMUM 6-INCH OVERLAP PRIOR TO DRIVING INTO THE GROUND.

B. MAINTENANCE:
1. SILT FENCE SHALL ALLOW RUNOFF TO PASS ONLY AS DIFFUSE FLOW THROUGH THE GEOTEXTILE. IF RUNOFF OVERTOPS THE SILT FENCE, FLOWS UNDER THE GEOTEXTILE OR AROUND THE FENCE ENDS, OR IN ANY OTHER WAY ALLOWS A CONCENTRATED FLOW DISCHARGE, PERFORM ONE OF THE FOLLOWING AS APPROPRIATE:
a. CHANGE THE LAYOUT OF THE SILT FENCE.
b. REMOVE ACCUMULATED SEDIMENT.
c. INSTALL OTHER SURFACE MANAGEMENT AND EROSION AND SEDIMENT CONTROL MEASURES.
2. REMOVE SEDIMENT DEPOSITS WHEN THEY REACH APPROXIMATELY ONE-HALF THE HEIGHT OF THE SILT FENCE OR IF SEDIMENT DEPOSITS CAUSE THE SILT FENCE TO BE INEFFECTIVE IN SLOWING SURFACE FLOW AND REMOVING SEDIMENT.
3. REPAIR DAMAGED SILT FENCE IN ACCORDANCE WITH THE INSTALLATION REQUIREMENTS OF THIS SECTION.
4. REMOVE INTRUSIVE VEGETATION, AS NEEDED.

C. CONTRACTOR MAY SUBMIT ALTERNATE INSTALLATION AND MAINTENANCE REQUIREMENTS FOR THIS ITEM FOR REVIEW AND APPROVAL BY THE COMPANY.

3.3 INLET PROTECTION

A. GEOTEXTILE INLET PROTECTION:
1. INSTALLATION:
a. INSTALL INLET PROTECTION EITHER BEFORE UPSLOPE LAND DISTURBANCE BEGINS OR BEFORE THE INLET BECOMES FUNCTIONAL.
b. COMPLETELY EXCAVATE THE EARTH AROUND THE INLET TO A DEPTH OF AT LEAST 18 INCHES.
c. CONSTRUCT A WOODEN FRAME OF 2-INCH X 4-INCH CONSTRUCTION GRADE LUMBER. DRIVE 2 INCH X 4-INCH POSTS 1 FOOT INTO THE GROUND AT FOUR CORNERS OF THE INLET. ASSEMBLE THE TOP PORTION OF THE 2-INCH X 4-INCH FRAME USING THE OVERLAP JOINT AS SHOWN ON THE DRAWINGS. THE TOP OF THE FRAME SHALL BE AT LEAST 6 INCHES BELOW ADJACENT ROADS IF PONDED WATER WILL POSE A SAFETY HAZARD TO TRAFFIC.
d. STRETCH THE WIRE MESH TIGHTLY AROUND THE FRAME AND SECURELY FASTEN IT TO THE FRAME.
e. STRETCH THE GEOTEXTILE TIGHTLY AROUND THE FRAME AND SECURELY FASTEN IT TO THE FRAME. EXTEND THE GEOTEXTILE FROM THE TOP OF THE FRAME TO 18 INCHES BELOW THE INLET NOTCH ELEVATION. OVERLAP THE GEOTEXTILE ACROSS ONE SIDE OF THE INLET SO THE ENDS OF THE GEOTEXTILE ARE NOT FASTENED TO THE SAME POST.
f. PLACE BACKFILL AROUND THE INLET IN COMPACTED 6-INCH LIFTS UNTIL THE BACKFILL IS EVEN WITH THE INLET NOTCH ELEVATION.
g. CONSTRUCT A COMPACTED EARTH BERM OR CHECK DAM IN THE DITCH LINE BELOW THE INLET IF THE INLET IS NOT IN A DEPRESSION. THE TOP OF THE BERM SHALL BE AT LEAST 6 INCHES HIGHER THAN THE TOP OF THE FRAME.
2. MAINTENANCE:
a. INSPECT THE INLET PROTECTION DURING ROUTINE INSPECTIONS.
b. REPLACE THE GEOTEXTILE WHEN IT BECOMES CLOGGED WITH SEDIMENT IN ACCORDANCE WITH THE INSTALLATION METHODS IN THIS SECTION.

3.4 TEMPORARY ROCK INLET/OUTLET PROTECTION

A. INSTALLATION:
1. WHERE INLET/OUTLET PROTECTION IS TO BE INSTALLED, PERFORM CLEARING, GRUBBING, AND STRIPPING PRIOR TO PERFORMING EARTHWORK.
2. SUBGRADE FOR THE FILTER OR BEDDING AND RIPRAP SHALL BE PREPARED TO THE REQUIRED LINES AND GRADES AS SHOWN ON THE PLAN.
3. INSTALL GEOTEXTILE UNDERLYING THE ENTIRE LENGTH AND WIDTH OF THE OUTLET PROTECTION AREA PRIOR TO STONE PLACEMENT. GEOTEXTILES SHALL BE LAID WITH THE LONG DIMENSION PARALLEL TO THE DIRECTION OF FLOW AND SHALL BE LAID LOOSELY. WHERE JOINTS ARE NECESSARY, STRIPS SHALL BE PLACED TO PROVIDE A 12-IN. MINIMUM OVERLAP, WITH THE UPSTREAM STRIP OVERLAPPING THE DOWNSTREAM STRIP.
4. GEOTEXTILE SHALL BE LAID WITHOUT WRINKLES OR CREASES, AND SECURELY ANCHORED ACCORDING TO MANUFACTURERS' RECOMMENDATIONS.
5. RIPRAP MAY BE PLACED BY EQUIPMENT BUT SHALL BE PLACED IN A MANNER TO PREVENT SLIPPAGE OR DAMAGE TO THE GEOTEXTILE.
6. RIPRAP SHALL BE PLACED BY A METHOD THAT DOES NOT CAUSE SEGREGATION OF SIZES. EXTENSIVE PUSHING WITH A DOZER CAUSES SEGREGATION AND SHALL BE AVOIDED BY DELIVERING RIPRAP NEAR ITS FINAL LOCATION WITHIN THE CHANNEL.
7. CONSTRUCTION SHALL BE SEQUENCED SO THAT OUTLET PROTECTION IS PLACED AND FUNCTIONAL WHEN THE STORM DRAIN, CULVERT, OR OPEN CHANNEL ABOVE IT BECOMES OPERATIONAL.
8. VEGETATE DISTURBED AREAS IN ACCORDANCE CONTRACT DOCUMENTS AND UNDER APPLICATION CONDITIONS AS DESCRIBED IN THE ODNR STANDARDS.

B. MAINTENANCE:
1. REPAIR INLET/OUTLET PROTECTION IN ACCORDANCE WITH THE INSTALLATION REQUIREMENTS OF THIS SECTION.
2. MOW THE VEGETATED AREAS AROUND THE OUTLET PROTECTION AS NECESSARY TO MAINTAIN A HEALTHY AND VIGOROUS STAND OF GRASS.
3. REMOVE SEDIMENT AND DEBRIS THAT ACCUMULATES.
4. REMOVE INTRUSIVE VEGETATION, AS NEEDED.
5. MISSING RIPRAP SHALL BE REPLACED AS SOON AS POSSIBLE.
6. PROTECT THE OUTLET PROTECTION FROM DAMAGE BY EQUIPMENT AND TRAFFIC.

3.5 STABILIZATION

A. STABILIZE DISTURBED AREAS THAT ARE NOT COVERED WITH STONE WITH RECP OR FGM IN ACCORDANCE WITH THIS SECTION.

B. FGM MAY BE INSTALLED FOR STABILIZATION IN PLACE OF MULCH AND RECP IN AREAS THAT ARE NOT COVERED IN STONE; HOWEVER, TEMPORARY AND PERMANENT SEEDING REQUIREMENTS AS DESCRIBED IN CONTRACT DOCUMENTS AND UNDER APPLICATION CONDITIONS AS DESCRIBED IN THE ODNR STANDARDS STILL APPLY.

3.6 STORM WATER DRAINAGE CHANNEL LINER

A. INSTALL LINER IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS.

3.7 INSPECTIONS

A. SURFACE WATER MANAGEMENT AND EROSION AND SEDIMENT CONTROLS SHALL BE INSPECTED. INSPECTION SHALL BE PERFORMED AND DOCUMENTED IN ACCORDANCE WITH THIS SECTION AND THE CONTRACT DOCUMENTS.

B. AT A MINIMUM, PERFORM INSPECTIONS AT THE FOLLOWING FREQUENCIES:
1. ONCE EVERY 7 CALENDAR DAYS; AND
2. WITHIN 24 HOURS AFTER ANY STORM EVENT GREATER THAN ½ INCH OF RAIN PER 24 HOUR PERIOD.

C. INSPECT SURFACE WATER MANAGEMENT AND EROSION AND SEDIMENT CONTROL MEASURES TO EVALUATE THEIR EFFECTIVENESS AND NEED FOR MAINTENANCE.

D. INSPECT DISTURBED AREAS AND AREAS USED FOR STORAGE OF MATERIALS THAT ARE EXPOSED TO PRECIPITATION FOR EVIDENCE OF OR THE POTENTIAL FOR POLLUTANTS ENTERING THE DRAINAGE SYSTEM.

E. INSPECT DISCHARGE LOCATIONS TO DETERMINE WHETHER SURFACE WATER MANAGEMENT AND EROSION AND SEDIMENT CONTROL MEASURES ARE EFFECTIVE IN PREVENTING IMPACTS TO RECEIVING WATERS.

F. INSPECT LOCATIONS WHERE VEHICLES ENTER OR EXIT THE SITE FOR EVIDENCE OF OFF-SITE VEHICLE TRACKING.

G. INSPECTION FREQUENCY MAY BE REDUCED UNDER THE FOLLOWING CONDITIONS.
1. THE ENTIRE SITE IS TEMPORARILY STABILIZED OR RUNOFF IS UNLIKELY DUE TO WEATHER CONDITIONS (E.G., SITE IS COVERED WITH SNOW OR ICE, OR THE GROUND IS FROZEN).
2. A WAIVER OF INSPECTION REQUIREMENTS IS AVAILABLE UNTIL 1 MONTH BEFORE THAWING CONDITIONS ARE EXPECTED TO RESULT IN A DISCHARGE IF ALL OF THE FOLLOWING CONDITIONS ARE MET:
a. THE PROJECT IS LOCATED IN AN AREA WHERE FROZEN CONDITIONS ARE ANTICIPATED TO CONTINUE FOR EXTENDED PERIODS OF TIME (I.E., MORE THAN 1 MONTH);
b. LAND DISTURBANCE ACTIVITIES HAVE BEEN SUSPENDED;
3. ONCE A DEFINABLE AREA HAS BEEN FINALLY STABILIZED AND ACCEPTED BY THE COMPANY, THE CONTRACTOR MAY MARK THIS ON THE INSPECTION FORM AND NO FURTHER INSPECTION REQUIREMENTS WILL APPLY TO THAT PORTION OF THE SITE.

H. RECORDS OF INSPECTIONS SHALL BE COMPLETED AND MAINTAINED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. AT A MINIMUM, THE INSPECTION REPORT MUST INCLUDE:
1. INSPECTION DATE;
2. NAMES, TITLES, AND QUALIFICATIONS OF PERSONNEL MAKING THE INSPECTION;
3. WEATHER INFORMATION FOR THE PERIOD SINCE THE LAST INSPECTION (OR SINCE COMMENCEMENT OF CONSTRUCTION ACTIVITY FOR THE FIRST INSPECTION) INCLUDING A BEST ESTIMATE OF THE BEGINNING OF EACH STORM EVENT, DURATION OF EACH STORM EVENT, APPROXIMATE AMOUNT (IN INCHES) OF RAINFALL FOR EACH STORM EVENT, AND WHETHER ANY DISCHARGES OCCURRED;
4. WEATHER INFORMATION AND A DESCRIPTION OF ANY DISCHARGES OCCURRING AT THE TIME OF INSPECTION;
5. LOCATION(S) OF DISCHARGES OF SEDIMENT OR OTHER POLLUTANTS FROM THE SITE;
6. LOCATION(S) OF SURFACE WATER MANAGEMENT AND EROSION AND SEDIMENT CONTROL MEASURES THAT NEED TO BE MAINTAINED;
7. LOCATION(S) OF SURFACE WATER MANAGEMENT AND EROSION AND SEDIMENT CONTROL MEASURES THAT FAILED TO OPERATE AS DESIGNED OR PROVED INADEQUATE FOR A PARTICULAR LOCATION;
8. LOCATION(S) WHERE ADDITIONAL SURFACE WATER MANAGEMENT AND EROSION AND SEDIMENT CONTROL MEASURES ARE NEEDED THAT DID NOT EXIST AT THE TIME OF INSPECTION; AND

I. IMPLEMENT THE APPROPRIATE CORRECTIVE ACTION IN ACCORDANCE WITH THE FOLLOWING PROTOCOL.
1. IF THE INSPECTION REVEALS THAT A CONTROL MEASURE IS IN NEED OF REPAIR OR MAINTENANCE, WITH THE EXCEPTION OF A SEDIMENTATION AND DETENTION POND, IT MUST BE REPAIRED OR MAINTAINED WITHIN 3 CALENDAR DAYS OF THE INSPECTION. SEDIMENTATION AND DETENTION PONDS MUST BE REPAIRED OR MAINTAINED WITHIN 7 CALENDAR DAYS OF THE INSPECTION.
2. IF THE INSPECTION REVEALS THAT A SURFACE WATER MANAGEMENT AND EROSION AND SEDIMENT CONTROL MEASURE FAILED TO PERFORM ITS INTENDED FUNCTION AND THAT ANOTHER MORE APPROPRIATE CONTROL MEASURE IS REQUIRED, THE CONTRACTOR MUST WORK WITH THE COMPANY TO AMEND THE SWPPP AND INSTALL THE NEW CONTROL MEASURE WITHIN 10 CALENDAR DAYS OF THE INSPECTION.
3. IF THE INSPECTION REVEALS THAT A PLANNED SURFACE WATER MANAGEMENT AND EROSION AND SEDIMENT CONTROL MEASURE IS NOT NEEDED, THE INSPECTION RECORD MUST CONTAIN A STATEMENT OF EXPLANATION AS TO WHY THE CONTROL MEASURE IS NOT NEEDED.

J. MAINTAIN THE FOLLOWING ITEMS FOR 3 YEARS FOLLOWING STABILIZATION OF THE SITE:
1. RECORDS SUMMARIZING THE RESULTS OF THE INSPECTIONS;
2. NAME(S) AND QUALIFICATIONS OF PERSONNEL MAKING THE INSPECTIONS;
3. DATE(S) OF THE INSPECTION;
4. MAJOR OBSERVATIONS RELATING TO THE IMPLEMENTATION OF THE CONTRACTOR'S WORK PLAN;
5. CERTIFICATION AS TO WHETHER THE FACILITY IS IN COMPLIANCE WITH SUBSTANTIVE REQUIREMENTS OF THE GENERAL PERMIT, AND IDENTIFICATION OF ANY INCIDENTS OF NON-COMPLIANCE; AND
6. RECORDS AND CERTIFICATION SHALL BE SIGNED IN ACCORDANCE WITH THE SUBSTANTIVE REQUIREMENTS OF THE GENERAL PERMIT.

3.8 FIELD QUALITY CONTROL/ACCEPTANCE CRITERIA

A. CONSTRUCTION QUALITY CONTROL (CQC) SHALL BE PERFORMED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

B. CONTRACTOR SHALL COORDINATE CONSTRUCTION ACTIVITIES THROUGH THE COMPANY TO ACCOMMODATE THE ACTIVITIES REQUIRED OF THE CQC CONTRACTOR.

C. CONTRACTOR SHALL NOTIFY THE COMPANY PRIOR TO WORK IN NEW LOCATIONS.

D. CQC CONTRACTOR WILL MONITOR INSTALLATION OF SURFACE WATER MANAGEMENT AND EROSION AND SEDIMENT CONTROL MEASURES TO CONFIRM COMPLIANCE WITH THIS SECTION, EARTHWORK NOTES, TRENCH EXCAVATION AND BACKFILL NOTES.

E. BASIS OF ACCEPTANCE: THE COMPANY WILL APPROVE THE WORK WHEN THE CONTRACTOR HAS THOROUGHLY DEMONSTRATED THAT THE WORK IS COMPLETE AND SATISFACTORY TO THE COMPANY.

3.9 SURVEY CONTROL

A. SURVEY PERMANENT LOCATIONS OF SURFACE WATER MANAGEMENT AND EROSION AND SEDIMENT CONTROL MEASURES IN ACCORDANCE WITH THE SURVEYING NOTES.

3.10 CLEANING

A. CLEAN EXPOSED SURFACE OF ALL GREASE, DIRT AND OTHER FOREIGN MATERIALS.

B. TOUCH UP ALL MARRED OR ABRADED SURFACES.

PRECAST CONCRETE NOTES:

PART 1 – GENERAL

1.1 DESCRIPTION

A. SCOPE:
1. FURNISH AND PROVIDE ALL SUPERVISION, LABOR, MATERIALS, TOOLS, EQUIPMENT, AND PERFORM ALL OPERATIONS AS SPECIFIED HEREIN OR AS INDICATED ON THE DRAWINGS FOR THE COMPLETE PLACEMENT OF PRE-CAST CONCRETE VAULTS.

B. COORDINATION:
1. PRECASTER SHALL BE PROVIDED APPROVED SUBMITTALS FOR THE PRECAST CONCRETE HALF-HEIGHT HEADWALL AND TWO REPLACEMENT CATCH BASINS (IF NECESSARY) AND REVIEW THESE SUBMITTALS AND COORDINATE FINAL DIMENSIONS OF PRECAST CONCRETE STRUCTURES WITH PIPING. NOTE ANY CONFLICTS WHICH CANNOT BE ACCOMMODATED TO CONTRACTOR AND THE COMPANY PRIOR TO FABRICATION OF PRECAST CONCRETE VAULT STRUCTURES.

1.2 REFERENCES

A. CONTRACTOR SHALL USE THE MOST RECENT VERSION OF STANDARDS AND CODES, UNLESS NOTED OTHERWISE.

B. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA).

C. AMERICAN CONCRETE INSTITUTE (ACI).
1. ACI 304R – GUIDE FOR MEASURING, MIXING, TRANSPORTING, AND PLACING CONCRETE.
2. ACI 318 – BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE.

D. ASTM INTERNATIONAL (ASTM).
1. ASTM C857 – PRACTICE FOR MINIMUM STRUCTURAL DESIGN LOADING FOR UNDERGROUND PRECAST CONCRETE UTILITY STRUCTURES.

E. PRECAST/PRESTRESSED CONCRETE INSTITUTE (PCI).
1. MNL 120 – DESIGN HANDBOOK FOR PRECAST AND PRESTRESSED CONCRETE, THIRD EDITION.

1.3 QUALITY ASSURANCE

A. CONTRACTOR IS RESPONSIBLE FOR PROVIDING QUALITY CONTROL IN ACCORDANCE WITH SECTION 01400, QUALITY CONTROL.

B. ADDITIONAL QUALIFICATIONS: MANUFACTURER SHALL HAVE A MINIMUM OF FIVE YEARS EXPERIENCE PRODUCING SUBSTANTIALLY SIMILAR EQUIPMENT, AND SHALL BE ABLE TO SHOW EVIDENCE OF AT LEAST FIVE INSTALLATIONS IN SATISFACTORY OPERATION FOR AT LEAST FIVE YEARS.

1.4 SUBMITTALS

A. ACTION SUBMITTALS: SUBMIT THE FOLLOWING:
1. PRODUCT DATA:
a. SEALER FOR EXTERIOR SURFACES INCLUDING MIXING/APPLICATION INSTRUCTIONS.
2. SHOP DRAWINGS:
a. PRECAST CONCRETE MAINTENANCE VAULTS AND VALVE VAULTS:
1) DESIGN, INCLUDING CALCULATIONS AND DRAWINGS, SIGNED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF OHIO.
2) CONCRETE MIX DESIGN.
3) JOINT SEALING AND PIPE PASSAGE DETAILS.

B. INFORMATIONAL SUBMITTALS: SUBMIT THE FOLLOWING:
1. CALCULATIONS AND TECHNICAL DATA:
a. PROPOSED DETAILS AND DESIGN CALCULATIONS FOR STRESSES IN ALL CRITICAL SECTIONS OF PRECAST MEMBERS FOR ALL LOADING CONDITIONS INCLUDING TRANSPORTATION, HANDLING, AND ERECTION.
2. CERTIFICATE OF COMPLIANCE: CERTIFY ADMIXTURES AND CONCRETE DO NOT CONTAIN CALCIUM CHLORIDE.
3. TEST REPORTS:
4. FOR PRECAST MANUFACTURER'S CONCRETE TEST CYLINDERS. PRECAST CONCRETE MAINTENANCE VAULTS AND VALVE VAULTS:
a. SETTING INSTRUCTIONS.
b. FABRICATION SCHEDULE AND PLANT OPERATIONS CONTACT NAME AND PHONE NUMBER.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. PACKING, SHIPPING, HANDLING AND UNLOADING:
1. DELIVER MATERIALS TO THE SITE TO ENSURE UNINTERRUPTED PROGRESS OF THE WORK. DELIVER PRE-CAST CONCRETE AND APPARATUSES IN AMPLE TIME TO PREVENT DELAY OF THE WORK.
2. FACTORY ASSEMBLED PARTS AND COMPONENTS SHALL NOT BE DISMANTLED FOR SHIPMENT UNLESS PERMISSION IS RECEIVED IN WRITING FROM THE COMPANY WITH RESPONSIBLE CHARGE FOR THE PROJECT. THIS PROVISION SHALL NOT APPLY IF THE ITEMS ARE TOO LARGE TO BE SHIPPED IN A COMPLETELY ASSEMBLED CONDITION.
3. EACH BOX OR PACKAGE SHALL BE PROPERLY MARKED TO SHOW ITS NET WEIGHT AND CONTENTS.

B. STORAGE AND PROTECTION:
1. STORE MATERIALS TO PERMIT EASY ACCESS FOR INSPECTION AND IDENTIFICATION.
2. FINISHED IRON OR STEEL SURFACES NOT PAINTED SHALL BE PROPERLY PROTECTED TO PREVENT RUST AND CORROSION DURING NORMAL INDOOR STORAGE.

C. ACCEPTANCE AT SITE:
1. ALL BOXES, CRATES AND PACKAGES SHALL BE INSPECTED BY CONTRACTOR UPON DELIVERY TO THE SITE. CONTRACTOR SHALL NOTIFY THE COMPANY, IN WRITING, IF ANY LOSS OR DAMAGE EXISTS TO EQUIPMENT OR COMPONENTS. REPLACE LOSS AND REPAIR DAMAGE TO NEW CONDITION IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

PART 2 PRODUCTS

2.1 GENERAL

A. MINIMUM SIZE OF PRE-CAST CONCRETE STRUCTURES SHALL BE IN ACCORDANCE WITH THE DRAWINGS.
1. LARGER SIZES MAY BE PROVIDED TO ACCOMMODATE PRECASTER'S STANDARD SIZES IF APPROVED BY THE COMPANY.

2.2 MATERIALS

A. REINFORCING STEEL: ASTM A615, 60 KSI YIELD GRADE, DEFORMED BILLET STEEL BARS, UNFINISHED; OR ASTM A996, TYPE R, 60 KSI YIELD GRADE, DEFORMED RAIL STEEL BARS, UNFINISHED.

B. CEMENT: ASTM C150, TYPE I, II, OR TYPE II, PORTLAND TYPE. USE ONE BRAND OF CEMENT THROUGHOUT THE WORK, UNLESS APPROVED BY THE COMPANY.

C. FINE AND COARSE AGGREGATES: ASTM C33 (NORMAL WEIGHT AGGREGATE); MATERIALS CONTAINING DELETERIOUS SUBSTANCES (SPALLING CAUSING) ARE NOT ACCEPTABLE.

D. ADMIXTURES:
1. AIR ENTRAINMENT: ASTM C260.
2. CHEMICAL: ASTM C494 TYPE A – WATER-REDUCING, TYPE B – RETARDING, TYPE C – ACCELERATING, TYPE D – WATER-REDUCING AND RETARDING, TYPE E – WATER-REDUCING AND ACCELERATING, TYPE F – WATER-REDUCING, HIGH RANGE, TYPE G – WATER-REDUCING, HIGH RANGE AND RETARDING; CONTAINING NO CHLORIDES.
3. FLY ASH: ASTM C618 CLASS F OR C WITH LOSS ON IGNITION LESS THAN 3 PERCENT.
4. GROUND GRANULATED BLAST FURNACE SLAG (GGBS): ASTM C989, GRADE 120.

E. NON-SHRINK GROUT: AS SPECIFIED IN THE NON-SHRINK GROUT NOTES.

F. SEALER FOR EXTERIOR SURFACES:
1. SILANE SEALER: ONE-COMPONENT PENETRATING SEALER, HYDROPHILIC (ISOPROPYL ALCOHOL AS A CARRIER) WITH 40 PERCENT ACTIVE INGREDIENTS.
2. MANUFACTURERS:
a. MASTER BUILDERS SOLUTIONS.
b. EUCLID CHEMICAL CO.
c. OR AS APPROVED EQUAL.

G. FLEXIBLE PLASTIC GASKET MATERIAL: FEDERAL SPECIFICATION SS-S-210A AND AASHTO M-198B.
1. MANUFACTURER:
a. HAMILTON-KENT MANUFACTURING COMPANY, CONCRETE SEALANTS, INC.
b. OR AS APPROVED EQUAL.

H. POLYURETHANE SEALANT: AS SPECIFIED IN SECTION 07920, JOINT SEALANTS.

I. GRANULAR BASE LEVELING COURSE: AS SPECIFIED IN THE TRENCH EXCAVATION AND BACKFILL NOTES.

J. GRATING: REPLACE IN KIND (IF REPLACEMENT CATCH BASINS ARE REQUIRED).

2.3 CONCRETE MIX

A. DESIGN STRENGTH: 5,000 PSI AT 28 DAYS.

2.4 DESIGN REQUIREMENTS

A. PRECAST HEADWALL AND CATCH BASINS:
1. DESIGN CATCH BASINS FOR A SURFACE AND TOP SLAB LOADING OF 300 POUNDS PER SQUARE FOOT.
2. DESIGN WALL PANELS TO WITHSTAND SOIL AND WATER PRESSURE OF 96 POUNDS PER CUBIC FOOT ON OUTSIDE OF VAULT; GROUND WATER TABLE/100-YEAR FLOOD ELEVATION TO BE EQUAL TO FINISHED GRADE FOR DESIGN PURPOSES.
3. DESIGN BASE SLAB SO THERE IS A FACTOR OF SAFETY OF 1.5 AGAINST BUOYANCY AND TOP STEEL CAN HANDLE NET UPLIFT PRESSURES. GROUND WATER TABLE/100-YEAR FLOOD ELEVATION TO BE EQUAL TO FINISHED GRADE FOR DESIGN PURPOSES.
4. MANUFACTURER:
a. OLDCASTLE PRECAST.
b. MACK INDUSTRIES.
c. OR AS APPROVED EQUAL.

2.5 FABRICATION

A. GENERAL:
1. REINFORCING STEEL:
a. PLACE IN POSITION BEFORE CONCRETE IS CAST.
b. KEEP CLEAN AND FREE FROM FORM OIL OR OTHER SUBSTANCES HARMFUL TO BOND.
2. COORDINATE DIMENSIONS, DETERMINE TYPE, QUANTITY, SIZE, AND LOCATION OF OPENINGS, AND FURNISH NECESSARY EMBEDDED ITEMS IN PRECAST CONCRETE.

B. SEALER:
1. APPLY TO WALLS AS INDICATED ON DRAWINGS OR SPECIFIED HEREIN, AT SITE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
2. PROTECT SURFACE UNTIL INSTALLED IN THE WORK.
3. REPAIR DAMAGE AS APPROVED BY MANUFACTURER.

C. PRECAST CONCRETE HEADWALLS AND CATCH BASINS:
1. TYPE AND SIZE: PRECAST CONCRETE WALLS AND SLABS WITH MINIMUM DIMENSIONS INDICATED ON DRAWINGS.
2. SYSTEM FABRICATION: PREFABRICATE COMPONENTS AT FACTORY; SHIP, ASSEMBLE AND COMBINE WITH SITE-PREPARED MATERIALS
3. GENERAL:
a. POURED AND VIBRATED AND CONSTRUCTED USING STEEL FORMS.
b. OUTSIDE SURFACES WITH UNIFORM VERTICAL BROOM FINISH, OR ABRASIVE, NON-SLIP FINISH APPLIED IN FACTORY.
c. IF WALL JOINTS OR WALL TO BASE SLAB JOINTS ARE NEEDED, USE TONGUE AND GROOVE DESIGN; SEALED WATER-TIGHT WITH FLEXIBLE PLASTIC GASKET MATERIAL AND POLYURETHANE SEALANT.
d. WALL PENETRATIONS FOR PIPING FABRICATED AT FACTORY.
e. TOP SLAB SHALL BE SLOPED TO SHED WATER.

PART 3 EXECUTION

3.1 EXISTING CONDITIONS

A. INSPECTIONS OF EXISTING CONDITIONS SHALL BE MADE IN ACCORDANCE WITH SECTION 01400, QUALITY CONTROL.

3.2 INSTALLATION

A. ERECTION:
1. HANDLE AND ERECT PRECAST CONCRETE WITH CARE AS RECOMMENDED BY MANUFACTURER.
2. ERECT PRECAST UNITS PLUMB, STRAIGHT, LEVEL, SQUARE, AND IN PROPER ALIGNMENT.
3. FIELD CUTTING: NOT ALLOWED WITHOUT PRIOR APPROVAL FROM THE COMPANY.

B. PRECAST VALVE VAULTS AND MAINTENANCE VAULTS:
1. FIELD INSTALLATION: ALLOWABLE STRESSES SHALL NOT BE EXCEEDED; ACCESSORIES SUPPLIED BY MANUFACTURER SHALL BE INSTALLED BY MANUFACTURER'S APPROVED PERSONNEL.
2. EXCAVATE IN ACCORDANCE WITH THE TRENCH EXCAVATION AND BACKFILL NOTES, FOR WORK OF THIS SECTION. HAND-TRIM EXCAVATION FOR ACCURATE PLACEMENT OF VAULT.
3. PLACE BEDDING MATERIAL LEVEL IN ONE CONTINUOUS LAYER NOT EXCEEDING 6 INCHES COMPACTED DEPTH; COMPACT TO 95 PERCENT STANDARD PROCTOR.
4. INSTALL VAULTS ON BEDDING.
5. BACKFILL AROUND SIDES OF VAULT; TAMP IN PLACE AND COMPACT TO 95 PERCENT STANDARD PROCTOR.
6. MAINTAIN OPTIMUM MOISTURE CONTENT OF BACKFILL MATERIAL TO ATTAIN REQUIRED COMPACTION DENSITY.

3.3 FIELD QUALITY CONTROL/ACCEPTANCE CRITERIA

A. BASIS OF ACCEPTANCE: THE MANUFACTURER'S RECOMMENDED INSTALLATION PROCEDURES, WHEN APPROVED BY THE COMPANY, WILL BECOME THE BASIS FOR INSPECTING AND ACCEPTING OR REJECTING ACTUAL INSTALLATION PROCEDURES USED ON THIS WORK.

B. WHEN ALL REQUIRED APPROVALS OF THIS PORTION OF THE WORK HAVE BEEN OBTAINED, AND AT A TIME DESIGNATED BY THE COMPANY, THOROUGHLY DEMONSTRATE TO OPERATION AND MAINTENANCE PERSONNEL THE OPERATION AND MAINTENANCE OF ALL ITEMS INSTALLED UNDER THE WORK OF THIS SECTION.

3.4 CLEANING

A. CLEAN EXPOSED SURFACE OF ALL GREASE, DIRT AND OTHER FOREIGN MATERIALS.

B. TOUCH UP ALL MARRED OR ABRADED SURFACES.

ARCADIS U.S., INC.
126 N. JEFFERSON STREET
SUITE 400
MILWAUKEE, WI 53202

AUTOCAD

REFERENCE DRAWINGS	OPEN CHANGES	REV	REVISION DESCRIPTION	DWN	ENG	DESIGN MANAGER	DATE
X-326-A-34859							
		c	REVISED 100 PERCENT DESIGN	FJH	TAM	S. B. MURPHY	02/29/24
		b	100 PERCENT DESIGN PACKAGE FOR FBP REVIEW	MPA	TAM	S. B. MURPHY	01/18/24
		a	90 PERCENT DESIGN PACKAGE FOR FBP REVIEW	FJH	TAM	S. B. MURPHY	09/15/23

Fluor-BWXT | Portsmouth LLC

P.O. BOX 548 PIKETON, OHIO 45661

CONTRACT	DEAC3010CC40017
DRAWN BY F. J. HAUGHN	02/29/24
CHECKED BY R. J. HANSEN	02/29/24
KM/RED T. A. MINEHARDT	02/29/24
DESIGN MANAGER S. B. MURPHY	02/29/24
SCALE	N/A

PORTSMOUTH GASEOUS DIFFUSION PLANT
D & D PROJECT

X-326 NORTHERN SLAB AREA DEMOLITION AND UTILITY REMOVAL CONSTRUCTION NOTES AND SPECIFICATIONS (3 OF 3)

FACILITY	DRAWING NUMBER	REV
X-326	X-326-C-34886	C

GENERAL HIGH DENSITY POLYETHYLENE NOTES (HDPE):

THE EXTENT OF WORK IS SHOWN ON THE DRAWINGS. CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, EQUIPMENT AND INCIDENTALS AS SHOWN, SPECIFIED OR REQUIRED TO INSTALL AND TEST ALL BURIED PIPING, FITTINGS, AND SPECIALS. THIS WORK INCLUDES THE FOLLOWING ITEMS:

1. CIVIL – GENERAL:
   - A. INSTALL PIPING AS SHOWN, SPECIFIED, AND AS RECOMMENDED BY PIPE AND FITTINGS MANUFACTURER.
   - B. IN EVENT OF CONFLICT BETWEEN MANUFACTURER'S RECOMMENDATIONS AND THE CONTRACT DOCUMENTS, REQUEST INTERPRETATION FROM THE COMPANY BEFORE PROCEEDING.
   - C. THE COMPANY WILL OBSERVE EXCAVATIONS AND BEDDING PRIOR TO LAYING PIPE BY CONTRACTOR. NOTIFY THE COMPANY IN ADVANCE OF EXCAVATING, BEDDING, PIPE LAYING, AND BACKFILLING OPERATIONS.
   - D. MINIMUM COVER OVER BURIED PIPING SHALL BE 30 INCHES, UNLESS OTHERWISE SHOWN OR APPROVED BY THE COMPANY.
   - E. EXCAVATION IN EXCESS OF THAT REQUIRED OR SHOWN, AND THAT IS NOT AUTHORIZED BY THE COMPANY SHALL BE FILLED AT CONTRACTOR'S EXPENSE WITH GRANULAR MATERIAL FURNISHED, PLACED, AND COMPACTED IN ACCORDANCE WITH SPECIFICATIONS.
   - F. COMPLY WITH NFPA 24 FOR "OUTSIDE PROTECTION", WHERE APPLICABLE TO WATER PIPING SYSTEMS USED FOR FIRE PROTECTION.

2. PLUGS:
   - A. TEMPORARILY PLUG INSTALLED PIPE AT END OF EACH DAY OF WORK OR OTHER INTERRUPTION OF PIPE INSTALLATION TO PREVENT ENTRY OF ANIMALS, LIQUIDS, AND PERSONS INTO PIPE, AND ENTRANCE OR INSERTION OF DELETERIOUS MATERIALS INTO PIPE.
   - B. INSTALL STANDARD PLUGS IN BELLS AT DEAD ENDS, TEES, AND CROSSES. CAP SPIGOT AND PLAIN ENDS.
   - C. FULLY SECURE AND BLOCK PLUGS, CAPS, AND BULKHEADS INSTALLED FOR TESTING TO WITHSTAND SPECIFIED TEST PRESSURE.
   - D. WHERE PLUGGING IS REQUIRED FOR PHASING OF THE WORK OR SUBSEQUENT CONNECTION OF PIPING, INSTALL WATERTIGHT, PERMANENT TYPE PLUGS, CAPS, OR BULKHEAD ACCEPTABLE TO THE COMPANY.

3. LAYING AND JOINING PIPE:
   - A. CONFORM TO MANUFACTURER'S INSTRUCTIONS AND REQUIREMENTS OF STANDARDS AND MANUALS.
   - B. INSTALL PIPE ACCURATELY TO LINE AND GRADE SHOWN AND INDICATED IN THE CONTRACT DOCUMENTS, UNLESS OTHERWISE APPROVED BY THE COMPANY. REMOVE AND REINSTALL PIPES THAT ARE NOT INSTALLED CORRECTLY.

4. PRODUCTS:
   - A. HIGH DENSITY POLYETHYENE MATERIALS
     - 1) DUAL CONTAINED HDPE PIPE
       - A) PIPE USED TO FABRICATE THE DUAL CONTAINED SYSTEM SHALL BE MADE OF HDPE MATERIAL WITH A MINIMUM MATERIAL DESIGNATION CODE OF PE4710.
       - B) BOTH THE CARRIER AND CONTAINMENT PIPE SHALL HAVE AN IPS (IRON PIPE SIZE) OD AND, WHEN REQUIRED, PIPE SHALL MEET AWWA C906 (4" TO 63") AND SHALL BE LISTED AS MEETING NSF-61. PIPE SIZES 3" AND LARGER SHALL HAVE A MANUFACTURING STANDARD OF AST, F 714, WHILE PIPE SMALLER THAN 3" SHALL BE MANUFACTURED TO THE DIMENSIONAL REQUIREMENTS LISTED IN ASTM D 3035.
       - C) THE CARRIER PIPE WILL HAVE A NOMINAL OD OF 8.625" WITH DIMENSION RATIO (DR) OF 11. THE CONTAINMENT PIPE WILL HAVE A NOMINAL OD OF 12.75" WITH DIMENSION RATIO (DR) OF 17. (ALTERNATIVELY, THE SIZE AND DR OF THE DUAL CONTAINMENT PIPE COMBINATIONS SHALL BE AS SPECIFIED ON PLANS.)
       - D) DUAL CONTAINED PIPE SHALL BE PREFABRICATED PRIOR TO SHIPMENT TO THE JOBSITE. NO ON-SITE FABRICATION TO THE PIPE, FITTINGS OR SYSTEM SHALL BE ALLOWED WITHOUT EXPRESS WRITTEN CONSENT OF THE COMPANY AND THE PIPING SUPPLIER. EACH END OF PIPE WILL HAVE A CENTRALIZER THAT IS THERMALLY BONDED TO BOTH THE OD OF THE PRIMARY CARRIER AND THE ID OF THE SECONDARY CONTAINMENT PIPING AND DESIGNED SUCH THAT MOVEMENT WILL BE RESTRAINED BETWEEN THE TWO PIPING SYSTEMS DURING THE SIMULTANEOUS BUTT FUSION PROCESS.
       - E) CENTRALIZER SHALL BE THERMALLY BONDED TO THE PRIMARY CARRIER PIPE AND MAINTAIN POSITION AND ALIGNMENT OF THE PRIMARY CARRIER IN RELATION TO THE SECONDARY CONTAINMENT PIPING.
       - F) DUAL CONTAINED PIPE SHALL BE MANUFACTURED BY AN ISO 9001 CERTIFIED MANUFACTURER. THE PIPE MANUFACTURER SHALL HAVE A MINIMUM 10 YEARS OF EXPERIENCE IN MANUFACTURING AND PRODUCTION OF DUAL CONTAINED PIPING AND RELATED FITTINGS. THE DUAL CONTAINMENT PIPING SYSTEM SHALL BE ISCO DUAL CONTAINED PIPE AND FITTINGS AS MANUFACTURED BY ISCO INDUSTRIES, INC., ASAHI/AMERICA, SIMTECH PROCESS SYSTEMS OR APPROVED EQUAL.
       - G) CENTRALIZERS– CENTRALIZERS USED FOR PIPE ENDS WILL BE EITHER MOLDED FROM HDPE PIPE GRADE RESINS OR MACHINED FROM HDPE PIPE GRADE SHEET. MANUAL OR HAND CUT CENTRALIZERS ARE NOT PERMITTED SINCE THEY HAVE A LOW DEGREE OF DIMENSIONAL ACCURACY. CENTRALIZERS SHOULD HAVE AT LEAST TWO OPENINGS THAT WILL PERMIT THE FLOW OF LIQUID BETWEEN THE CARRIER PIPE AND THE CONTAINMENT PIPE. THE OD OF THE CENTRALIZER SHALL MATCH THE ID OF THE CONTAINMENT PIPING AS CLOSELY AS POSSIBLE. CENTRALIZER SPACING FOR PREFABRICATED PIPE WILL HAVE A SPACING BASED ON MANUFACTURER'S RECOMMENDATION, BUT NO GREATER THAN 6' ON CENTER.
     - 2) DUAL CONTAINED HDPE FITTINGS
       - A) GENERAL– FITTINGS SHALL BE MADE OF HDPE MATERIAL WITH A MINIMUM MATERIAL DESIGNATION CODE OF PE4710. THE PRESSURE RATING OF CARRIER FITTINGS SHALL HAVE A MINIMUM PRESSURE RATING EQUAL TO OR GREATER THAN THE PIPE TO WHICH THEY ARE JOINED UNLESS OTHERWISE SPECIFIED ON THE PLANS OR ACCEPTED BY OWNER/ENGINEER. WHERE REQUIRED, ALL FITTINGS SHALL MEET THE REQUIREMENTS OF AWWA C901 OR C906.
       - B) END TERMINATIONS – END TERMINATION FITTINGS SHALL BE USED TO SEAL THE SYSTEM AT BOTH ENDS. THE FITTING SHALL BE SIMULTANEOUSLY BUTT FUSED TO THE CARRIER AND CONTAINMENT PIPE TO SEAL THE ANNULAR SPACE. TERMINATIONS THAT ARE NOT BUTT FUSED IN THE SYSTEM WILL NOT BE ALLOWED. THIS FITTING WILL ALSO PROVIDE THE TRANSITION TO SINGLE WALL PIPING USING THE FOLLOWING COMPONENTS AND GUIDELINES:

         •FLANGE ADAPTERS SHALL MEET THE DIMENSIONAL AND MATERIAL REQUIREMENTS OF ASTM F 2880.

         •FLANGE ASSEMBLIES SHALL BE ASSEMBLED AND TORQUED ACCORDING TO PPI TN-38, "BOLT TORQUE FOR POLYETHYLENE FLANGED JOINTS."
     - 3) DUAL CONTAINED HDPE MANHOLES AND STRUCTURES
       - A) GENERAL– STRUCTURES AND MANHOLES SHALL BE SUPPLIED BY THE SAME SUPPLIER AS DUAL CONTAINMENT PIPE AND FITTINGS
     - 4) APPROVED SUPPLIERS
       - A) ALL PIPE, FITTINGS, AND APPROVAL FOR FUSION EQUIPMENT SHALL BE PROVIDED BY ONE SUPPLIER. APPROVED SUPPLIERS ARE ISCO INDUSTRIES, INC. OR APPROVED EQUAL.

TRACER TAPE INSTALLATION NOTES:

1. DETECTABLE UNDERGROUND WARNING TAPE FOR NON-METALLIC PIPELINES:
   - A. PROVIDE POLYETHYLENE TRACER TAPE WITH ALUMINUM BACKING FOR BURIED, NON-METALLIC PIPING, WHICH INCLUDES PIPE THAT IS PVC, CPVC, POLYETHYLENE, HDPE, FRP, ABS, AND VITRIFIED CLAY.
   - B. PROVIDE MAGNETIC TRACER TAPE 12 TO 18 INCHES BELOW FINISHED GRADE, BURIED PIPE ALIGNED WITH THE PIPE CENTERLINE.
   - C. FOR PIPELINES BURIED EIGHT FEET OR GREATER BELOW FINISHED GRADE, PROVIDE SECOND LINE OF MAGNETIC TRACER TAPE 2.5 FEET ABOVE CROWN OF BURIED PIPE, ALIGNED ALONG THE PIPE CENTERLINE.
   - D. TAPE SHALL BE SPREAD FLAT WITH MESSAGE SIDE UP BEFORE BACKFILLING.

2. MESSAGE SHALL READ, "CAUTION CONVEYANCE PIPE BURIED BELOW" OR "CAUTION ELECTRICAL LINE BURIED BELOW" WITH BOLD LETTERS APPROXIMATELY TWO INCHES HIGH. MESSAGES SHALL BE PRINTED AT MAXIMUM INTERVALS OF TWO FEET. TAPE SHALL BE CUSTOM COLORED THE SAME AS THE PIPELINE.
   - A. MANUFACTURER: PROVIDE PRODUCTS OF ONE OF THE FOLLOWING:
     - 1) BRADY CORPORATION
     - 2) SETON IDENTIFICATION PRODUCTS
     - 3) MARKING SERVICES, INC.
     - 4) OR EQUAL.

HDPE PIPE INSTALLATION NOTES:

1. CLEANING, GENERAL:
   - A. CLEAN PIPE SYSTEMS AS FOLLOWS:
     THOROUGHLY CLEAN ALL PIPING, INCLUDING FLUSHING WITH WATER, DRY AIR, OR INERT GAS AS REQUIRED, IN MANNER APPROVED BY THE COMPANY, PRIOR TO PLACING IN SERVICE.

PIPE TESTING NOTES:

1. HDPE PIPE:
   - A. CONTRACTOR IS REQUIRED TO SUBMIT A TEST PLAN PRIOR TO PRESSURE TESTING PIPE HYDROSTATICALLY. PNEUMATIC TESTING SHALL NOT BE USED. TEST FOR CARRIER PIPES SHALL BE DONE IN ACCORDANCE WITH ASTM F2164.
   - B. PIPE SHALL BE FILLED AND PRESSURIZED TO A REQUIRED TEST PRESSURE OF 1.5 TIMES THE DESIGN PRESSURE PRIOR TO PIPE BURIAL. PARTIAL BURIAL BETWEEN JOINTS MAY BE ACCEPTABLE AT THE DIRECTION OF THE COMPANY.
   - C. THE NEW PIPING SYSTEMS CAN BE TESTED INDEPENDENTLY OF THE EXISTING SYSTEM BEFORE IT IS ATTACHED TO THE EXISTING X-326 DEMOLITION WATER CONVEYANCE SYSTEM.

FUSION OF HDPE PIPE NOTES:

1. FUSION OF HDPE PIPE SHALL BE COMPLETED PER THE MANUFACTURER'S INSTRUCTIONS.
2. DUAL CONTAINED HDPE PIPE
   - A. ALL DUAL CONTAINED HDPE PIPE SHALL BE JOINED USING THE SIMULTANEOUS FUSION WELDING PROCESS WHICH PRODUCES HOMOGENEOUS, SEAL, LEAK TIGHT JOINTS FOR BOTH THE CARRIER AND CONTAINMENT PIPE.
   - B. THE DUAL CONTAINMENT SUPPLIER SHALL PROVIDE WRITTEN SIMULTANEOUS FUSION WELDING PROCEDURE AS PART OF THE SUBMITTAL PACKAGE. THE PROCEDURE SHOULD IDENTIFY QUALITY CHECKS AND INCORPORATE PRINCIPLES OUTLINED IN ASTM F 2620 OR PPI TR-33. THE PROCEDURE SHALL IDENTIFY HOW THE SIMULTANEOUS BUTT FUSION PRESSURE IS DETERMINED.
   - C. THE DUAL CONTAINMENT SUPPLIER SHALL PROVIDE WRITTEN SIMULTANEOUS FUSION WELDING PROCEDURE AS PART OF THE SUBMITTAL PACKAGE. THE PROCEDURE SHOULD IDENTIFY QUALITY CHECKS AND INCORPORATE PRINCIPLES OUTLINED IN ASTM F 2620 OR PPI TR-33. THE PROCEDURE SHALL IDENTIFY HOW THE SIMULTANEOUS FUSION PRESSURE IS DETERMINED.
   - D. FUSION JOINTS SHALL BE MADE BY PERSONNEL TRAINED BY THE DUAL CONTAINMENT SYSTEM SUPPLIER. A RECORD OR CERTIFICATE OF TRAINING FOR THE FUSION OPERATOR MUST BE PROVIDED THAT DOCUMENTS TRAINING DATE
   - E. CONSIDERATIONS SHOULD BE GIVEN TO ADVERSE WEATHER CONDITIONS, SUCH AS TEMPERATURES BELOW FREEZING, PRECIPITATION, OR WIND. PROVISIONS SHALL BE ACCEPTED BY THE COMPANY.
3. AS INSTRUCTED BY THE COMPANY, THE CONTRACTOR SHALL USE A CALIBRATED DATALOGGER TO DOCUMENT THE WELD INFORMATION OF EACH FUSION WELD.

COUPLINGS, ADAPTERS, AND SPECIALS FOR HDPE PIPING:

1. DUAL CONTAINED END CAPS:
   - A. DESCRIPTION: DUAL CONTAINED END CAP FOR USE WITH DUAL CONTAINED HDPE PIPE.
   - B. PRODUCTS AND MANUFACTURERS: PROVIDE ONE OF THE FOLLOWING:
     - 1) ISCO INDUSTRIES
     - 2) OR EQUAL.
   - C. PROVIDE ALL RELEVANT ACCESSORIES AS RECOMMENDED BY THE MANUFACTURER.

2. PAINTING
   - A. SHOP PAINTING:
     - 1) CLEAN AND PRIME-COAT FERROUS METAL SURFACES OF PRODUCTS IN THE MANUFACTURER'S SHOP IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, UNLESS OTHERWISE SPECIFIED IN THIS SECTION
     - 2) COAT MACHINED, POLISHED AND NON_FERROUS SURFACES BEARING SURFACES AND SIMILAR UNPAINTED SURFACES WITH NON-PETROLEUM BASED CORROSION PREVENTION COMPOUND THAT SHALL BE MAINTAINED DURING STORAGE AND UNTIL PRODUCTS ARE PLACED INTO OPERATION.
   - B. FIELD TOUCH-UP PAINTING SHALL BE PERFORMED BY THE CONTRACTOR AND SHALL MEET MANUFACTURER'S REQUIREMENTS.

ADHESIVE ANCHOR NOTES:

1. INSTALLATION OF ADHESIVE ANCHORS SHALL BE COMPLETED PER THE MANUFACTURER'S INSTRUCTIONS.

RADCON/IMPACTED WATER COLLECTION NOTES:

1. IF THE EXISTING X-326 SLAB HASN'T BEEN REMOVED THE PUMPS IN SUMPS X-326-1 AND X-326-2 MUST PUMP WATER TO THE MODULAR TREATMENT SYSTEM C-TRAIN.

2. ONLY WHEN THE EXISTING X-326 SLAB HAS BEEN COMPLETELY REMOVED, THE PIPING FROM THE PUMPS IN SUMPS X-326-1 AND X-326-2 WILL BE ROUTED TO THE MODULAR SEDIMENTATION TANK AFTER WHICH IT WILL BE PUMPED TO MODULAR TREATMENT SYSTEM D-TRAIN.

3. EXISTING DUAL WALL PIPES ARE TO BE DRAINED THEN ISOLATED. DRAINED WATER IS TO BE SENT TO THE D-TRAIN IF THE X-326 SLAB HAS BEEN REMOVED AND C-TRAIN IF IT HAS NOT. WHILE THE DUAL WALL PIPE IS BEING CUT A COLLECTION BASIN SHALL BE USED TO COLLECT ANY WATER FROM THE PIPE. ANY COLLECTED WATER SHALL BE TRANSFERRED TO D-TRAIN IF THE SLAB HAS BEEN REMOVED AND TO C-TRAIN IF THE SLAB REMAINS.

ARCADIS U.S., INC.
126 N. JEFFERSON STREET
SUITE 400
MILWAUKEE, WI 53202

AUTOCAD

REFERENCE DRAWINGS	OPEN CHANGES	REV	REVISION DESCRIPTION	DWN	ENG	DESIGN MANAGER	DATE
X-326-A-34859							
		d	REVISED 100 PERCENT DESIGN	AJA	RAW	S. B. MURPHY	2/29/24
		c	100 PERCENT DESIGN PACKAGE FOR FBP REVIEW	AJA	RAW	S. B. MURPHY	1/16/24
		b	90 PERCENT DESIGN PACKAGE FOR FBP REVIEW	AJA	RAW	S. B. MURPHY	09/15/23
		a	60 PERCENT DESIGN PACKAGE FOR FBP REVIEW	AJA	RAW	S. B. MURPHY	06/07/23

Fluor-BWXT | Portsmouth LLC
P.O. BOX 548 PIKETON, OHIO 45661

CONTRACT	DEAC3010CC40017	
DRAWN BY	A. J. AMAYA	2/29/2024
CHECKED BY	K. DOUGLAS	2/29/2024
MM/RED	R. A. WOLFORD	2/29/2024
DESIGN MANAGER	S. B. MURPHY	2/29/2024
SCALE	1"= 1'	

PORTSMOUTH GASEOUS DIFFUSION PLANT
D & D PROJECT

X-326 NORTHERN SLAB AREA
DEMOLITION AND UTILITY REMOVAL

CONVEYANCE NOTES

FACILITY	DRAWING NUMBER	REV
X-326	X-326-C-34887	d

APPENDIX D: STRATEGY AND DESIGN FOR THE X-326 PROCESS BUILDING POST-SLAB DEMOLITION SURFACE SOIL CONFIRMATION SAMPLING

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CONTENTS

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FIGURES

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TABLES

Page

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ACRONYMS

ASL	analytical support level
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended
CMI	corrective measures implementation
D&D	decontamination and decommissioning
DDP	demolition design plan
DOE	U.S. Department of Energy
DQO	data quality objective
DU	deferred unit
EPA	U.S. Environmental Protection Agency
FCN	field change notice
FRL	final remediation level
GPS	Global Positioning System
LCS	laboratory control sample
NSA	Northern Slab Area
Ohio EPA	Ohio Environmental Protection Agency
OSWDF	On-site Waste Disposal Facility
PCB	polychlorinated biphenyl
PEMS	project environmental measurements system
PORTS	Portsmouth Gaseous Diffusion Plant
PRG	preliminary remediation goal
QA	quality assurance
QC	quality control
RD/RA	remedial design/remedial action
SSA	Southern Slab Area
TCE	trichloroethene
UCL	upper confidence limit
VSL	validation support level
VOC	volatile organic compound

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D.1. X-326 PROCESS BUILDING POST-SLAB DEMOLITION SAMPLING AND ANALYSIS DESIGN

The X-326 Process Building housed the diffusion equipment for the final phase of the uranium-235 enrichment process at the Portsmouth Gaseous Diffusion Plant (PORTS). The uranium processing performed in the X-326 Process Building was capable of the highest levels of enrichment. Demolition of the above-grade structures of the X-326 Process Building was completed in August 2023 per the *Above-grade Demolition Design Plan for the X-326 Process Building and Associated Special Nuclear Material Monitoring Portals, Tie Lines, and Pipe Racks at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (X-326 Above-grade DDP) (U.S. Department of Energy [DOE] 2024a). Demolition of the remaining at- and below-grade structures of the X-326 Process Building will be completed per the demolition design plan (DDP) of which this appendix is a part. Following demolition of the at- and below-grade structures of the X-326 Process Building, which includes the concrete slab floor of the former building, confirmation sampling of surface soil (hereafter referred to as confirmation sampling) will be conducted in soil underlying the slab and the impacted water containment and management system surrounding the building as part of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA) process to evaluate any potential release related to decontamination and decommissioning (D&D) of the building (as mentioned in Appendix D, *Demolition Design for Storage and Disposal of Polychlorinated Biphenyl Remediation Wastes at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio*, Section 3, *Management of Air, Liquid, and Solid Waste Streams,* of the X-326 Above-grade DDP). Additionally, confirmation surface soil sampling will be conducted in the areas of track alley and other berm system compartments, the basements and tunnels, and the load-out stations on the western edge of the concrete slab where demolition debris was loaded into trucks for transfer to the On-site Waste Disposal Facility (OSWDF).

Process knowledge for the X-326 Process Building, which was documented in Appendix B, *Supporting Information for the X-326 Process Building Demolition Design,* of the X-326 Above-grade DDP, indicates that contaminants associated with equipment and process operations conducted in the building include polychlorinated biphenyls (PCBs), metals, technetium-99, uranium (and its progeny), and transuranic isotopes. It is reasonable to assume that during above-grade demolition of the X-326 Process Building, and during follow-on equipment sizing operations on the X-326 slab for equipment from the X-333 Process Building, these contaminants could have potentially migrated to underlying soil via impacted water entering cracks that developed in the concrete slab from demolition activities using heavy machinery. Additionally, these contaminants could have migrated to soil via breaches along slab/liner interfaces that occurred during demolition of the above-grade portion of the structure (as documented in the Annual Report for Fiscal Year 2022 and subsequent Annual and Quarterly Progress Reports submitted to the Ohio Environmental Protection Agency [Ohio EPA] under *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* [D&D DFF&O] [Ohio EPA 2012]). Other potential pathways for contaminant migration exist in the area, including sub-slab utility system segments and various backfilled areas from the original construction.

Based on sample results reported in Section 6 of the *Deferred Units Resource Conservation and Recovery Act Facility Investigation/Corrective Measures Study Report at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (DU RFI/CMS Report) (DOE 2021), volatile organic compounds (VOCs) (primarily trichloroethene [TCE] and related degradation compounds) have been detected in vapor spaces beneath the X-326 Process Building. Therefore, TCE will also be considered in this sampling plan for due diligence. Therefore, TCE, PCBs, metals, technetium-99, uranium, and transuranics are identified as the chemicals of interest for this soil confirmation sampling strategy.

This soil sampling strategy presents the confirmatory soil sampling that will be performed to obtain analytical data for soils to be left at the completion of the planned demolition activities. Confirmatory sampling of soil will occur across the entire spectrum of areas addressed by the planned demolition identified in this X-326 At- and Below-grade DDP, including areas under the slab, at locations previously used for debris loadout, under catchment areas of the impacted water containment and management system (including the track alley), under basement and tunnel areas, and in areas where contamination has been reached utility system segments being removed.

The entire X-326 Process Building concrete slab (552 ft by 2,280 ft), including the track alley that is adjacent and parallel to the main concrete floor slab on the west side of the former building, covers approximately 29 acres (Figure D.1). For this confirmatory soil sampling strategy, the main concrete floor slab area (530 ft by 2,280 ft) without the track alley will be referred to as the concrete slab. The floor of the track alley and other associated berm system areas, which are at a lower elevation than the main concrete slab, and the slab/liner interface are discussed separately in this sampling strategy. Both the slab and track alley include underlying foundation features. The track alley is treated separately here as an integrated component of the impacted water containment and management system installed around the former building to collect contaminated runoff from the demolition area. On the west side of the former building the liner was anchored to the exterior wall of the track alley. Figure D.2 provides conceptual cross-sectional views of the impacted water containment and management system that surrounds the concrete slab. The slab/liner interface (with the concrete slab on the north, south and east sides of the building and the track alley on the west side of the building), and general location of surface soil samples to be collected beneath the slab/liner interface are provided on the figure.

Additionally, three grout-filled basements remain under the concrete slab and numerous utility system segments exist under the slab and footer system and also outside the slab footprint within the overall city block. Each basement is connected to a tunnel that extends to the east, beyond the extent of the concrete slab. During demolition of the above-grade structures, five load-out stations, where trucks were loaded with demolition debris, were located along the western edge of the concrete slab. Demolition will remove each of these features and dispose associated contaminated residual soils from the demolition actions. Confirmation sampling of soils that will remain is addressed in this sampling strategy.

The confirmation sampling analytical data will be statistically evaluated to ensure that any residual contaminants left in the footprint of the former X-326 Process Building exist below levels that would pose unacceptable risk to potential receptors. This sampling strategy was developed to satisfy the data quality objectives (DQOs) detailed in Attachment D.1 of this appendix.

Demolition of the at- and below-grade structures of the former X-326 Process Building will be accomplished in two phases. Therefore, confirmation sampling will also be accomplished in two separate phases (Phase 1 - Southern Slab Area [SSA], and Phase 2 - Northern Slab Area [NSA]). The SSA and NSA are separated by a supplemental containment berm located across the concrete slab at approximately 745 ft from the southern edge of the slab. Consistent with the definitions used in the X-326 At- and Below-grade DDP, the NSA includes the northern concrete slab, adjacent track alley, and impacted water containment and management system, and the SSA includes the southern concrete slab, adjacent track alley, and impacted water containment and management system. Both the SSA and NSA demolitions address other structures within the city block, such as utility system segments. Two of the basements with adjoining tunnels are located in the NSA, and one basement with an adjoining tunnel is located in the SSA. The locations of the northern and southern areas of the concrete slab (hereafter, northern slab and southern slab), the track alley, the impacted water containment and management system surrounding the building, basements, tunnels, and load-out stations are shown on Figure D.1.

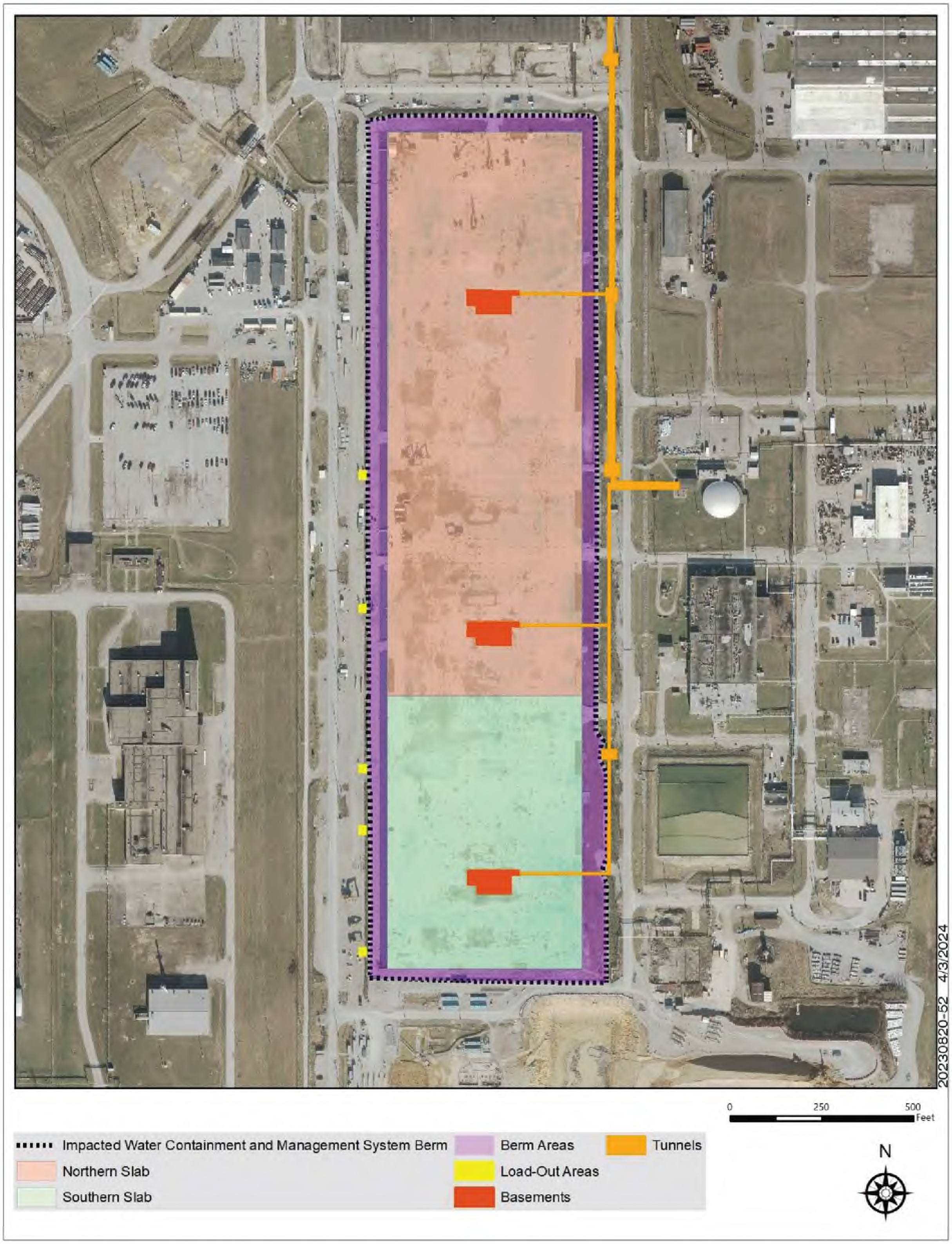

Figure D.1 Location of X-326 At- and Below-Grade Demolition Features for Confirmatory Soil Sampling

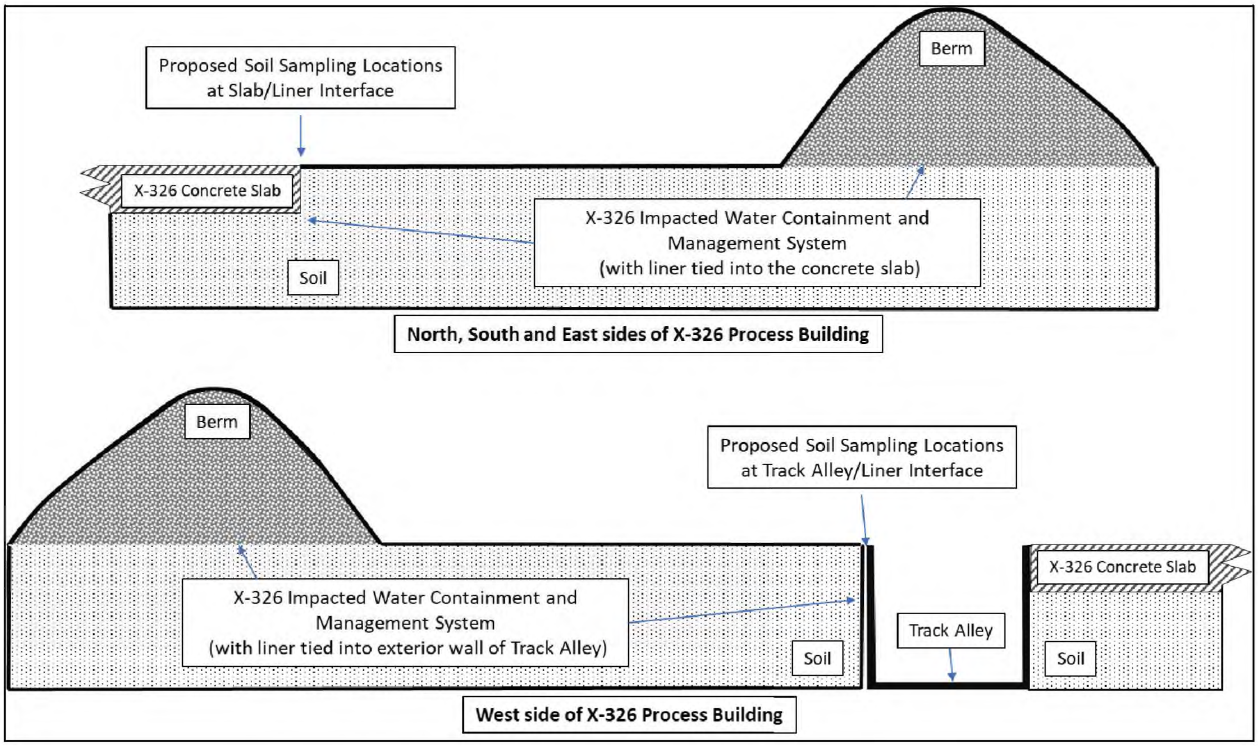

Figure D.2. Slab/Liner Interface Conceptual Cross-sectional Views

The X-326 Southwest Corner Deferred Unit (DU) (a 200 ft by 300 ft area in the southwest corner of the slab) underlies the SSA as does a portion of the 5-Unit Plume being excavated (Phases 5 and 6) pursuant to the *5-Unit Groundwater Plume Area Excavation Work Plan at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (DOE 2022). Figure 17 in the that work plan shows the location of the X-326 Southwest Corner DU excavation and Phases 1 through 6 of the 5-Unit Plume excavation in relation to the X-326 Process Building concrete slab. Note that the follow-on excavation actions in the DU corrective measures implementation (CMI) portion of the SSA (initially the excavation of the DU CMI soils and its associated safe slope soil layback followed by the 5-Unit Plume Area Phase 6 excavation and its associated safe slope soil layback) precludes the need for confirmatory soil sampling in the affected footprint, since those soils will be disposed at the OSWDF rather than remaining in place. This concept is further discussed in specific sample planning sections.

Demolition will begin with the SSA. Soils underlying the southern slab (a 530 ft by 743 ft area in this sampling strategy) and the adjacent areas will be sampled at appropriate times as the demolition activities progress. The NSA will be demolished later and will be a separate confirmation sampling area (i.e., soils underlying the northern slab [a 530 ft by 1,537 ft area in this sampling strategy], the adjacent track alley/berm areas, slab/liner interface areas, and other features).

Confirmatory soil samples to be collected under this sampling strategy will be collected from surface soil (i.e., depth interval of 0-6 inches from the top of the soil surface) as exposed by demolition activities, including areas previously underlying the building's concrete slab and foundation materials, track alley/berm areas, the area of the slab/liner interface, basements, tunnels, former debris load-out stations, and areas where utility system segments exhibiting contamination are removed. A combination of biased and random sampling will be used for selection of the confirmatory soil sampling locations. Full details of the sampling design are included in Section D.5.

Data will be evaluated statistically and are anticipated to provide sufficient information to demonstrate that concentrations of D&D-related contaminants are not present in resulting surface soil at concentrations that exceed the risk-based protectiveness criteria (e.g., preliminary remediation goals [PRGs]). PRGs for PORTS contaminants have been prepared consistent with the approach used to establish Final Remediation Levels in the *Decision Document for Resource Conservation and Recovery Act Deferred Units at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (Decision Document for PORTS Deferred Units) (Ohio EPA 2023). Where background values for PORTS soils identified in *Final Soil Background Report for the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (PORTS Soil Background Report) (DOE 2015) exceed the calculated PRG, the background value has been presented as the PRG. Analytical methodology, requested reporting limits, and PRGs for chemicals of interest in this sampling strategy are presented in Section D.4.

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D.2. PROJECT ORGANIZATION

The goals of the confirmatory soil sampling will be accomplished by utilizing site management representatives identified below. Table D.1 provides general responsibilities for the managers and specialists of the project team.

Table D.1. Project Organization

Manager/Specialist	Summary of Responsibilities
Environmental Remediation Manager	Provide overall management, technical oversight, and assessment of data usability
Environmental Safety and Health Project Manager	Guide implementation of PORTS Health and Safety Program for field task
QA Project Specialist	Oversee and coordinate the responsibilities for field validation and field surveillances
Field Project Manager	Oversee and coordinate day-to-day activities
Sample and Data Manager	Provide coordination for laboratory analysis, sample shipments, and data verification
Data Validation Manager	Develop and approve QA/QC requirements, data validation, and laboratory assessments
Environmental Field Characterization Manager	Oversee sampling activities in the field

Notes:
PORTS = Portsmouth Gaseous Diffusion Plant
QA = quality assurance
QC = quality control

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D.3. PROJECT SCHEDULE

An estimated sampling and analysis schedule is provided for informational purposes in Table D.2. Project-specific details regarding the physical sample data verification process and validation support levels (VSLs) are discussed in Section D.7.2.

Table D.2. Project Schedule

Activity	Planned Timing
Southern Slab Soils	The confirmatory soil sampling will be completed following slab and foundation removal. The gridded slab area soils may be sampled all at once or as the work progresses and planned sample collection locations have been cleared. Other areas identified for sampling will be sampled as the areas are available following demolition actions, as applicable.
Northern Slab Soils	The confirmatory soil sampling will be initiated following the demolition of the northern slab and track alley. The gridded slab area soils may be sampled all at once or as the work progresses and planned sample collection locations have been cleared. Other areas identified for sampling will be sampled as the areas are available following demolition actions, as applicable.
Analysis	Analytical results to be coordinated with the selected laboratory; 100% verification.
Data Verification	Project goal is to complete data verification for each laboratory data package within seven days of receipt of laboratory; 100% verification.
Data Validation	Project goal is to complete data validation for each verified laboratory data package within seven days; 100% validation (80% at VSL B, 20% at VSL D).

Notes:
VSL = validation support level

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D.4. CHEMICALS OF INTEREST

Soil samples will be analyzed for the chemicals of interest listed in Table D.3. Analyses will be conducted in accordance with referenced analytical methods (or equivalent) and requested reporting limits (or best available method detection limit).

Table D.3. Chemicals of Interest, Requested Reporting Limits, and PRGs

Chemical of Interest		Reporting Limit	PRG[1]	CAS Number	Laboratory Method[2]
Total Metals	Antimony	1 mg/kg	5.4*	7440-36-0	EPA SW846 - 6010/6020/7471
	Arsenic	1 mg/kg	29*(bkg)	7440-38-2	
	Barium	1 mg/kg	1,600	7440-39-3	
	Beryllium	1 mg/kg	57	7440-41-7	
	Cadmium	1 mg/kg	5.4	7440-43-9	
	Copper	1 mg/kg	915	7440-50-8	
	Lead	1 mg/kg	800*	7439-92-1	
	Manganese	1 mg/kg	1,491*(bkg)	7439-96-5	
	Mercury	1 mg/kg	1.6	7439-97-6	
	Nickel	1 mg/kg	51*	7440-02-0	
	Selenium	1 mg/kg	15.2*	7782-49-2	
	Silver	1 mg/kg	7(bkg)	7440-22-4	
	Thallium	1 mg/kg	1.3*	7440-28-0	
	Vanadium	1 mg/kg	58*(bkg)	7440-62-2	
	Zinc	2 mg/kg	746	7440-66-6	
Radionuclides	Technetium-99	1 pCi/g	71.8*	14133-76-7	LSC/ICP-MS
	Americium-241	0.5 pCi/g	26.9	14596-10-2	Alpha Spec
	Neptunium-237	0.5 pCi/g	17.5	13994-20-2	
	Plutonium-238	0.5 pCi/g	81.2	13981-16-3	
	Plutonium-239	--	70.5	15117-48-3	
	Plutonium-240	--	71.3	14119-33-6	
	Uranium-233/234	--	2.9*	--	ICP-MS
	Uranium-235/236	--	1.7*	--	
	Uranium-238	--	2.9*	7440-61-1-R	
Conventional	Chromium, hexavalent	1 mg/kg	14.4*	18540-29-9	EPA SW846 - 3060/7196A
PCBs	Total PCBs[3]	<1.0 mg/kg	25*	1336-36-3	EPA SW846 - 8082
VOCs	Trichloroethene	0.005 mg/kg	0.036*	79-01-6	EPA SW846 - 8260

Notes:
[1]Values represent the 1-16 ft bgs depth interval. Units are mg/kg or pCi/g. *Value was published as a FRL. (bkg)Value represents the PORTS soil background concentration.
[2]Equivalent analytical or laboratory methods may be used, provided DQOs are closely satisfied.
[3]PCBs, Total is equal to the sum of the Aroclors-(1016, 1221, 1232, 1242, 1248, 1254, 1260, 1268).

bgs = below ground surface
CAS = Chemical Abstract Service
DQO = data quality objective
EPA = U.S. Environmental Protection Agency
FRL = Final Remediation Level
ICP = inductively coupled plasma
LSC = liquid scintillation counting
MS = mass spectrometry
PCB = polychlorinated biphenyl
pCi/g = picocuries per gram
PRG = Preliminary Remediation Goal
VOC = volatile organic compound

The PRGs in Table D.3 were developed in the same manner as final remediation levels (FRLs) were developed in the DU RFI/CMS Report. FRLs for the DUs were initially developed as PRGs for soil, sediment, vapor intrusion, and groundwater and established as FRLs in the Decision Document for PORTS Deferred Units. Table D.3 includes values previously published as FRLs for the DUs. Where previous FRL values were not computed the same calculation process has been used to establish PRGs for the additional contaminants addressed by Table D.3. Exposure risks from soil contaminants were evaluated for construction workers, industrial workers, and outdoor workers based on hazard index and based on excess lifetime cancer risk of 1 in 500,000. Risks were also evaluated for the effects of migration of the contaminant to groundwater using a dilution attenuation factor assumption of 20. The constraining soil contaminant concentration value (lowest value) among these was identified as the PRG.

In some situations, computed PRGs were less than existing PORTS area background soil values as established by the PORTS Soil Background Report. Consistent with the process for development of PRGs for the DUs, background soil values were identified as PRGs when the computed PRGs were less than the background values (as noted in Table D.3). Background soil contaminant levels representing the 1-ft to 16-ft below ground surface depth were used where soil background was identified for the PRG.

D.5. SAMPLING DESIGN

D.5.1 SAMPLING STRATEGY

Demolition of the remaining at- and below-grade structures of the former X-326 Process Building concrete slab, track alley/berm areas, impacted water containment and management system, basements, and tunnels as well as related post-demolition confirmation sampling of the area, will be accomplished in two separate phases (north and south) due to project timing and follow-on actions that will occur to the SSA prior to any demolition of the NSA.

Following removal of the concrete slab, footers, piers and sub-slab utilities in the SSA, remaining surface soils formerly underlying the removed materials (specifically, the southern slab, track alley, adjacent slab/liner interface, basements, tunnels, and load-out stations) will be subject to confirmatory soil sampling. The NSA demolition will occur at a later date that has not been established; therefore, the NSA will be a separate confirmation sampling area. See Figure D.1 for the locations of the northern and southern slabs, track alley, impacted water containment and management system berm, basements, tunnels, and load-out stations.

A combination of biased and random sampling will be used for selection of the confirmatory soil sampling locations. For soils under the southern slab area, candidate sampling locations were identified where visible cracks are observed based on observations made during a visual walkover survey. Note that the visual walkover survey from the northern slab determined that the area had enough damage that a sampling approach based on crack locations was not practical and more general grid centroid sample locations would be representative. For the SSA candidate crack locations were randomly selected in each grid, as described below. For selection of slab/liner interface sampling locations an interval-based selection has been adopted for the southern area and a random selection process has been adopted for the northern area, as described below. In both cases, the goal was to collect more than eight to ten samples, with the NSA generally being double what has been planned for the SSA (since the areas involved are essentially double). For the track alley and berm catchment basin underlying soils, an interval-based process has been adopted for both the southern and northern areas. The sample number targets for these areas were similar to those for the slab/liner interface areas. Statistical evaluations of resulting data will be completed to ensure that risk-based protectiveness levels are met (i.e., concentrations of residual contaminants in surface soil underlying the slab, basements, tunnels, track alley, slab/liner interface, and load-out stations do not pose an unacceptable risk/hazard to potential receptors).

To facilitate the selection of the confirmatory soil sampling locations for the soils to be unearthed from the demolition of the overlying concrete slabs and foundation materials, separate sampling grids for these areas were digitally created. The 530 ft by 743 ft southern slab was gridded into a total of 24 (4 east-west by 6 north-south) grid blocks, each approximately 133 ft by 124 ft. The 530 ft by 1,537 ft northern slab was gridded into a total of 48 (4 east-west by 12 north-south) grid blocks, each approximately 133 ft by 128 ft. The sampling grids for both the southern and northern slab soils are shown in Figures D.3 and D.4, respectively.

Confirmatory soil sampling and evaluation of the southern (Phase 1 demolition) area (including the concrete slab, adjacent track alley/berm areas, slab/liner interface, basement, tunnel, and load-out station) will be conducted in support of the Phase 1 demolition activities. Similar sampling of the northern project area (in support of Phase 2 of the demolition) will occur at a separate and later time. The following subsections of this document provide the sampling strategy and design for the proposed sampling.

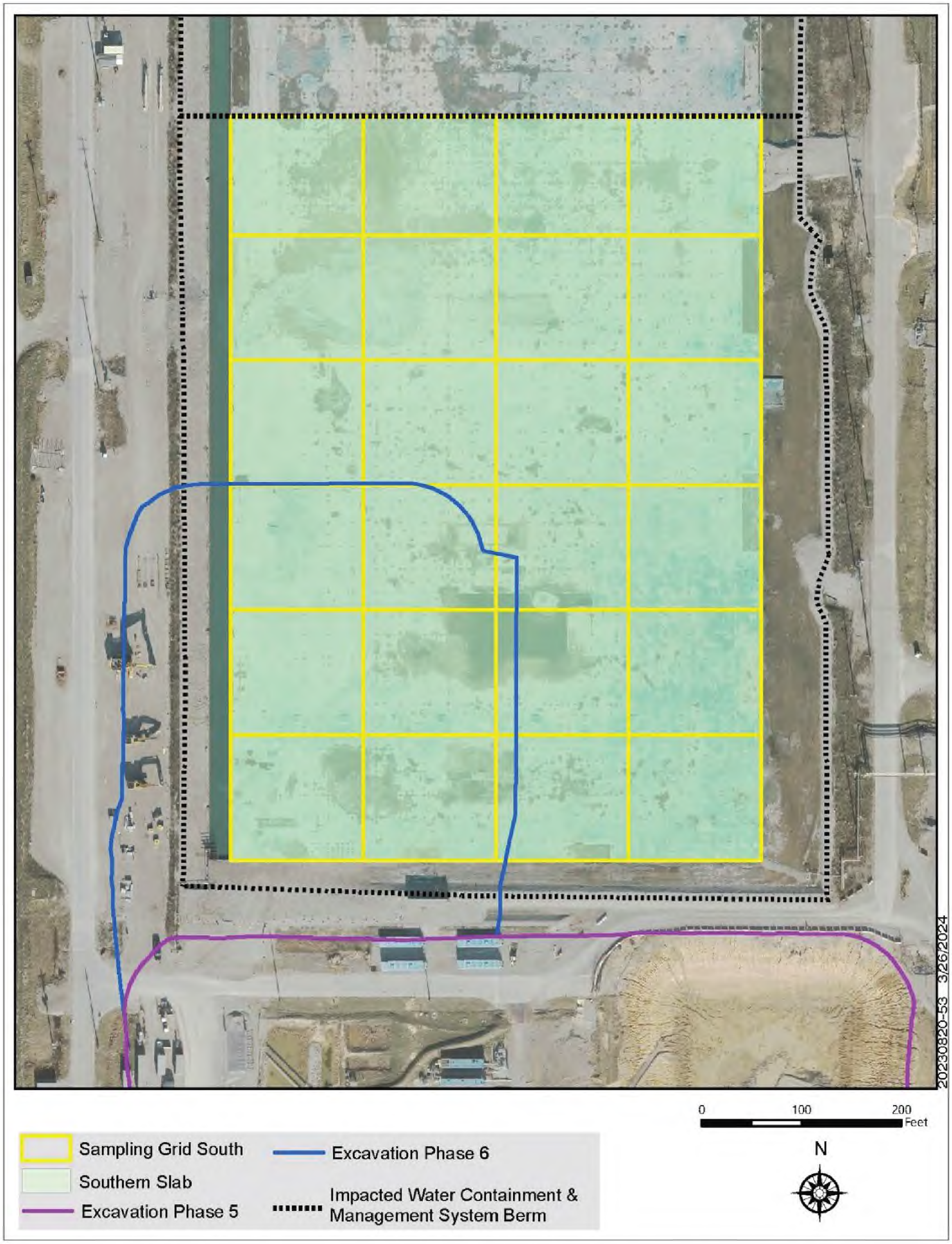

Figure D.3. Confirmation Sampling Grids for Soils Underlying the Southern Slab

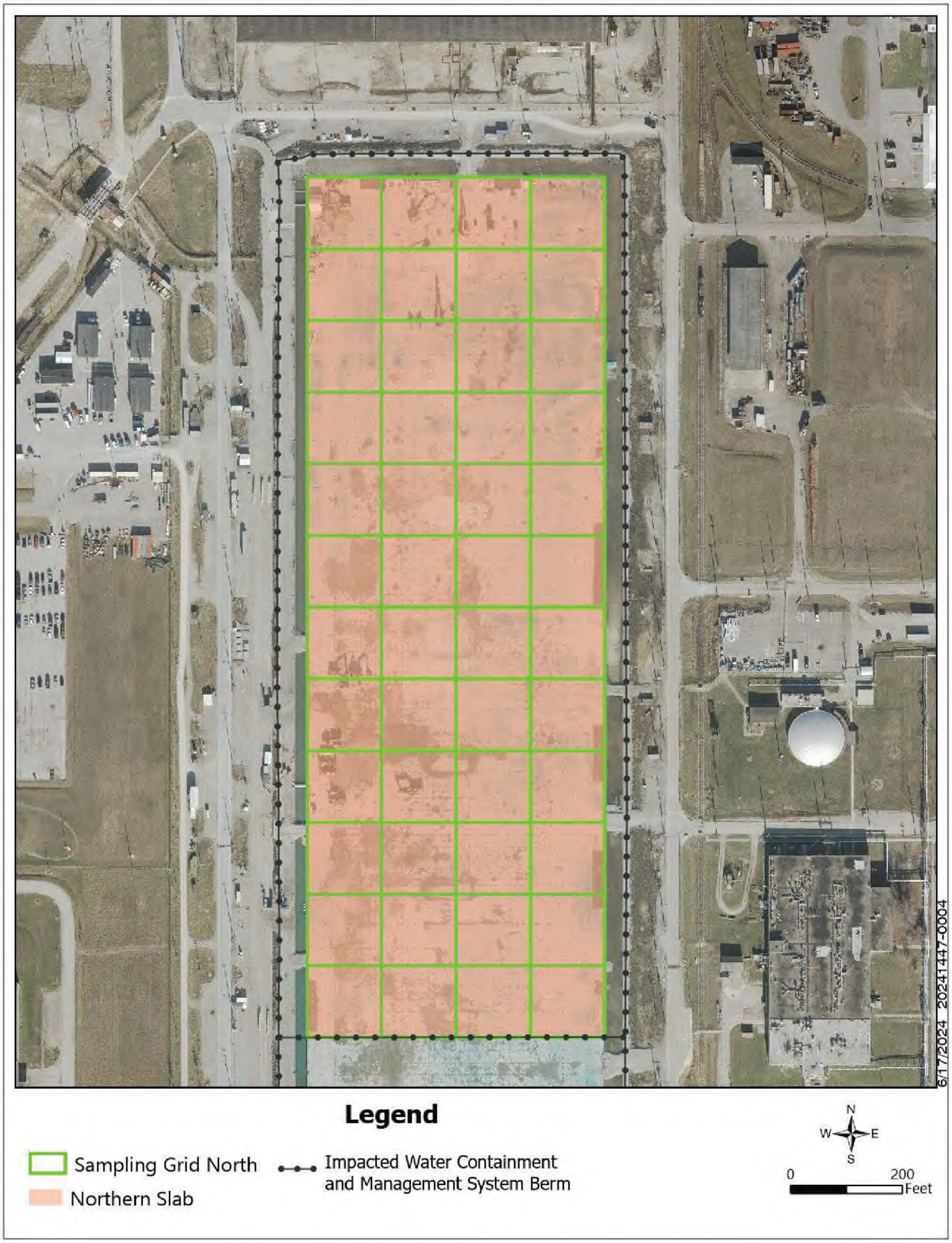

Figure D.4. Confirmation Sampling Grids for Soils Underlying the Northern Slab

D.5.1.1 Soil Sample Location Selection for the Southern Slab and the Adjacent Track Alley/Berm Areas and Slab/Liner Interface

The selection of the confirmatory surface soil sampling locations for the southern slab area and adjacent track alley/berm areas and slab/liner interface was completed by first conducting a visual walkover survey of the southern slab to identify cracks, or networks of cracks, within the concrete slab. During the visual walkover survey, significant cracks in the concrete slab were identified and the most extensive crack within each building column area (an area of approximately 20 ft by 20 ft), if applicable, was mapped to Global Positioning System (GPS) coordinates using the northing and easting system applicable.

Each crack or crack network location identified during the initial visual walkover survey of the slab was assigned a number and, applying a random number generation routine, one crack or crack network location from each of the 24 grid blocks was randomly selected as a confirmation sampling location. This approach provides 18 proposed confirmation sampling locations for surface soil underlying the southern slab as shown in Figure D.5. Note that six of the grids (Numbers 13, 14, 17, 18, 21, and 22) are fully impacted by the follow-on DU CMI excavation work, so no surface soil sampling will be conducted for these grids. Four alternate sample locations were selected using this process (Figure D.5). Alternate sample locations may not be located in the same grid as the original sample due to the randomized nature of sample location selection.

As the demolition work progressed from south to north on the above-grade structures of the X-326 Process Building, occasionally pieces of the edge of the slab would be torn away from the slab due to the impacts from mechanical demolition equipment pulling on the columns located at the outer edge of the building thus creating a space where the liner material had separated from the batten used to secure the liner to the slab. This occurred at multiple locations mainly on the eastern edge and at locations along the north and south face of the slab. The west side was not affected because the liner on the west side was anchored to the wall of the track alley, not the edge of the slab where columns were being pulled down. Repairs to the liner system at the edge of the slab were made when it was safe to do so, weather permitting (cold temperatures interfered with the glue used to reattach the liner). Once repairs were made, the initial integrity of the liner system was restored for the repaired location.

Confirmatory soil sampling locations for slab/liner interface areas for the southern area have been selected based on a 125-ft interval between samples, with sample locations presented on Figure D.6. Similarly, confirmatory soil samples for areas under the track alley and under other lined berm catchment areas have been selected based on a 125-ft interval between samples, but offset from planned slab/liner interface samples. Track alley/berm area samples are placed on the center line area. For the track alley, sample locations fall under the center line of the track alley, midway between the east and west walls. For the berm catchment areas (i.e., the north and east areas from the edge of the slab) this is halfway between the slab edge and the corresponding berm mound.

Due to damage to the slab resulting from mechanical shearing activities that occurred in grids 5 and 6 (see Figure D.5) three additional biased confirmatory soil samples from under this slab area have been included (see Table D.4).

Tables D.4 and D.5 provide the sample locations for soil samples from the slab area and from the slab/liner interface and berm areas, respectively. All soil samples will be collected at a depth interval of 0-6 inches from the top of the soil surface and analyzed for TCE, PCBs, metals, technetium-99, uranium, and transuranics. For the three biased locations identified on Figure D.5, samples will also be collected at 3ft from the top of surface soil. Quality control (QC) samples will also be collected and analyzed as detailed in Section D.6.3.

If sufficient soil sample volumes are not recovered for a specified sample location during soil sampling activities, an additional sample location will be used to acquire additional soil to complete the surface soil sampling. This additional sample will not be placed more than 2 ft from the original sample location. For grid-based soil samples, if a soil boring location cannot be sampled within 5 ft laterally from its established location, an alternate location will be selected, sampled, and documented using appropriate field sampling logs. For slab/liner interface and berm area sample locations the sample location can be relocated in the field as needed to address field issues.

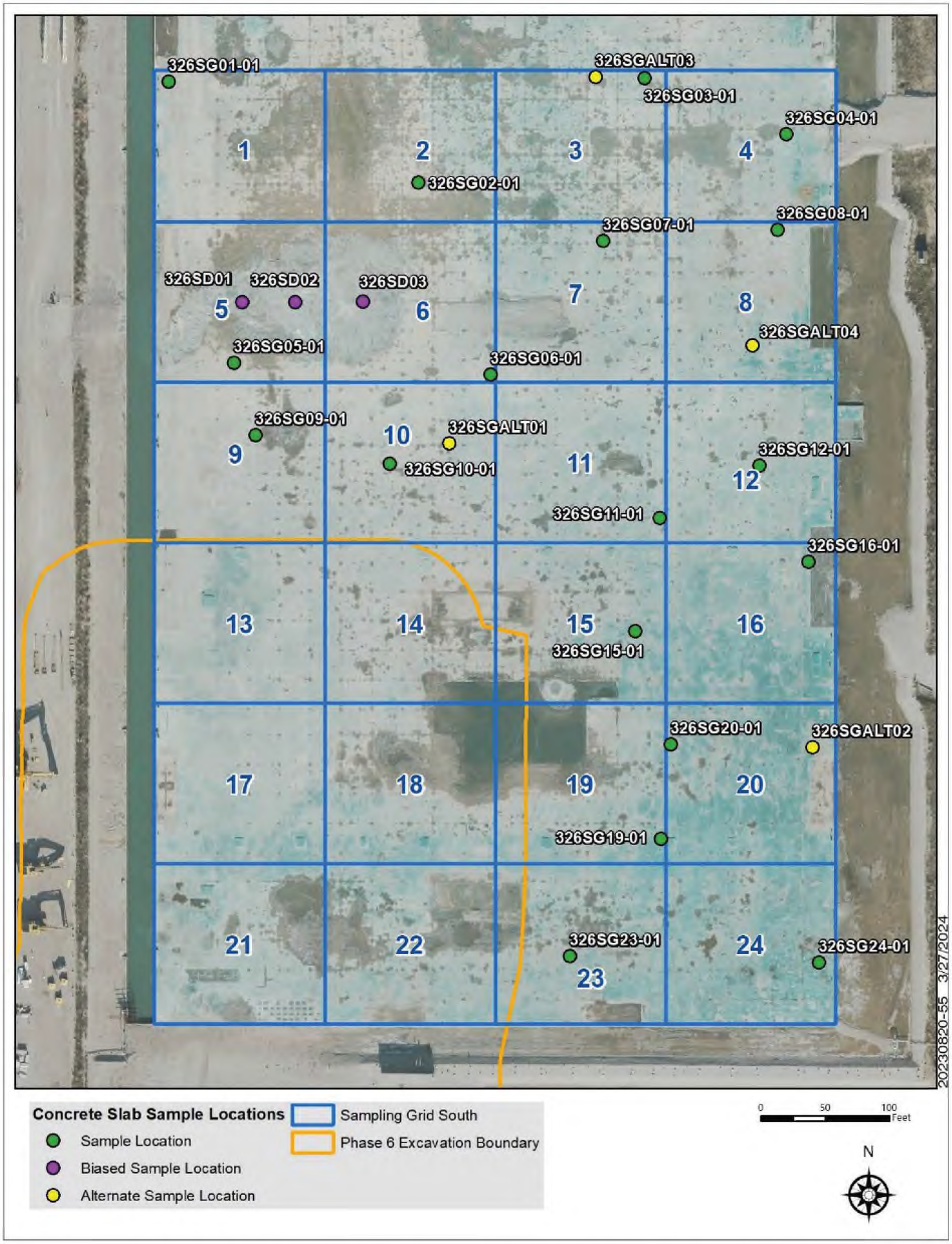

Figure D.5. Soil Sample Locations within the Southern Slab Sampling Grid

Figure D.6. Soil Sample Locations for the Slab/Liner Interface and the Track Alley/Berm Areas for the Southern Slab

Table D.4. Sample Location Site Coordinates for Surface Soil Underlying the Southern Slab

Confirmation Sampling Area	Sample Location ID	Easting	Northing
Southern Slab	326SG01-01	1826015.565	367720.004
	326SG02-01	1826210.104	367641.375
	326SG03-01	1826386.430	367722.693
	326SG04-01	1826496.980	367679.160
	326SG05-01	1826066.764	367500.941
	326SG06-01	1826266.576	367491.837
	326SG07-01	1826354.180	367596.228
	326SG08-01	1826490.251	367604.731
	326SG09-01	1826083.616	367444.638
	326SG10-01	1826187.865	367422.512
	326SG11-01	1826398.384	367380.117
	326SG12-01	1826476.197	367420.859
	326SG15-01	1826379.199	367291.963
	326SG16-01	1826514.301	367346.076
	326SG19-01	1826399.234	367130.247
	326SG20-01	1826407.024	367203.814
	326SG23-01	1826328.595	367039.028
	326SG24-01	1826522.461	367033.741
	326SD01	1826073.060	367548.360
	326SD02	1826114.520	367548.360
	326SD03	1826167.310	367548.600
	326SGALT01*	1826234.353	367438.384
	326SGALT02*	1826517.691	367201.327
	326SGALT03*	1826348.527	367723.935
	326SGALT04*	1826470.606	367514.674

Notes:
*Predefined alternate sample location.

ID = identification

Table D.5. Sample Location Site Coordinates for Track Alley/Berm Areas, and Slab/Liner Interface Adjacent to the Southern Slab

Confirmation Sampling Area	Sample Location ID*	Easting	Northing
Southern Slab / Liner Interface	326SL01	1825983.438	367666.274
	326SL02	1825983.438	367541.274
	326SL03	1825983.438	367416.2739
	326SL04	1826317.539	366985.6655
	326SL05	1826442.539	366985.6655
	326SL06	1826535.485	367048.1654
	326SL07	1826535.485	367173.1655
	326SL08	1826535.485	367298.1655
	326SL09	1826535.485	367423.1656
	326SL10	1826535.485	367548.1657
	326SL11	1826535.485	367673.1658
Southern Track Alley / Berm Areas	326SBA01	1826555.035	367727.7218
	326SBA02	1826564.085	367603.7738
	326SBA03	1826568.035	367478.7738
	326SBA04	1826568.735	367353.7737
	326SBA05	1826566.535	367228.7736
	326SBA06	1826568.185	367103.7735
	326SBA07	1826568.535	366985.6655
	326SBA08	1826410.485	366967.0655
	326SBA09	1826285.485	366967.7656
	326SBA10	1825994.289	367478.7738
	326SBA11	1825994.289	367603.7738
	326SBA12	1825994.289	367727.5738

Notes:
*Alternate nearby locations can be substituted when sample location is not accessible for sampling.

ID = identification

D.5.1.2 Sample Location Selection for the Northern Slab and Adjacent Track Alley/Berm Areas and Slab/Liner Interface

A post-demolition confirmatory soil sampling strategy similar to the one developed for the southern slab and adjacent track alley and slab/liner interface (Section D.5.1.1) was prepared for soils underlying the northern slab and adjacent track alley and slab/liner interface. The northern slab area was similarly gridded for evaluation into 48 blocks. A visual walkover survey of the northern slab was performed, as was performed for the southern slab, and concrete cracks were determined to be widespread; therefore, sampling at the centroid of each grid is proposed instead of biasing the sampling to soils beneath specific crack locations. Mapped GPS coordinates correspond to the centroid location of each grid block. This results in 48 surface soil sampling locations for the soils underlying the northern slab. No alternate sample locations have been selected using this process; impacted sample locations can be replaced by another location within the grid block as close to the centroid as practical. Figure D.7 shows the grid and proposed sample locations and numbers for the northern slab area.

For each 1-ft segment of the northern slab's east, west, and north perimeters representing the slab/liner interface, a random number generation routine was used to select 24 confirmatory soil sampling locations. Of the 24 samples planned, 18 were selected randomly from the slab/liner interface along the north and east sides of the northern slab where the liner had separated from the slab at some locations. The remaining six locations were randomly selected from the slab/liner interface along the west side of the northern slab.

Figure D.8 shows the randomly selected confirmation sample locations for soils underlying the slab/liner interface and the track alley/berm areas for the northern slab.

Using a similar interval-based approach used for track alley/berm area sample locations for the southern area (see Section 5.1.1) sample locations were selected for the northern area based on a 250-ft interval between samples. Figure D.8 shows the sample locations for soil underlying the track alley/berm areas adjacent to the northern slab.

The complete data set for soil underlying the northern slab and the adjacent track alley and slab/liner interface is expected to include a total of 60 surface soil samples (i.e., 21 sample locations underlying the slab, 24 sample locations underlying the slab/liner interface, and 15 samples underlying the track alley and berm areas).

Tables D.6, D.7, and D.8 provide the soil sample locations for samples from the slab area and from the slab/liner interface and berm areas, respectively. All soil samples will be collected at a depth interval of 0-6 inches from the top of the soil surface and analyzed for TCE, PCBs, metals, technetium-99, uranium, and transuranics. QC samples will also be collected and analyzed as detailed in Section D.6.3.

If sufficient soil sample volumes are not recovered for a specified sample location during soil sampling activities, an additional sample location will be used to acquire additional soil to complete the surface soil sampling. This additional sample will not be placed more than 2 ft from the original sample location. If a soil boring location cannot be sampled within 5 ft laterally from its established location, an alternate location will be selected, sampled, and documented using appropriate field sampling logs.

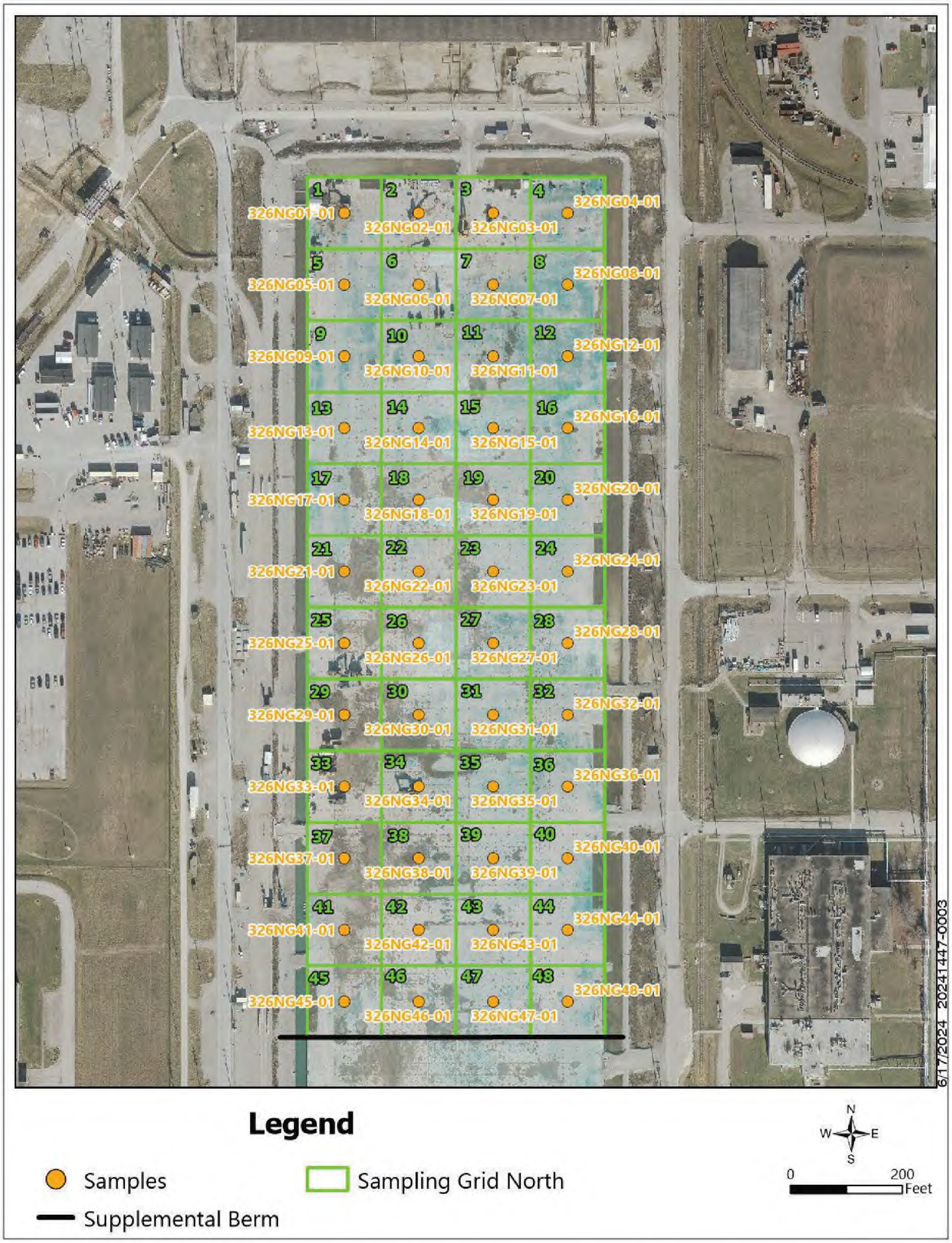

Figure D.7. Soil Sample Locations within the Northern Slab Sampling Grid

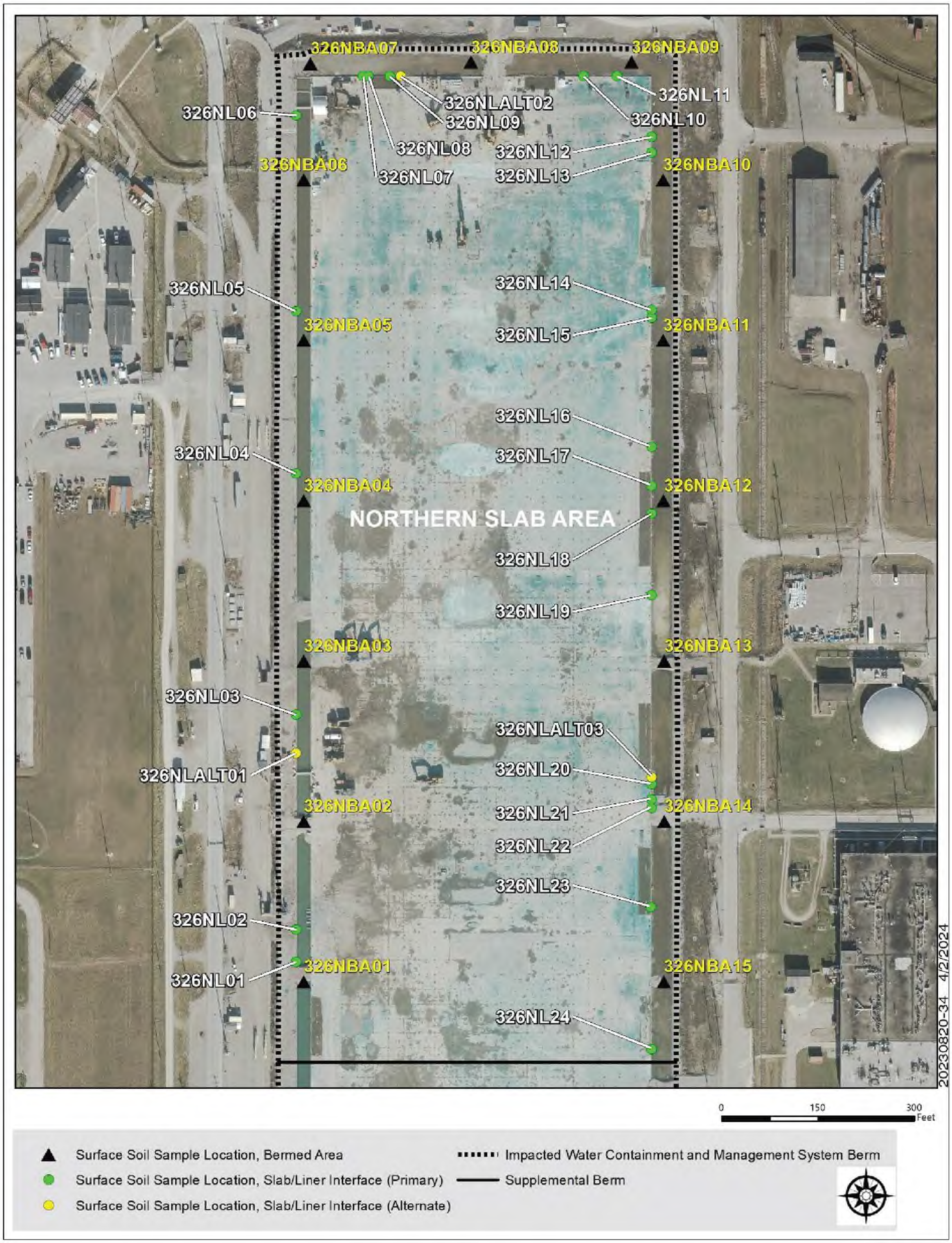

Figure D.8. Soil Sample Locations for the Slab/Liner Interface and the Track Alley/Berm Areas for the Northern Slab

Table D.6. Sample Location Site Coordinates for Surface Soil Underlying the Northern Slab

Confirmation Sampling Area	Sample Location ID	Easting	Northing
Northern Slab	326NG01-01	1826071.448	369203.0689
	326NG02-01	1826204.448	369203.0689
	326NG03-01	1826337.447	369203.0689
	326NG04-01	1826470.447	369203.0689
	326NG05-01	1826071.448	369074.8693
	326NG06-01	1826204.448	369074.8693
	326NG07-01	1826337.447	369074.8693
	326NG08-01	1826470.447	369074.8693
	326NG09-01	1826071.448	368946.6698
	326NG10-01	1826204.448	368946.6698
	326NG11-01	1826337.447	368946.6698
	326NG12-01	1826470.447	368946.6698
	326NG13-01	1826071.448	368818.4702
	326NG14-01	1826204.448	368818.4702
	326NG15-01	1826337.447	368818.4702
	326NG16-01	1826470.447	368818.4702
	326NG17-01	1826071.448	368690.2707
	326NG18-01	1826204.448	368690.2707
	326NG19-01	1826337.447	368690.2707
	326NG20-01	1826470.447	368690.2707
	326NG21-01	1826071.448	368562.0711
	326NG22-01	1826204.448	368562.0711
	326NG23-01	1826337.447	368562.0711
	326NG24-01	1826470.447	368562.0711
	326NG25-01	1826071.448	368433.8716
	326NG26-01	1826204.448	368433.8716
	326NG27-01	1826337.447	368433.8716
	326NG28-01	1826470.447	368433.8716
	326NG29-01	1826071.448	368305.672
	326NG30-01	1826204.448	368305.672
	326NG31-01	1826337.447	368305.672
	326NG32-01	1826470.447	368305.672
	326NG33-01	1826071.448	368177.4725
	326NG34-01	1826204.448	368177.4725
	326NG35-01	1826337.447	368177.4725
	326NG36-01	1826470.447	368177.4725

Table D.6. Sample Location Site Coordinates for Surface Soil Underlying the Northern Slab (continued)

Confirmation Sampling Area	Sample Location ID	Easting	Northing
Northern Slab	326NG37-01	1826071.448	368049.273
	326NG38-01	1826204.448	368049.273
	326NG39-01	1826337.447	368049.273
	326NG40-01	1826470.447	368049.273
	326NG41-01	1826071.448	367921.0734
	326NG42-01	1826204.448	367921.0734
	326NG43-01	1826337.447	367921.0734
	326NG44-01	1826470.447	367921.0734
	326NG45-01	1826071.448	367792.8739
	326NG46-01	1826204.448	367792.8739
	326NG47-01	1826337.447	367792.8739
	326NG48-01	1826470.447	367792.8739

Notes:
ID = identification

Table D.7. Sample Location Site Coordinates for Track Alley/Berm Areas, and Slab/Liner Interface Adjacent to the Northern Slab

Confirmation Sampling Area	Sample Location ID	Easting	Northing
Northern Slab / Liner Interface	326NL01	1825982.479	367886.0164
	326NL02	1825982.479	367936.0166
	326NL03	1825982.479	368271.0166
	326NL04	1825982.479	368647.0165
	326NL05	1825982.479	368900.0167
	326NL06	1825982.479	369205.0164
	326NL07	1826086.784	369266.2528
	326NL08	1826095.039	369266.2528
	326NL09	1826128.039	369266.2528
	326NL10	1826430.039	369266.253
	326NL11	1826481.785	369266.253
	326NL12	1826535.485	369171.665
	326NL13	1826535.485	369146.665
	326NL14	1826535.485	368901.666
	326NL15	1826535.485	368889.666
	326NL16	1826535.485	368688.665
	326NL17	1826535.485	368627.666
	326NL18	1826535.485	368584.666
	326NL19	1826535.485	368457.666
	326NL20	1826535.485	368162.665
	326NL21	1826535.485	368138.666
	326NL22	1826535.485	368125.666
	326NL23	1826534.410	367971.271
	326NL24	1826535.485	367749.666
	326NLALT01*	1825982.479	368211.016
	326NLALT02*	1826145.039	369266.252
	326NLALT03*	1826535.485	368173.665

Notes:
*Predefined alternate sample location.

ID = identification

Table D.8. Sample Location Site Coordinates for Track Alley/Berm Areas of the Northern Slab

Confirmation Sampling Area	Sample Location ID	Easting	Northing
Northern Track Alley / Berm Areas	326NBA01	1825994.289	367854.4689
	326NBA02	1825994.289	368104.469
	326NBA03	1825994.289	368354.4692
	326NBA04	1825994.289	368604.4693
	326NBA05	1825994.289	368854.4695
	326NBA06	1825994.289	369104.4697
	326NBA07	1826005.039	369285.8528
	326NBA08	1826255.039	369287.803
	326NBA09	1826505.039	369287.803
	326NBA10	1826553.935	369104.4598
	326NBA11	1826554.135	368854.4597
	326NBA12	1826554.785	368604.4595
	326NBA13	1826555.435	368354.4594
	326NBA14	1826555.885	368104.4592
	326NBA15	1826555.085	367854.459

Notes:
*Predefined alternate sample location.

ID = identification

D.5.1.3 Sample Location Selection for Soil Underlying Basements and Tunnels

Confirmatory soil sampling will be conducted in the areas of the basements and tunnels associated with the X-326 Process Building concrete slab. Following removal of the concrete floor of the basements (two in the northern slab and one in the southern slab) and adjoining tunnels, and prior to backfilling these subsurface features, sampling of soil beneath the basement/tunnel floors will be conducted. Three sample locations and one alternative sample location have been selected for each basement and each tunnel. All soil samples will be collected at a depth interval of 0-6 inches from the top of the soil surface and analyzed for TCE, PCBs, metals, technetium-99, uranium, and transuranics. QC samples will also be collected and analyzed as detailed in Section D.6.3.

Figure D.9 shows the randomly selected confirmation sample locations for soil underlying the floors of the basement/tunnels. Table D.9 lists the confirmation sample location identification and site coordinates for each basement/tunnel sample location.

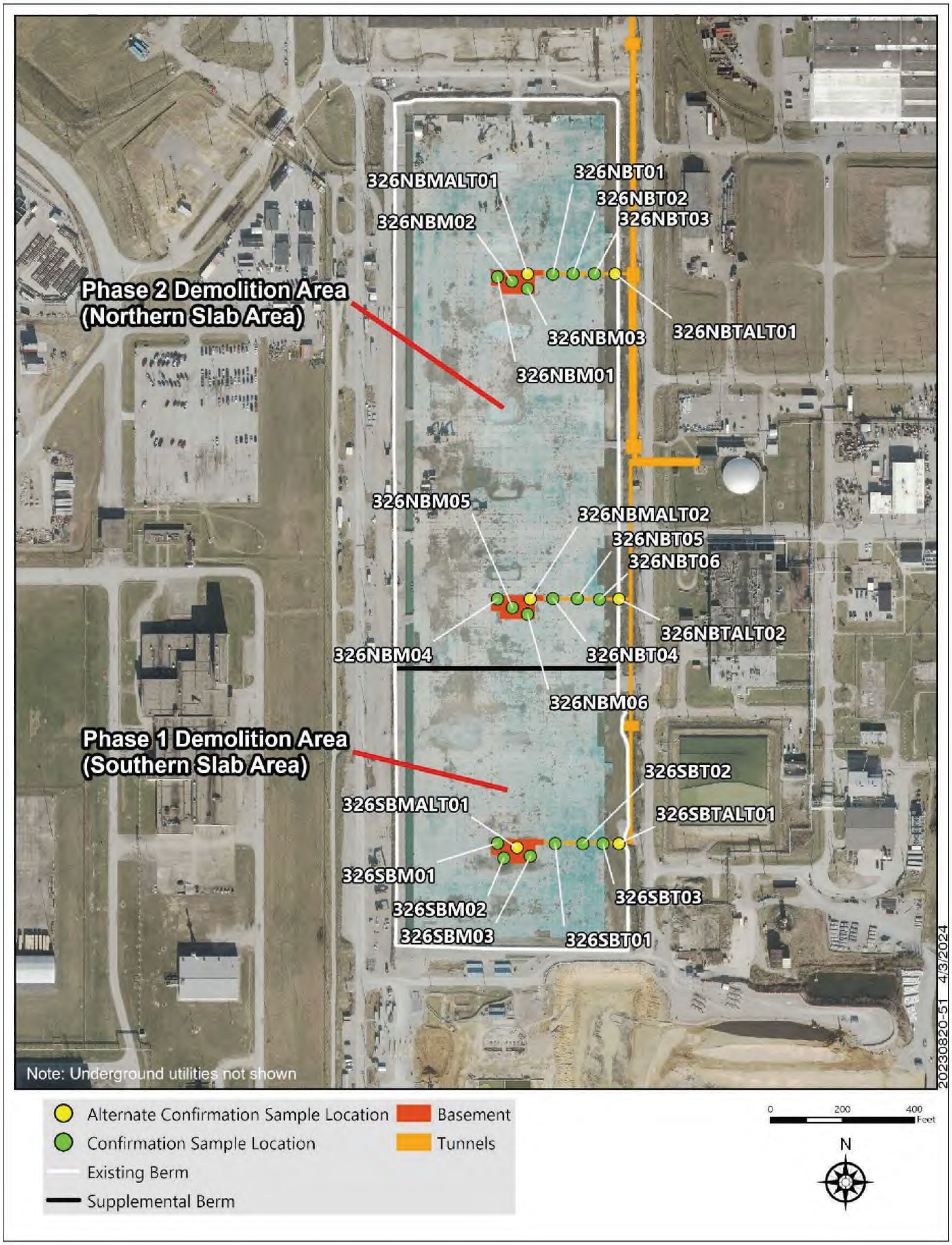

Figure D.9. Confirmation Sample Locations for Surface Soil Underlying Basements and Tunnels

Table D.9. Sample Location Site Coordinates for Surface Soil Underlying the Basements and Tunnels

Confirmation Sampling Area	Location ID[1]	Easting	Northing
Southern Slab Basement	326SBM01	1826238.542	367243.750
	326SBM02	1826256.250	367202.083
	326SBM03	1826330.208	367207.292
	326SBMALT01	1826292.708	367231.250
Southern Slab Tunnel	326SBT01	1826398.958	367242.708
	326SBT02	1826476.042	367242.708
	326SBT03	1826531.250	367242.708
	326SBTALT01	1826576.042	367242.708
Northern Slab Basements	326NBM01	1826238.542	368815.625
	326NBM02	1826279.167	368804.167
	326NBM03	1826321.875	368783.334
	326NBM04	1826239.583	367921.875
	326NBM05	1826280.208	367897.917
	326NBM06	1826321.875	367879.167
	326NBMALT01	1826321.875	368823.958
	326NBMALT02	1826330.208	367921.875
Northern Slab Tunnels	326NBT01	1826392.708	368822.917
	326NBT02	1826448.958	368823.958
	326NBT03	1826508.333	368823.958
	326NBT04	1826392.708	367922.917
	326NBT05	1826460.417	367922.917
	326NBT06	1826521.875	367920.833
	326NBTALT01	1826565.625	368823.958
	326NBTALT02	1826576.042	367921.875

Notes:
[1]For the Location IDs, the following abbreviations apply: NBM = Northern Slab Basement, NBT = Northern Slab Tunnel, SBM = Southern Slab Basement, SBT = Southern Slab Tunnel, ALT = Alternate

ID = identification

D.5.1.4 Sample Location Selection for Surface Soil at Loadout Stations

Confirmation soil sampling will be conducted in the locations of the loadout stations on the western edge of the concrete slab where demolition debris was loaded into trucks for transfer to the OSWDF. Two sample locations and one alternate sample location have been selected for each loadout station: two along the western edge of the northern slab and three along the western edge of the southern slab. All soil samples will be collected at a depth interval of 0-6 inches from the top of the soil surface and analyzed for TCE, PCBs, metals, technetium-99, uranium, and transuranics. Samples will be collected after any demolition work in these areas has been completed, if applicable. QC samples will also be collected and analyzed as detailed in Section D.6.3.

Figure D.10 shows the randomly selected confirmation sample locations for soil underlying the loadout stations. Table D.10 lists the confirmation sample location identification and site coordinates for each loadout sample location.

If additional loadout stations are identified during demolition of the X-326 Process Building at- and below-grade structures, a sampling approach similar to the one presented in this sampling strategy will be used to perform confirmation sampling at these additional load-out stations.

D.5.1.5 Sample Location Selection for Contaminated Utility System Segments

As demolition actions progress to removal of utility system segments from under the X-326 slab and outside of the slab footprint, within the city block boundaries, contaminants from the demolition processes may be encountered in remaining utilities or in original backfill materials from placement of the utilities during the construction of PORTS. If significant areas of soil contamination are encountered, contaminated soils will be removed as residual soil for disposal. Biased location confirmatory soil sample collection will occur in areas where significant volumes of soil have been removed to address contamination identified through field detection methods. Placement and number of samples will be subject to the judgement of the project manager.

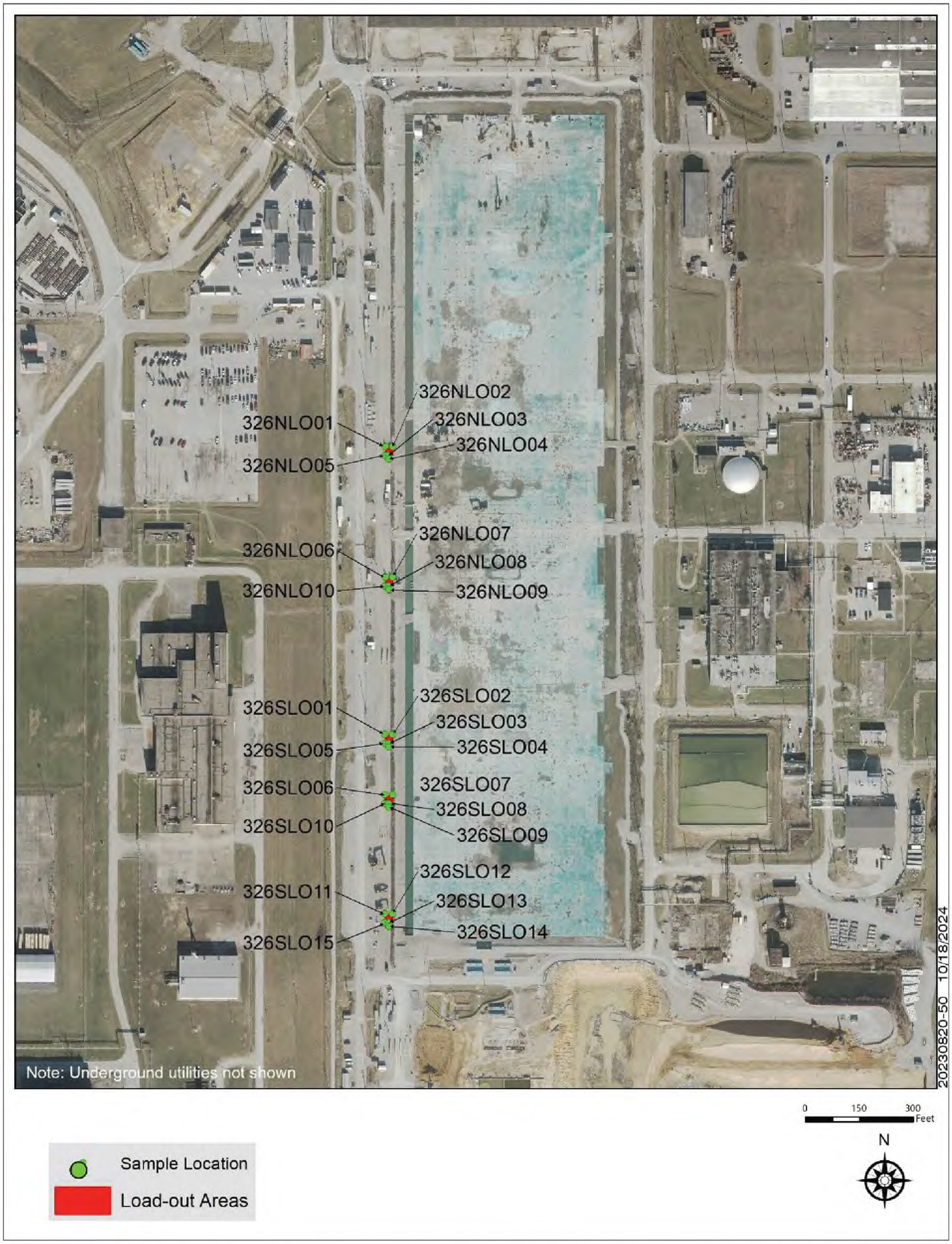

Figure D.10. Confirmation Sample Locations for Surface Soil at the Loadout Stations

Table D.10. Sample Location Site Coordinates for Surface Soil at the Loadout Stations

Confirmation Sampling Area	Location ID[1]	Easting	Northing
Southern Loadout Stations	326SLO01	1825927.047	368343.245
	326SLO02	1825947.880	368343.245
	326SLO03	1825937.480	368318.506
	326SLO04	1825937.480	368308.506
	326SLO05	1825927.047	368318.506
	326SLO06	1825926.965	367980.488
	326SLO07	1825947.799	367980.488
	326SLO08	1825937.399	367955.749
	326SLO09	1825937.399	367945.749
	326SLO10	1825926.965	367955.749
Northern Loadout Stations	326NLO01	1825926.830	367543.542
	326NLO02	1825947.664	367543.542
	326NLO03	1825937.264	367518.803
	326NLO04	1825937.264	367508.803
	326NLO05	1825926.830	367518.803
	326NLO06	1825926.879	367376.238
	326NLO07	1825947.713	367376.238
	326NLO08	1825937.313	367351.499
	326NLO09	1825937.313	367341.499
	326NLO10	1825926.879	367351.499
	326NLO11	1825926.779	367044.893
	326NLO12	1825947.613	367044.893
	326NLO13	1825937.213	367020.154
	326NLO14	1825937.213	367010.154
	326NLO15	1825926.779	367020.154

Notes:
[1]For the Location IDs, the following abbreviations apply: NLO = Northern Loadout, SLO = Southern Loadout,

ID = identification

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D.6. SAMPLING COLLECTION METHODS

Sample collection, handling, and QC are conducted in accordance with the *Sample Analysis Data Quality Assurance Project Plan (SADQ) at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (SADQ) (DOE 2014), or equivalent and laboratory methods specified in Table D.3.

All samples will be collected, documented (chain of custody), and transported in sample containers and handled in accordance with task-specific work control documents and/or approved procedures in accordance with the laboratory analytical method specific requirements. Samples will be collected in accordance with Section D.5.1, following applicable and approved field sampling protocols, procedures, and sample handling protocol as needed.

Samples will be collected using the appropriate tools in accordance with the task-specific work control documents and/or approved procedures that have been developed in accordance with laboratory method requirements. Surface soil samples can be collected with manually operated, hand-held tools (e.g., a hand auger, or similar method) at a depth interval of 0-6 inches from the top of the soil surface.

Samples will be collected, preserved, shipped, and analyzed consistent with the selected sample and analytical methods. Sample volumes will be consistent with the analytical laboratory statement of work. Each sample collected will be analyzed as an individual sample; individual samples will not be composited for analysis.

D.6.1 SAMPLING LOGS

Sampling logs, including a description of the sampled media (i.e., surface soil) will be completed in accordance with site procedures.

D.6.2 DECONTAMINATION OF SAMPLING EQUIPMENT

If sampling tools are required, clean sample equipment will be used for the collection of each sample. This may be achieved by using a new disposable tool for each sample increment collected. All sampling tools will be assessed prior to sample collection to ensure the material of construction will not interfere with or be a component of the chemicals of interest; an equipment rinsate sample may be collected to confirm this assessment.

Non-disposable sampling equipment will be decontaminated thoroughly before use and before reuse per applicable procedures. Samplers will clean and decontaminate non-disposable sampling equipment and devices (if applicable) in accordance with site procedures.

Initial decontamination activities may occur near the sampling area (i.e., wiping down equipment to remove contamination) in accordance with applicable site procedures for decontaminating sampling equipment and devices. This may include wiping and rinsing the sampling tools. This method will generate a separate waste stream for decontamination. The decontamination materials will be managed and disposed of as secondary waste, along with used personal protective equipment and disposable sampling equipment. The rinse water will be collected and recorded as an equipment rinsate blank sample. Equipment rinsate blanks are samples of American Society for Testing and Materials Type II water passed over the sampling equipment prior to use. A minimum of one equipment rinsate blank will be analyzed for the parameters associated with that sampling event if the sampling device has undergone decontamination.

Disposable sampling equipment will be kept sealed until just prior to sampling to prevent contamination. Disposable equipment will be used, where practical, to minimize the opportunity for cross-contamination.

D.6.3 QUALITY CONTROL SAMPLES

Field QC samples will be collected at a frequency of one per sample batch or one per 20 soil samples per sampling area as noted in Table D.8. Field QC and the rationale for selection of specific field QC samples are described with site procedures.

All samples will be analyzed at analytical support level (ASL) D (i.e., full data deliverable and full analytical QC, 1/20 per sampling area or 1/batch per sampling area). Results will receive 100% verification and 100% validation. Twenty percent of the sampling data randomly selected will receive VSL D data validation (full validation), and the remaining 80% will receive VSL B validation (QC forms and performance only). Data validation and usability of all samples will be performed in accordance with site procedures. The following laboratory quality assurance (QA)/QC samples will be analyzed as needed:

- Method blanks – one per sample batch or one per 20 samples
- Matrix spike – one per sample batch or one per 20 samples per sampling area
- Laboratory control sample (LCS) or LCS duplicate – one per analytical batch, not to exceed 20 samples
- Laboratory duplicate – one per analytical batch, not to exceed 20 samples.

The laboratory will be responsible for all QA/QC and corrective actions as defined per the analytical methods and the required methodology.

Table D.11 provides a summary of confirmation samples and field QC samples for each sampling area.

Table D.11. Summary of Confirmation and Field QC Samples

Sampling Area	Number of Confirmation Samples	Number of QC Samples (per Type)[1]
Soils Underlying Southern Slab	21	2
Soils Underlying Southern Slab/Liner Interface	11	1
Soils Underlying Southern Track Alley/Berm Areas	12	1
Soils Underlying Southern Slab Basement/Tunnel	6	1
Soils Underlying Northern Slab	48	3
Soils Underlying Northern Slab/Liner Interface	24	2
Soils Underlying Northern Track Alley/Berm Areas	15	1
Soils Underlying Northern Slab Basements/Tunnels	12	1
Soils at Loadout Stations	10	1
Totals[2]	159	13

Notes:
[1]Type may be field duplicates, field blanks, trip blanks or equipment rinsates, as applicable.
[2]Does not include additional judgmental biased sampling locations that may be collected during the project execution, such as samples from utility system segment excavations.

QC = quality control

D.7. ANALYTICAL METHODS, DETECTION LIMITS, AND DATA VALIDATION

To ensure the quality of the analytical data, all the samples will be analyzed at ASL D (i.e., full data deliverable and full analytical QC per batch). ASL D data deliverables contain all raw data and QC such that analytical data verification and data validation of all sample collection, sample handling, sample preparation, analytical performance, data reduction, and data manipulation (i.e., calculation, weights, etc.) are provided.

The analytical methods to be used and the recommended reporting limits are presented in Table D.3 of this sampling strategy. Analytical data will be generated using U.S. Environmental Protection Agency (EPA)-approved methods or other well-established and approved methods.

D.7.1 FIELD VALIDATION

Independent field validation is performed to ensure that sample collection and documentation are in accordance with the DQO, sampling strategy, and related task-specific documents. As part of the field validation, sampling event logs and documentation will be reviewed to ensure their completeness and compliance with the requirements in those documents. The field validation report will provide management feedback regarding the completeness of field sampling events and track noncompliant sampling issues. This review will verify that any field measuring instruments were calibrated and checked as required and will assure the comparability of documented information on the different sampling logs and chain-of-custody forms.

The field validation effort also assures the analytical data validation function that compliant field activities support qualified laboratory data results. Field validation will follow a technically sound and consistent approach to evaluate field measurements and data obtained. The process will be documented and defensible. The validator must assess field records to determine that the data meet QA/QC standards for usability and adhere to the requirements of the DQOs, this sampling strategy, and other task-related documents.

The field documentation review must be objective and must be performed independently of the sampling functions and their management. All field validation team members must have the authority to access and review all required sampling information, field measurements, and results generated. When field validation is being performed, the field validator(s) will report to the QA data quality function.

D.7.2 DATA VERIFICATION AND VALIDATION

Initial review of analytical data is performed by the Sample Management Office and includes verification that all required deliverables were provided by the laboratory within the required turnaround time. Another verification task is comparing the hard-copy data deliverables to the associated data uploaded by the laboratory to the project environmental measurements system (PEMS) to ensure a one-to-one correspondence between the two sources of information.

Data will be validated using a graded approach, which may include examination of field measurements, field QC, sampling and handling procedures, laboratory analysis, reporting, and nonconformance. Verification is the process of checking data for completeness, correctness, and compliance with analytical specifications (such as the analytical statement of work and other project plans). Results from fixed-base laboratories will receive 100% verification. Results will receive 100% validation – 80% at VSL B and 20% at VSL D.

Data validation will be performed in accordance with *Guidance on Environmental Data Verification and Data Validation* (EPA 2002) and applicable procedures included on EPA's website for *Superfund Contract Laboratory Program National Functional Guidelines for Data Review* (EPA 2023).

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D.8. FIELD CHANGES / NONCONFORMANCES

In accordance with Section 3.9 of the SADQ, a field change notice (FCN) process will be used when changes to the scope of the activity are needed; when clarification is needed for the planned activity or additional information is applicable; when errors in the original SAP or other plans must be corrected; when resampling activities will occur; when sample locations change; etc. Applicable approval(s) will be obtained using the FCN process prior to deviation from the approved sampling strategy, as defined by the SADQ. Also see Section 4.5 of the *Comprehensive Deactivation, Demolition, and Disposition Remedial Design/Remedial Action Work Plan for the Process Buildings and Complex Facilities Remedial Action Project and Remedial Design for Deactivation of Complex Facilities at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (Comprehensive Process Buildings RD/RA Work Plan) (DOE 2024b).

Note that alternate sample locations have been identified for sampling areas in this sampling strategy. Alternate sample locations should be used if needed; however, if using an alternate sample location is not applicable due to field conditions, a sample can be collected within 5 ft of the original sample location.

Nonconformances will be identified and documented in accordance with Section 14.5 of the SADQ. If a reportable condition is identified, a nonconformance report will be initiated. The reporting organization will request the QA organization's assistance in evaluating conditions and documenting the identified nonconformance. Deviations from this plan once concurred-with by Ohio EPA will additionally follow applicable reporting requirements of the D&D DFF&O, Attachment B, Task VII, as required under the Comprehensive Process Buildings RD/RA Work Plan.

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D.9. DATA MANAGEMENT, EVALUATION, AND STORAGE

Data collected under this sampling strategy will be managed and evaluated using standard database tools and procedures consistent with the SADQ. All analytical data for this confirmation sampling will be stored in the PEMS database. Analytical methodology, including data verification and validation will be performed according to procedures described in Section D.7.2 of this sampling strategy. Data management and evaluation of the verified/validated analytical data and data reporting are further described below.

D.9.1 DATA MANAGEMENT

Sample identification numbers will be entered into the designated data management system (i.e., PEMS) and linked with all information for that sample, including location name, sampling information, QC records, and analytical results.

As specified in the SADQ, sampling teams will describe daily activities in the field logbook, which should provide enough detail for accurate reconstruction of events without reliance on memory. A logbook is a narrative record of events describing the field activities. All field measurements, observations, and sample collection information associated with physical sample collection will be recorded in the field logbook, as required per procedure. A copy of the logbook will be sent to field validation and the Field Characterization Manager upon request.

Sample logs, as applicable, will be completed according to the SADQ and applicable site procedures. The sample identification number, method of sample collection, sampling strategy number, and other details will be specified in the sample log, which is generated by PEMS. The date and time of sample collection, in addition to other pertinent details, will be recorded on the sample log in the field by the field technician. The sample identification number will also be used to identify the samples during analysis, data entry, and data management, and on the chain-of-custody form. All physical samples submitted for laboratory analysis will be collected and reported at ASL D as specified in this sampling strategy or on an FCN.

Laboratory analytical data packages are transferred in electronic formats and/or in standard hard copy. The receipt of data packages from on-site and off-site laboratories is tracked in Tracker. Tracker, which interfaces with PEMS, is a sample management database used to create laboratory statements of work based on sampling strategy requirements, which communicates with analytical laboratories and tracks samples from sample shipment to data reporting to sample disposal (i.e., cradle-to-grave tracking). Data packages will be filed and distributed in accordance with existing data management processes.

D.9.2 DATA EVALUATION AND REPORTING

Because the demolition at the X-326 Process Building concrete slab, track alley, and impacted water containment and management system area must be accomplished in two separate phases with confirmation sampling to follow each phase, separate confirmation sampling data sets will be used for the NSA and SSA. Two final data sets will be generated: one for the NSA (Phase 2 demolition activities) and one for the SSA (Phase 1 demolition activities). The following description for data evaluation applies to the two data sets.

Upon receipt of the verified and validated analytical results for the confirmation samples, the data will be organized. For each of the data sets, a 95% upper confidence limit (UCL) of the mean for each analyte will be calculated using ProUCL Software supported by *ProUCL Version 5.1 Technical Guide Statistical Software for Environmental Applications for Data Sets with and without Nondetect Observations,* *EPA/600/R-07/041* (EPA 2015). The 95% UCL of the mean for each data set will then be compared to the relevant criteria (see Table D.3) for each of the contaminants.

If the 95% UCL of the mean exceeds the criteria for any chemical(s) of interest in a data set, then a future removal action under separate CERCLA authority to ensure removal of contaminants that pose unacceptable risk would be anticipated.

The sampling strategy described above has been selected to ensure relevant criteria are met for TCE, PCBs, metals, technetium-99, uranium, and transuranics.

All data obtained during confirmation sampling will be submitted to the Ohio EPA in a letter report following completion of each phase of demolition and sampling (i.e., Phase I – SSA and Phase II – NSA).

D.10. SURVEILLANCE

All laboratories used to analyze characterization samples will be audited by a QA representative. These laboratories are listed on the qualified suppliers list. The QA representative will perform periodic assessments, as necessary, of all participating laboratory facilities. These audits and assessments are focused on, but not limited to, the following: laboratory QA program, information management systems, materials management operations, waste disposal, and analytical method performance and compliance.

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D.11. REFERENCES

DOE 2024a, *Above-grade Demolition Design Plan for the X-326 Process Building and Associated Special Nuclear Material Monitoring Portals, Tie Lines, and Pipe Racks at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio*, DOE/PPPO/03-0888&D7, U.S. Department of Energy, Piketon, Ohio, May.

DOE 2024b, *Comprehensive Deactivation, Demolition, and Disposition Remedial Design/Remedial Action Work Plan for the Process Buildings and Complex Facilities Remedial Action Project and Remedial Design for Deactivation of Complex Facilities at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio*, DOE/PPPO/03-0758&D3, U.S. Department of Energy, Piketon, Ohio, June.

DOE 2021, *Deferred Units Resource Conservation and Recovery Act Facility Investigation/Corrective Measures Study Report at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio*, DOE/PPPO/03-0772&D3, U.S. Department of Energy, Piketon, Ohio, August.

DOE 2015, *Final Soil Background Report for the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio*, DOE/PPPO/03-0667&D1, U.S. Department of Energy, Piketon, Ohio, April.

DOE 2014, *Sample Analysis Data Quality Assurance Project Plan (SADQ) at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio*, DOE/PPPO/03-0278&D2, U.S. Department of Energy, Piketon, Ohio, February.

EPA 2023, *Superfund Contract Laboratory Program National Functional Guidelines for Data Review*, U.S. Environmental Protection Agency, Washington D.C, website: Superfund CLP National Functional Guidelines for Data Review | US EPA.

EPA 2015, *ProUCL Version 5.1 Technical Guide*, *Statistical Software for Environmental Applications for Data Sets with and without Nondetect Observations*, EPA/600/R-07/041, Washington D.C., October.

EPA 2002, *Guidance on Environmental Data Verification and Data Validation*, EPA QA/G-8, U.S. Environmental Protection Agency, Washington D.C., November.

Ohio EPA 2023, *Decision Document for Resource Conservation and Recovery Act Deferred Units at the Portsmouth Gaseous Diffusion Plant, Piketon, OH,* Ohio Environmental Protection Agency Columbus, Ohio, July.

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*, Ohio Environmental Protection Agency, Columbus, Ohio, July 16.

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ATTACHMENT D.1: DATA QUALITY OBJECTIVES FOR THE X-326 PROCESS BUILDING POST-SLAB DEMOLITION SURFACE SOIL CONFIRMATION SAMPLING, PORTSMOUTH GASEOUS DIFFUSION PLANT, PIKETON, OHIO

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DATA QUALITY OBJECTIVES FOR THE X-326 PROCESS BUILDING POST-SLAB DEMOLTION SURFACE SOIL CONFIRMATION SAMPLING, PORTSMOUTH GASEOUS DIFFUSION PLANT, PIKETON, OHIO

DQO Step 1: The problem

D&D of the above-grade portions of the X-326 Process Building and size reduction activities for deactivation wastes from the X-333 Process Building resulted in damage to the concrete building slab and created the potential for release of D&D-related contaminants (i.e., PCBs, metals, technetium-99, uranium, and transuranics) to surface soil in the area beneath the concrete slab (including the track alley), the associated demolition-impacted water containment and management system (i.e., a bermed and lined water containment structure around the perimeter of the X-326 Process Building designed to collect, contain, and manage impacted water from the demolition area), basements, tunnels, loadout stations and buried utility system segments. The liner of the impacted water containment and management system is also known to have separated from the concrete slab in several locations, necessitating repairs. Separation of the liner from the slab may have briefly compromised the protection to underlying surface soil, potentially allowing D&D-related contaminants to impact surface soils.

After demolition of the X-326 Process Building concrete slab, footers, utility systems, etc., confirmatory soil sampling of exposed surface soil (hereafter referred to as confirmatory sampling) in the area of the former concrete slab, track alley, the slab/liner interface, basements, tunnels, load-out stations and contaminated utility system segment soils will be conducted as part of the CERCLA process for evaluating the protectiveness of soil contamination levels remaining after the completion of the at- and below-grade demolition. For this project, surface soil is media from a depth interval of 0-6 inches from the top of the remaining surface. The planned confirmation sampling is consistent with a Removal Site Evaluation pursuant to 40 CFR 300.410.

Confirmatory sampling will provide data to determine if surface soils in the area of the former X-326 Process Building have been impacted by contaminants potentially released from the X-326 Process Building demolition (and follow-on activities conducted on the building's concrete slab) and ensure those contaminants do not pose unacceptable risk to human health or the environment. Data from this sampling effort will also support radiation protection during the work. This will be accomplished by statistically evaluating the sample data to ensure soil contaminant concentrations do not exceed relevant risk-based protectiveness criteria for TCE, PCBs, metals, technetium-99, uranium, and transuranics.

What is the objective?	Obtain a sufficient amount of analytical data from representative soil sampling locations associated with the demolition of the former X-326 Process Building (i.e. concrete slab, track alley/berm areas, slab/liner interface, basements, tunnels, loadout stations, and utility system segments) to use a 95% UCL of the mean for each analyte and determine if concentrations of D&D-related contaminants (i.e., PCBs, metals, technetium-99, uranium, transuranics) and TCE are less than relevant criteria relating to risk/hazard to potential receptors.
What is the description of the areas?	The confirmation sampling area includes the surface soils including those exposed by the X-326 Process Building at- and below-grade demolition, including the concrete slab, track alley/berm areas, the slab/liner interface, basements, tunnels, loadout stations, and utility system segments. Confirmation sampling for the NSA and the SSA will be conducted separately. The entire X-326 Process Building concrete slab (552 ft by 2,280 ft), including the track alley that is adjacent and parallel to the main concrete floor slab on the

DATA QUALITY OBJECTIVES FOR THE X-326 PROCESS BUILDING POST-SLAB DEMOLTION SURFACE SOIL CONFIRMATION SAMPLING, PORTSMOUTH GASEOUS DIFFUSION PLANT, PIKETON, OHIO	
	west side of the former building, covers approximately 29 acres. The northern slab covers an approximate area of 530 ft by 1,537 ft and the southern slab covers an approximate area of 530 ft by 743 ft. The city block that contains the former building and other utility system segments is bounded by Scioto Avenue on the west, Pike Avenue on the east, and 5th Street and 15th Street on the south and north, respectively includes an area of approximately 45 acres.
Who are the data users?	DOE and site contractors working in the following groups: Waste Management, Environmental Protection, and Environmental Remediation. Environmental Protection will use this information to assist with regulatory compliance, such as applicable or relevant and appropriate requirements. Environmental Remediation and Waste Management requires this information to determine the eventual disposition of affected soils, if required. Radiation Protection requires this information to analyze against DOE-authorized limits for radionuclides.
What are the contaminants/analytes of interest?	TCE, PCBs, metals, technetium-99, uranium, and transuranics are the contaminants of interest related to the demolition and known soil contaminants, including contaminants associated with X-333 Process Building materials that were size reduced at the X-326 slab.
DQO Step 2: The decision	
What is the purpose of obtaining the data?	The purpose of obtaining the data is to determine if concentrations of building- and soil-related contaminants are present in surface soil in the area of the former X-326 Process Building at concentrations that exceed relevant criteria.
What are the objectives of obtaining the data?	The objective for obtaining the data is to calculate a 95% UCL of the mean for each analyte in the data set for comparison to relevant protectiveness criteria.
DQO Step 3: Inputs to the decision	
What historical data exists?	Existing historical area soil sampling results are no longer relevant due to demolition actions that may have released additional contaminants. Historical building data frames the nature of the contaminants likely to have been released as a

DATA QUALITY OBJECTIVES FOR THE X-326 PROCESS BUILDING POST-SLAB DEMOLTION SURFACE SOIL CONFIRMATION SAMPLING, PORTSMOUTH GASEOUS DIFFUSION PLANT, PIKETON, OHIO	
	result of demolition and other activities. Only newly-collected post demolition soil data will be used.
What process knowledge exists?	Process knowledge of contaminants that were present in the X-326 Process Building provides a means to predict behavior and location of released contaminants based on known fate and transport characteristics (e.g., the limited solubility, hydrophobicity, and predictable adsorption characteristics of PCBs).
What additional data needs to be collected?	Surface soil samples will be collected from discrete areas where soils to be left after the demolition actions may have been exposed released contaminants (i.e., the concrete slab, track alley, associated impacted water containment and management system, basements, tunnels, loadout stations, and utility system segments) and analyzed to obtain data to confirm that TCE PCB, metals, technetium-99, uranium, and transuranics are not present in concentrations exceeding relevant protectiveness criteria.
DQO Step 4: Study boundaries	
What is the potential contamination?	Demolition of the X-326 Process Building potentially released contaminants to surface soil in the area. Contaminants in soils may include TCE, PCBs, technetium-99, and uranium.
What considerations affect the number of the samples?	The total number of soil samples must be adequate to perform statistical evaluations of the data for the NSA and the SSA.
Are there sampling problems?	There are no identified sampling problems.
Are there other sampling constraints, such as temporal, schedule, seasonal concerns, regulatory requirements, etc.?	Some soil samples must be collected at the time that the deepest excavated soils are exposed in an area (such as basement and tunnel soils and any sampling required in utility system segment excavation/demolition activities) since these areas will be backfilled as demolition progresses.
DQO Step 5: Decision rule	
How are the analytical RLs established?	The RLs for the chemicals of interest (analytes) will be generated based on the lowest available method detection limit to meet the project requirement.

DATA QUALITY OBJECTIVES FOR THE X-326 PROCESS BUILDING POST-SLAB DEMOLTION SURFACE SOIL CONFIRMATION SAMPLING, PORTSMOUTH GASEOUS DIFFUSION PLANT, PIKETON, OHIO	
DQO Step 6: Decision errors	
What are the steps to be taken after the analytical results are received?	All analytical data packages received will be reported at ASL D. ASL D data deliverables contain all QC and raw data such that verification and validation of all sample handling/preparation and analytical performance, data reduction, and reporting can be performed. Results will receive 100% verification and 100% validation. Data are planned to be validated as follows: 20% of samples randomly selected at VSL D (full validation) and 80% VSL B (QC forms and performance only). After the analytical data have been verified and validated and any issues have been resolved with the laboratory, the data will be evaluated to determine if it meets the project needs, based on the type, quantity (i.e., representative average concentrations of the contaminant in the soil sample), and distribution of contamination. This plan incorporated sources of uncertainty, including sampling uncertainty, laboratory uncertainty (laboratory duplicates, field duplicates, and matrix spike/matrix spike duplicates), and systematic uncertainty (e.g., lack of access, safety issues).
DQO Step 7: Design for obtaining data	
State the type of data to be obtained.	Documentation from site walkovers will be obtained, as will validated analytical laboratory data for soil samples.
State the approach to sample selection.	Soil sampling locations have been selected to provide broad coverage of areas that could have been impacted by contaminants from the above-grade demolition of the X-326 Process Building, the follow-on at- and below-grade demolition activities, or even prior contaminants releases in the building area soils. Sampling is divided into north and south areas to match the demolition project approach. A combination of biased and random sampling will be used for selection of the sampling locations. Biased sample locations will be identified in the SSA at locations that correspond to where visible cracks are observed in the concrete slab. These biased sample locations will be identified through observations made during a visual walkover survey. From the NSA samples will be collected from the centroid of gridded areas. A random sampling approach will be used to select soil sample locations for the slab/liner interface adjacent to the NSA. The slab/liner

DATA QUALITY OBJECTIVES FOR THE X-326 PROCESS BUILDING POST-SLAB DEMOLTION SURFACE SOIL CONFIRMATION SAMPLING, PORTSMOUTH GASEOUS DIFFUSION PLANT, PIKETON, OHIO	
	interface of the SSA and the track alley and berm areas of the SSA and NSA will receive interval-based sampling to ensure overall coverage. The total number of biased and random soil samples included in the data sets for the NSA and SSA will provide an adequate number of sample results to perform statistical evaluations of the data for each area. Following removal of the concrete floor of the basements (two in the northern slab and one in the southern slab) and adjoining tunnels and prior to backfilling these subsurface features, sampling of soil beneath the basement/tunnel floors will be conducted. Additionally, confirmation soil sampling will be conducted in the locations of the loadout stations on the western edge of the concrete slab where demolition debris was loaded into trucks for transfer to the On-site Waste Disposal Facility. The selection of the biased sampling locations began by gridding the 530 ft by 743 ft southern slab into approximately 133 ft by 124 ft grid blocks for a total of 24 grid blocks. During the visual walkover survey of the concrete slab, cracks were identified, and the most extensive area of each identified crack, or network of cracks, was assigned a GPS location identification. One crack location from each grid block was randomly selected as a surface soil sampling location. This will provide a maximum of 18 sampling locations for surface soil currently underlying the southern slab (due to elimination of six grids impacted by the follow-on overall excavation of the area for disposal of these soils. Three additional samples of soils underlying slab were identified for the area where X-333 process equipment was sheared for disposal. A similar gridding approach has been used to select sampling locations for the northern slab, except that the northern slab is an area of 530 ft by 1,537 ft that is gridded into 48 grid blocks. This will provide a maximum of 48 sampling locations for surface soil currently underlying the northern slab. Due to the nature of the slab cracking and subsequent and planned protection efforts for the northern slab, the soil sample locations will be assigned to the centroid of each gridded block for the northern area. During demolition operations for the above-grade structure, the synthetic liner separated from the slab at some locations due to demolition activities of the structure above the slab and liner. Soil sample locations at the slab/liner interface are randomly selected (for the NSA) using a random number generator. Of the 24 samples planned for the northern slab/liner interface, 18 were selected randomly from the area where the liner was known to have separated from the concrete slab. The remaining six locations were randomly selected from the area of the

DATA QUALITY OBJECTIVES FOR THE X-326 PROCESS BUILDING POST-SLAB DEMOLTION SURFACE SOIL CONFIRMATION SAMPLING, PORTSMOUTH GASEOUS DIFFUSION PLANT, PIKETON, OHIO	
	slab/liner interface where there was no evidence of liner separation. For the slab/liner interface of the SSA, samples have been selected at 125-ft intervals, excluding the areas to be removed by follow-on deep excavation). A total of 11 samples are planned for the southern slab/liner interface. Sample locations were selected for sampling of soil underlying the track alley and berm catchment areas adjacent to the southern slab based on 125-ft intervals (staggered from the slab/liner samples) and based on 250-ft intervals for the northern slab. Samples will be collected under the approximate midline of the track alley or berm catchments, as applicable. The total number of resulting samples is 12 and 15 for the SSA and NSA, respectively. Three sample locations have been selected for each basement and each tunnel (one basement with adjoining tunnel in the SSA and two basements with adjoining tunnel in the NSA). Two sample locations and one alternative sample location have been selected for each load-out station: two along the western edge of the northern slab and three along the western edge of the southern slab. A sufficient number of alternate sample locations are planned for the slab, track alley, slab/liner interface, basement, tunnel, and loadout station sampling. Biased samples may also be collected from utility system segment demolition areas if significant contamination was noted and removed (to provide confirmation that removal was complete). All surface soil samples will be collected at a depth interval of 0-6 inches from the top of the surface and analyzed for TCE, PCBs, metals, technetium-99, uranium, and transuranics.

Not

ASL = analytical support level
CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended
CFR = Code of Federal Regulations
D&D = decontamination and decommissioning
DOE = U.S. Department of Energy
DQO = data quality objective
FRL = final remediation level
GPS = Global Positioning System
NSA = Northern Slab Area
PCB = polychlorinated biphenyl
QC = quality control
RL = reporting limit
SSA = Southern Slab Area
UCL = upper confidence limit
VOC = volatile organic compound
VSL = validation support level

APPENDIX E: X-326 PROCESS BUILDING AT- AND BELOW-GRADE DEMOLITION AIR MONITORING PLAN

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ACRONYMS

ACGIH	American Conference of Governmental Industrial Hygienists
ARAR	applicable or relevant and appropriate requirement
CFR	U.S. Code of Federal Regulations
D&D	decontamination and decommissioning
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
FBP	Fluor-BWXT Portsmouth LLC
HAP	hazardous air pollutant
MAGLC	maximum acceptable ground-level concentration
NAAQS	National Ambient Air Quality Standards
NESHAP	National Emission Standards for Hazardous Air Pollutants
OAC	*Ohio Administrative Code*
ODH	Ohio Department of Health
Ohio EPA	Ohio Environmental Protection Agency
PCB	polychlorinated biphenyl
$PM_{2.5}$	particulate matter 2.5 microns or less in diameter
PM_{10}	particulate matter 10 microns or less in diameter
PORTS	Portsmouth Gaseous Diffusion Plant
TBC	to-be-considered (guidance)
TCE	trichloroethene
TLV	threshold limit value
VOC	volatile organic compound

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E.1. INTRODUCTION

The U.S. Department of Energy's (DOE's) plan for the decontamination and decommissioning (D&D) of the former Portsmouth Gaseous Diffusion Plant (PORTS) includes the demolition of the remaining at- and below-grade structures of the X-326 Process Building, continued operation of a wastewater containment and management system (until no longer required), operation of wastewater treatment processes (until no longer required), management of resulting wastes, and placing waste in the On-site Waste Disposal Facility. These activities are described in the main text of the *At- and Below-Grade Demolition Design Plan for the X-326 Process Building at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (X-326 At- and Below-grade DDP). As discussed in Section 1, *Introduction*, of the X-326 At- and Below-grade DDP, this document describes plans for two separate scopes (structure demolition and soil excavation corrective measures implementation) conducted under two separate regulatory authorities. The two separate but related scopes of this document are the X-326 At- and Below-grade DDP and the X-326 Process Building Southwest Corner Soil Deferred Unit Excavation Corrective Measures Implementation Plan (hereafter referred to as the X-326 CMI Plan). This air monitoring plan addresses emissions from the demolition activities associated with the X-326 At- and Below-grade DDP. The air monitoring plan that addresses the X-326 CMI Plan is covered under the *5-Unit Groundwater Plume Area Excavation Work Plan at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (DOE 2022).

This project-specific air monitoring plan is considered a replacement for the air monitoring plan that is currently in place from the X-326 Process Building above-grade demolition project. This existing air monitoring plan, which was presented in Appendix F, *X-326 Process Building Above-grade Demolition Air Monitoring Plan*, of the *Above-Grade Demolition Design Plan for the X-326 Process Building and Associated Special Nuclear Material Monitoring Portals, Tie Lines, and Pipe Racks at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (X-326 Above-grade DDP) (DOE 2024), identified that the air monitoring for the above-grade demolition project would continue to address the X-326 Process Building project area and the operation of the X-622-1 Water Treatment Facility (C-Train) following completion of the active above-grade demolition phase until replaced by a subsequent air monitoring plan to address the demolition of the remaining at- and below-grade portions of the X-326 Process Building. The project-specific air monitoring plan described in this appendix will apply for the air sampling and data reporting once this at- and below-grade demolition plan is approved and demolition activities begin. This replacement plan builds from the approach of the pre-existing plan but adds adjustments for contaminants expected, supports flexibility for locations and numbers of air monitoring stations as the work progresses, provides air monitoring for activities to be performed on the northern portion of the X-326 slab (including concrete and other debris size reduction operations), and addresses the completion of air monitoring needs at the end of the remedial actions for the X-326 Process Building at- and below-grade structures.

Data from the existing air monitoring plan has demonstrated that the contaminants, that were present in the above-grade structures of the X-326 Process Building, were maintained generally well-below protection levels defined by applicable or relevant standards. Although contaminants in the remaining at- and below-grade materials of the X-326 Process Building represent a very small fraction of the contaminants that were present in the former above-grade structure, a similar air monitoring approach is being proposed for the project work. The contaminants present in the remaining at- and below-grade structures may be released as emissions due to demolition and waste size reduction actions planned.

The majority of waste volume generated during the at- and below-grade demolition activities will be concrete from the slab as well as from foundation materials (e.g., footers, piers, grade beams). Additional wastes to be generated include reinforcing steel (i.e., rebar), deactivated utility system segments (e.g., cooling water pipelines, drain lines, sanitary sewer piping, and electrical duct banks containing conduits with electrical cables), and residual soil. Other wastes generated under this demolition activity include the contents of the impacted water containment and management system, which includes the soil used to create the berm structure, the liner system, the gravel bed of the bermed area, and any accumulated sediments that settled in the gravel of the bermed area.

Sampling and monitoring of air emissions during demolition is an integral element in the design of the at- and below-grade demolition project. This appendix provides the requirements for air sampling and air monitoring (hereafter identified as air monitoring) during the at- and below-grade structures demolition project.

The air monitoring program presented in this plan will be placed into operation in advance of demolition field activities for the at- and below-grade structures associated with the scope of this X-326 At- and Below-grade DDP. This replacement air monitoring plan includes an initial total of seven project-specific monitoring locations in the vicinity of the footprint of the X-326 Process Building concrete slab, plus an additional monitoring location north of the X-333 Process Building, which was originally sited based on air modeling summarized in *Air Emissions Modeling Report for the On-site Waste Disposal Facility (OSWDF), Soil Excavation Projects, and X-326 Process Building Demolition at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (Air Emissions Modeling Report) (DOE 2020). Monitoring locations will be able to monitor for the following parameters: radiological particulates, metals, polychlorinated biphenyls (PCBs), and volatile organic compounds (VOCs). Particulate matter will initially be monitored at the same two locations monitored for particulate matter in the existing plan (one at the southwest corner of the X-326 Process Building concrete slab and one at the northeast corner X-326 Process Building concrete slab).

Project-specific air monitoring under this plan will continue as long as necessary to monitor the remaining X-326 Process Building demolition project activities, other collocated activities, the project area, and the operation of the wastewater treatment process (currently housed at the X-622-1 Water Treatment Facility) until DOE determines, in consultation with the Ohio Environmental Protection Agency (Ohio EPA), that the source of contaminants at the former X-326 Process Building project site has been remediated and the enhanced, project-specific air monitoring is no longer necessary.

The design of the air monitoring plan for the X-326 Process Building at- and below-grade demolition and associated wastewater treatment processing has benefited from the experience gained from operating the air monitoring program for the X-326 Process Building above-grade demolition. Experience with air monitoring equipment and the process of optimizing field sampling periods for some air monitoring equipment has led to revised methods. Experience with analytical laboratory capabilities (such as realistic turnaround times and detection limits for certain laboratory protocols) and PORTS data management and assessment throughput capabilities have also been reflected in the design of this air monitoring plan.

This appendix includes the rationale and design criteria for the air monitoring plan (Section E.1.1), provides a discussion about the relevance of the Air Emissions Modeling Report for the demolition work to be performed and introduces an additional evaluation that has been performed (Section E.2), and identifies the specific air monitoring proposed (Section E.3.3), including a figure identifying the proposed monitoring locations. A brief summary of the records, reporting, and notifications required is discussed in Section E.4. Section E.5 lists the references cited for this plan.

E.1.1 RATIONALE AND DESIGN CRITERIA

This plan establishes requirements for air monitoring in conjunction with the X-326 Process Building at- and below-grade demolition project. It includes monitoring intended to address emissions from the wastewater treatment operation that supports demolition (currently housed at the X-622-1 Water Treatment Facility) and the waste hauling activities from the combination of demolition and soil projects. Air monitoring is intended to address requirements from applicable or relevant and appropriate requirements (ARARs) and to-be-considered (guidance) (TBCs) as well as other applicable requirements and standards that are adopted as relevant.

Table E.1 summarizes the ARARs and TBCs that provide exposure limits and requirements related to the X-326 Process Building at- and below-grade demolition air monitoring. Other requirements, such as selection of applicable exposure criteria also apply, and are described in subsequent text.

Table E.1. Summary of ARARs and TBCs Applicable to Demolition Air Monitoring

Regulation/Regulatory Citation	Summary of Requirement
Air Nuisances *OAC* 3745-15-07	A public nuisance with 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 shall not be caused.
Particulate *OAC* 3745-17-08	Reasonably achievable control measures to prevent particulate matter from becoming airborne shall be taken.
Radionuclides 40 CFR 61.92 NESHAP Subpart H	Emissions of radionuclides to the ambient air from DOE facilities shall not exceed those amounts that would cause any member of the public to receive an annual effective dose equivalent of 10 mrem.
Radiological Dose DOE Order 458.1(4)(b)	Except as provided, exposure to individual members of the public from DOE radiological activities shall not exceed a total effective dose of 100 mrem/yr (and other limits as specified).

Notes:
ARAR = applicable or relevant and appropriate requirement
CFR = U.S. Code of Federal Regulations
DOE = U.S. Department of Energy
NESHAP = National Emission Standards for Hazardous Air Pollutants
OAC = *Ohio Administrative Code*
TBC = to-be-considered (guidance)

In addition to the ARARs identified in Table E.1, the Clean Air Act is the overarching regulatory framework for air emissions. Under the Clean Air Act, the U.S. Environmental Protection Agency (EPA) set National Ambient Air Quality Standards (NAAQS) for criteria pollutants (carbon monoxide, lead, particulate matter, ozone, nitrogen dioxide, and sulfur dioxide) in ambient air considered harmful to public health and the environment. The NAAQS represent guidelines for health protection to be used by states to evaluate ambient air conditions to determine whether the standard has been met in all areas of the state. The standards are not designed for direct application to individual operations like PORTS, but the numerical values are useful guides for protecting public health. Pike County is in attainment for each of the NAAQS.

EPA has also identified a list of hazardous air pollutants (HAPs) that are considered air toxics that can pose health risks. EPA works with state governments to reduce the emissions of HAPs. *Ohio Administrative Code* (*OAC)* Chapter 3745-114, *Toxic Air Contaminants*, identifies contaminants considered toxic under *OAC* regulations, and additional Ohio regulations specify the rules for reviewing new or modified sources with air toxics contaminants, including *Ohio Revised Code* Chapter 3704.03 and associated engineering guides.

Public dose limits for radionuclides from DOE facilities have been established under 40 U.S. Code of Federal Regulations (CFR) 61, *National Emission Standards for Hazardous Air Pollutants* (NESHAP) Subpart H (40 CFR 61.92 et seq).

NESHAP Subpart M (40 CFR 61.140 et seq) also establishes acceptable methods for management of asbestos at active waste disposal sites and those methods are incorporated into PORTS procedures.

The federal and state requirements form the basis for evaluating potential emissions from PORTS activities for specific contaminants and identifying corresponding compliance criterion or criteria that may be adopted as relevant.

Air modeling was originally completed in the Air Emissions Modeling Report, which evaluated individual activities (such as the specific types of demolition work planned) for potential air emissions and then subsequently evaluated the dispersion of the emissions in the environment. Air modeling predicts the air concentrations of contaminants that are likely to occur as a result of the activities being performed. Air monitoring is the primary means to verify that actual emissions from the activities (resulting from operational methods and emissions controls) are maintained within applicable or relevant criteria and demonstrate protectiveness for workers, the public, and the environment. Air monitoring for the X-326 Process Building at- and below-grade demolition project (and collocated debris sizing activities) will provide data to characterize emissions and demonstrate that airborne concentrations of contaminants fall within site boundary pollutant concentration criteria. The data will also provide feedback on the effectiveness of engineering and administrative controls used for the mitigation of air emissions.

Demolition air monitoring activities will utilize a zones concept that recognizes the differences between requirements applicable for each zone based on their location relative to the source of emissions, as described further in Section E.3.1. Within the work zone, worker protection is addressed by existing site programs designed to meet the specific regulatory requirements applicable to the workplace. Air monitoring under this project-specific air monitoring plan focuses on the project boundary and beyond. The air monitoring program will provide data to characterize emissions associated with demolition activities that will also be used by project management to review the effectiveness of engineering and administrative control measures implemented by the project. Project-specific air monitoring data collected during and following demolition activities will also be evaluated by supporting organizations, including Environmental Remediation, Environmental Protection, and Radiation Protection. The data will be reviewed to:

- Evaluate emissions relative to administrative action levels
- Evaluate the effectiveness of control measures
- Identify if/where adjustment of controls is needed.

Project-specific air monitoring results will be summarized in quarterly progress reports that are provided to Ohio EPA in accordance with Section XIV, *Progress Reports and Notice*, of *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* (D&D DFF&O) (Ohio EPA 2012). Reporting in the D&D DFF&O Quarterly Progress Reports is further discussed in Section E.4. Once the demolition project is complete, the results will also be summarized in a field work completion report for the project.

E.2. AIR EMISSIONS CRITERIA AND MODELING RESULTS

Emissions estimates and dispersion modeling documented in the Air Emissions Modeling Report for the above-grade demolition of the X-326 Process Building were based on key inputs from the demolition project work activities and other specific parameters from PORTS, such as typical wind speeds and wind directions. The details of air modeling performed for the X-326 Process Building above-grade demolition activities are provided in the X-326 Above-grade DDP. This follow-on at- and below-grade demolition project for the remaining slab and related structures of the former X-326 Process Building is continuing the demolition tasks for the X-326 Process Building, which predominantly involves the demolition and size reduction of concrete. The at- and below-grade demolition project work activities will include less overall contaminant content, however, prevention and mitigation of particulate emissions continues to be a significant focus. The same approaches for emissions mitigation will be used as those employed during the above-grade demolition. For chemical and radiological contaminants, the original air modeling performed for the X-326 Process Building above-grade demolition is considered still relevant and bounding for the planned at- and below-grade demolition project. The original evaluation is also considered bounding for the emissions from C-Train and from waste hauling operations.

In order to further evaluate particulate emissions from the planned slab demolition and concrete size reduction processes an additional evaluation was performed in *X-326 Process Building, X-626-1 Recirculating Pump House, and X-626-2 Pump House At- and Below-Grade Demolition Particulate Matter Emissions Assessment, Portsmouth Gaseous Diffusion Plant Decontamination and Decommissioning Project, Piketon, Ohio* (Slab Demolition Evaluation) (see Attachment 1 to this appendix). The evaluation concludes that the particulate emissions are anticipated to be less than (i.e., emissions rates will be lower than) the particulate emissions from the X-326 Process Building above-grade structure demolition and disposal activities. These results are supportive of continuing the general air monitoring approach used for the X-326 Process Building above-grade demolition.

As described in Section E.3.3 in more detail, air monitoring planned for the X-326 Process Building at- and below-grade demolition activities will initially use the same number of environmental air monitoring stations as the pre-existing air monitoring plan being replaced by this plan. Each monitoring station location will continue to include multiple pieces of sampling or monitoring equipment as sited around the perimeter of the demolition work areas. Because of the proximity to other site remediation activities that may produce VOC emissions from soil (primarily trichloroethene [TCE]), monitoring for VOCs has been added under this plan.

E.2.1 ESTABLISHING LIMITING EXPOSURE CRITERIA

State and federal standards have been evaluated to identify a set of criteria that apply for the protection of the public and the environment from the contaminants present.

Ohio EPA Standards. Ohio EPA regulates air pollution under multiple portions of *OAC* Chapter 3745. Under Chapter 3745-15-05, *General Provisions on Air Pollution Control*, "De Minimis" air contaminant source exemption, a source may not qualify for an exemption from certain requirements if the source emits more than one ton of HAPs.

For Ohio toxic air contaminants identified in the list in *OAC* 3745-114-01, limiting exposure criteria for members of the public located beyond the PORTS boundary are set based on the Ohio EPA requirements in *Option A – Review of New Sources of Air Toxic Emissions* (issued May 1986 and sometimes known as the Air Toxic Policy). Option A identifies a process to evaluate new air emission sources through modeling and comparison to a calculated guideline for public exposure known as the maximum acceptable ground-level concentration (MAGLC) for contaminants. MAGLCs are calculated from worker exposure limits known as threshold limit values (TLVs). TLV exposure limits, developed for industrial worker exposure scenarios, are set and maintained by the American Conference of Governmental Industrial Hygienists (ACGIH). Through the process prescribed in Option A guidance, a TLV is adjusted from the worker exposure scenario to a public/resident exposure scenario, accounting for the longer duration of exposure and the potential for members of the public to be more susceptible to impacts from contaminants. MAGLC values represent reasonable limiting exposure criteria for air concentrations of chemical contaminants at off-site receptor locations and provide a basis for comparison to concentrations of contaminants predicted from air modeling. MAGLCs were calculated for all PORTS contaminants listed in *OAC* 3745-114-01 as representative off-site regulatory exposure criteria for comparison to modeled PORTS air emissions. Although there is no MAGLC for uranium and the regulation of uranium emissions is outside the scope of the Air Toxic Policy, a MAGLC-like value for uranium has been calculated based on the ACGIH TLV for uranium, 0.2 mg/m^3 (200 µg/m^3). The MAGLC-like value for uranium (4.76 µg/m^3) will be compared to the modeled uranium concentration at the site boundary as a reasonable standard for PORTS to adopt for comparative evaluations.

Federal Standards. Under the Clean Air Act, a NAAQS for particulate matter 10 microns or less in diameter (PM_{10}) concentration in ambient air has been set at a 24-hour average of 150 µg/m^3 (not to be exceeded more than once per year on average over three years). A NAAQS was also set at 35 µg/m^3 (averaged over 24 hours) for particulate matter 2.5 microns or less in diameter ($PM_{2.5}$). PORTS has adopted these standards as relevant and appropriate criterion even though the limits are not directly applicable to individual sites like PORTS.

NESHAP Subpart M limits exposure to asbestos fibers through mandated procedures and specified packaging criteria for asbestos abatement and demolition activities. Additionally, under *OAC* 3745-20-06, *Standard for active asbestos waste disposal sites*, Ohio EPA requires that asbestos emissions "not cause or permit any visible emissions to the outside air." ACGIH has set a TLV at 0.1 fibers/cm^3, and the Occupational Safety and Health Administration uses the same limit for its permissible exposure limit.

Table E.2 identifies criterion considered to apply or adopted as relevant at the PORTS boundary for the contaminants known to be present. The criteria are used in the rest of this air monitoring plan.

Table E.2. Air Emissions Site Boundary Criteria

Contaminant Type/Parameter		Criterion ($\mu g/m^3$)	Criterion Type
Radionuclide Particulate	Total Uranium	4.76	MAGLC-like
HAP Metals	Antimony	11.90	MAGLC
	Arsenic	0.24	MAGLC
	Beryllium	1.19E-03	MAGLC
	Cadmium	0.048	MAGLC
	Chromium	1.19	MAGLC
	Cobalt	0.48	MAGLC
	Lead	1.19	MAGLC
	Manganese	0.48	MAGLC
	Mercury	0.60	MAGLC
	Nickel	2.38	MAGLC
	Selenium	4.76	MAGLC
PCBs	Total PCBs	12	MAGLC
Volatiles	Total VOCs/Volatile HAPs	1334	MAGLC
Particulate	PM_{10}	150	Adopted NAAQS
	$PM_{2.5}$	None	Not Set

Notes:
HAP = hazardous air pollutant
MAGLC = maximum acceptable ground-level concentration
NAAQS = National Ambient Air Quality Standards
PCBs = polychlorinated biphenyls
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
PM_{10} = particulate matter 10 microns or less in diameter
VOCs = volatile organic compounds

E.2.2 RESULTS FROM AIR MODELING

Air modeling was documented in the Air Emissions Modeling Report. Modeled emission concentrations for the criteria pollutant PM_{10} at the site boundary did not exceed the 150 $\mu g/m^3$ criterion. Particulate emissions evaluated under the Slab Demolition Evaluation estimate that the planned activities for the X-326 at- and below-grade demolition will not exceed particulate levels modeled under the Air Emissions Modeling Report. Annual emission rates for the toxic air contaminant HAPs and PCBs were below the MAGLC-based site boundary criteria and below the 1-ton-per-year air level used by Ohio for screening emissions for a permit exemption. Although the demolition activities are being performed under a Comprehensive Environmental Response, Compensation, and Liability Act of 1980 regulatory framework that exempts the work from the administrative burden of obtaining permits, the small quantities of these pollutants to be released would have fallen within permit exemption criteria.

The effective radionuclide dose equivalent from using the specialized model, Clean Air Act Assessment Package-1988, for each year evaluated by the model (combination of all projects), was less than 0.1 mrem/yr, which is well below the NESHAP regulatory limit of 10 mrem/yr. These modeling results are based on controls described in the model and which will be applied in the field work. The highest radiological dose results from modeling the X-326 Process Building above-grade demolition and Water Treatment C-Train emissions were 1.30E-03 mrem/yr and 6.50E-02 mrem/yr, respectively, occurring along the eastern site boundary near the large parking area for the site workforce. The results indicate that these activities will comply with regulatory standards and protect human health and the environment.

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E.3. AIR MONITORING

The goal of air monitoring is to collect samples and perform measurements to provide objective evidence of the airborne concentration of pollutants. Air monitoring will be conducted for the X-326 Process Building at- and below-grade demolition project in addition to the site air monitoring already conducted by the existing PORTS site ambient air monitoring network. This plan builds from the approach currently employed under the project-specific air monitoring plan for the X-326 Process Building above-grade demolition and replaces that previous plan. Project-specific air monitoring activities under the 5-Unit Excavation Work Plan are also underway in the near vicinity, generally to the south of the air monitoring being performed under the X-326 project-specific air monitoring plan.

E.3.1 PROJECT ZONES FOR AIR MONITORING

Individual work activities (or material configurations) are the point at which air emissions are created, at the interface between work activities and contaminated materials or pollutants. The creation of air emissions from work activities and the subsequent monitoring of the airborne concentration of pollutants can be best understood by considering each project as the conceptual center of a series of zones surrounding the work, with each zone successively farther from the initial activity. Work activities that generate emissions occur in the innermost zone (the work zone), and air monitoring approaches are driven by the different sets of requirements in each zone.

Air monitoring for the X-326 Process Building at- and below-grade demolition project will reflect the zones of exposure potential that exist around the actual work activities. Exposure zones are defined as follows:

- Work zone
- Project work boundary
- Site zone
- Public zone
- Background zone.

The characteristics of each zone and the general air monitoring approach for each zone are described below. Based on the zones approach, specific monitoring equipment, operational approach, target analytes, and data management and reporting are addressed in Section E.3.3.

Work Zone. The work zone is the innermost area where only project workers operate. Contaminants are most highly concentrated in this zone, and workers, who have the potential to come into direct contact with contaminants, may be required to wear protective equipment in this zone. Airborne contaminants (e.g., particulate, fibers, and vapors) in the work zone can potentially be generated or released during the variety of physical activities conducted to demolish the remaining at- and below-grade structures of the former process building and where airflow interfaces with stored waste materials and exposed contaminated surfaces. Airborne contaminant levels would be expected to generally correspond to levels of activity underway (though fixative applications and water misting and other mitigation measures will be applied to control air emission rates). Since PORTS demolition activities are largely tied to heavy equipment (e.g., excavator-mounted shears, grappling effectors, front-end loaders, concrete crushers), the highest potential emission areas are in the vicinity of the heavy equipment, and the highest pollutant concentrations would occur near and downwind of these activities.

Air monitoring within the work zone is conducted to the requirements of existing industrial hygiene and radiological control programs, implemented for the protection of the workers present and to ensure that the contaminated area boundaries are well-defined from areas outside the work zone, where individuals can be present without specific protections. Work zone monitoring will be conducted in accordance with the *Worker Safety and Health Program* (Fluor-BWXT Portsmouth LLC [FBP] 2024) which is outside the scope of this air monitoring plan. Personnel exposure data collected during the X-326 Process Building above-grade demolition demonstrated that moderate levels of personal protective equipment were sufficient for worker protection.

Project Work Boundary. The project boundary at the edge of the work zone represents the transition from where additional controls (such as worker personal protective equipment) are needed for safety to a zone where unprotected site workers and visitors can be present. Air monitoring at the edge of the work zone is conducted to collect objective evidence that contaminant exposure and radiological dose outside the work zone are below limits for industrial worker exposure (i.e., negative confirmation). Air monitoring at the project boundary may use equipment similar to that used in the work zone for industrial hygiene and radiological protection applications. However, project-specific air monitoring under this X-326 At- and Below-grade DDP is primarily conducted at this location also. Project boundary monitoring operated under other site programs will include stationary samplers, passive dosimeters, and radiological continuous air monitors that will monitor for contaminant emissions generated from within the work zone (including the haul road and water treatment operations). Project-specific air monitoring under this X-326 At- and Below-grade DDP primarily employs environmental monitoring equipment designed to take larger volumes of air samples or timed samples to and provide results in units applicable to environmental regulatory criteria.

Site Zone. The site zone lies beyond the project boundary but within the PORTS boundary. As with the project work boundary, unprotected general site workers and potential visitors are expected in the site zone, including members of the public making use of the site through roads. The site zone includes large areas potentially upwind or downwind of the project activities. Any dispersed airborne contaminants that can be detected in the site zone could be expected to also potentially be detectable beyond the PORTS boundary in the public zone, so air monitoring in this zone generally uses equipment designed for environmental ambient air monitoring. This equipment typically collects large volumes of air samples over long periods of time using protocols designed to prepare data for comparison to exposure limits applicable to the public.

A large portion of the existing PORTS ambient air monitoring network, an air monitoring network not connected to specific projects, is located within the site zone. The ambient air monitoring network is illustrated in Figure E.1 and discussed in more detail in Section E.3.2.

Public Zone. While the public has access to PORTS, the zone identified as the public zone is represented by the areas beyond the PORTS boundary and reflects the zone where air emission exposure limits from federal and state regulations and DOE rules to protect the public apply. Air monitoring equipment used in this zone, which is also part of the PORTS ambient air monitoring network, is designed to collect large air volumes for samples for chemical and radiological analysis.

Background Zone. An area sufficiently distant and generally upwind from PORTS has been identified in the past as a location to use similar air monitoring equipment to gather samples used to define background levels of contaminants in the general area of PORTS. For example, naturally occurring radioactive materials in soils, man-made radiation from weapons testing and nuclear accidents (e.g., Chernobyl and Fukushima Daiichi), and even asbestos fibers are present in ambient air and are detectable in samples upwind from PORTS.

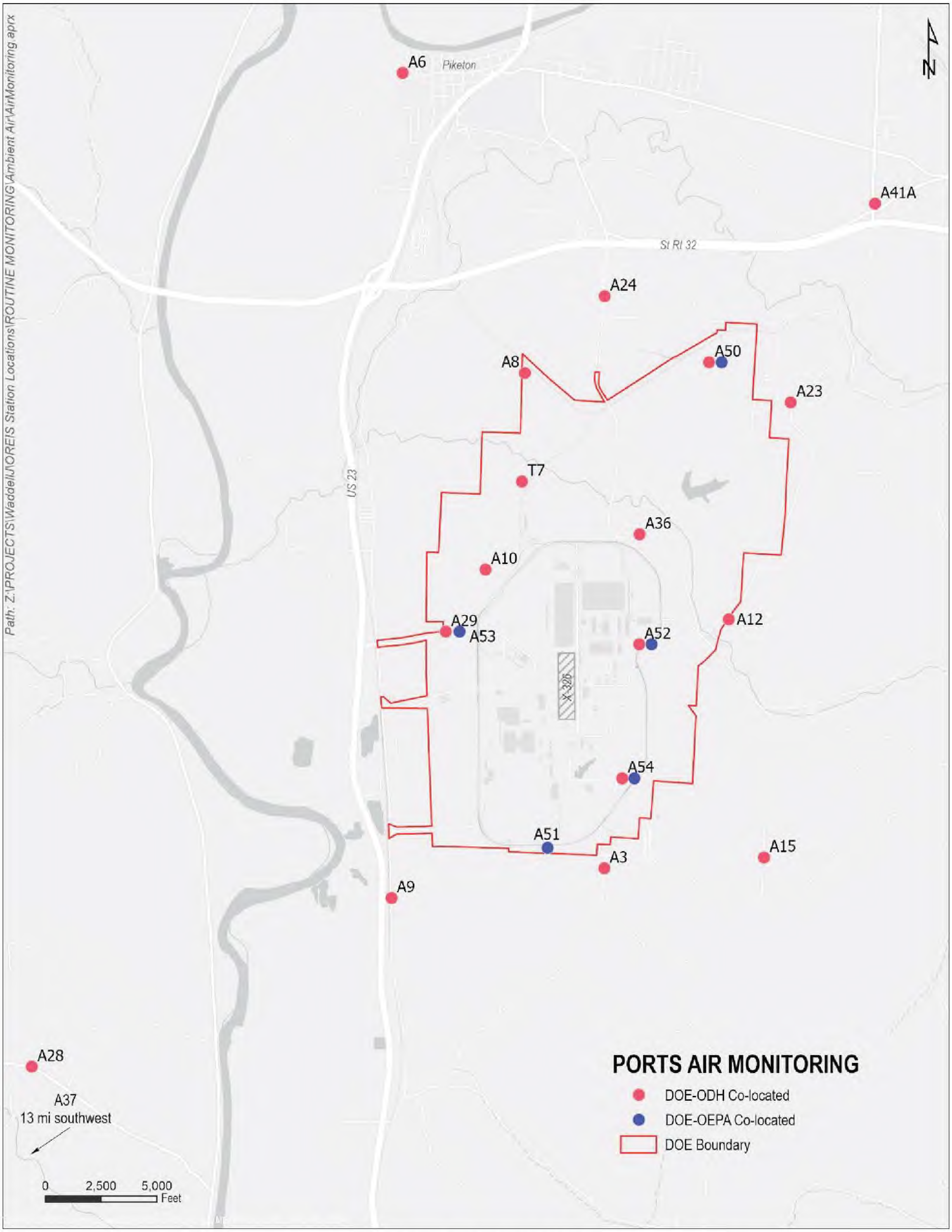

Figure E.1. PORTS Non-Project Air Monitoring Locations

E.3.2 EXISTING PORTS AMBIENT AIR MONITORING PROGRAM

The PORTS ambient air monitoring network was initially established to support evaluation and reporting of radiological emissions through annual demonstration of compliance with NESHAP Subpart H for DOE facilities, as well as to provide the air pathway dose for compliance with public dose limits. The network was expanded during 2020-2021 to include additional locations and monitored pollutants supporting the start-up of D&D demolition and excavation activities at PORTS based on the results of air modeling. Co-located monitors were also established during this time for comparison of DOE data with Ohio EPA and Ohio Department of Health (ODH).

Prior to 2020, the PORTS ambient air monitoring network consisted of monitors for radiological particulate and fluorides, located both on and off site, to evaluate overall site impacts from emissions and support the preparation of required annual summary reports, such as the Annual NESHAP Radionuclide Emission Report. During that time, radiological particulate samples were collected at 15 locations for laboratory analysis of radionuclides that may be associated with PORTS operations. These monitors are located on site, at the site perimeter, within the local area outside the site boundary, and one in an area west of PORTS considered unimpacted by PORTS operations (to provide background data). These sampling locations lie outside the project work zones identified in the Air Emissions Modeling Report.

In 2020, Ohio EPA and ODH installed new co-located equipment alongside DOE equipment for independent analysis and ease of data comparison. DOE and Ohio EPA installed five new monitoring stations on site with co-located equipment belonging to each agency for sampling metals, asbestos, VOCs, and PM_{10}. DOE installed three new locations for radiological particulate (in addition to the existing 15 monitors), and ODH installed 18 new radiological monitors alongside each DOE monitor for an independent analysis.

Figure E.1 identifies the location of the current Ohio EPA, ODH, and DOE co-located monitoring equipment in relation to the PORTS site and the former X-326 Process Building. These monitoring locations are considered non-project air monitoring because the sites are intended to provide a representation of the entire site collectively.

In 2021, large-scale open-air demolition, excavation, and waste placement activities started at PORTS, each major project having its own project-specific air monitoring plans. Each remediation project at PORTS monitors for project-specific contaminants, such as PCBs, radiological particulate, metal particulate, asbestos, VOCs (and HAP VOCs), PM_{10}, and $PM_{2.5}$. The pre-existing permanent air monitor network combined with the various project-specific monitors throughout the site results in a robust air monitoring network capable of evaluating various dynamic activities and project zones.

The PORTS ambient air monitoring network will continue to perform its existing functions in evaluating the overall effects of PORTS air emissions. At the same time, additional data from other project-specific air monitoring will also be available for consideration. All ambient air data collected will be reviewed for potential applicability to project activities, such as the X-326 Process Building at- and below-grade demolition, regardless of whether the data is from a location specific to said project.

The PORTS air monitoring network plays an integral part in evaluating compliance with NESHAP Subpart H. The PORTS ambient air monitoring data is also used in the calculation of the multi-pathway annual radiological dose to maximally exposed members of the public as required under DOE Order 458.1 (where all contributing pathways, not just the contribution from the air pathway, are each evaluated).

E.3.3 DEMOLITION PROJECT-SPECIFIC AIR MONITORING

Air monitoring for the X-326 Process Building at- and below-grade demolition includes multiple site programs that collect data for differing purposes (radiological protection, industrial hygiene, annual reporting, etc.) outside of the scope of this air monitoring plan. The project-specific air monitoring plan for the X-326 at- and below-grade demolition is focused on providing an additional layer of environmental air monitoring equipment for the demolition project to monitor nearby air for project-related contaminants (such as radionuclides, asbestos, PCBs, VOCs, and particulate) and to provide data necessary to evaluate performance relative to environmental protectiveness criteria. At the project work zone boundary (and at one location representative of the overall waste hauling activities) project-specific environmental air monitoring equipment will be utilized to collect additional worker safety and environmental air samples to compare to relevant standards and criteria.

The following sections provide information regarding planned environmental air monitoring that is considered equivalent to the formal data quality objectives and Sampling and Analysis Plan processes specified in the *Sample Analysis Data Quality Assurance Project Plan (SADQ) at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (SADQ) (DOE 2014). Separate data quality objectives and sampling and analysis plan documents have not been prepared.

E.3.3.1 Demolition Air Monitoring Network

This project-specific air monitoring plan will initially utilize seven air monitoring stations located around the perimeter of the planned demolition activities, as identified in Figure E.2, plus one location specified by the Air Emissions Modeling Report (A72) located northwest of the X-333 Process Building. These locations correspond to the existing air monitoring stations used for air monitoring during the above-grade demolition project.

The X-326 Process Building at- and below-grade demolition project will be executed in two phases in the field. Phase 1 will remove the southern portion of the slab and its foundation materials and associated utilities and other structures, including segments of the impacted water containment system. The demolition activities in Phase 1 include the first approximately 745 ft of the slab, measuring from the south. Phase 2, which is expected to be performed at a later date, will remove the remaining northern portions. These projects will ultimately result in the removal of the manmade structures from the city block that are deactivated by the time Phase 2 work is underway. Once contaminated structures are removed as required under the D&D DFF&O the area is expected to no longer require enhanced project-specific air monitoring (a decision that will be determined by DOE in consultation with Ohio EPA).

The initial placement of air monitoring stations for the Phase 1 portion of the demolition project is depicted in Figure E.2 and Table E.3 identifies the air monitoring equipment initially associated with each air monitoring station. Both retrospective sampling equipment (equipment that collects a sample to represent a time period) and real-time measurement equipment (equipment that reports data results and summaries in near real-time) are included.

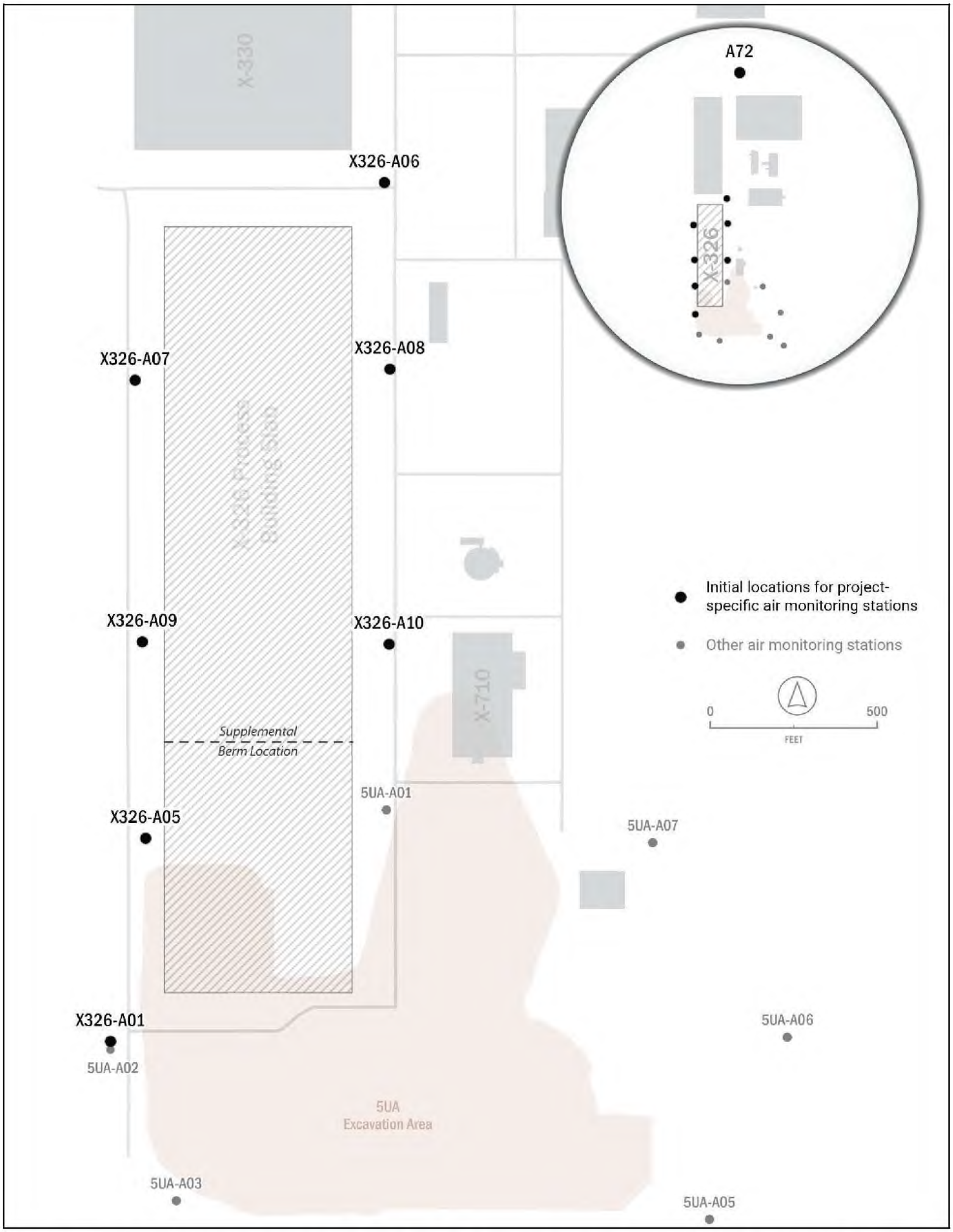

Figure E.2. X-326 Process Building At- and Below-grade Demolition Project Air Monitoring Stations

Table E.3. Demolition Project-specific Air Monitoring Stations

Location ID	Location Description[a]	Contaminant Type					
		Rad. Part.	Metals	PCBs	VOCs[b]	PM_{10} $PM_{2.5}$	Asbestos[a]
X326-A01	X-326 Process Building slab – South of southwest corner	●	●	●	●	●	●
X326-A05	X-326 Process Building slab – West side, near proposed supplemental berm	●	●	●	●		●
X326-A06	X-326 Process Building slab – North of northeast corner	●	●	●	●	●	●
X326-A07	X-326 Process Building slab – West side	●	●	●	●		●
X326-A08	X-326 Process Building slab – East side, across for A07	●	●	●	●		●
X326-A09	X-326 Process Building slab – West side	●	●	●	●		●
X326-A10	X-326 Process Building slab – East side, across from A09	●	●	●	●		●
A72	North of northwest corner of X-333 Process Building	●	●	●	●	●	

Notes:
[a]Number and location of monitors, as well as specific parameters and/or frequency of collection, are subject to change during the course of the project based on whether work involves asbestos-containing materials.
[b]Including Total VOCs and volatile HAPs. Except for location A72, sampling for VOCs will only occur when VOCs may be present and only at monitoring locations that are near the potential VOC source.

HAP = hazardous air pollutant
ID = identification
Part. = particulate
PCBs = polychlorinated biphenyls
$PM_{2.5}$= particulate matter 2.5 microns or less in diameter
PM_{10} = particulate matter 10 microns or less in diameter
Rad. = radioactive
VOCs = volatile organic compounds

Initial monitoring station placement has been selected based on overall coverage around the perimeter of the demolition project area. As work progresses, movable air monitor stations may be moved to alternate locations around the demolition project (based on such considerations as work locations and monitoring results) to ensure that monitoring locations are placed in areas likely to exhibit the most significant airborne concentrations of contaminants as the demolition work progresses.

The total number of air monitoring stations and the types of equipment used are expected to vary as work activities vary. The equipment previously installed at these locations will be enhanced when and where needed with sampling capabilities for VOCs. VOC samples are only expected to be collected periodically, as needed, such as when field instruments indicate the presence of VOCs during the demolition activities or during the Phase 1 demolition follow-on remedial action for the CMI soils. TCE may be present when areas of the southwest portion of the slab are removed (therefore, VOC sampling would be conducted during that work). Asbestos sampling would also be expected to be tied to specific work activities where asbestos may be encountered, such as when removing cooling water system piping or if electrical duct banks are being removed and asbestos is present. The number of air monitoring station locations may be reduced after the work area shrinks with the removal of the southern portion of the slab (i.e., Phase 1 demolition work).

Table E.2 identifies each air monitoring station and the corresponding contaminant type(s) to be sampled/monitored. Current location numbering reflects PORTS engineering assignments. When equipment is relocated, new numbers are assigned to differentiate the new location from previous locations. For example, if equipment at location X326-A10 is moved, it might receive the new number X326-A11. If equipment is moved multiple times during the course of the demolition project phases, multiple numbers will be used.

E.3.3.2 Sampling/Monitoring Equipment by Contaminant Type
Specialized air sampling equipment deployed around the X-326 Process Building at- and below-grade demolition project for specific contaminant types is indicated in Table E.3. Both real-time measurements and retrospective air samples (samples that are collected over time and analyzed later in a laboratory setting to determine air concentrations during the sample collection period) are included. Example equipment types for each contaminant are described below.

Radioactive Particulate. Samples for radioactive particulate will be collected using high-volume particulate air samplers, such as the Hi-Q Environmental High-Volume Air Sampler and the field portable, battery/solar-operated Mesa Labs BGI Omni FT. The Omni units are easily moved to where sampling is desired at any given time. The Hi-Q samplers run continuously using glass fiber filters. Filters are collected weekly and composited into one monthly sample. Samples from both types of equipment will be analyzed at a laboratory.

PCBs. PCB samples will be collected using a high-volume air sampler, such as the Tisch Environmental TE-1000PUF-BL, which includes a particulate sampler stage and a polyurethane foam element for collecting vapor samples. PCBs have a low vapor pressure at ambient conditions, so only very limited quantities of PCBs are expected to be present in a vapor phase. However, PCBs tightly adsorb onto particulate matter and would be dispersed if the particulate disperses. Sample duration is a 24-hour period, and both the particulate filter and polyurethane foam elements will be analyzed at a laboratory.

PM_{10} and $PM_{2.5}$. Particulate matter in the 10-micron-diameter range and smaller, and 2.5-micron-diameter and smaller ranges will be counted using a real-time, continuous particulate matter mass monitor, such as the Teledyne API T640, which uses scattered light spectrometry for measurement. Such an instrument can differentiate among various particle size classes ($PM_{2.5}$, PM_{10}, and large particulate) and can communicate hourly and daily averages in real-time to remote devices or networks.
No laboratory sample analysis is needed.

Metals. Particulate matter will be collected for analysis of HAP metals content using a high-volume sampler, such as the Tisch Environmental High-Volume Air Sampler with glass fiber filters. Sample duration is a 24-hour period, and sample media will be analyzed at a laboratory.

VOCs. For the collection of volatile organic vapors (e.g., total VOCs and TCE), equipment such as the Entech Instruments Canister Sampler and TM1200 timer unit will be used to collect a whole air sample. This approach uses a timer to start and stop the sampling process at specific times automatically. It can be used to create an integrated sample over a period of time, such as a 24-hour period. The timer and inlet systems are connected to an evacuated stainless steel sample canister. All materials in the exposure path are designed to be as inert as practical concerning the target analytes. For example, the internal surfaces of the stainless-steel canister are passivated with a coating, such as SUMMA nickel chromium oxide. The pressure differential of the evacuated canister and the ambient air drives the sampled air volume into the canister. Equipment configurations for the planned sampling ensure a constant sampling flow rate across a wide range of pressure differences. The canister is valved-off when sampling is complete and sent to the laboratory for analysis.

Asbestos. Asbestos sampling will be completed using a Sensidyne Aircon-2 (or similar) with an appropriate sample filter cassette based on the laboratory analytical method to be used. Initial results will determine the concentration of fibers, and further analysis may be performed on high fiber concentration results to identify whether the fibers are asbestos or non-asbestos. Fiber counting will be conducted at a laboratory.

E.3.3.3 Monitoring Parameters and Sample Collection

Sample collection and real-time air monitoring plans for the X-326 Process Building at- and below-grade demolition project have been determined based on the types of pollutants present in the materials to be demolished (and in consideration of ancillary project activities performed on the slab of the former process building). While the majority of previous building contaminants were removed during the above-grade demolition, demolition debris from the at-and below-grade activities is expected to include contaminants left from the demolition of the X-326 Process Building. Additionally, the demolition actions may also generate fugitive dust, radiological materials, PCBs, asbestos-containing materials, and other particulate contaminants common in building materials, including HAP metals. VOCs are not considered a contaminant in the structural materials; however, VOCs may be encountered when portions of the slab are removed or when monitoring for VOCs associated with the DU X-326 CMI work or the nearby 5-Unit Plume Area excavation work. Therefore, monitoring for VOCs will be temporarily added to air monitoring when applicable to increase overall areal coverage of sampling for this contaminant type.

Table E.4 provides a summary of the air emission parameters to be determined from air sampling equipment deployed at the project work boundary and beyond, including samples collected for retrospective analysis and direct measurements performed in real-time, the analytical method(s) to be used, and the initial frequency of the sampling or measurement.

Contaminant types listed in Table E.4 are generally collected by separate sampling/monitoring equipment described in Section E.3.3.2. For each X-326 Process Building at and below-grade demolition project boundary air monitoring location, up to six types of air monitoring equipment may be present.

E.3.3.4 Sample Collection Frequency

Although both retrospective sampling equipment and real-time monitoring equipment provide quality information for evaluating the performance of the demolition project, real-time monitoring information may identify operational issues in minutes rather than weeks. Therefore, real-time continuous monitoring equipment will be deployed at the demolition project for two of the potential airborne contaminants (PM_{10} and $PM_{2.5}$ and alpha-beta radiological activity). These types of data will provide the project with the opportunity to quickly evaluate impacts of variations in work practices and weather conditions on environmental contaminant concentrations. Real-time monitoring equipment can also provide a warning to the project team if action levels, or other administrative levels, are being approached.

Table E.4. Monitoring Parameters for Demolition and A72 Air Samples

Contaminant Type/Parameter		CAS Number	Analytical Method[a]	Frequency[b]
PCBs	PCBs	1336-36-3	EPA Method TO-4A	Monthly
Radionuclides	Americium-241	14596-10-2	Alpha Spectroscopy (EML HASL-300 Method Am-05-RC, GL-RAD-A-032, EML HASL-300 Method Pu-02-RC, EML HASL-300 Method Th-01-RC)	Monthly[c]
	Neptunium-237	13994-20-2		
	Plutonium-238	13981-16-3		
	Plutonium-239/240	N760		
	Thorium-230	14269-63-7		
	Technetium-99	14133-76-7	Beta Liquid Scintillation Counting (EML HASL-300 Method Tc-01-RC)	
	Uranium (total)[d]	7440-61-1	Alpha Spectroscopy (EML HASL-300 Method U-02-RC)	
	Uranium-233/234	NS632		
	Uranium-235/236	N1047		
	Uranium-238	24678-82-8		
Particulate	PM_{10} and $PM_{2.5}$	—	Teledyne Field Instrument; EPA PM_{10} FEM; *FR* Volume 81, p. 45285	Hourly and daily averages
Asbestos[e]	Asbestos	N2540	NIOSH 7400/7402	Daily or weekly (based on field activities)
HAP Metals	Metals	Various	EPA Method SW846-6020/SW846-7471B	Weekly
VOCs	Total VOCs	Various	EPA Method TO-15	Weekly
	Volatile HAPs (TCE)	79-01-06		

Notes:
[a]Or equivalent recognized standard/method.
[b]Frequency of sample collection and analysis is subject to change based on project phase and field experience with sampling equipment and laboratory capabilities.
[c]Filters from samplers are collected weekly and composited into one monthly sample. Analysis frequencies as described in Section E.3.3.4.
[d]Total uranium will be calculated from isotopic uranium constituents. If sample sizes are too small to support all analyses, preference will be given for completing uranium analyses.
[e]Not applicable to the A72 air monitoring station. Sampling planned during work involving asbestos-containing materials.

CAS = Chemical Abstracts Service
EML = Environmental Measurements Laboratory
EPA = U.S. Environmental Protection Agency
FEM = Federal Equivalent Method
FR = Federal Register
HAP = hazardous air pollutant
HASL = Health and Safety Laboratory (currently known as National Urban Security Technology Laboratory)
NIOSH = National Institute for Occupational Safety and Health
PCBs = polychlorinated biphenyls
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
PM_{10} = particulate matter 10 microns or less in diameter
TCE = trichloroethene
VOCs = volatile organic compounds

Media from retrospective air samplers installed at the project work boundary will be collected at defined intervals that may evolve based on field conditions and experience. The general sample collection and analysis approach is summarized below (also in Table E.5 in Section E.3.3.7). During start-up activities and periods when field activities are changing; samples may be collected and analyzed more frequently to facilitate faster data reporting or to collect additional data points for evaluation of the effects of operating conditions. Additionally, technical issues with sample collection could result in changes, which would be noted in follow-up correspondence with Ohio EPA.

Air monitors for metal particulate collect one 24-hour sample each week using glass fiber filters. Filters will be analyzed at a laboratory for antimony, arsenic, beryllium, cadmium, chromium, cobalt, lead, manganese, nickel, selenium, and mercury. Results are converted to a concentration based on the amount of air pulled through the filter during the sample period.

Radiological particulate monitors collect weekly samples on glass fiber filters. Filters are sent for laboratory analysis of technetium-99, uranium-233/234, uranium 235/236, and uranium-238. Once per quarter, the radiological sample will also be analyzed for americium-241, neptunium-237, plutonium-238, plutonium-239/240, and thorium-230 (in addition to the monthly analysis for uranium isotopes and technetium-99). Results are converted to a concentration based on the amount of air pulled through the filter(s) during the sample period.

PCB monitors sample for one 24-hour period each month using a combination of filter and polyurethane foam media, which will be collected for laboratory analysis once each month. Results are converted to a concentration based on the amount of air pulled through the filter during the sample period.

Asbestos samples will be collected once per week during demolition and waste processing activities involving asbestos-containing materials. Sample duration will be tailored to the specific demolition activities and work schedule, typically 8 to 10 hours. Project personnel will communicate planned demolition activities involving potential asbestos-containing material to environmental groups in advance to support sample planning for these work activities. Results are converted to a concentration based on the amount of air pulled through the filter during the sample period.

Asbestos samples will not be collected for the A72 sample collection location, but VOC sampling will occur. VOC canisters will collect one 24-hour sample once per week for laboratory analysis. VOC sampling will occur at applicable (nearby) X-326 perimeter locations during the project when VOCs are encountered.

Within the project work zone, job coverage sampling, measurement collection, and monitoring for worker protection will be conducted under the *Worker Safety and Health Program*, which also includes compliance with 10 CFR 835, *Occupational Radiation Protection*. Under these programs, air sampling is conducted as needed to support worker safety, including characterizing areas for radiological activity in accordance with 10 CFR 835 and identifying other contaminants (such as asbestos, silica, and PCBs) and contaminant levels in work areas to identify controls and worker respiratory protection requirements. Worker job coverage monitoring is not included in the scope of this project-specific air monitoring plan.

E.3.3.5 Sampling and Equipment Quality Assurance

All air monitoring equipment calibration and operation will conform to applicable quality assurance requirements, both programmatic and instrument-specific. They will be performed by personnel trained and qualified in the requirements. Requirements for environmental sampling activities are addressed in the SADQ. Operation, calibration, and audits of air monitoring equipment are documented in site procedures based on the manufacturer's instructions and EPA guidance, and field technicians are trained on their use. Calibration of radiation/contamination detection instrumentation (such as hand-held monitors), which may contribute data for environmental uses, is included in site radiological control program procedures.

E.3.3.6 Sample Analysis Quality Assurance

Samples for analysis are collected, identified, and tracked to ensure traceability, document chain of custody, and are protected from damage and tampering. Laboratory analyses are performed to required standards (i.e., respective method requirements and acceptable laboratory practices), using approved procedures executed by trained and qualified personnel on equipment of known precision and accuracy and reported with qualifying information, as applicable, and related quality assurance sample data.

E.3.3.7 Evaluation of Sampling and Measurement Data

Analytical results from retrospective air sampling and field measurements for contaminants are managed under the requirements identified in this plan and applicable procedures. Results from air sampling conducted at the project boundary and beyond will be evaluated versus pollutant-specific criteria applicable to the PORTS site boundary based on action levels established. Documented background concentrations will be considered when evaluating reported sample results, where applicable (e.g., a PM_{10} background of 23 $\mu g/m^3$ exists in the vicinity of PORTS). Administrative action levels for the air monitoring results have been set to coincide with fractions of the criteria applicable to (or adopted for) the site boundary (i.e., MAGLCs, MAGLC-like values, and the adopted NAAQS for PM_{10}).

Low action levels have been set at 50% of the respective MAGLC, MAGLC-like value, or adopted NAAQS for particulate, VOCs, volatile HAPs, total uranium, metals, and PCBs. Previous experience from the demolition of the above-grade structures of the X-326 Process Building has been taken into consideration during the process of setting action levels. In the event that calculated air concentrations from samplers or monitors exceed low action levels, it may indicate that the demolition project operational conditions are producing greater emissions than expected from the mitigation approach being employed. If low action levels are exceeded by project air monitoring data, a project-level (internal) operational review will be conducted to identify improvement opportunities. Exceeding low action levels does not indicate a potential for exceeding site boundary concentration requirements but has been set to ensure that emission values greater than those anticipated are evaluated if they occur. An operational review may include but is not limited to a review of meteorological data (e.g., wind, temperature) to determine if weather conditions could have contributed to the exceedance, specific demolition activities to determine whether any incidents or ongoing operations could have contributed to the exceedance, field logs and other information concerning the operation of the air sampler, and impacts from external activities (e.g., wildfires, farming activities). Action level values are summarized in Table E.5.

Medium action levels have been set at 75% of the respective MAGLC, MAGLC-like value, or adopted NAAQS. If the sampling results exceed a medium action level for a parameter, the operational conditions are considered to be inconsistent with the basis used for the operational design, and there is a probability that the project emissions could contribute to an exceedance for the parameter criterion at the site boundary. A full operational review that includes project support from the environmental, safety, and quality assurance organizations will be conducted to identify and implement necessary operational improvements in a timely manner.

High action levels have been set based on 100% of the respective MAGLC, MAGLC-like value, or adopted NAAQS. In the event that project air monitoring data indicates exceedance of a high action level, the project will stop work to identify, report, and correct the causes immediately upon receipt of such data results. Stop work will apply to work with the potential to generate the types of emissions exceeding high action levels. The action levels that apply to the project are provided in Table E.5.

As identified in more detail in Section E.4, notifications to Ohio EPA will occur soon after any data showing exceedance of an action level is reported to PORTS.

Table E.5. Demolition Project and A72 Air Monitoring Action Levels

Contaminant Type/Parameter		Criterion (μg/m³)	Action Levels[a]		
			Low[b] (μg/m³)	Medium[c] (μg/m³)	High[d] (μg/m³)
Radionuclide Particulate	Total Uranium	4.76	2.38	3.57	4.76
HAP Metals	Antimony	11.90	5.95	8.93	11.90
	Arsenic	0.24	0.12	0.18	0.24
	Beryllium	1.19E-03	5.95E-04	8.93E-04	1.19E-03
	Cadmium	0.048	0.024	0.036	0.048
	Chromium	1.19	0.60	0.89	1.19
	Cobalt	0.48	0.24	0.36	0.48
	Lead	1.19	0.60	0.89	1.19
	Manganese	0.48	0.24	0.36	0.48
	Mercury	0.60	0.30	0.45	0.60
	Nickel	2.38	1.19	1.79	2.38
	Selenium	4.76	2.38	3.57	4.76
PCBs	Total PCBs	12	6	9	12
Volatiles	Total VOCs/Volatile HAPs	1334	667	1001	1334
Particulate	PM_{10}	150	75	113	150

Notes:

[a]Where an action level is less than the laboratory MDC, the MDC will apply. No action levels for $PM_{2.5}$ have been set.

[b]Based on 50% of the respective MAGLC, MAGLC-like value, or adopted NAAQS criteria.

[c]Based on 75% of the respective MAGLC, MAGLC-like value, or adopted NAAQS criteria.

[d]Based on 100% of the respective MAGLC, MAGLC-like value, or adopted NAAQS criteria.

HAP = hazardous air pollutant
MAGLC = maximum acceptable ground-level concentration
MDC = minimum detectable concentration
NAAQS =National Ambient Air Quality Standards
PCBs = polychlorinated biphenyls
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
PM_{10} = particulate matter 10 microns or less in diameter
VOCs = volatile organic compounds

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E.4. RECORDS, REPORTING, AND NOTIFICATIONS

This section addresses records, reporting requirements, and notifications associated with air monitoring for the X-326 Process Building at- and below-grade demolition project.

Records will be generated by air monitoring activities conducted by the X-326 Process Building at- and below-grade demolition project. Original data collected in the field and generated from sampling (e.g., field data sheets, field logbooks, field activity logs, sample collection logs, instrument calibration records, analytical sample data, chain of custody records, and field change notices) are considered records. Documentation of calculations, measurements, methods, input parameters, and procedures used to evaluate data collected in accordance with this plan are also records.

All records shall be maintained and controlled in a manner that prevents loss, damage, and deterioration and will be filed in accordance with the relevant DOE records retention schedule, as applicable.

Records shall be authorized by the signature and date of the originator. Errors shall be corrected by crossing 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, 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. The PORTS Records Management Program adheres to the requirements in the most current version of DOE Order 243.1B, *Records Management Program*.

Sample results and real-time measurements of electronic data created by air monitoring devices will be managed in site databases for retrieval, evaluation, and reporting.

In accordance with this X-326 At- and Below-grade DDP, work conducted during the demolition activities will continue to be documented in the D&D DFF&O Quarterly Progress Reports. D&D DFF&O Quarterly Progress Reports provide a summary of the operations, maintenance, and monitoring activities accomplished during the previous period and discuss upcoming activities. Summaries of findings, sampling activities, sampling data, and laboratory/monitoring data will be provided to Ohio EPA via the D&D DFF&O Quarterly Progress Reports or other methods agreed upon by DOE and Ohio EPA. A summary and discussion of analytical or field measurements exceeding medium or high action levels identified in Table E.5 will also be included as applicable.

Notification will be made to Ohio EPA within 48 hours in the event that evaluation of validated project air monitoring data indicates that a high action level identified in Table E.5 has been exceeded. EPA will be notified in accordance with NESHAP regulations if the annual dose evaluation of air monitoring data indicates a NESHAP regulatory compliance limit has been exceeded.

As stated in Section E.3.3.7, in the event that project air monitoring results exceed a high action level, the project will promptly stop work to identify, report, and correct the causes upon validation of such data results. Stop work will apply to work with the potential to generate the types and levels of emissions exceeding high action levels. Ohio EPA will be informed regarding the causes of the exceedance and plans for the restart of field activities.

In the event of exceedance of action levels less than the high action level, the project will identify and implement appropriate actions internally and will document the decisions and resultant response actions via the D&D DFF&O Quarterly Progress Reports. Corrective actions that meet the definition of a major change will require Ohio EPA concurrence prior to implementation.

Table E.6 summarizes reporting and notifications associated with the demolition project.

Table E.6. Demolition Air Monitoring Reporting and Notifications

Type of Data	Reporting	Frequency
Discussion of analytical and field measurement results exceeding Medium Action Levels or High Action Levels identified in Table E.5	D&D DFF&O Quarterly Progress Report	Quarterly
Notification of High Action Level Exceedance	Direct communication followed by correspondence	Within 48 hours of receipt and evaluation of validated data

Notes:
D&D 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*

E.5. REFERENCES

DOE 2024, *Above-grade Demolition Design Plan for the X-326 Process Building and Associated Special Nuclear Material Monitoring Portals, Tie Lines, and Pipe Racks at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio*, DOE/PPPO/03-0888&D7, U.S. Department of Energy, Piketon, Ohio, May.

DOE 2022, *5-Unit Groundwater Plume Area Excavation Work Plan at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio*, DOE/PPPO/03-0868&D3, U.S. Department of Energy, Piketon, Ohio, August.

DOE 2020, *Air Emissions Modeling Report for the On-site Waste Disposal Facility (OSWDF), Soil Excavation Projects, and X-326 Process Building Demolition at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio*, DOE/PPPO/03-0924&D1, U.S. Department of Energy, Piketon, Ohio, March.

DOE 2014, *Sample Analysis Data Quality Assurance Project Plan (SADQ) at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio*, DOE/PPPO/03-0278&D2, U.S. Department of Energy, Piketon, Ohio, February.

FBP 2024, *Worker Safety and Health Program*, FBP-OS-PDD-00001, Rev. 15, Fluor-BWXT Portsmouth LLC, Piketon, Ohio, April.

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*, Ohio Environmental Protection Agency, Columbus, Ohio, July 16.

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