CONVEYANCE OF REAL PROPERTY AT THE PORTSMOUTH GASEOUS DIFFUSION PLANT IN PIKE COUNTY, OHIO

U.S. Department of Energy
DOE/EA-1856
Draft

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Sam Eldridge (signature on file)	10-20-16
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Prepared for
U.S. Department of Energy
Portsmouth/Paducah Project Office

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ACRONYMS

ACP	American Centrifuge Plant
ADT	average daily traffic
Centrus	Centrus Energy Corporation
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended
CEQ	Council on Environmental Quality
CFR	*Code of Federal Regulations*
D&D	decontamination and decommissioning
DOE	U.S. Department of Energy
DUF_6	depleted uranium hexafluoride
EA	environmental assessment
EIS	environmental impact statement
EM	Environmental Management
EPA	U.S. Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FONSI	finding of no significant impact
IGWMP	Integrated Groundwater Monitoring Plan
LLW	low-level (radioactive) waste
LMES	Lockheed Martin Energy Systems, Inc.
NAAQS	National Ambient Air Quality Standards
NCES	National Center for Education Statistics
NEPA	National Environmental Policy Act of 1969
NHPA	National Historic Preservation Act of 1966
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRC	U.S. Nuclear Regulatory Commission
NRHP	National Register of Historic Places
OAC	*Ohio Administrative Code*
ODNR	Ohio Department of Natural Resources
ODSA	Ohio Development Services Agency
Ohio EPA	Ohio Environmental Protection Agency
OHPO	Ohio Historic Preservation Office
OSWDF	on-site waste disposal facility
OVEC	Ohio Valley Electric Corporation
PCB	polychlorinated biphenyl
PHWH	primary headwater habitat
PORTS	Portsmouth Gaseous Diffusion Plant
PSD	prevention of significant deterioration
RCRA	Resource Conservation and Recovery Act of 1976, as amended
RI/FS	remedial investigation/feasibility study
ROD	Record of Decision
ROI	region of influence
RTE	rare, threatened, and endangered
SODI	Southern Ohio Diversification Initiative
TSCA	Toxic Substances Control Act of 1976
USACE	U.S. Army Corps of Engineers
USC	*United States Code*

USDA	U.S. Department of Agriculture
USEC	United States Enrichment Corporation
USFA	U.S. Fire Administration
USFWS	U.S. Fish and Wildlife Service
VOC	volatile organic compound
WAI	Wastren Advantage Inc.
WRCC	Western Regional Climate Center

1. INTRODUCTION

1.1 PURPOSE AND NEED FOR ACTION

The Proposed Action evaluated in this Environmental Assessment (EA) is U.S. Department of Energy (DOE) conveyance of real property located at the Portsmouth Gaseous Diffusion Plant (PORTS). The primary purpose of the conveyance (hereinafter "transfer") of real property is economic development, but purposes other than economic development such as public benefit, conservation, or mitigation may also occur. The Proposed Action includes the option of leasing the real property prior to completing the transfer, but it does not include leasing only. For this EA, real property is defined as land, together with the improvements, structures, and fixtures located thereon. Transfers of real property at PORTS will assist DOE in shrinking the site footprint to reduce the costs of maintaining the site. This EA, *Conveyance of Real Property at the Portsmouth Gaseous Diffusion Plant in Pike County, Ohio,* evaluates the transfer of real property to the Southern Ohio Diversification Initiative (SODI) and/or other parties so that they may sell, lease, or license the transferred real property to further economic development in the area. DOE's action will be consistent with the goals of the President's Memorandum *Disposing of Unneeded Federal Real Estate—Increasing Sales Proceeds, Cutting Operating Costs, and Improving Energy Efficiency* (June 10, 2010).

PORTS concluded its operational (gaseous diffusion) mission in 2001. The site is a DOE Environmental Management (EM) program closure site, fully engaged in cleanup to include the decontamination and decommissioning (D&D) of contaminated facilities and the remediation of soil, sediment, surface water, and groundwater. As a result of the conclusion of the enrichment mission, the ongoing execution and progress of cleanup to reach the agreed-upon end-state, and initiatives within the federal government to transfer unneeded real property (per the above-mentioned 2010 Presidential Memorandum), DOE needs to reduce its footprint and reduce the cost of maintaining the site. Economic development transfers will reduce or eliminate operational and maintenance costs at PORTS. Transferring excess, unutilized and underutilized real property for local economic development purposes would have a positive impact on the economy in Piketon, Ohio and surrounding communities. Such transfer of real property for local development purposes could also reduce negative economic impacts caused by changes in the DOE mission at PORTS.

As discussed in Section 2, real property is expected to become available incrementally over time in coordination with the cleanup program. It is anticipated that real property outside the centrally developed area of PORTS would be unneeded and eligible for transfer sooner than real property that is within the centrally developed area, where most D&D will be occurring.

1.2 BACKGROUND

PORTS is located on a 3,777-acre site (Figures 1 and 2) in a rural area of Pike County in south-central Ohio. PORTS began operations in 1954 and was one of three uranium enrichment facilities originally built in the United States; the other two were constructed in Oak Ridge, Tennessee, and Paducah, Kentucky. PORTS used the gaseous diffusion process to provide highly-enriched uranium to the U.S. Navy and low-enriched uranium for electrical power generation. From 1991 until production ceased in 2001, PORTS produced only low-enriched uranium for commercial power plants. In 1993, DOE leased the gaseous diffusion operations used for commercial uranium enrichment to the United States Enrichment Corporation (USEC). DOE has responsibility for environmental restoration and waste management activities, uranium programs, and long-term stewardship of nonleased facilities at PORTS.

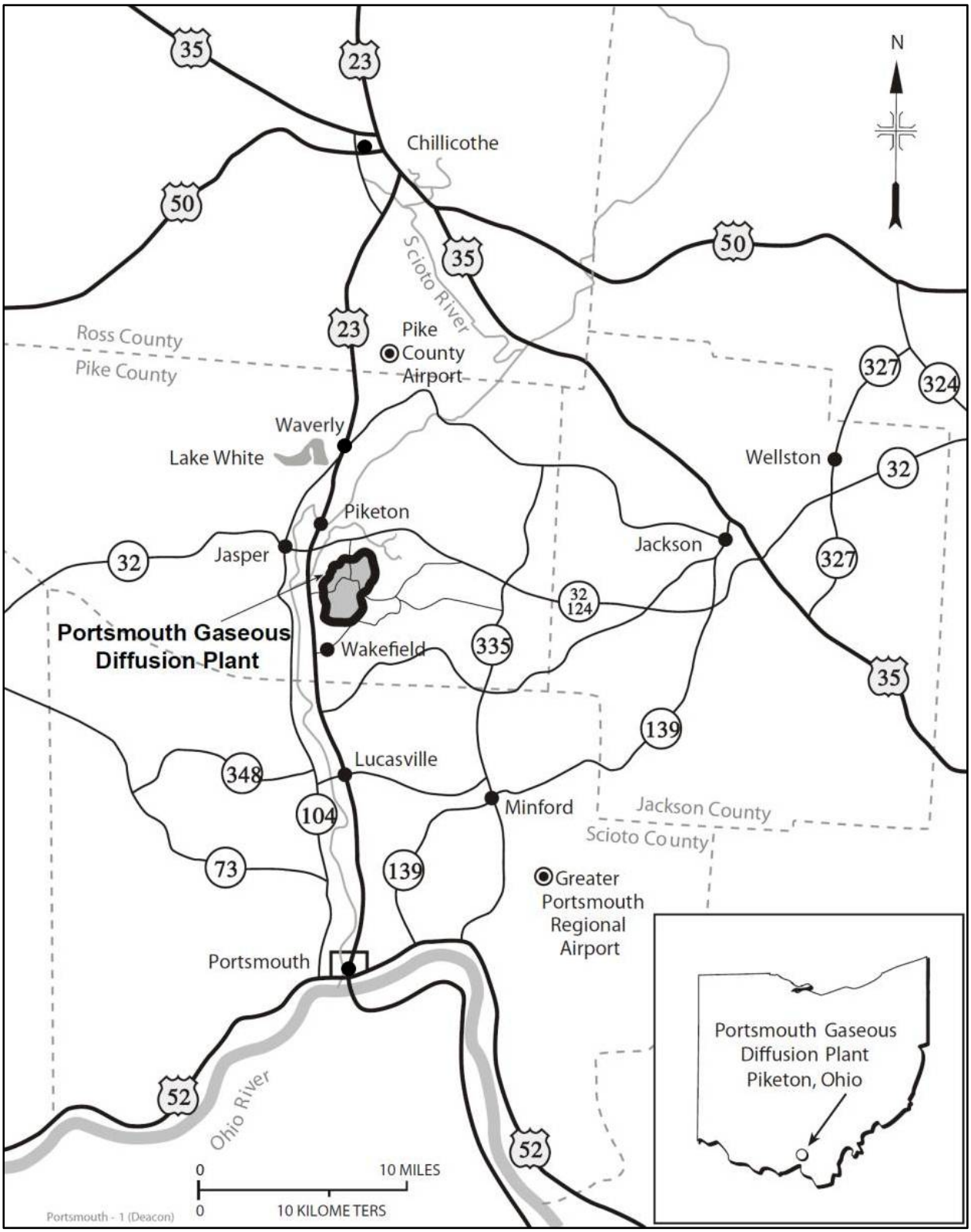

Figure 1. Location of PORTS

Figure 2. Aerial View of PORTS (circa early 2000s)

Two notable facilities have been constructed at PORTS since the initial plant construction. In the early 1980s, DOE built a separate gas centrifuge enrichment plant at PORTS as an alternative means of uranium enrichment. Two process buildings, a centrifuge recycle and assembly building, and several support facilities were constructed. The gas centrifuge enrichment facilities were leased to USEC and are currently leased to Centrus Energy Corporation (Centrus). Then, in 2008, the Depleted Uranium Hexafluoride (DUF_6) Conversion Facility was constructed to convert DUF_6 into constituents for disposal and commercial resale.

Should the gas centrifuge enrichment facilities cease to be leased, the buildings and land would return to DOE, which would determine an appropriate disposition path at that time. Likewise, when the DUF_6 conversion mission is completed, real property associated with that facility will also be available following any D&D or remediation that may be necessary. The real property associated with both the gas centrifuge and the DUF_6 conversion facilities are considered in this EA.

The PORTS reservation is owned by DOE. The plant consists of more than 400 facilities (a facility can be a building, utility system, or infrastructure unit) with three main process buildings designated as X-333, X-330, and X-326 that house the gaseous diffusion equipment. The three main process buildings are located in the center of PORTS and cover a combined footprint of approximately 90 acres. Various support and auxiliary buildings/structures and infrastructure are also present. Most facilities are planned to be removed under DOE's D&D program using controlled demolition, with waste materials treated as necessary and packaged for final disposition. Materials that can be recycled or reused will be segregated from the waste, as appropriate (DOE 2015a).

The three process buildings, as well as most of the remaining site facilities, are situated within the approximately 1,200-acre industrialized area bounded by Perimeter Road. The central, industrialized area is largely devoid of trees, with managed lawns, parking lots, and paved roadways dominating the open space. The portion of the DOE property outside of Perimeter Road, much of which has also been disturbed or developed during the various phases of plant construction and expansion, consists of more than 2,500 acres and is used for a variety of purposes including a water treatment plant, sediment ponds, sanitary landfills, cylinder storage yards, open fields, and forested buffer areas (DOE 2015a). Closed landfills and burial grounds account for approximately 101 acres. More than 300 acres of land are dedicated to the on-site waste disposal facility (OSWDF) and its support facilities, which will be used to manage waste from the PORTS D&D project (100 acres will be permanently committed as a waste disposal location with no alternate use in the future [DOE 2015b]). The D&D of the PORTS facilities and associated waste disposition activities were reviewed through the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA) process (DOE 2015a; DOE 2015b) and are not covered in this EA.

1.3 SCOPE OF THIS ENVIRONMENTAL ASSESSMENT

DOE has prepared this EA to assess the consequences of the potential transfer of PORTS real property. D&D and remediation of the PORTS site is independent of the Proposed Action described in this document and will be performed independent of any real property transfer decisions.

The EA has been prepared in accordance with the Council on Environmental Quality (CEQ) regulations (40 *Code of Federal Regulations* [*CFR*] Parts 1500 to 1508) that implement the National Environmental Policy Act of 1969 (NEPA) and the DOE NEPA implementing procedures in 10 *CFR* Part 1021. If DOE determines the impacts this EA describes are not significant, it will issue a finding of no significant impact (FONSI) for the actions described in Section 2. If impacts are potentially significant, DOE will consider a mitigated FONSI or evaluate the need to prepare an environmental impact statement (EIS). A mitigated FONSI would specify mitigation measures that would reduce impacts below the level of significance. Future specific transfers of real property may require a NEPA adequacy review to determine if additional NEPA analysis might be required beyond this EA, as discussed below.

If DOE determines there are significant impacts identified by this EA or by future supplemental analysis of any specific future use, it would evaluate whether a notice of intent and preparation of an EIS would be required. DOE would determine significance based on the context and intensity considerations provided in 40 *CFR* 1508.27. The additional NEPA review may be prepared by DOE or another federal agency, depending on the nature of the proposal.

Some future uses anticipated (see Section 2.1.1) could have greater potential than others for creating adverse environmental impacts to some environmental resource areas. For this reason, DOE's guidance (DOE 2004a) for implementing the CEQ regulations (40 *CFR* 1502.1 and 1502.2) recommends a sliding-scale approach so that actions with greater potential effect can be discussed in more detail than those that have less potential for impact. Because the actual future use of the facilities and land is not known, a bounding analysis is used to estimate potential impacts. A bounding analysis is prepared when no specific activity has been identified for analysis. Because of the lack of detail on a future use or uses, especially in the case of real property transfer for development purposes, the bounding analysis typically uses assumptions regarding land uses and anticipated operations and employs analytical methods to estimate potential environmental impact.

Reasonably foreseeable future uses and their associated environmental impacts are addressed in this EA. The bounding analysis is based on the assumption that various types of industrial, commercial,

mixed-use, and business park uses primarily would occur on the real property. This assumption was based on the types of industries and businesses currently operating in industrial parks in the region around PORTS, the types of industries most likely to locate to or expand in southern Ohio, and businesses that transferees would likely recruit. In addition, some areas may be designated for forest/wildlife management or conservation purposes (potentially as mitigation measures related to site cleanup). Residential use of the property is not included in the scope of this EA. Prior to future real property transfers, DOE would obtain information from interested parties who are requesting real property. This information would enable DOE to screen a potential transferee's proposed future uses against the uses evaluated in this EA. That DOE screening would enable DOE to ascertain whether future uses are within the bounds of this analysis.

This EA does not:

- Define to whom DOE could or might transfer real property
- Identify specific future uses for individual parcels of real property
- Address D&D and remediation activities at PORTS taken under CERCLA and *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.*

This EA is only a part of the process DOE must follow before it can transfer real property. Individual future transfer proposals will be screened against this EA.

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2. DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

Two alternatives are analyzed in this EA: the Proposed Action (the transfer of real property) and the No Action Alternative (DOE continues its mission and maintains ownership of the site). The Proposed Action has been identified as meeting DOE's purpose and need to reduce its footprint of the site, which would reduce the cost of maintaining the site as described in Section 1.1. The No Action Alternative provides a baseline for comparison of environmental impacts in Section 3 of this EA. Under the No Action Alternative, DOE would retain all right, title, and interest in the real property and no real property transfer would occur. The two alternatives are discussed in the following sections.

2.1 PROPOSED ACTION

DOE proposes to transfer, by fee title transfer, excess, underutilized, or unutilized (hereafter, "unneeded") real property at PORTS to interested parties who would sell, lease, or license the real property to further economic development in southern Ohio. The Proposed Action includes the option of leasing the real property prior to completing the transfer, but it does not include the option to lease only. Other types of transfers may also occur to assist DOE in shrinking its site footprint, such as transfers for conservation or mitigation purposes, though it is presumed that the majority of transfers would be to further economic development opportunities in the region. DOE intends to transfer the property for economic development purposes in accordance with 10 *CFR* 770, *Transfer of Real Property at Defense Nuclear Facilities for Economic Development*. Transfer of DOE real property is authorized under Section 161 g of the Atomic Energy Act (42 *United States Code* [*USC*] 2201 [g]).

As shown on Figure 3, PORTS consists of 3,777 acres of DOE-owned land. Of the 3,777 acres, 2 acres are separate from the main site at the inactive X-608 pump house, located north of the site in the Village of Piketon. This is the only noncontiguous real property at PORTS. Perimeter Road surrounds an approximately 1,200-acre centrally developed area which contains most of the site facilities. More than 400 facilities (including buildings, utilities, systems, ponds, and infrastructure units) are located on PORTS, including the American Centrifuge Plant (ACP) (Centrus leases facilities from DOE for the ACP) and DUF_6 conversion facilities. These two facilities would not be considered for property transfer until they were unneeded (real property related to the ACP and DUF_6 facilities could be transferred at a future time and are considered in this EA). In general, most of the existing facilities at PORTS are located within the 1,200-acre centrally developed area and are planned to be removed under DOE's D&D Program.

The transfer of unneeded real property would support the DOE objective to reduce the DOE footprint at the site and reduce life-cycle costs. Real property outside the centrally developed area would be determined to be unneeded and therefore eligible for transfer sooner than real property within the centrally developed area, where most D&D will be occurring. For example, three of the largest facilities on the site (designated X-326, X-330, and X-333) are process facilities that were constructed in the 1950s to support the site's original enrichment mission. These three facilities are radiologically contaminated and occupy a footprint of more than 30 acres each. These facilities, as well as the ancillary facilities and infrastructure that supported the uranium enrichment process, will be demolished pursuant to the *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) (Process Buildings D&D Record of Decision [ROD]). The timeframe for D&D will preclude near-term transfer of this real property. The real property on which these process buildings are located would be available and considered for transfer once D&D has been completed and soil contamination has been remediated, if needed.

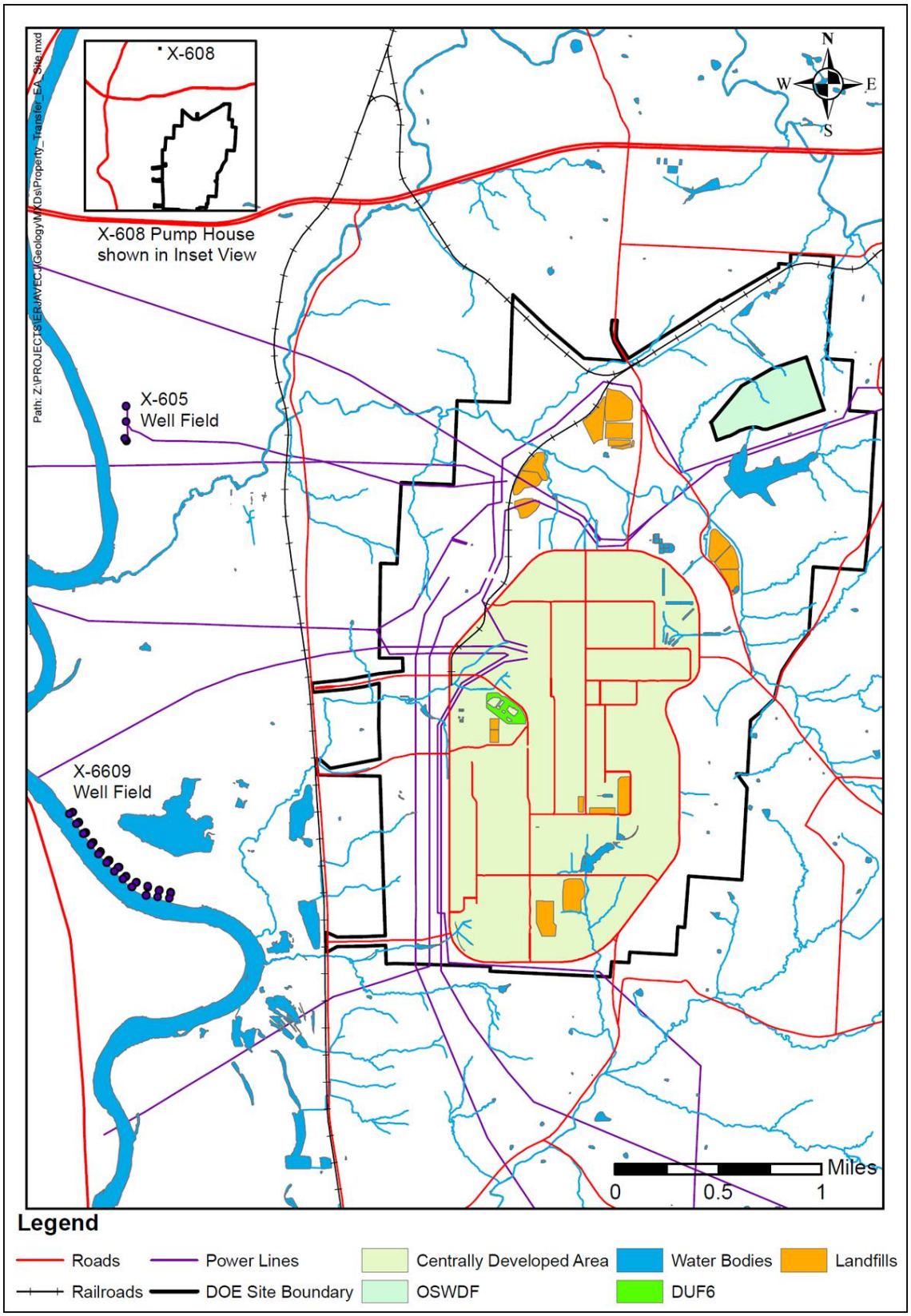

Figure 3. DOE PORTS Area

Under the Proposed Action, DOE could transfer up to 3,677 acres of real property located within the EA study area (designated by the DOE site boundary on Figure 3).[1] The size of individual transfers of unneeded real property could vary. DOE would determine whether or not real property is considered unneeded based on real property utilization and mission considerations. Once real property is deemed unneeded, an environmental due diligence review would occur for each proposed transfer that DOE evaluates. A determination of *suitability* to transfer (i.e., environmental due diligence) would be needed before unneeded real property *availability* for transfer is ascertained. DOE will consider all real property transfer requests on a case-by-case basis and will evaluate each request individually. For the purposes of this EA, it is assumed the property transfers would generally occur within an approximately 30-year period.

The Proposed Action assumes that the transferred real property would be developed for a range of uses, up to and including light industrial/general commercial to heavy industrial, as well as combined mixed uses (see Section 2.1.1 for a discussion of potential uses). Some transferred real property is expected to be left as open space. Recent trends in industrial and business parks recognize the value of open space as an amenity in keeping with the public interest in sustainability and the eco-industrial park movement. In addition to the construction of new facilities, development activities could include placement and compaction of earth backfill to establish required building elevations for new construction, land contouring (such as creation of elevated grades for visual enhancements and/or desired settings), and utility connections. Construction activities would also include vehicle access roads, parking lots, pedestrian walkways, and other enhancements such as lighting and landscaping.

2.1.1 Land Use Scenarios and Assumptions

Specific future industrial and commercial uses of the property are not known. Using input on preferred uses from the public (Ohio University 2012a), DOE has developed reasonably foreseeable uses to bound the analysis in this EA. These uses could include, but are not limited to, uses such as:

- Light to heavy industrial facilities including processing, manufacturing, assembly, and fabrication plants, which may use processed or previously manufactured materials or may produce products from raw materials

- Storage, warehousing, wholesaling, distribution, and trans-modal facilities, including truck and rail service terminals and related facilities

- Storage facilities for coal, coke, building material, sand, gravel, stone, and lumber and enclosed or open storage of equipment and supplies, etc.

- Research and testing facilities, including renewable, integrated, and advanced energy, industrial, environmental testing, and scientific research laboratories

- Administrative, technical, and professional offices in an office park setting or as individual facilities associated with on-site manufacturing facilities. Office space could also be constructed for use by DOE and its contractor workforce, such as for future D&D activities that will remove presently occupied facilities from use.

[1]DOE acknowledges that significant portions of land within the 1,200-acre centrally developed area would not be transferred until after certain D&D and remedial actions are completed. Also, some property used for waste disposal locations will not be transferred. However, for the purposes of this analysis, the scope of this EA addresses the potential transfer of up to 3,677 acres of DOE-owned property.

- Waste or chemical treatment facilities, including hazardous and mixed waste treatment for shipment to off-site storage and disposal facilities

- Recycling operations, including those for radioactively contaminated materials and those associated with metal treatment and processing

- Renewable energy production facilities (e.g., solar farms)

- Various commercial uses including retail stores, bulk cleaning and laundry plants, cold storage lockers, furniture and carpet warehouses, car washes, equipment and appliance repair, vehicle service centers, and convenience stores with gasoline/diesel pumps.

For any uses outside of the bounds evaluated in this EA, DOE may transfer the property and place conditions in the deed that require the transferee to obtain all necessary approvals for the use of the real property. The following activities by transferees may also occur as continuation of ongoing land management activities (e.g., mitigation measures related to site cleanup), and could occur in combination with the economic development endeavors identified above:

- Forestry management activities
- Wildlife management activities
- Conservation purposes and/or passive recreation.

DOE expects the impacts related to wildlife management or conservation uses would be less than those of industrial uses.

Table 1 presents assumptions regarding the characteristics and requirements of the typical businesses and industries that could use the transferred PORTS real property. The business and industrial uses shown in Table 1 would be part of the land use categories listed above.

Table 1. Characteristics and Requirements of Typical Businesses and Industries that Could Occur on Real Property after Transfer

Industry	Emissions	Effluents	Wastes	Comments
General process manufacturing, fabrication, and assembly	Facility may require state air permit for oil or natural gas combustion	Wastewater discharged to sewer in accordance with wastewater discharge permit restrictions	Solid waste is recycled or sent to a permitted landfill; RCRA hazardous wastes would be treated, stored, and disposed of according to state and federal regulations	Size of facility may require compliance with state and federal storm water runoff regulations
Apparel and finished fabrics (e.g., fabricated textiles, footwear, or luggage)	Minor air emissions, such as ketones, toluene, methanol, ammonia, and xylenes, controlled through the use of engineering controls and regulated under a state air quality permit	Wastewater discharged to sewer in accordance with wastewater discharge permit restrictions	Solid waste is recycled or sent to a permitted landfill; RCRA hazardous wastes would be treated, stored, and disposed of according to state and federal regulations	Size of facility may require compliance with state and federal storm water runoff regulations
Lumber and wood products (e.g., millwork, prefabricated wood buildings and manufactured homes, wood containers)	Minor air emissions, such as particulates, VOCs, CO, CO_2, NO_x, formaldehyde, and phenol, controlled through the use of engineering controls and regulated under a state air quality permit	Wastewater discharged to sewer in accordance with wastewater discharge permit restrictions	Solid waste is recycled or sent to a permitted landfill; RCRA hazardous wastes would be treated, stored, and disposed of according to state and federal regulations	Size of facility may require compliance with state and federal storm water runoff regulations
Furniture and fixtures (e.g., household and institutional furniture; mattresses and bedsprings; showcases, partitions, shelving, and lockers)	Minor air emissions, such as VOCs from finishing, and oil or natural gas combustion controlled through the use of engineering controls and regulated under a state air quality permit	Wastewater discharged to sewer in accordance with wastewater discharge permit restrictions	Solid waste is recycled or sent to a permitted landfill; RCRA hazardous wastes would be treated, stored, and disposed of according to state and federal regulations	Size of facility may require compliance with state and federal storm water runoff regulations
Storage, warehousing, wholesaling, and distribution facilities	Fugitive dust emissions and mobile emissions from internal combustion sources; facility may require state air permit for oil and natural gas combustion	Wastewater discharged to sewer in accordance with wastewater discharge permit restrictions	Solid waste is recycled or sent to permitted landfill; RCRA hazardous wastes would be treated, stored, and disposed of according to state and federal regulations	Size of facility may require compliance with state and federal storm water runoff regulations

Table 1. Characteristics and Requirements of Typical Businesses and Industries that Could Occur on Real Property after Transfer (Continued)

Industry	Emissions	Effluents	Wastes	Comments
Research and testing facilities	Minor air emissions controlled through the use of engineering controls and regulated under a state air quality permit	Wastewater discharged to sewer in accordance with wastewater discharge permit restrictions	Solid waste is recycled or sent to permitted landfill; RCRA hazardous wastes would be treated, stored, and disposed of according to state and federal regulations	Size of facility may require compliance with state and federal storm water runoff regulations
Heavy industrial	Natural gas combustion releases, SO_2, NO_x, VOCs, and CO; air emissions, such as particulates, CO_2, formaldehyde, and phenol, and other pollutants controlled through the use of engineering controls and regulated under a state air quality permit	Wastewater discharged to sewer in accordance with wastewater discharge permit restrictions	Solid waste is recycled or sent to permitted landfill; RCRA hazardous wastes would be treated, stored, and disposed of according to state and federal regulations	Size of facility may require compliance with state and federal storm water runoff regulations
Commercial offices	Facility may require state air permit for oil and natural gas combustion	Wastewater discharged to sewer in accordance with wastewater discharge permit restrictions	Solid waste recycled or sent to permitted landfill	Size of facility may require compliance with state and federal storm water runoff regulations
Waste treatment and recycling facilities (e.g., electronics recycling, contaminated materials treatment and recycling, metals decontamination and reuse)	Air emissions such as particulates, VOCs, radionuclides, and other pollutants controlled through the use of engineering controls and regulated under a state air quality permit and a radiological license	Wastewater discharged to sewer in accordance with wastewater discharge permit restrictions	Solid waste is recycled or sent to permitted landfill; RCRA hazardous wastes would be treated, stored, and disposed of according to state and federal regulations	Size of facility may require compliance with state and federal storm water runoff regulations
Retail shops (e.g., laundry, dry cleaner, auto parts, mailing service, appliance repair, copying center)	Air quality permit generally not required except for dry cleaner	Wastewater discharged to sewer in accordance with wastewater discharge permit restrictions	Solid waste recycled or sent to permitted landfill	None

Table 1. Characteristics and Requirements of Typical Businesses and Industries that Could Occur on Real Property after Transfer (Continued)

Industry	Emissions	Effluents	Wastes	Comments
Auto repair shop/vehicle maintenance center	Minor air emissions controlled through the use of engineering controls and regulated under a state air quality permit	Wastewater discharged to sewer in accordance with wastewater discharge permit restrictions	Oil is collected for recycle or disposal; solid waste is recycled or sent to permitted landfill; RCRA hazardous wastes would be treated, stored, and disposed of according to state and federal regulations	None
Convenience food store with gasoline/diesel pumps	Air quality permit generally not required	Wastewater discharged to sewer in accordance with wastewater discharge permit restrictions	Solid waste sent to permitted landfill	Underground storage tank regulations must be met

Source: EPA Office of Enforcement and Compliance Assurance, Sector Notebooks, http://es.epa.gov/occa/sector/. U.S. Census Bureau, North American Industry Classification System, http://census.gov/cpcd/www/naics.html.

EPA = U.S. Environmental Protection Agency
NO_x = nitrogen oxides
RCRA = Resource Conservation and Recovery Act of 1976, as amended
VOC = volatile organic compound

The bounding analysis used in this EA assumes that the potential industrial and commercial uses would be compatible with other similar non-DOE uses in the area. The uses would also need not to negatively impact other ongoing missions and activities being performed by DOE. DOE also has based the bounding analysis in this EA on the following assumptions:

- Construction activities involving ground disturbance would be conducted incrementally, as property is transferred, and would limit the potential for soil erosion. Sensitive resources such as historic properties would be protected or mitigated as necessary through the use of deed restrictions, and the transferee would comply with all applicable local, state, and federal regulations pursuant to deed restrictions.

- Future owners and/or occupants would be responsible for seeking, obtaining, and complying with any applicable federal, state, and/or local permits and licenses for activities and operations at their facilities. Examples include, but are not limited to, building permits, permits for air emissions, industrial wastewater discharge permits, storm water discharge permits, and U.S. Nuclear Regulatory Commission (NRC) or State of Ohio licenses for operations that involve the handling or use of radioactive materials.

- State and federal storm water regulations to minimize erosion and sedimentation would be met by the transferees as part of their development planning. As applicable, notification of any disturbance would be made to the appropriate authorities prior to construction activities.

- Future owners and/or occupants would be responsible for obtaining utilities (existing utility systems at PORTS that are owned by DOE may be utilized or transferred but they are currently planned for D&D).

The future uses of the property are bounded by the types of uses identified above. Ensuring the identified future uses are within these categorical bounds will be accomplished through deed clauses or restrictions. If transferees identify a future use that is not within the bounds analyzed within this EA, additional NEPA review would be required. Residential use of the property is not included in the scope of this EA because site-wide environmental restoration cleanup goals are based on industrial land use scenarios.

2.1.2 CERCLA 120(h) Compliance

To transfer real property, DOE must comply with the requirements of CERCLA Sect. 120(h)[2], which is an environmental due diligence review process that applies to all transfers of real property "owned by the United States" to nonfederal entities.

To comply with these requirements, DOE would prepare a report that documents the baseline environmental condition of the real property proposed for transfer and identifies hazardous materials that are present, stored, or have been released within the proposed transfer footprint. The report, called an environmental baseline survey, would also include information on prior property ownership, past and present property use, and past and present activities on adjacent properties. Before a transfer could occur, DOE would have to make a determination that the condition of the property is protective of human health and the environment for its intended future use (e.g., industrial/commercial/business), and therefore the property is suitable for transfer, via a risk evaluation process. Property would only be transferred after

[2]This requirement is not unique to PORTS or to DOE, but is required of all federal agency property transfers.

DOE satisfies the CERCLA 120(h) process and obtains agreement from the appropriate regulatory authorities.

2.2 NO ACTION ALTERNATIVE

The No Action Alternative provides a baseline with which environmental impacts of the Proposed Action can be compared and is required by DOE NEPA regulations (10 *CFR* 1021). Under the No Action Alternative, the land uses at PORTS would continue to be managed by DOE, real property would not be transferred, and there would be no economic development or footprint reduction resulting from transfers as proposed in this EA. Ongoing and planned activities at the site would continue until completion, including environmental restoration, waste management, D&D, and other DOE functions (e.g., maintaining a level of security and maintenance appropriate to the site activity).

2.3 ALTERNATIVES CONSIDERED BUT ELIMINATED

2.3.1 Lease-only or License-only Alternative

An alternative eliminated by DOE from further analysis was the transfer of the property by lease only or license only. Transfer via lease or license would not meet the stated need for the Proposed Action because it would not reduce DOE's footprint. Establishment of a lease program would introduce higher costs to DOE because personnel would need to be put in place to manage the leases. In addition, financing construction on leased real estate complicates the transactions for the lessee, making the real estate less competitive with other real estate which is not complicated by owner/lessee agreements.

2.3.2 Use of Property in a Manner Not Consistent With Expected Future Use

DOE did not include residential use in this analysis because it is inconsistent with the cleanup end state exposure of industrial use.

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3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section describes the affected environment and potential environmental consequences of the Proposed Action and the No Action Alternative to the natural and human environment for the following potentially affected environmental resource areas: land use, visual resources, air quality, noise, geology and soils, water resources, ecological resources, socioeconomics and environmental justice, cultural resources, infrastructure and transportation, waste management, human health and safety, and intentionally destructive acts. Much of the specific information and data in this section is from either the 2014 Annual Site Environmental Report (DOE 2016a) or the 2015 Annual Groundwater Report (DOE 2016b), which are the most recent publicly available reports.

The Proposed Action in this EA analyzes the potential transfer of DOE real property at the PORTS site to one or more entities for uses that could be different from its current use. The transfer action itself would not have environmental impacts; rather, future development by a new owner could have the potential for environmental impacts. To provide information and context to decision makers and other document reviewers, this EA analyzes reasonably foreseeable land uses (industrial/commercial/mixed-use business park, conservation, and forestry/wildlife management uses).

The analysis in this EA serves only as a basis for estimating the potential environmental impacts of development, construction, and operational actions after property transfer. Potential uses would be contingent on the transferee's receipt of necessary permits and authorizations, and on additional environmental reviews undertaken by the transferees.

3.1 LAND USE AND VISUAL RESOURCES

This section describes land use on the PORTS site and in its vicinity. Visual resources are also described. The descriptions are followed by an assessment of the potential impacts the Proposed Action and No Action Alternative would have on land use and visual resources.

3.1.1 Affected Environment

3.1.1.1 Land use

PORTS is located in a rural area of Pike County in south central Ohio (Figure 1). PORTS is approximately 20 miles north of the Kentucky/Ohio state line and 70 miles southeast of Columbus, Ohio. Towns in the vicinity of PORTS include Piketon, located 4 miles north; Waverly, located 8 miles north; Jasper, located 1.2 miles northwest; and Lucasville, located 8 miles south of the site. The largest cities within an approximately 50-mile radius are Portsmouth, Ohio, located 27 miles to the south, and Chillicothe, Ohio, located 27 miles to the north.

Land uses in the general vicinity of PORTS include urban, residential, private and commercial farms, light industries, and transportation corridors (highways and railroads). In Pike County, the land use is approximately 66 percent forest, 23 percent cropland, and 8 percent pasture. The remaining 3 percent is classified as urban land, open water, and bare/mines areas (Ohio Development Services Agency [ODSA] 2016a). The latter classification refers to largely unvegetated areas of nonurban land, some of which may be associated with mining. Based on information from the Ohio Department of Natural Resources (ODNR) website (http://ohiodnr.gov/), two public recreational areas are located in the vicinity of the PORTS site: Brush Creek State Forest is located 15 miles southwest of the site, and Lake White State Park is located 6 miles north of the site.

In the immediate area surrounding PORTS, land is used primarily for agricultural cultivation and grazing, forests, and rural residences. The dominant land use is farming, which accounts for

approximately 25,430 acres. Farmland that qualifies for protection under the Farmland Protection and Policy Act of 1981 is located primarily along the Scioto River floodplain. Marginal quality farmland is located adjacent to PORTS. The soil survey of Pike County (U.S. Department of Agriculture [USDA] 1990) indicates that soils adjacent to PORTS and on the site are of low fertility and do not qualify as prime farmland. The land surrounding PORTS has 24,400 acres of forest cover (USEC 2004).

The PORTS site contains 3,777 acres of DOE-owned land. On the PORTS site, Perimeter Road surrounds a 1,200-acre centrally developed industrial use area, which includes a 750-acre controlled access area (DOE 2014a). The portion of the site outside of Perimeter Road comprises approximately 2,500 acres of land, including several contiguous parcels ranging from 1 to more than 1,000 acres. Land uses in this area include a water treatment plant, sewage treatment plant, holding ponds, sanitary and inert landfills, cylinder storage yards, parking areas, open fields, and forested buffer areas (DOE 2014a). The OSWDF, which covers 100 acres permanently committed as a waste disposal location (DOE 2015b), is also located in the area outside of Perimeter Road.

PORTS includes more than 400 facilities, including three large process buildings, support buildings and structures, utilities, plant systems, holding ponds, and infrastructure units. All of the facilities are planned for D&D pursuant to the Process Buildings D&D ROD. Two facilities not included in the Process Buildings D&D ROD are the Centrus ACP, which was constructed to produce enriched uranium for commercial nuclear reactor fuel, and the DUF_6 Conversion Facility, which is used by DOE to convert DUF_6 into constituents for disposal and commercial resale.

DOE is engaged in the D&D of the site and waste management of the generated waste pursuant to the Process Buildings D&D ROD and the *Record of Decision for the Site-wide Waste Disposition Evaluation Project at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (DOE 2015b) (Waste Disposition ROD), along with the continued remediation of soil and groundwater. DOE evaluated the waste anticipated to be produced by D&D of buildings and structures at PORTS, including the three major process buildings (X-326, X-330, and X-333) that previously enriched uranium, and concluded an OSWDF was the preferred alternative for disposition of the bulk of the D&D wastes.

At present, DOE has two real property leases with SODI. The first lease was signed in April 1998 for 7 acres of land on the north side of the DOE property. This tract is used as a right-of-way for a railroad spur that connects to the existing DOE north rail spur. SODI subleases a portion of this property to allow access to the rail line for a wood-grading operation. In October 2000, a second lease between DOE and SODI was signed to allow concurrent SODI access to and use of the existing north rail spur.

3.1.1.2 Visual resources

NEPA and CEQ regulations stipulate that visual resources are one of the elements or factors in the human environment that must be considered in determining the impacts of a Proposed Action. For example, would the Proposed Action impede the view of or change the visual characteristics of identified visual resources such as important landmarks and historic sites, parks, and designated scenic areas or roadways?

There are no designated scenic areas in the near vicinity of PORTS. More than 90 percent of the land surrounding PORTS is either undeveloped or serves as agricultural land for cultivation and grazing. PORTS is surrounded by lightly to heavily forested areas to the immediate north, east, south, and west, which obscure public views of the site from these directions. As a result, facilities on the site are generally not visible to the public from highways or other off-site locations.

The area of the PORTS site within Perimeter Road is primarily flat land that resulted from industrial development. It is dominated by numerous PORTS buildings and facilities of moderate height, one notable exception being the on-site water storage tower. The remainder of the site is a largely rural landscape with a mixture of flatlands and hills. The northern portion of the PORTS site consists of open and forested buffer areas. Many of the open areas within the site are maintained as lawns and fields.

3.1.2 Environmental Consequences

The total land area that would actually be transferred is unknown at this time. However, this analysis assumes 3,677 acres for eventual real property transfer. Existing facilities at PORTS are generally located within the 1,200-acre centrally developed area. As such, approximately 2,577 acres are considered undeveloped (though they are not undisturbed). Of the 2,577 acres, approximately 1,550 acres (about 60 percent) are assumed to be readily developable. The analysis also assumes the remaining acreage could be transferred but would not be developed due to various constraints (e.g., wetlands, land with slopes greater than 15 percent, utilities, etc.) that would make development more costly compared to the balance of the readily developable property on the site.

3.1.2.1 Proposed Action

Under the Proposed Action, the present land use of PORTS would change over time as property is transferred and development occurs. The visual character of the less developed areas would change from a more natural to a more man-made environment and the landscape, particularly outside of Perimeter Road, would change from largely undeveloped to developed. Constraints on developing portions of the site include wetlands, cemeteries, and closed landfills. These areas can be transferred, but any future development would need to be coordinated by the transferee and the appropriate regulatory authority. Areas where DOE has a mission need to retain real property, such as active landfills and operational areas (areas undergoing D&D or remediation, the DUF_6 site, and the Centrus ACP), would not be appropriate for transfer until the areas are no longer needed for DOE mission purposes (they could be transferred at a future time). Desirable infrastructure such as power lines, utility rights-of-way, and rail spurs are also present, though they may also create development constraints. Thus, all portions of PORTS are not equally developable; other complementary uses such as open space and recreational elements may be able to be incorporated into future development. Constraints such wetlands would not preclude a transfer, but the deed would need to identify the resource and the means by which it is regulated, should the transferee wish to alter the resource. Land use and visual impacts from forestry/wildlife management or conservation uses would be minimal. Facilities and land areas on the site are generally not visible to the public from highways or other off-site locations. Therefore, because the site is already an industrial site, minimal impacts to land use and visual resources would be expected from the Proposed Action.

3.1.2.2 No Action Alternative

Under the No Action Alternative, the existing land use would continue and the land would remain as DOE property. No additional impacts to land use or visual resources would occur other than those expected from implementing the D&D and remedial action program. The maintenance or repair of infrastructure and on-site structures would be expected to continue.

3.2 CLIMATE, AIR QUALITY, AND NOISE

This section describes the climate and air quality at PORTS and in its vicinity, as well as the sound environment at PORTS and the vicinity. These descriptions are followed by an assessment of the potential impacts the Proposed Action and No Action Alternative would have on climate, air quality, and the sound environment.

3.2.1 Affected Environment

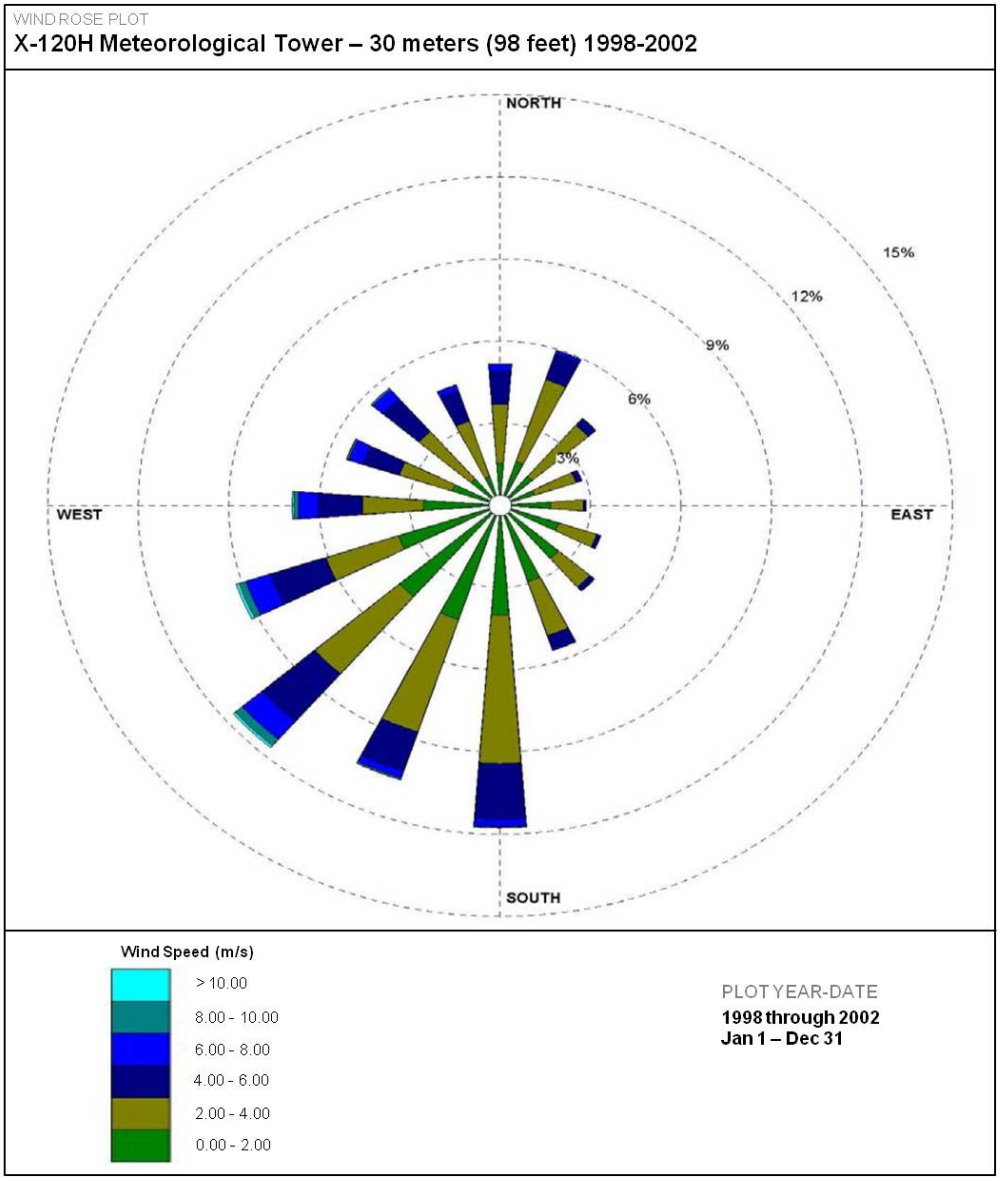
3.2.1.1 Climate

The climate of the PORTS area is humid-continental and is characterized by warm, humid summers and cold, humid winters. For the period of record (June 1893 to September 2012) in Waverly, Ohio (approximately 8 miles north of PORTS), the daily temperature averages 73°F in the summer (June through August) and 33°F in the winter (December through February). The average annual temperature is 54°F. Record high and low temperatures are 107°F and -31°F, respectively (Western Regional Climate Center [WRCC] 2016).

Precipitation is distributed relatively evenly throughout the year and averages approximately 40 in./year. The month with the highest average precipitation for the period of record (June 1893 to September 2012) is July, followed by May. Groundwater recharge and flood potential are greatest during the spring. October is the driest month. Snowfall averages approximately 19 in./year, and snowmelt is part of the total annual precipitation (WRCC 2016).

Surface meteorological data, including wind data, is collected at the on-site meteorological tower at the 33-, 98-, and 197-ft levels. The tower is in the southern part of the site. A comparison of annual wind roses indicates that wind patterns at the 33-ft level are different from those at the 98- and 197-ft levels. Winds at the 33-ft level appear to be influenced by local topographical and/or vegetative features. Accordingly, wind data at the 98-ft level, believed to be representative of the site, are presented in Figure 4, which is based on hourly surface data from the on-site tower. More than 40 percent of the time, wind blew from the southwest quadrant and the prevailing wind was from the south. Average wind speed was about 6.2 mph. Directional wind speed was highest (7.4 mph) from the northwest, and it was lowest (4.0 mph) from the east. Because PORTS is not near a coastal area, potential adverse impacts from hurricanes are not a concern (DOE 2004b).

Tornadoes are rare in the area surrounding the PORTS site. From January 1950 through December 2015, 1,130 tornadoes were reported throughout Ohio with an average of 17 tornadoes per year. While 11 tornadoes were reported in Pike County during this period, all were level F2 or less (wind speeds less than 157 mph) on the Fujita scale (National Oceanic and Atmospheric Administration [NOAA] 2016).



Source: modified from USEC 2004

Figure 4. Wind Rose for PORTS (98-ft level)

3.2.1.2 Air quality

DOE characterizes ambient air quality in an area in terms of the primary and secondary National Ambient Air Quality Standards (NAAQS). The *Clean Air Act* (42 *USC* 7401 et seq.) requires that the U.S. Environmental Protection Agency (EPA) set standards for pollutants considered harmful to public health and the environment. To assess air quality, EPA has established maximum concentrations of pollutants that are referred to as NAAQS. Table 2 presents a list of the NAAQS; the Ohio State Ambient Air Quality Standards are identical. Six criteria pollutants used as indicators of air quality include ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter with a mean diameter of 10 µm or less (PM_{10}), particulate matter with a mean diameter of 2.5 µm or less ($PM_{2.5}$), and lead. Areas in which the ambient air concentrations meet the standards for each criteria pollutant

are designated as *attainment areas*. Areas that do not meet the standards are designated as *nonattainment areas*. PORTS is located in the Wilmington-Chillicothe-Logan Intrastate Air Quality Control Region, which covers the south-central part of Ohio. Pike County is in attainment for all criteria pollutants (40 *CFR* 81.336) (Ohio Environmental Protection Agency [Ohio EPA] 2010).

Table 2. NAAQS and Attainment Status for PORTS

Pollutant	Averaging Times	NAAQS Primary Standard	Secondary Standard	Attainment Status
Carbon monoxide	8-hour[a]	10 µg/m^3 9 ppm	None	Attainment
	1-hour[a]	40 µg/m^3 35 ppm	None	Attainment
Lead	Rolling 3-month average	0.15 µg/m^3	Same	Attainment
	Quarterly average	1.5 µg/m^3	Same	Attainment
Nitrogen dioxide	Annual	100 µg/m^3 0.053 ppm	Same	Attainment
	1-hour[b]	100 ppb	None	Attainment
Particulate matter (PM_{10})	24-hour[c]	150 µg/m^3	Same	Attainment
Particulate matter ($PM_{2.5}$)	Annual[d]	12 µg/m^3	15 µg/m^3	Attainment
	24-hour[b]	35 µg/m^3	Same	Attainment
Ozone	8-hour[e]	0.075 ppm	Same	Attainment
	1-hour[a]	0.12 ppm	Same	Attainment
Sulfur dioxide	1-hour[a]	75 ppb	None	Attainment

Source: Ohio EPA 2010

[a]Not to be exceeded more than once per year.
[b]To attain this standard, the 3-year average of the 98th percentile is considered.
[c]To attain this standard, this level should not be exceeded more than once per year, on average, over 3 years.
[d]Annual mean averaged over 3 years.
[e]To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor is considered.

NAAQS = National Ambient Air Quality Standards
Ohio EPA = Ohio Environmental Protection Agency

DOE is required to submit an annual report called the Ohio EPA Fee Emissions Report for nonradiological air pollutants. DOE reported the following emissions of nonradiological air pollutants for 2014: 12.18 tons of particulate matter, 2.96 tons of organic compounds, and 0.595 ton of nitrogen oxides. Emissions for 2014 are associated with the X-627 Groundwater Treatment Facility, X-333 Coolant System, X-326 Dry Air Plant Emergency Generator, and plant roads and parking areas (DOE 2016a).

The DUF_6 Conversion Facility emits only a small quantity of nonradiological air pollutants. Because of these small emissions, Ohio EPA requires a Fee Emissions Report only once every 2 years. A report was not required in 2014. DOE reported less than 10 tons/year of specified nonradiological air pollutants for 2013 (the report requires reporting of emissions in increments: zero, less than 10 tons, 10 to 50 tons, more than 50 tons, and more than 100 tons). DOE reported 70 lb of hydrogen fluoride were emitted to the air in the Toxic Chemical Release Inventory for 2014 (DOE 2016a).

Another potential air pollutant present at PORTS is asbestos, which is released by D&D of plant facilities. Asbestos emissions are controlled by a system of work practices in accordance with Ohio EPA regulations. The amount of asbestos removed and disposed of is reported to Ohio EPA. In 2014, no asbestos-containing materials were shipped from PORTS (DOE 2016a).

Prevention of significant deterioration (PSD) regulations (40 *CFR* 52.21) limit the maximum allowable incremental increases in ambient concentrations of SO_2, NO_2, and PM_{10} above established baseline levels. The PSD regulations, which are designed to protect ambient air quality in Class I and Class II attainment areas, apply to major new sources and major modifications to existing sources. The nearest Class I PSD areas are Otter Creek Wilderness Area in West Virginia, about 177 miles east of PORTS; Dolly Sods Wilderness Area in West Virginia, about 193 miles east of PORTS; and Mammoth Cave National Park in Kentucky, about 200 miles southwest of PORTS. These Class I areas are not located downwind of the prevailing winds at PORTS.

Greenhouse Gas Emissions. Operations at PORTS contribute to greenhouse gas emissions and specifically carbon dioxide (CO_2) emissions. Historically and currently, the majority of CO_2 emissions from PORTS operations have been associated with the generation of electricity that is supplied to the site. EPA requires annual reporting of greenhouse gas emissions from PORTS (CO_2, methane, and nitrous oxide). In 2014, DOE reported emissions of 15,958 metric tons of CO_2, 0.3 metric ton of methane, and 0.03 metric ton of nitrous oxide. These emissions resulted from combustion of natural gas used at the X-690 Boilers (DOE 2016a).

Another source of CO_2 emissions at PORTS is employee transportation. EPA estimates that each gallon of gasoline produces 19.4 lb of CO_2 emissions (EPA 2008). Assuming that each PORTS worker drives 30 miles round trip to work in a vehicle with a fuel economy rating of 20 miles per gal of gasoline, each worker would generate approximately 29 lb of CO_2 in their daily commute to work. Assuming a 5-day workweek and 50 working weeks per year, the annual amount of CO_2 emissions generated by each worker would be 7,300 lb (about 3.6 tons). Based on current site employment (approximately 2,650 including DOE and site tenants), approximately 9,650 tons of CO_2 would be emitted annually from employee transportation. The total amount of CO_2 emissions from PORTS would be approximately 27,240 tons annually. Total CO_2 emissions in the state of Ohio in 2013 were approximately 252,430,000 tons (U.S. Energy Information Administration 2016). Consequently, operations at PORTS contribute approximately 0.01 percent of the state-wide CO_2 emissions in Ohio.

Radiological Air Quality. DOE collects samples from 15 ambient air monitoring stations and analyzes them for the radionuclides that could be present in ambient air due to the site activities. These radionuclides are isotopic uranium (uranium-233/234, uranium-235, uranium-236, and uranium-238), technetium-99, and selected transuranic radionuclides (americium-241, neptunium-237, plutonium-238, and plutonium-239/240). The ambient air monitoring stations measure radionuclides released from point sources, fugitive air emissions (emissions that are not associated with a specific release point such as a stack), and background levels of radiation (radiation that occurs naturally in the environment and is not associated with the site operations) (DOE 2016a).

DOE's annual site environmental reports evaluate airborne discharges of radionuclides from the site against EPA's dose limits specified in 40 *CFR* Part 61, Subpart H, and National Emission Standards for Hazardous Air Pollutants. No transuranic radionuclides were detected at the PORTS ambient air monitoring stations in 2014. Technetium-99 was detected at each of the 15 ambient air stations. The maximum activity of technetium-99 in ambient air was 0.030 picocurie per cubic meter (pCi/m^3) at a monitoring station north of the plant on Shyville Road, which is 0.003 percent of the DOE

derived concentration standard of 920 pCi/m^3 (DOE 2011). Uranium-233/234 and uranium-238 were detected at each of the monitoring stations. The maximum activity of uranium-233/234 in ambient air (0.00026 pCi/m^3) was detected at an on-site station at the X-611 Water Treatment Plant. The maximum activity of uranium-238 in ambient air (0.00010 pCi/m^3) was detected at a station north of the plant on Shyville Road. These activities are 0.02 percent and 0.008 percent, respectively, of the DOE derived concentration standards for uranium-233/234 (1.1 pCi/m^3) and uranium-238 (1.3 pCi/m^3) (DOE 2011). Potential impacts to human health from PORTS emissions are discussed in Section 3.10.

3.2.1.3 Noise

The *Noise Control Act* of 1972, along with its subsequent amendments (*Quiet Communities Act* of 1978; 42 *USC* 4901–4918), delegates authority to the states to regulate environmental noise and directs government agencies to comply with local community noise statutes and regulations. The State of Ohio and Pike County, where PORTS is located, have no quantitative noise-limit regulations (DOE 2004b).

EPA has recommended a maximum noise level of 55 A-weighted decibels [dB(A)] as the day-night sound level to protect individuals against outdoor activity interference and annoyance. This level is not a regulatory goal, but is "intentionally conservative to protect the most sensitive portion of the American population" with "an additional margin of safety." For protection against hearing loss in the general population from nonimpulsive noise, the EPA guideline recommends a 24-hour period limit of 70 dB(A) or less.

The noise-producing activities within PORTS are associated with demolition and construction activities similar to those at any other typical industrial site. Daily notifications are also transmitted through a public address system throughout the site. Another noise source is associated with traffic (including rail) in and out of PORTS. In particular, train whistle noise, at a typical noise level of 95 to 115 dB(A), is intentionally high at public grade crossings. Rail traffic noise is not currently a factor in the local noise environment because rail traffic is infrequent (DOE 2004b). The site also conducts periodic siren testing.

PORTS is in a rural setting, and no residences or other sensitive receptor locations (e.g., schools, hospitals) exist in the immediate vicinity of any noisy on-site operations. Ambient sound level measurements around the site are not available; the ambient noise level around the site is relatively low, however, except for infrequent vehicular noise. In general, the background environment is typical of rural areas; the day-night sound level based on the population density in Pike County is estimated to be about 40 dB(A) (EPA 1974). Other than nearby residences, no sensitive receptor sites, such as schools, picnic areas, recreation areas, playgrounds, active sports areas, parks, motels, or hotels, are in the immediate vicinity of the site (DOE 2004b).

3.2.2 Environmental Consequences

3.2.2.1 Proposed Action

Regardless of the amount of land transferred and ultimately developed, the use of heavy equipment during site preparation and construction would generate engine exhaust containing air pollutants associated with diesel combustion. Similar air emissions would be generated by delivery vehicles bringing supplies and equipment to the construction site and by construction workers commuting in personal vehicles. These emissions would be short-term, sporadic, and localized (except for emissions associated with the personal vehicles of construction workers and vehicles transporting construction materials and equipment). Dispersion would decrease concentrations of pollutants in the ambient air as distance from the construction site increases. The quantities of air pollutants produced by vehicles and equipment associated with construction would not substantially contribute to the total emissions from mobile sources already operating in the area, and would not be expected to adversely affect local air quality.

In addition, construction activities could generate an increase in fugitive dust (i.e., airborne particulate matter that escapes from a construction site) from earthmoving and other construction vehicle operation. Not all of the area available for construction would be under construction at any one time. Rather, earthwork would likely be undertaken in increments. Increases in fugitive dust concentrations would probably be noticeable on the site and in the immediate vicinity, and ambient concentrations of particulate matter could rise in the short-term. However, control measures for lowering fugitive dust emissions (i.e., covers and water or chemical dust suppressants) would minimize these emissions. As discussed in Section 3.2.1.2, the air quality around PORTS is in attainment for all criteria pollutants (40 *CFR* §81.336), and would be expected to remain as such during any construction activities.

Construction noise would cause a temporary and short-term increase of the ambient sound environment within the site and in the area immediately surrounding the property. Sensitive noise receptors in the vicinity of PORTS include residences located within 500 ft of the site boundary. Noise levels from construction of new facilities would not cause harm to these residents, but may cause some annoyance. These nearby residents may be disturbed if the noise is greater than 60 decibels (dB) at their homes. At 60 dB, speech communication outdoors and sleep indoors may be affected. However, construction activities normally would be limited to daytime hours, and thus would not impact existing background noise levels at night. Noise levels from operation of new facilities would not be expected to cause harm to nearby residents, but may cause some annoyance. Nearby residents may be disturbed if the noise is greater than 60 dB at their homes. Noise compatibility is generally a consideration in planning for development, and can be a factor in obtaining the appropriate construction permits and operating licenses as part of applicable zoning regulations, to which developers would be subject.

Specific details about atmospheric pollutants that may be emitted by companies locating within the proposed development are not available. However, the types of commercial businesses and industries that are anticipated to be recruited could produce air emissions (e.g., volatile organic compounds [VOCs], particulates, etc.) typical of standard industrial and research operations. These minor emissions are typically controlled within the facility using conventional treatment technologies such as scrubber systems and particulate filters, and external impacts are negligible. New facility operations that have air contaminant sources would be required to obtain an air pollution permit-to-install and permit-to-operate from Ohio EPA. The terms and conditions of the permits would include emission limits and would outline specific monitoring, operating conditions, and record-keeping requirements for the source. Exceptions for small air pollution sources, called de minimus sources, and permit-by-rule exemptions can be granted by Ohio EPA. Major sources of air emissions typical of heavy industries and subject to a Title V permit from Ohio EPA are possible, but unlikely. If required, the appropriate permits would be obtained by the transferee. Therefore, due to this regulatory process, no violations of air quality standards and no adverse impacts to air quality are expected. For facilities licensed by the NRC or the State of Ohio, radiological air emissions would be limited to the conditions of the license and would need to meet regulatory requirements for human health exposures.

Increased activities at PORTS would increase emissions of greenhouse gases associated with site operations. Because the majority (97 percent) of greenhouse gas emissions are associated with electricity generation needed to support site activities, new activities that consume large quantities of electricity would have the highest impact on future greenhouse gas emissions. Greenhouse gases associated with employee transportation contribute less than 3 percent of the emissions from PORTS activities. Consequently, employment changes at PORTS would have a minor impact on future greenhouse gas emissions. On a state-wide level, the CO_2 emissions from PORTS contribute a negligible amount (approximately 0.01 percent) of the CO_2 emissions in Ohio.

Forestry/wildlife management and conservation uses would have negligible air quality and noise impacts in the developed and undeveloped areas.

3.2.2.2 No Action Alternative

Under the No Action Alternative, property would not be transferred and no development would occur that could potentially affect climate, air quality, or noise. No additional impacts to air quality or noise would occur other than those expected from implementing the D&D and remedial action program.

3.3 GEOLOGY AND SOILS

This section provides descriptions of the existing geological formations and soils on the PORTS site and in its vicinity. These descriptions are followed by an assessment of the potential impacts the Proposed Action and No Action Alternative would have on geology and soils.

3.3.1 Affected Environment

3.3.1.1 Geology

PORTS is situated within the Appalachian Plateau Physiographic Province of the Appalachian Highland region near its northwestern terminus at the Central Lowlands Province. The Appalachian Plateau is characterized by deeply dissected valleys and even, crested ridge tops. Just east of the Scioto River, the summits of the main ridges rise to an altitude of more than 1,160 ft above mean sea level, with relief of up to 490 ft from the bottom of the valleys.

Surface and near-surface geology at the site have been heavily influenced by glaciation and the associated meltwaters. PORTS is located in an abandoned river valley that was later filled with lake sediments deposited during the existence of prehistoric Lake Tight. Bedrock at the site is composed of sedimentary rocks, primarily shale and sandstone, deposited in a broad shallow sea during the Paleozoic Era more than 230 million years ago. The geologic units of interest at the site are, in ascending order, Ohio Shale, Bedford Shale, Berea Sandstone, Sunbury Shale, Cuyahoga Shale, Gallia Sand, and Minford Clay. Figure 5 shows the relationship of the geologic units to the site and the region.

The Ohio Shale is 300 to 400 ft thick at the site. It is black and thinly bedded and may contain noncommercial quantities of natural gas or oil. The Bedford Shale consists of interbedded thin sandstone and shale. The Berea Sandstone has a larger sand content than the Bedford Shale but is otherwise similar. The Sunbury Shale is a black carbonaceous shale; this unit thins from east to west and is absent in western portions of the site (DOE 2016b). The Teays Formation overlies the Sunbury Shale and Cuyahoga Shale and is made up of Gallia Sand and Minford Clay, in ascending order. These unconsolidated deposits have a fluvial origin and occupy ancient channels of the Teays River System. The Gallia Sand member is a silty to clayey, coarse to fine-grained sand with a pebble base. The Minford Clay member contains interbedded silts and clays and is divided into two zones: an upper zone of clay and a lower zone of silty clay.

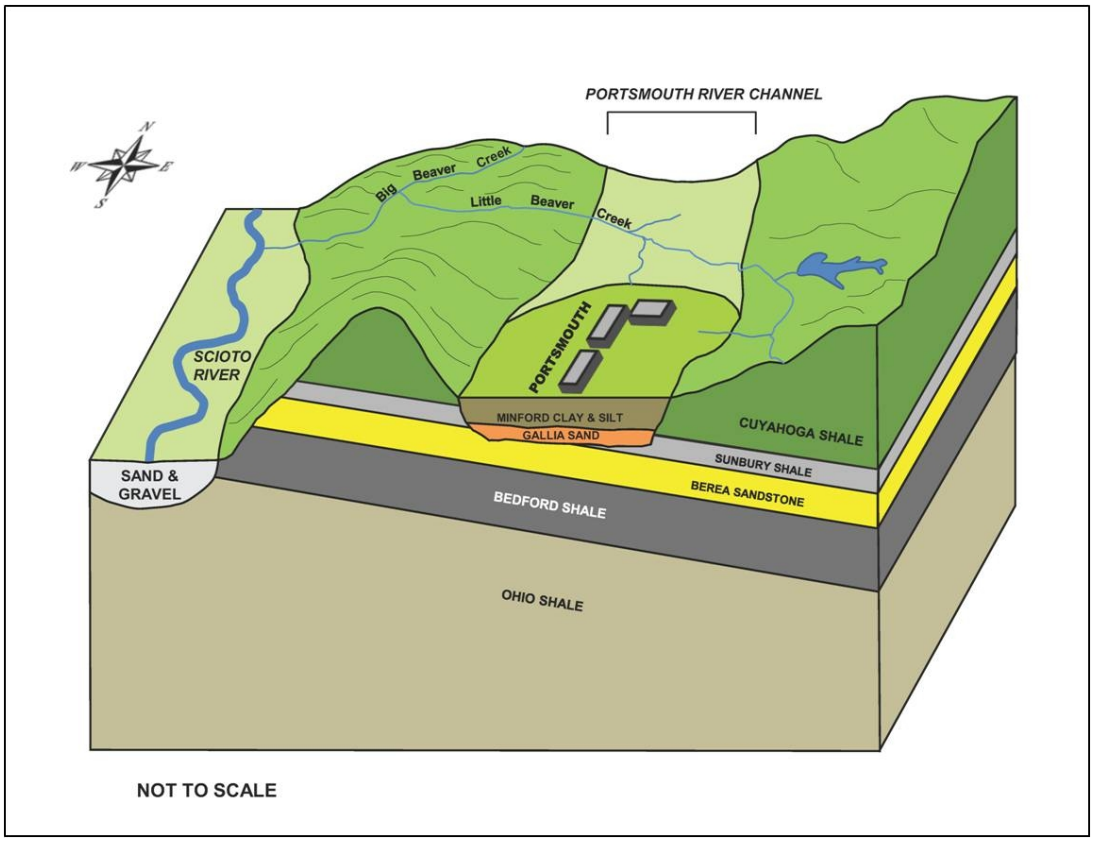


Figure 5. Schematic Block Diagram Showing Geological Relationships at PORTS

Geologic studies conducted to determine the potential seismic hazard for PORTS have determined that only one fault is located within 25 miles of the site. This fault lies approximately 18 miles to the west of the facility. No seismicity has been recorded on this fault, and few seismic events have occurred within 25 miles of PORTS during the historic period (past 100 years). Based on data from ODNR, 21 earthquakes occurred within 50 miles of the site between January 1900 and April 2016, and only a few of those were likely felt in the vicinity of PORTS (ODNR 2016). The largest event occurred on May 17, 1901, with an epicenter approximately 20 miles from the site and an estimated magnitude of 4.3. Since 1978, two Ohio earthquakes with a magnitude greater than 3.0 occurred within 50 miles of the site. Since 1978, three Kentucky earthquakes with a magnitude greater than 3.0 also occurred within 50 miles of the site (Hansen 2007). It should be noted that all of the earthquakes in the area since 1978 were less than 3.6 in magnitude. On August 23, 2011, an earthquake with a magnitude of 5.8 occurred in east-central Virginia (approximately 285 miles from PORTS) and was felt throughout Ohio. In December 2014 an earthquake with a magnitude of 2.0 occurred approximately 4.3 miles southeast of PORTS (this event is listed in the ODNR database but not in the USGS earthquake database), and in February 2015 an earthquake with a magnitude of 2.6 occurred approximately 16 miles northeast of PORTS.

The Kentucky River Fault Zone and the Lexington Fault System (formerly the Bryant Station-Hickman Creek Fault) are located farther from the site; the latter fault is approximately 60 miles to the southwest. These faults bound the southern part of a north-northeast trending area of seismicity in central and eastern Ohio. Soil testing for a proposed gas centrifuge enrichment plant indicated the potential for

earthquake-induced soil liquefaction at PORTS is relatively low (Law Engineering 1978). The potential for soil-structure interaction (ground motion magnification) is also slight.

3.3.1.2 Soils

According to the soil survey of Pike County, 22 soil types occur within the PORTS property boundary. The predominant soil type at the site is Omulga Silt Loam (USDA 1990). Most of the area within the active portion of PORTS is classified as Urbanland-Omulga complex with a 0 to 6 percent slope, which consists of urban land and a deep, nearly level, gently sloping, moderately well-drained Omulga soil in preglacial valleys. The urban land is covered by roads, parking lots, buildings, and railroads, making identification of the soil series difficult. The soil in these areas is so obscured or disturbed that assignment of specific soil series is not feasible. Other dominant soil types found in the upland areas surrounding the industrial complex include the Rarden, Coolville, Latham, and Wharton series.

The Omulga series is characterized as deep, nearly level, moderately drained soils formed in loess and alluvium in preglacial valleys (USDA 1990). The surface layer of Omulga Silt Loam is dark grayish-brown, friable, and approximately 10 in. thick. The subsoil is approximately 54 in. thick and is composed of three portions: a yellow-brown, friable silt loam; a fragipan (brittle, compacted subsurface soil) of yellow-brown, mottled, firm, and brittle silty clay loam; and a yellow-brown, mottled, friable silt loam approximately 20 in. thick. Generally, the root zone is restricted to the zone above the fragipan. Well-developed soil horizons may not be present in all areas inside Perimeter Road because of cut and fill operations related to construction.

The remaining soil series (Rarden, Coolville, Latham, and Wharton) are similar because they are characterized as deep soils formed in shale and siltstone residuum on ridgetops and hillsides in upland areas (USDA 1990). These soils are chiefly inorganic silt and clay with some fat clay (clay of high plasticity). They have a pH ranging from 3.6 to 6.5 units, whereas the Omulga soils have a slightly higher pH (4.5 to 7.3 units). The soils developed on shale residuum are characterized as having slow permeability and low available water capacity.

Soil samples are collected annually from ambient air monitoring locations and analyzed for transuranic radionuclides (americium-241, neptunium-237, plutonium-238, and plutonium-239/240); technetium-99; total uranium; and uranium isotopes (uranium-233/234, uranium-235, uranium-236, and uranium-238). No transuranics or technetium-99 were detected in any of the soil samples collected during 2014 (DOE 2016a). Uranium, uranium-233/234, uranium-235/236, and/or uranium-238 were detected at each of the sampling locations. Uranium and uranium isotopes are usually detected at similar levels at all of the soil sampling locations, including the background location, which suggests that the uranium detected in these samples is due to naturally-occurring uranium (DOE 2016a).

3.3.2 Environmental Consequences

3.3.2.1 Proposed Action

Regardless of the amount of land transferred and ultimately developed, site clearing, grading, and contouring would alter the topography of the property in the areas that would be developed. However, the geologic formations underlying those sites should not be adversely affected. The potentially affected bedrock is generally stable and is adequate to support structures using standard construction techniques. Geotechnical studies would most likely be conducted prior to any construction. Seismic hazards are relatively low in the PORTS area, and structures should be designed to conform to appropriate seismic standards.

Construction would disturb soils, and some topsoil might be removed in the process. However, construction activities involving ground disturbance would be conducted incrementally to limit the potential for soil erosion. Construction projects that disturb 1 acre or more of land require a storm water permit from Ohio EPA under the National Pollutant Discharge Elimination System (NPDES) program. The permit process also requires a storm water pollution prevention plan for the development footprint. This plan includes erosion, sediment, and storm water management controls such as use of silt fences, sediment basing, and erosion control matting to minimize the potential for adverse impacts. It is also expected that topsoil would be replaced as construction activities are completed, and disturbed areas would be revegetated. Impacts to geology and soils would be minimal.

Changes to the developed and undeveloped portions of the site for forestry/wildlife management and conservation could involve land-disturbing activities, and the potential impacts and mitigating measures described above for industrial use would still apply. That is, requirements would protect against soil erosion during the disturbances, and measures to stockpile and reuse top soil would be expected.

3.3.2.2 No Action Alternative

Under the No Action Alternative, property would not be transferred and would remain under DOE control. It is assumed that the land would remain as it exists, and no other development is currently being considered. No additional impacts to geology or soils would occur other than those expected from implementing the D&D and remedial action program.

3.4 WATER RESOURCES

This section describes the existing water resources on the PORTS site and in its vicinity. These descriptions are followed by an assessment of the potential impacts the Proposed Action and No Action Alternative would have on surface water and groundwater.

3.4.1 Affected Environment

This section describes the existing bodies of surface water on the PORTS site and in its immediate vicinity. These include the various streams, drainage ditches, holding ponds, and lagoons on the site. The major drainage artery in the vicinity is the Scioto River.

3.4.1.1 Surface water

PORTS is located within the Lower Scioto River watershed about 2 miles east of the confluence of the Scioto River and Big Beaver Creek. The Scioto River flows 235 miles through nine counties in Ohio, and through the cities of Columbus, Circleville, Chillicothe, and Portsmouth. At Portsmouth, in Scioto County, the river empties into the Ohio River. Surface water features on the PORTS site include streams, ditches, holding ponds, and lagoons (Figure 6). The PORTS site has one lagoon, seven holding ponds, several unnamed tributaries and drainage pathways, and eight named streams and ditches (USEC 2004). The named streams and ditches are Little Beaver Creek, Big Run Creek, Northwest Tributary, North Drainage Ditch, Northeast Drainage Ditch, East Drainage Ditch, Southwest Drainage Ditch, and West Drainage Ditch.

The largest stream on the site is Little Beaver Creek, which drains the northern portion of the site and discharges into Big Beaver Creek, which then discharges into the Scioto River. Upstream of the plant, Little Beaver Creek flows intermittently during the year. Little Beaver Creek receives treated wastewater from the X-230J7 Holding Pond (via the East Drainage Ditch) and storm water runoff from the northwestern and northern sections of the site via several storm sewers, water courses, and the X-230L North Holding Pond.

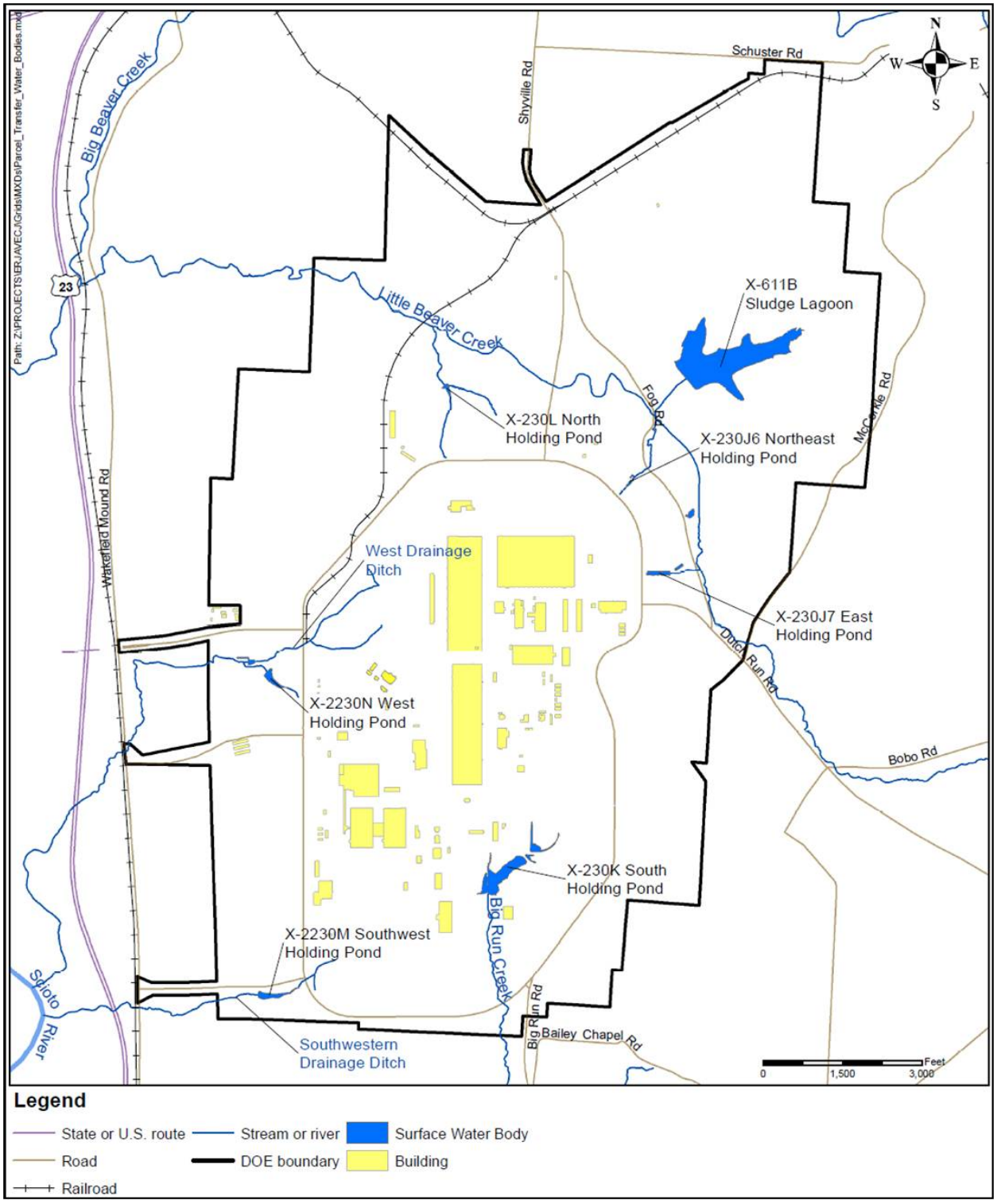


Figure 6. Surface Water Features in the PORTS Vicinity

The next largest stream, Big Run Creek, drains the east-central and southern portions of the site. Big Run Creek receives effluent from the X-230K South Holding Pond and flows off site to the southwest where it joins the Scioto River, approximately 4 river miles from the site. Storm sewers in the southern end of the site discharge to the X-230K South Holding Pond. The West Drainage Ditch, which drains the west-central portion of the site and receives surface water from existing open drainage swales and the X-230J5 West Holding Pond and X-2230N West Holding Pond, flows for 4 stream miles before discharging into the Scioto River. The Southwest Drainage Ditch, which drains the southwestern portion of the site, is a small, intermittent watercourse leading from the X-2230M Southwest Holding Pond to the Primary Headwater Habitat (PHWH) stream systems in the upland areas of PORTS. In April 2012, a Level 1 Assessment of the physical habitat and geomorphic characteristics of several streams in the northeastern portion of PORTS (related to a siting study for an OSWDF) was performed by DOE. A total of eight PHWH stream systems were initially identified during the Level 1 Assessment, and a total of 22 individual streams were present within the area of study. There were no field indicators of predominant groundwater influence. In conclusion, no streams have been assigned a provisional Class IIIB PHWH classification, which is the most biologically diverse, continuous, spring-fed PHWH stream type.

Storm water at the site is collected by a series of storm water sewers and open culverts. The site has eight specific collection areas which transmit storm water flow to one of the on-site streams or ditches. All of the streams and ditches transport surface water, including storm water, from the site to the Scioto River.

The *Ohio Administrative Code* (*OAC*) for the Scioto River drainage basin (*OAC* 3745-1-09) classifies the designated uses of the surface waters within and surrounding PORTS as aquatic life habitat, water supply, or recreational use. The most stringent criteria associated with any one of the use designations assigned to a water body will apply to that water body. The surface water features that drain the site, as well as the Scioto River, and their designated uses in accordance with *OAC* 3745-1-09 are as follows:

- Little Beaver Creek: State Resource Water, Warm Water Habitat, Agricultural Water Supply, Industrial Water Supply, and Primary Contact Recreation

- Big Run Creek: Warm Water Habitat, Agricultural Water Supply, Industrial Water Supply, and Primary Contact Recreation

- Piketon DOE Tributary (also known as the Southwestern Drainage Ditch): Limited Resource Water, Agricultural Water Supply, Industrial Water Supply, and Secondary Contact Recreation

- West Ditch: Warm Water Habitat, Agricultural Water Supply, Industrial Water Supply, Secondary Contact Recreation

- Scioto River: Warm Water Habitat, Public Water Supply, Agricultural Water Supply, Industrial Water Supply, Primary Contact Recreation.

The designated uses of the rivers, streams, and ditches aid in defining the parameters associated with the NPDES permits issued by the State of Ohio. There are three NPDES permits at PORTS with a total of 19 permitted outfalls (DOE 2016a). Historically, all of these NPDES permits have maintained very high compliance rates.

Three municipal water supply facilities are located in the segment of the Scioto River between the town of Higby, which is located approximately 8 miles upstream (northeast) of Waverly, and the confluence with the Ohio River; three other water suppliers use groundwater wells. Both Waverly and Piketon use groundwater wells. The PORTS water supply comes from two well fields located near the Scioto River to the east of PORTS which draw groundwater from the Scioto River alluvium. The City of Portsmouth uses water from the Ohio River through an intake at the Ohio River upstream from the mouth of the Scioto River.

Surface Water Quality. Surface water monitoring is conducted in conjunction with groundwater assessment monitoring to determine if contaminants present in groundwater are detected in surface water samples. Surface water is collected quarterly from 14 locations (DOE 2016a) as shown on Figure 7.

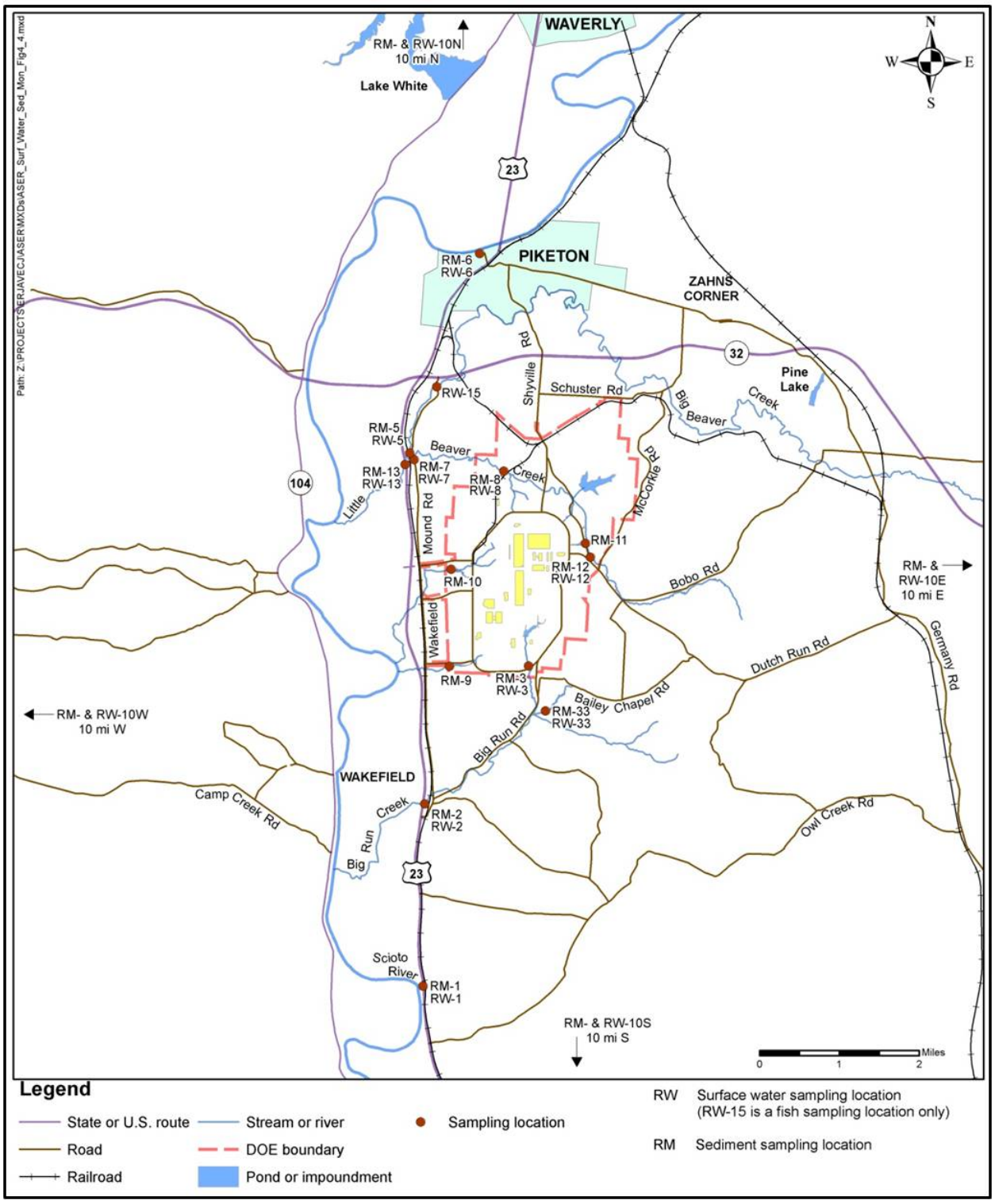
Trihalomethanes, a category of VOCs that are byproducts of water chlorination, include bromoform, bromodichloromethane, chloroform, and dibromochloromethane. These compounds are detected at most of the surface water sampling locations because the streams receive discharges that contain chlorinated water from the site's NPDES outfalls. These detections were well below the applicable Ohio EPA water quality criteria for the protection of human health in the Ohio River drainage basin (DOE 2016a).

Since the 1990s, trichloroethene has been detected regularly at low levels in samples collected from the Southwestern Drainage Ditch (UND-SW01, located inside Perimeter Road). In 2014, trichloroethene was detected at 0.2 to 4.3 µg/L in each of the four samples collected from the Southwestern Drainage Ditch at UND-SW01. *Cis*-1,2-dichloroethene was also detected at an estimated concentration of 0.27 µg/L in the second quarter sample collected at UND-SW01. VOCs, including trichloroethene and *cis*-1,2-dichloroethene, were not detected in the samples collected from the Southwestern Drainage Ditch at UND-SW02. Detections of trichloroethene were well below the Ohio EPA nondrinking water quality criterion (810 µg/L) for the protection of human health in the Ohio River drainage basin (DOE 2016a).

Trichloroethene was detected at elevated concentrations (up to 43 µg/L) in samples collected in the first and second quarters of 2014 from the East Drainage Ditch and Little Beaver Creek. Additional activities were immediately initiated near the X-237 Groundwater Collection System, including sampling surface water and groundwater and collecting groundwater elevation measurements in the vicinity of the X-237 Groundwater Collection System. The X-237 north and south pumping wells (X237-NPW and X237-SPW) were cleaned in April 2014. After cleaning, concentrations of trichloroethene detected in East Drainage Ditch and Little Beaver Creek returned to typical levels. All detections of trichloroethene were well below the Ohio EPA nondrinking water quality criterion (810 µg/L) for the protection of human health in the Ohio River drainage basin (DOE 2016a).

Surface water samples (filtered and unfiltered) are collected quarterly from four locations in the drainage basins downstream from the depleted uranium cylinder storage yards and analyzed for polychlorinated biphenyl compounds (PCBs). PCBs were not detected in any of the surface water samples (filtered or unfiltered) collected during 2014 (DOE 2016a).

Samples collected were analyzed for selected transuranics (americium-241, neptunium-237, plutonium-238, and plutonium-239/240). Plutonium-239/240 was detected at 0.128 pCi/L in the second quarter 2014 sample collected at Little Beaver Creek sampling location LBC-SW03. This is 0.09 percent of the derived concentration standard for plutonium-239/240 in water of 140 pCi/L (DOE 2011). No other transuranics were detected in the surface water samples collected during 2014.



Source: DOE 2016a

Figure 7. Surface Water Monitoring Locations

Technetium-99 was detected at levels up to 18.3 pCi/L in samples collected from the East Drainage Ditch (EDD-SW01) and Little Beaver Creek (LBC-SW01, LBC-SW02, LBC-SW03, and LBC-SW04). Technetium-99 is occasionally detected in samples collected from the East Drainage Ditch and Little Beaver Creek. These detections are within the historical range of technetium-99 detected in Little Beaver Creek, and are 0.04 percent or less of derived concentration standard for technetium-99 in water of 44,000 pCi/L (DOE 2011, DOE 2016a).

Technetium-99 was detected in the second quarter samples collected from Big Run Creek: BRC-SW01 (8.63 pCi/L), BRC-SW02 (60.2 pCi/L), and BRC-SW05 (76.5 pCi/L). Technetium-99 was also detected in the first and second quarter samples collected from West Drainage Ditch sampling locations WDDSW01 and WDD-SW03 at a maximum activity of 11.6 pCi/L. The technetium-99 detections in Big Run Creek and West Drainage Ditch are 0.2 percent or less of the derived concentration standard for technetium-99 in water of 44,000 pCi/L (DOE 2011) (DOE 2016a).

Uranium was routinely detected in the 2015 surface water samples at levels similar to those detected in previous years (DOE 2016b). Concentrations of uranium isotopes in surface water were 1 percent or less of the derived concentrations standards (680 pCi/L for uranium-233/234, 720 pCi/L for uranium-235, and 750 pCi/L for uranium-238) (DOE 2011). Because uranium occurs naturally in rocks and soil, some or all of the uranium detected in these samples may be due to naturally-occurring uranium.

3.4.1.2 Groundwater

Two water-bearing zones are present beneath PORTS: the Gallia and Berea formations. The Gallia is the uppermost water-bearing zone and contains most of the groundwater contamination at the site. The Berea is deeper than the Gallia and is usually separated from the Gallia by the Sunbury shale, which acts as a barrier to impede groundwater flow between the Gallia and Berea formations. The direction of groundwater flow beneath the site is controlled by a complex interaction between the Gallia and Berea units. The flow patterns are also affected by the presence of building sumps and storm sewer drains, and by the reduction in recharge caused by the presence of buildings and paved areas. Groundwater flow patterns in both the Gallia and Berea units are characterized by an east-west-trending groundwater divide. The direction of groundwater flow is generally to the south in the southern sections of PORTS and to the north in the northern sections (DOE 2004b).

In the vertical direction, almost all wells exhibit a downward gradient from the Gallia to the Berea unit. The extent of the gradient is influenced by the thickness of the Sunbury Shale. Where the Sunbury Shale is thick, the downward gradient is large. Only in places where the Sunbury Shale is absent are upward gradients observed. Three main discharge areas exist for the groundwater system beneath Portsmouth: Little Beaver Creek to the north and east, Big Run Creek to the south, and the West Ditch and Southwestern Drainage Ditch to the west (DOE 2004b).

Groundwater monitoring at the site is required by a combination of state and federal regulations, legal agreements with Ohio EPA and EPA, and DOE Orders. The Integrated Groundwater Monitoring Plan (IGWMP) has been developed to establish groundwater monitoring requirements for PORTS. Groundwater monitoring performed at PORTS is completed in accordance with the IGWMP and an annual report provides the results of such monitoring. In the future, groundwater monitoring will also include the OSWDF area.

Five groundwater contamination plumes have been identified on site at PORTS in the following areas: X-749 Contaminated Materials Disposal Facility/X-120 Former Training Facility (Quadrant I), Quadrant I Groundwater Investigative (5-Unit) Area, Quadrant II Groundwater Investigative (7-Unit) Area, X-701B

Former Holding Pond (Quadrant II), and X-740 Former Waste Oil Handling Facility (Quadrant III). The main contaminants are VOCs and radionuclides (uranium and technetium-99) and the primary contaminant is trichloroethene. Two of the areas (Quadrant II Groundwater Investigative Area and the X-701B Former Holding Pond area) have trichloroethene concentrations exceeding 100,000 µg/L. Other monitoring areas may have groundwater contaminated with metals, or may be monitored to comply with regulatory requirements for closed landfills. Remediation of groundwater is being conducted primarily under Ohio EPA's Resource Conservation and Recovery Act of 1976 (RCRA) Corrective Action Program. During recent sampling, trichloroethene was not detected in groundwater beyond the DOE property boundary at concentrations that exceed the EPA drinking water standard of 5 µg/L (DOE 2016a).

The IGWMP also addresses monitoring of residential water supplies near the site to verify that site contaminants have not migrated to off-site drinking water wells. Results of this program indicate that contaminants from the site have not migrated to off-site drinking water wells (DOE 2016a).

DOE has filed a deed notification at the Pike County Auditor's Office to restrict the use of groundwater beneath DOE property. As such, groundwater directly beneath the site is not used as a domestic, municipal, or industrial water supply, and contaminants in the groundwater beneath the site do not affect the quality of the water in the Scioto River Valley buried aquifer (DOE 2016a).

Water Supply Monitoring. Routine monitoring of residential drinking water sources is completed at PORTS in accordance with the requirements of Section VIII in the September 1989 Consent Decree between the State of Ohio and DOE and the Residential Groundwater Monitoring Requirements contained in the IGWMP. The purpose of the program is to determine whether residential drinking water sources have been adversely affected by plant operations. Six residential drinking water sources participated in the program in 2015. Wells are sampled semiannually by collecting a regular sample and a duplicate sample from each well. The site's water supply is also sampled as part of this program. Sampling locations may be added or deleted if requested by a resident and as program requirements dictate. Typically, sampling locations are deleted when a resident obtains a public water supply (DOE 2016b).

Groundwater Treatment Facilities. In 2015, a combined total of approximately 33.7 million gal of water were treated at the site's Groundwater Treatment Facilities. Approximately 26 gal of trichloroethene were removed from the water. All processed water is discharged through NPDES outfalls before exiting PORTS (DOE 2016b). Treatment facility information is summarized in Table 3.

Table 3. Summary of Trichloroethene Removed by PORTS Groundwater Treatment Facilities in 2015

Facility	Water Treated (gal)	Trichloroethene Removed (gal)
X-622	19,877,210	2
X-623	30,245	0.01
X-624	2,875,600	10
X-627	10,946,405	14
Total	**33,729,460**	**26**

Source: DOE 2016b

DOE = U.S. Department of Energy

3.4.1.3 Floodplains and wetlands

Floodplains. Floodplains are land areas adjacent to streams or rivers susceptible to being inundated by stream-derived waters. PORTS occupies an upland area bounded on the east and west by ridges of low-lying hills that have been deeply dissected by present and past drainage features. The facilities on the site are located at a nominal elevation of 670 ft above mean sea level, which is about 100 ft above the historical flood level for the Scioto River in the area. The highest recorded flood elevation of the Scioto River in the vicinity of the site was 570 ft above mean sea level in January 1913 (USEC 2004). Figure 8 depicts the 100-year floodplains for the vicinity surrounding the site (Federal Emergency Management Agency [FEMA] 2009). As shown on that figure, the entire site is located outside of the 100-year floodplain, with the exception of a small area in the northwest portion of the site that is associated with Little Beaver Creek.

Wetlands. The U.S. Army Corps of Engineers (USACE) defines wetlands as "those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Wetlands usually include swamps, marshes, bogs, and similar areas. In identifying a wetland, three characteristics should be met. First is the presence of hydrophytic vegetation that has morphological or physiological adaptations to grow, compete, or persist in anaerobic soil conditions. Second, hydric soils are present and possess characteristics that are associated with reducing soil conditions. Third, site hydrology, meaning the area is inundated or saturated to the surface at some time during the growing season of the prevalent vegetation, must be present (DOE 2004b).

The Ohio State Division of Natural Areas and Preserves has listed two wetland areas, located outside of the PORTS boundaries but near the site, as significant wetland communities: a palustrine forested wetland about 5 miles east of the site, and Givens Marsh, a palustrine wetland with persistent emergent vegetation about 2.5 miles northeast of the site (DOE 2004b). (Palustrine wetlands are inland wetlands in which the vegetation is predominantly trees and shrubs, and are typically associated with shallow, nonflowing water.)

A wetlands survey of PORTS was conducted in 1995 (Lockheed Martin Energy Systems, Inc. [LMES] 1996). The results of that survey found that PORTS contains 45 wetlands (41 jurisdictional and four nonjurisdictional) totaling about 34 acres, excluding retention ponds and streams. Jurisdictional wetlands are those that fall under the protection of Section 404 of the *Clean Water Act*; DOE and State of Ohio regulations, as well as Executive Order 11990, protect both jurisdictional and nonjurisdictional wetlands. Most of the wetlands are associated with wet fields, areas of previous disturbance, drainage

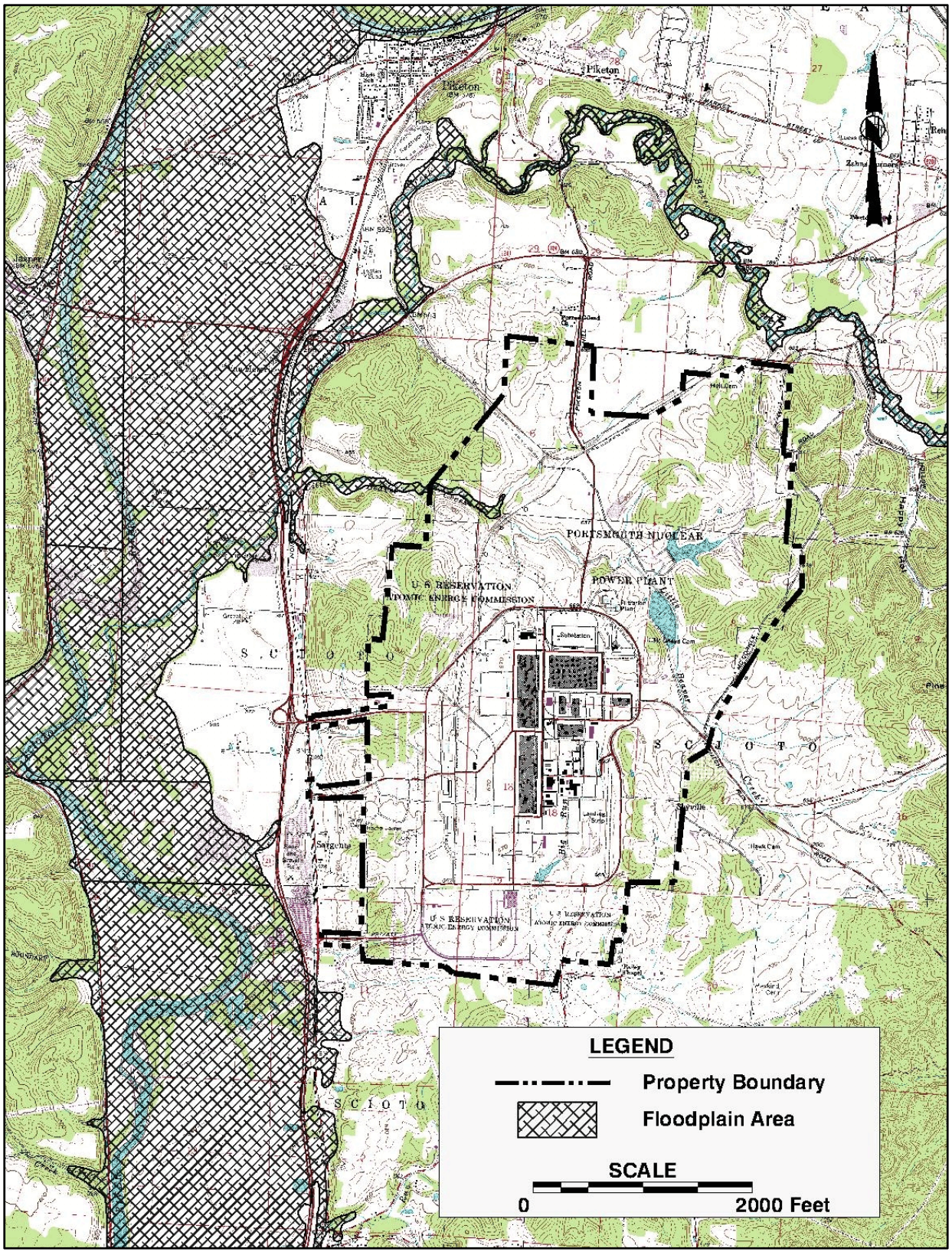


Figure 8. 100-Year Floodplains Near PORTS

ditches, or wet areas along roads and railroad tracks. Palustrine forested wetlands occur along Little Beaver Creek (DOE 2004b).

A wetlands study was completed in 2013 for the northeastern portion of PORTS, related to a siting study for a potential OSWDF. The wetlands survey used methods described in USACE's *Corps of Engineers Wetland Delineation Manual* and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region* (Version 2.0). The results of that study are presented in the Waste Disposition Remedial Investigation/Feasibility Study (RI/FS) report (DOE 2014a). Potential wetlands were identified in the field and then assessed using the *Ohio Rapid Assessment Method for Wetlands*, (Version 5.0) to categorize the wetlands based on the Ohio EPA Anti-Degradation Designation. Wetlands assigned to Category 1 support minimal wildlife habitat and minimal hydrological and recreational functions. They do not provide critical habitat for threatened or endangered species or contain rare, threatened, or endangered (RTE) species. Such wetlands are categorized as limited quality waters under the Ohio EPA antidegradation rule, *OAC* 3745-1-05.

Wetlands assigned to Category 2 support moderate wildlife habitat or hydrological or recreational functions and may include wetlands dominated by native species, but generally without the presence of, or habitat for, RTE species. Wetlands assigned to Category 3 support superior habitat or hydrological or recreational functions and may be typified by high levels of diversity or a high proportion of native species. The survey did not identify any high-quality Category 3 wetlands. There was good correlation to the jurisdictional wetlands found in the area in the earlier 1996 study, but generally the wetlands are now smaller.

An Ohio University habitat mapping study (Ohio University 2012b) also evaluated wetland habitats. This study mapped approximately 38 acres of wetland habitat within the PORTS property boundary (but outside Perimeter Road). All wetlands mapped during this project were classified as palustrine (associated with shallow, topographically retained basins). Many of the wetland habitat areas mapped during this project coincided with previously identified wetlands.

Wetland field assessments inside Perimeter Road were updated in the fall of 2014 (Wastren Advantage Inc. [WAI] and Stantec Consulting Services, Inc. 2015). This wetland assessment followed the same methodology used in the previous study of the northeastern portion of PORTS. Field surveys identified 69 total wetlands, totaling less than 15 acres, inside Perimeter Road. Thirty-six of the wetlands were categorized as Category 1, 10 were categorized as Category 2, and the remaining 23 wetlands were classified as Category 1 or 2 or Modified Category 2. Similar to the previous study, no high-quality Category 3 wetlands were identified. The locations and categories of the wetlands that have been identified at PORTS in previous studies and maintained in a database are presented in Figure 9. The wetland assessments have identified 148 wetlands covering approximately 36 acres. Most of the acreage (approximately 23 acres) is identified as Category 2.

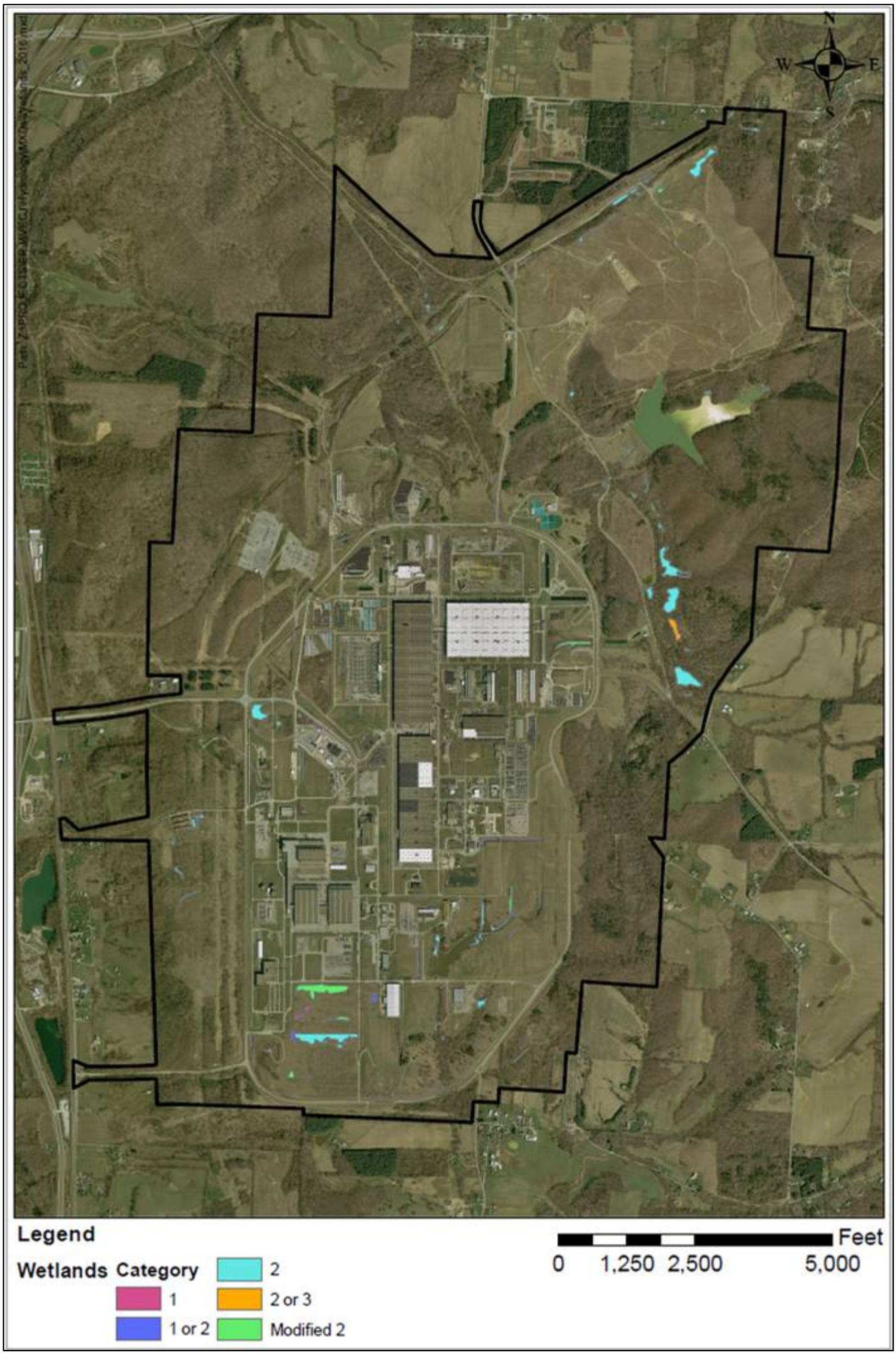


Figure 9. Wetlands Identified at PORTS

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3.4.2 Environmental Consequences

3.4.2.1 Proposed Action

Surface Water. Surface water resources on the property are limited to holding ponds, ditches, and low-flow streams, and potential adverse impacts, while expected, should be minimal. Construction activities on transferred real property (developed or undeveloped) would likely involve areas of disturbed or newly uncovered soil, which would increase the potential for runoff to carry sediment to drainage channels. Construction activities would be required to follow the appropriate regulatory process, including obtaining a construction storm water NPDES permit from Ohio EPA. The permit process requires a storm water pollution prevention plan for construction activities that exceed more than 1 acre of disturbed earth. The potential indirect impacts to surface water resources would be minimized by using best management practices, including standard erosion controls such as siltation fences and buffer zones of natural riparian vegetation, during construction activities. Grass would be planted in cleared areas to minimize the time soils are exposed, stabilize the soils, and control erosion. The potential for adverse impacts would exist until disturbed areas are stabilized. Thus, minor, short-term impacts to surface water resources would be expected from construction under the proposed action. Construction would also involve the presence of heavy equipment with the potential for leaks and spills of fuels or other petroleum products that could be carried away by runoff or sink into the ground. Spills of fuel and/or hazardous material could also have an adverse impact on surface waters if not controlled or contained.

The addition of new impervious surfaces would increase the rate and volume of storm water runoff within the affected area. Because the streams and drainage areas are small, changes in runoff could have significant impacts on the amount of water that would reach Little Beaver Creek and Big Run Creek, but changes to the amount of water in the Scioto River would be negligible. Increases in surface water runoff as a result of new construction would be attenuated through the use of temporary or permanent storm water controls such as detention or retention basins and other structures, use of permeable pavement, and stabilization of disturbed areas through landscaping and vegetation. The use of these measures would also increase groundwater recharge through direct percolation, offsetting the loss of pervious surface due to construction and minimizing downstream impacts. Storm water runoff after construction activities are completed and any discharge from facility operations to surface water would be in accordance with limitations established under the applicable NPDES permit.

For NRC- or State of Ohio-licensed facilities, radiological water effluents would be limited to the conditions of the license and would need to meet regulatory requirements for human health exposures.

Use of the real property (developed and undeveloped areas) for forestry/wildlife management and conservation would involve less impact to surface water over the long term than industrial uses. Nonindustrial uses would likely involve more natural conditions than industrial or commercial uses, with more vegetation and less runoff, less potential for adverse impacts to surface water quality, and less overall water use.

Groundwater. No impacts to groundwater are anticipated from any construction activities or normal facility operations. Use of groundwater directly beneath DOE property would be prohibited as a condition of the deed for title transfer. The deed restriction would ensure the protection of human health by preventing exposure to contaminants that could potentially be present in the groundwater. Impacts to groundwater quality could occur as a result of a fuel or hazardous material spill and subsequent migration of contaminants through the soil profile to the groundwater table, but the causes of these impacts are not limited to transferee activities. However, it is expected that the quantities of materials with the potential to affect groundwater would be transported or stored on-site using the proper containers and according to

all applicable regulations. The use of local, state, or federal permits, safety procedures, spill prevention plans, and spill response plans in accordance with applicable laws would minimize the severity of potential impacts from accidents.

Forestry/wildlife management and conservation uses of the PORTS site could have minimal impact on groundwater, but because impacts would be limited to increased recharge (correlating to decreased runoff), they would be considered beneficial impacts.

Floodplains. Because the entire site is located outside the 100-year floodplain, with the exception of a small area in the northwest portion of the site associated with Little Beaver Creek, no significant floodplain impacts should be associated with any property transfers or ultimate development.

Wetlands. The potential for, and degree of, adverse impacts would depend on how the future owners and/or occupants develop and use the property. Activities associated with development could have beneficial impacts or adverse impacts on wetlands. Beneficial impacts include any actions that would improve the quality of wetlands or actions that would enhance the ability of wetlands to perform wetland functions. Adverse impacts include any activity that would adversely affect the survival, quality, and natural and beneficial values of wetlands. Impacts on wetlands might result from activities occurring directly in wetlands or might result indirectly from activities that occur in areas adjacent to wetlands. The consequences of wetland alteration might last for decades (long-term impacts) or may be minor enough that wetlands could recover in a few years (short-term impacts).

Ohio EPA and the USACE jointly regulate wetlands-related activities. Any proposed activities that would affect wetlands or other waters of the United States or the State of Ohio would require a Section 404 permit from the USACE and a Section 401 Water Quality Certification from the state. It would be the responsibility of the new owners and/or occupants to secure these prior to initiating work in any wetlands. As construction on real property is planned, any available opportunities to minimize or avoid unnecessary impacts to wetlands would be taken to the degree practicable. However, if wetlands cannot be avoided, the development and implementation of appropriate mitigation measures for adverse impacts would be warranted. Permit conditions would stipulate which activities could occur in or around the affected wetlands. Regulatory permits would also specify all required mitigation measures, including potential compensation. The need to comply with the regulatory permits would be noted in the deed.

Forestry/wildlife management and conservation uses at the PORTS site could involve minimal development in wetlands. Any proposed construction in a wetland, such as a footbridge or bird blind, would involve permitting and certification requirements, which would minimize impacts.

3.4.2.2 No Action Alternative

Under the No Action Alternative, property would not be transferred and would remain under DOE control. It is assumed that the land would remain as it exists, and no other development is currently being considered. Because the real property would essentially remain in its current condition, the amount of runoff from the site and water uses would be similar. There would be no impacts to groundwater, surface waters, floodplains, or wetlands other than those expected from implementing the D&D and remedial action program.

3.5 ECOLOGICAL RESOURCES

This section describes the existing ecological environment on the PORTS site and in its vicinity. It includes descriptions of terrestrial resources (flora and fauna), aquatic resources, RTE species, and environmentally sensitive areas. The descriptions are followed by an assessment of the potential impacts the Proposed Action and No Action Alternative would have on ecological resources.

3.5.1 Affected Environment

3.5.1.1 Terrestrial resources

Flora. Ten terrestrial habitat types have been identified at PORTS (DOE 1997, DOE 2014a). These include:

- Old field areas – Early successional stage of disturbed areas dominated by tall weeds, shade-intolerant trees, and shrubs
- Scrub thicket – Later successional stage covering old field areas dominated by dense thickets of small trees
- Managed grassland – Open areas actively maintained (mowed) and dominated by grasses
- Upland mixed hardwood forest – Mesic to dry upland areas dominated by black walnut, black locust, honey locust, black cherry, and persimmon
- Pine forest – Advanced successional stage following scrub thicket; the overstory is dominated by Virginia pine.
- Pine plantation – Nearly pure stands of Virginia pine
- Oak-hickory forest – Well-drained upland soils; white oak and shagbark hickory are the most dominant of the oaks and hickories.
- Riparian forest – Periodically flooded, low areas associated with streams; dominated by cottonwood, sycamore, willows, silver maple, and black walnut.
- Beech-maple forest – Undisturbed areas dominated by American beech and sugar maple
- Maple forest – Dominated by sugar maple and other shade-tolerant species.

The most common type of vegetation on PORTS is managed grassland, which makes up approximately 30 percent of the total area of the site; also common are oak-hickory forest, which comprises approximately 17 percent, and upland mixed hardwood forest, which covers approximately 11 percent of the site (DOE 1997). The areas covered by each habitat type are presented in Table 4. These numbers do not account for the recent removal of approximately 200 acres of upland mixed hardwood forest for construction of the OSWDF.

Table 4. Terrestrial Habitat Types at PORTS

Habitat Type	Approximate Total Area (acres)	Approximate Number of Communities	Percent of Total Area[a]
Managed grassland	1,102	Numerous[b]	29.2
Oak-hickory forest	632	14	16.7
Old field	420	10	11.1
Upland mixed hardwood forest	400	20	10.6
Riparian forest	153	10	4.1
Maple forest	128	7	3.4
Scrub thicket	79	10	2.1
Pine forest	69	10	1.8
Beech-maple forest	5	1	0.1
Old white pine plantation with mixed hardwoods	5	1	0.1

Source: DOE 1997

[a]Total site area is approximately 3,777 acres. Approximately 629 acres (16.7 percent) of the total area is covered by buildings, parking lots, and roads.
[b]This habitat is present in many areas interspersed between buildings and paved areas across the plant site.

DOE = U.S. Department of Energy

Fauna. Terrestrial habitats on PORTS support a relatively high diversity of terrestrial and aquatic wildlife species. Species observed on PORTS include 27 mammal species, 114 bird species (year-round residents, winter residents, and migratory species), 11 reptile species, and 6 amphibian species (DOE 2014a).
The most abundant mammals include the white-footed mouse (*Peromyscus leucopus*), short-tailed shrew (*Blarina brevicauda*), opossum (*Didelphis virginiania*), eastern cottontail (*Sylvilagus floridanus*), and white-tailed deer (*Odocoileus virginianus*). Common birds found at the reservation include year-round residents, winter residents, and migratory species. These include red-tailed hawk (*Buteo jamaicensis*); water birds such as the mallard (*Anas platyrhynchos*) and wood duck (*Aix sponsa*); game birds such as wild turkey (*Meleagris gallopavo*); and nongame birds such as nuthatches (*Sitta* sp.) and wrens *(Troglodytes* sp.). The most common of the 11 reptile species and 6 species of amphibians observed on the site include the eastern box turtle (*Terrapene carolina*), black rat snake (*Elaphe obsolete*), northern black racer (*Coluber constrictor constrictor*), American toad (*Bufo americanus*), and northern dusky salamander *(Desmognathus fuscus*) (DOE 2014a).

Common species occurring in open grassland areas include eastern cottontail (*Sylvilagus floridanus*), meadow vole (*Rodentia muridae*), and eastern meadowlark (*Sturnella magna*). Small wooded areas support numerous woodland and forest edge species such as raccoon (*Procyon lotor*), gray squirrel (*Sciurus carolinensis*), red-headed woodpecker (*Melanerpes erythrocephalus*), cardinal (*Cardinalis cardinalis*), white-breasted nuthatch (*Sitta carolinensis*), and yellow-rumped warbler (*Dendroica coronata*). Species that occur in the open grasslands and forest edges that are either actively managed (mowed) or adjacent to developed areas are tolerant of human activities and disturbances (DOE 2014a).

PORTS is within the natural range of the Indiana bat (*Myotis sodalis*), but no members of this federally-listed endangered species have ever been identified in bat surveys of the site. An area of deciduous sugar maple forest along the Northwest Tributary stream corridor was previously identified as

the only area at PORTS that may be suitable habitat (in summer months) for the Indiana bat. However, the most recent habitat study by Ohio University indicates that moderately to highly suitable bat habitat is present across most of the PORTS site outside of Perimeter Road (Ohio University 2012b). PORTS is also within the range of the northern long-eared bat (*Myotis septentrionalis*), which is a federally-listed threatened species. The northern long-eared bat roosts and forages in upland forests during late spring and summer (from early April through the end of September). However, in the winter the bats hibernate elsewhere.

3.5.1.2 Aquatic resources

The aquatic habitats on PORTS include the various holding ponds, intermittent streams, and streams that flow from or through the site. The aquatic habitats include Little Beaver Creek, the West Drainage Ditch, and the DOE Piketon Tributary, all of which discharge into the Scioto River. Little Beaver Creek and the West Drainage Ditch are designated warm water habitats. Warm water habitats are capable of supporting and maintaining a balanced, integrated, adaptive community of warm water aquatic organisms having a diverse species composition and functional organization. The aquatic habitat associated with Little Beaver Creek supports good to exceptional fish communities downstream of the X-230-J7 discharge from PORTS, and fair fish communities upstream due to intermittent stream flow (DOE 2014a).

Various species of reptiles and amphibians are associated with streams and other surface water on the site. The most common of the 34 total fish species and four hybrids found in Little Beaver Creek are the bluntnose minnow (*Pimephales notatus*), central stoneroller (*Campostoma anomalum*), creek chub (*Semotilus atromaculatus*), rainbow darter (*Etheostoma caeruleum*), spotfin shiner (*Cyprinella spiloptera*), and striped shiner (*Luxilus chrysocephalus*) (DOE 2007, DOE 2014a).

3.5.1.3 Rare, threatened, and endangered species

The Endangered Species Act of 1973 provides federal protection to species, and their habitats, that are listed as federal threatened or endangered species. A federal threatened species is defined as any species likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. A federal endangered species is defined as any species in danger of extinction throughout all or a significant portion of its range (50 *CFR* 17). Ohio Statutes 1518 and 1531 provide protection for state-listed threatened and endangered species. The ODNR defines a state endangered species as "a native species or subspecies threatened with extirpation from the state." A state threatened species is defined as "a species or subspecies whose survival in Ohio is not in immediate jeopardy, but to which a threat exists." A species of concern is defined as "a species or subspecies which might become threatened in Ohio under continued or increased stress." A special interest species is defined as "a species that occurs periodically and is capable of breeding in Ohio."

The potential existence of federal and state RTE species, as well as candidate species, in the vicinity of PORTS was determined through a review of previously prepared NEPA documents, by reviewing the results of previous studies, and through prior consultation with U.S. Fish and Wildlife Service (USFWS) and the ODNR, Division of Wildlife and Division of Natural Areas and Preserves. Previous consultation with the USFWS has indicated that the Indiana bat is the only federally-listed endangered species whose home range includes PORTS. However, no occurrence of the Indiana bat or any other federally-listed endangered plant or animal species has been documented on the PORTS site (DOE 2004b, DOE 2007, DOE 2015b). The northern long-eared bat is a federally-listed threatened species that has been documented on the PORTS site.

An additional review of previous documents and studies indicated that the northern long-eared bat, sharp-shinned hawk (*Accipiter striatus*), Carolina yellow-eyed grass (*Xyris difformis*), Virginia

meadow-beauty (*Rhexia virginica*), and rough green snake (*Opheodrys aestivus*) may occur at PORTS. Isolated sightings of some of these state-listed species have occurred in the past on the PORTS site, but no recent sightings have been reported with the exception of the northern long-eared bat. In addition, there has been evidence of barn owls (*Tyto alba*) nesting in one of the process buildings at PORTS. The barn owl is a state-listed threatened species. Another species that has been identified in the region, but not observed on PORTS, is the timber rattlesnake. Table 5 lists the federally- and state-listed endangered, threatened, potentially threatened, and special concern species in the vicinity of PORTS.

Past and recent consultations with the USFWS indicate that some of the riparian areas on PORTS may be suitable summer habitat for the Indiana bat. Roosting and nursery sites may include forested areas with loose barked trees and standing dead trees. Potential summer habitat for the Indiana bat has been identified within the corridors along Little Beaver Creek in the northern portion of the plant and along the Northwest Tributary stream. Ohio University conducted a detailed habitat mapping study in 2012. Findings from this study, using updated guidelines, indicate that Indiana bat habitat may be more extensive than indicated in prior studies. The primary trees that produce exfoliating bark and nesting cavities (e.g., sycamore and shagbark hickory) are abundant in the older forest habitats (Ohio University 2012b). In 1994 and 1996, DOE conducted on-PORTS surveys to identify suitable bat habitat and then conducted mist netting in those areas to determine if Indiana bats were present. The surveys identified these two potential habitat areas for Indiana bats, and the mist netting resulted in the documentation of four different species of bats in these two riparian areas, but no Indiana bats were found at PORTS (DOE 2007). Another bat mist-net survey was conducted in May 2011. During this survey, 4 nights of sampling resulted in the capture of eight bats, but no Indiana bats were observed (EnviroScience 2011). Based on USFWS approval of a mist net plan, a second mist net survey was conducted in the northeastern portion of PORTS in July and August 2013 over 10 nights. No Indiana bats were found, but nine northern long-eared bats were captured, inventoried, and released, along with four other species (DOE 2014a).

Table 5. Federally- and State-listed Terrestrial RTE Species in the PORTS Vicinity

Common Name	Scientific Name	Status[a]	
		Federal	State
Faunal Species			
Indiana bat	*Myotis sodalis*	E	E
Northern long-eared bat	*Myotis septentrionalis*	T	T
Rough green snake	*Opheodrys aestivus*	NL	S
Sharp-shinned hawk	*Accipiter striatus*	NL	S
Barn owl	*Tyto alba*	NL	T
Timber rattlesnake	*Crotalus horridus*	S	E
Floral Species			
Virginia meadow-beauty	*Rhexia virginica*	NL	P
Carolina yellow-eyed grass	*Xyris difformis*	NL	E
Lopsided rush	*Juncus secundus*	NL	P
Balsam groundsel	*Packera paupercula*	NL	T
Blackseed speargrass	*Piptochaetium avenaceum*	NL	E
Running buffalo clover	*Trifolium stoloniferum*	E	E

[a]E = endangered; P = potentially threatened; S = species of concern; T = threatened; NL = not listed.

The Virginia meadow-beauty has been found near the X-611A Old Lime Sludge Lagoons, and Carolina yellow-eyed grass has been tentatively identified at the X-611B Sludge Lagoon. The Virginia meadow-beauty is associated with the wetlands of the former sludge lagoon, and its preferred habitat is wet, sandy soils, particularly in sandy swamps. The Carolina yellow-eyed grass was observed in 1994; however, formal documentation of the species could not be performed because the grass was not in fruit or flower. Carolina yellow-eyed grass prefers wet peaty or sandy soils typically found in marshes or bogs. Several additional state-listed plant species have been preliminarily identified during the recent habitat mapping project by Ohio University.

Thirteen additional state-listed RTE plant species were preliminarily identified on the PORTS site during the 2012 Ohio University habitat study. These plant species identifications did not meet the multi-level criteria (three-season survey) necessary to definitively identify the presence of an RTE plant species. It should also be noted that these identifications were performed during the habitat identification and characterization work and were not part of a comprehensive, site-wide effort aimed specifically at identifying all RTE plant species on the PORTS site. Some of these species were identified in formally established sampling plots, but others were identified along the way during pedestrian transit from one sampling plot to another. The state listing statuses of these 13 RTE plant species, plus those of the previously identified Virginia meadow-beauty and Carolina yellow-eyed grass, are presented in Table 6 (Ohio University 2012b). The USFWS has listed running buffalo clover (*Trifolium stoloniferum*) as an endangered floral species in Pike County, but this species was not identified at PORTS during the Ohio University habitat study.

Table 6. State-listed RTE Plant Species Identified at PORTS

Common Name	Scientific Name	State Listing Status[a]
American sweetflag	*Acorus americanus*	P
Anisescented goldenrod	*Solidago odora*	T
Blackjack oak	*Quercus marilandica*	P
Bulbous woodrush	*Luzula bulbosa*	T
Carolina yellow-eyed grass	*Xyris difformis*	E
Coastal plain willow	*Salix caroliniana*	P
Common marsh bedstraw	*Galium palustre*	E
Common pondweed	*Potamogeton natans*	P
Porter's reedgrass	*Calamagrostis porteri*	T
Potato dwarfdandelion	*Krigia dandelion*	T
Procession flower	*Polygala incarnata*	E
Smooth rose	*Rosa blanda*	P
Sparselobe grapefern	*Botrychium biternatum*	E
Virginia meadow-beauty	*Rhexia virginica*	P
White thoroughwort	*Eupatorium album*	T

Source: Ohio University 2012b

[a]E = endangered; P = potentially threatened; T = threatened

Ohio EPA previously determined that two state-endangered fish species and four state-threatened fish species exist near PORTS, but they are restricted to the Scioto River. Little Beaver Creek, the main body of water running through the PORTS site, does not provide sufficient habitat to support threatened or endangered species of fish (USEC 2004).

3.5.1.4 Invasive species

An invasive species is defined as "an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health." An alien species means "with respect to a particular ecosystem, any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem." Approximately 52 ODNR-designated invasive floral species have been identified in Pike County. Those classified as targeted invasive species pose the most concern because they are aggressive and difficult to control. ODNR has targeted these species as the highest priorities for control and elimination efforts.

Invasive floral species on the PORTS site are known as a result of data collected during the recent Ohio University study (Ohio University 2012b) of ecological habitats on the site and in its vicinity. In addition, a number of invasive floral species were identified during the 1995 survey of wetlands on the PORTS site (LMES 1996). As a result of these two studies, 26 invasive species of flora have been identified on the PORTS site. Of these 26 species, 20 are ODNR-designated invasive species. Four of these 20 (garlic mustard [*Alliaria petiolata*], amur honeysuckle [*Lonicera maackii*], Japanese honeysuckle [*Lonicera japonica*], and multiflora rose [*Rosa multiflorum*]) are classified as targeted invasive species.

Most of the 26 species of invasive flora on the PORTS site are associated with terrestrial habitat edge areas and areas of soil disturbance, which is normal and expected. According to the Ohio University study, invasive aquatic plant species occur at a very low frequency in and around wetland habitats and ponds on the PORTS site.
Invasive faunal species on the PORTS site and in Pike County are few when compared to the invasive plant species. Four species of invasive fauna are known to be present in Pike County. These include the grass carp (*Ctenopharyngodon idella*), zebra mussel (*Dreissena polymorpha*), emerald ash borer beetle (*Agrilus planipennis*), and the gypsy moth (*Lymantria dispar dispar*) (ODNR 2012, Ohio Department of Agriculture 2016).

3.5.1.5 Environmentally sensitive areas

No environmentally sensitive areas are present in the 5-mile area surrounding PORTS. Such areas would include state and national parks, conservation areas, wild and scenic rivers, and other areas of recreational, ecological, scenic, or aesthetic importance (USEC 2004).

Several potential environmentally sensitive areas are located within the PORTS boundary including wetland areas, riparian areas along Little Beaver Creek and its Northwest Tributary, and areas where state-listed RTE plant species have been observed. No sensitive areas with federally-listed plant species have been observed on the PORTS site. The sensitive areas that were identified are as follows:

- The Northwest Tributary stream corridor is considered a sensitive area because it represents some of the best potential Indiana bat and northern long-eared bat habitat at PORTS, although recent studies indicate such habitat is far more extensive in areas outside of Perimeter Road than previously indicated (Ohio University 2012b).

- Several jurisdictional and nonjurisdictional wetlands are present on the PORTS site. Recent wetland surveys have been conducted, and many of the identified wetlands coincide with the previously identified wetlands. The recent surveys will be considered during planning and development.

- The area near the X-611B Sludge Lagoon should be considered a sensitive area because of the possible presence of Carolina yellow-eyed grass, which was observed at PORTS in 1994 (DOE 1996).

- The area near the X-611A Old Lime Sludge Lagoons is a sensitive area because the Virginia meadow-beauty plant species was identified at the base of the dike. Some of the previously mentioned wetlands also are present near this area.

- The recent habitat study by Ohio University has identified additional on-site locations that harbor 13 state-listed potentially RTE plant species (Ohio University 2012b).

3.5.2 Environmental Consequences

3.5.2.1 Proposed Action

Development of transferred property would have direct or indirect impacts on plants and animals. Construction impacts would include direct mortality or injury to biota and the elimination or fragmentation of the existing habitat. Potentially affected wildlife and plants are common to the area and some animal species would be able to relocate to other nearby areas that offer the same type of habitat mix. Impacts would be greater in areas that are relatively undeveloped and have a greater diversity of undisturbed habitat. Impacts within the centrally developed area would be negligible because of the heavily disturbed nature of the area and lack of suitable habitat.

Direct adverse impacts to aquatic resources would be minimal. Similar to surface water resources, minor, short-term impacts to aquatic resources would be expected from construction under the proposed action. Minimizing the amount of disturbance and blending development with the natural setting of the area would reduce the impacts to biological resources. Natural habitat around areas of development should be left as a buffer zone between the developed areas and undeveloped portions of the site. Areas disturbed during development, but not used for new facilities, should be revegetated after construction is completed. The use of native species for revegetation would have a positive impact. Normal facility operations should not have any adverse impacts to wildlife or pose any unacceptable ecological risk.

The Indiana bat and northern long-eared bat are the only federally-listed threatened and endangered faunal species whose home ranges include the PORTS site. Construction-related activities could adversely impact suitable Indiana bat and northern long-eared bat habitat areas on the PORTS site. If potential bat roost trees with exfoliating bark are present in areas that would be impacted during construction, the USFWS recommends saving these trees and the other trees surrounding them wherever possible.

Specific ways to either avoid or minimize impacts to the bats are identified below:

- Seasonal clearing – Tree clearing activities will be conducted between October 1 and March 31 to avoid impacts to the bats by removing the trees while the bats are in hibernation elsewhere.

- Water resource protection – The PORTS streams will be kept as clear of sediment as possible during construction, which preserves drinking water quality and prey production for the bats.

- Land conservation – USFWS encourages habitat preservation for the northern long-eared bat and DOE is evaluating the opportunities for habitat preservation in one area of the PORTS reservation as part of a larger mitigation effort for streams, wetlands, and bats at PORTS.

Also under the proposed action, invasive floral or faunal species could enter PORTS in shipments of equipment and materials necessary to support construction and development. The greatest potential for invasive species to enter PORTS and impact the existing environment would result from the purchase and use of commercially available seed and plants to restore vegetation in areas of soil disturbed by

construction activities. Invasive species impacts on PORTS would be avoided by administratively restricting vegetation restoration and landscaping to the use of native plant species and the seeds of such species. With the implementation of avoidance, purchasing, and administrative measures, potential impacts from invasive species at PORTS and other locations in its region of influence (ROI) would be minimal.

Operation of industrial facilities on transferred land would pose very little additional impact on ecological resources beyond construction-related activities.

Forestry/wildlife management or conservation uses in the developed areas of the site would have minimal impact, and could have a beneficial impact by increasing the quality of ecological resources. Potential impacts to ecological resources in the undeveloped area would depend on where specific types of activities would occur in relation to existing wildlife habitat, but impacts are estimated to be negligible.

3.5.2.2 No Action Alternative

There would be no additional impacts to ecological resources under the No Action Alternative other than those expected from implementing the D&D and remedial action program. PORTS would remain DOE property, and the current land use would remain unchanged until any future disposition could be decided. Absent active management, natural succession of vegetation would continue to occur within the existing habitats, which would be a positive impact.

3.6 CULTURAL RESOURCES

Descriptions of the cultural resources environment at PORTS and in its vicinity are provided in this section. These descriptions are followed by an assessment of the potential impacts the Proposed Action and No Action Alternative would have on these resources.

3.6.1 Affected Environment

Cultural resources include any prehistoric or historic district, site, building, structure, or object resulting from, or modified by, human activity. Some cultural resources may be designated as historic properties pursuant to the National Historic Preservation Act of 1966 (NHPA) (16 *USC* 470 et seq.). Historic properties are cultural resources listed in, or eligible for listing in, the National Register of Historic Places (NRHP) because of their significance and integrity. Under federal regulations (36 *CFR* 800), federal agencies must assess the impacts their actions have on historic properties and, if appropriate, must avoid, minimize, or mitigate adverse impacts.

PORTS and its surrounding area have the potential to yield both prehistoric and historic cultural resources. Beginning in 1996 and continuing until 2012, DOE has conducted a number of cultural resource surveys to identify historic properties. In addition to archeological resources, an inventory was conducted to identify architectural resources (DOE-built resources) at PORTS.

Archaeological Resources. A Phase I archaeological survey of PORTS was performed in 1996 and 1997. Collection of information about potential archaeological sites continued through 2013. A combined total of 117 archaeological resources have been identified within PORTS; of these, 99 prehistoric and historic-era archaeological sites have been assigned state trinomial site numbers by the Ohio Historic Preservation Office (OHPO). Eighteen sites are isolated artifact find locations, but because they lack archaeological integrity, no trinomial site numbers were assigned. At these ground locations only one artifact (either prehistoric or historic) was found and there were no other signs of past human occupation. The surveys identified four of the 117 sites to be eligible for the NRHP, and two of these are located in the vicinity of the OSWDF. With the exception of four prehistoric archaeological

sites (now three, as discussed below and in Section 3.6.2.1), all of the other archaeological sites at PORTS have been determined to be ineligible for listing on the NRHP.

DOE has developed mitigation measures for the adverse impact of the OSWDF to the one historic property where avoidance or minimization is not practicable. As a mitigation measure, DOE has performed a Phase III data recovery effort of the affected site, in coordination with the Tribal Nations and the OHPO. Recorded artifacts will be preserved at a recognized federal repository by a curation professional. A technical report documenting the data recovery processes and results will be prepared and shared with the OHPO. A summary-level report intended for a general audience will also be prepared in addition to the technical report as an aspect of public outreach. A second site is located in the vicinity of the project area and will be avoided.

Architectural Resources. Numerous architectural resources have been identified on PORTS. In 1996 and 1997 an architectural inventory of buildings, facilities, and structures on PORTS was conducted to comply with Section 110 of the NHPA, as amended, which requires federal agencies to inventory the cultural resources present on their lands. This inventory identified 196 architectural resources consisting of plant buildings and other man-made structures. These properties included various buildings, facilities, and structures identified to be within the scope of the DOE D&D Program (DOE 2015a). Based on their relationship with the historic Cold War mission of PORTS, 33 of the 196 PORTS buildings are considered historic properties. DOE has committed to the final comprehensive mitigation measures in the Process Buildings D&D ROD. Examples of these mitigation measures are listed below.

DOE is developing a Historic Context Report for preservation purposes that will document the history of the operations and facilities at PORTS from 1952 through the end of the Cold War. DOE also maintains the PORTS Virtual Museum, which provides multimedia documentation of PORTS and its history, operations, oral histories, and cleanup program, and includes links to published NHPA reports. DOE will expand the virtual museum to include information on the prehistoric activities in the area around PORTS by Native Americans.

The following mitigation activities are being performed to document and comprehensively interpret the archaeological and architectural resources and environment at PORTS:

- Collect and evaluate items recovered from PORTS facilities for potential future display by DOE or others.

- Conduct public outreach to local school districts and others. Public outreach efforts are ongoing and will continue until the DOE EM mission at PORTS is complete.

- The Comprehensive Summary Report summarizing all NHPA-related studies (prehistoric, historic-era, and DOE-era) enables a better understanding of the breadth of history at PORTS. This report was developed and submitted to the Ohio State Historic Preservation Officer in December 2015.

- Panoramic photographs are being taken at regular intervals during and after demolition, and these will be archived with panoramic photos that were taken during plant construction.

- Pursuing placement of two State of Ohio historic markers that will offer information on PORTS history and prehistory. DOE will coordinate with the OHPO on the content of the markers.

3.6.2 Environmental Consequences

3.6.2.1 Proposed Action

Section 106 of the NHPA requires that projects undertaken, funded, licensed, or permitted by federal agencies be reviewed to determine if they could affect properties that are listed in the NRHP or are eligible for listing in the NRHP. There is a potential for impacts that could occur either indirectly or directly, depending on future development activities and locations. Only two archaeological historic properties may be transferred in the future. DOE would include restrictions in the deed to avoid adverse impacts and indicate that, should a transferee propose adverse impacts, the Section 106 process would be followed.

Using the PORTS site for forestry/wildlife management and conservation use would not likely involve significant construction, if any. Therefore, these uses would present the least potential for impacts to cultural resources.

3.6.2.2 No Action Alternative

The no action alternative would have adverse impacts resulting from the D&D and waste disposition activities, but those impacts will be mitigated pursuant to commitments made in their respective RODs. The current land use would remain unchanged until any future disposition could be decided.

3.7 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

Socioeconomics is the study of the interrelation between social and economic factors. For analysis under NEPA, these factors include employment and income, demographics, availability of housing and community services, and community fiscal status. A description of the socioeconomic environment at PORTS and its vicinity is provided in this section, along with descriptions of the distributions of minority and low-income populations in the vicinity of PORTS. The descriptions are followed by an assessment of the potential impacts the Proposed Action and No Action Alternative would have on socioeconomics and environmental justice.

3.7.1 Affected Environment

3.7.1.1 Socioeconomics

The economic ROI for this analysis includes Jackson, Pike, Ross, and Scioto counties in Ohio. This region encompasses the area in which workers are expected to spend most of their salary and in which a significant portion of site purchase and nonpayroll expenditures from construction, manufacturing, and operations is expected to take place. Selection of the counties included in the ROI is primarily based on the current residential locations of the workers at PORTS. At present approximately 92 percent of these workers reside in the four-county ROI. Figure 1 shows a map of the counties surrounding PORTS that comprise the ROI, along with major population centers.

Population. Pike County, the home of PORTS, is primarily rural in nature. The remaining counties in the ROI are also largely rural in character, except near the towns of Portsmouth in Scioto County and Chillicothe in Ross County. Based on 2010 population figures, over the last 20 years population within the ROI has grown at a higher rate than in the state of Ohio. The ROI population is projected to grow at a smaller rate compared to state of Ohio rates during the current decade, increasing 0.2 percent between 2010 and 2020. Historic and projected populations in the ROI and in the state are presented in Table 7.

Table 7. Historic and Projected Populations for the ROI and Ohio

	1990	2000	2010	2020	2030
Jackson County	30,230	32,641	33,225	33,630	34,010
Pike County	24,249	27,695	28,709	29,000	29,420
Ross County	69,330	73,345	78,064	79,850	81,510
Scioto County	80,327	79,195	79,499	77,430	75,520
ROI	204,136	212,876	219,497	219,910	220,460
Ohio	10,847,115	11,353,140	11,536,504	11,574,870	11,615,100

Source: ODSA 2016a, U.S. Census Bureau 2016a

ODSA = Ohio Development Services Agency
ROI = region of influence

The population of the ROI in 2010 was 219,497 (U.S. Census Bureau 2016a). In 2000, 37 percent of the population of the ROI resided in Scioto County. Between 2000 and 2010, each of the counties in the ROI experienced a small (0.4 to 6.4 percent) increase in population.

Chillicothe, in Ross County, is the largest population center in the ROI with a 2010 population of 21,901. Other population centers include Portsmouth in Scioto County and Jackson in Jackson County, with 2010 populations of 20,226 and 6,397, respectively. The largest town in Pike County is Waverly, and the closest town to PORTS is Piketon. The 2010 populations of these towns were 4,408 and 2,181, respectively (U.S. Census Bureau 2016a).

Employment. Table 8 shows employment by sector in 2013. The service sector (education and health services plus financial and business services) provides the highest percentage of the employment in the ROI at approximately 31 percent, followed by the government sector, the trade, transportation, and utilities sector, and the manufacturing sector, with 20.4 percent, 17.4 percent, and 13.9 percent, respectively. The past decade has seen a slight employment shift from the manufacturing and construction sectors toward the service and government sectors within the ROI.

Table 8. 2013 Employment by Sector (Percent) for PORTS

	Jackson (%)	Pike (%)	Ross (%)	Scioto (%)	ROI (%)
Mining	2.0	0.4	0.3	0.2	0.6
Construction	3.4	5.9	2.4	3.0	3.2
Manufacturing	31.2	7.6	15.5	6.6	13.9
Trade, Transportation, and Utilities	15.9	15.4	19.3	16.8	17.4
Financial and Business Services	9.5	26.5	7.3	8.4	10.5
Education and Health Services	12.1	17.7	17.9	29.4	20.8
Government	14.5	15.8	23.7	21.1	20.4
Others	11.4	10.6	13.7	14.4	13.2

Source: ODSA 2016a

ODSA = Ohio Development Services Agency
ROI = region of influence

The ROI has experienced a decrease in the labor force since 2010. The labor force dropped from 92,600 in 2010 to 86,700 in 2015 (ODSA 2016b), for a negative growth rate of -6.4 percent for that period. Employment for the ROI slightly increased from 80,700 in 2010 to 81,000 in 2015, for an increase of 0.4 percent for that period. The ROI unemployment rate, which was 12.9 percent in 2010, dropped to 6.8 percent by 2015 as shown in Table 9. The average unemployment rate for the State of Ohio was 6.8 percent in 2015, a decrease from 12.9 percent in 2010 (ODSA 2016b). The unemployment rate in the ROI is higher than that of the state as a whole.

Table 9. ROI Employment and Unemployment Rates

	Employment		Unemployment (percent)	
	2010	**2015**	**2010**	**2015**
Jackson County	12,500	12,100	12.5	8.6
Pike County	9,900	9,500	14.8	7.4
Ross County	30,000	32,000	11.9	5.3
Scioto County	28,300	27,400	13.3	7.6
ROI	80,700	81,000	12.9	6.8
Ohio	5,247,000	5,423,000	10.3	4.9

Source: ODSA 2016b

ODSA = Ohio Development Services Agency
ROI = region of influence

DOE Employment. As of April 30, 2016, there were 2,635 non-DOE government personnel supporting PORTS (including 208 Centrus personnel and one non-DOE subcontractor supporting both DOE and Centrus) (Restoration Services Inc. 2016).

Personal Income. The ROI per capita income was $28,553 in 2010, which was 22 percent lower than the Ohio per capita income of $36,377 for the same year. As presented in Table 10, the ROI and the four counties have a lower per capita income than the state of Ohio and the United States. In 2010, the ROI per capita income was $28,553, or 71 percent of the national per capita income of $40,277. In 2014, the ROI per capita income increased to $32,067, but slightly decreased to 70 percent of the national per capita income. During the same period, the per capita income in Ohio increased from $36,377 to $42,236, which is approximately 92 percent of the national per capita income.

Table 10. Per Capita Income of the ROI and Ohio

	2010	2014	Percent U.S. Per Capita Income 2010	Percent U.S. Per Capita Income 2014
Jackson County	28,915	32,701	72	71
Pike County	27,191	32,093	68	70
Ross County	28,532	32,228	71	70
Scioto County	28,913	31,627	72	69
ROI	28,553	32,067	71	70
Ohio	36,377	42,236	91	92
United States	40,277	46,049	100	100

Source: ODSA 2016b

All per capita income dollar amounts presented are in nominal dollars (i.e., current dollars, not adjusted for inflation), as reported by the U.S. Bureau of Economic Analysis.

ODSA = Ohio Development Services Agency
ROI = region of influence

Housing. Detailed housing characteristics for the ROI are presented in Table 11. In 2014, housing density in the ROI averaged 43 units per square mile and the median home value was $97,639. In contrast, the Ohio state average housing density is 114.8 units per square mile, and the median home value is $129,600 for the state (U.S. Census 2016a).

Table 11. ROI Housing Characteristics, 2014

	Number of Owner-Occupied Units	Number of Rental Units	Percent Vacancy Rate Rental Units	Median Value
Jackson County	8,934	4,354	8.6	$89,600
Pike County	7,803	3,056	12.9	$96,200
Ross County	20,533	7,775	11.3	$111,100
Scioto County	20,484	8,968	13.5	$88,200
ROI	57,754	24,153	11.6	$97,639

Source: ODSA 2016a (county profiles)

ODSA = Ohio Development Services Agency
ROI = region of influence

Schools. The ROI has 33 public school districts with a total of 86 schools. These schools served a student population of 33,286 in the 2013-2014 school year (Table 12) (National Center for Education Statistics [NCES] 2016a). Several schools within the ROI have student/teacher ratios lower than the state average of 16.3 (NCES 2016b). The ROI overall has a student/teacher ratio of 15.0.

Table 12. 2013–2014 School Year Public Education Inventory for the ROI

	Number of Schools	Student Enrollment	Number of Teachers	Student/Teacher Ratio
Jackson County	12	5,230	334	15.7
Pike County	15	4,765	284	16.8
Ross County	26	11,142	793	14.0
Scioto County	33	12,149	801	15.2
ROI	86	33,286	2,212	15.0
Ohio	3,699	1,719,929	105,703	16.3

Source: NCES 2016a, 2016b

NCES = National Center for Education Statistics
ROI = region of influence

Health Care Facilities. Adena Pike Medical Center, the hospital closest to PORTS, is located on Dawn Lane northwest of State Route 104, approximately 7.5 miles north of PORTS and just south of Waverly. The Adena Urgent Care facility is located on State Route 104 near the Adena Pike Medical Facility. PORTS has an on-site medical center and the X-1007 Fire Station maintains a first aid room and provides ambulance service for emergency conditions. Adena Pike Medical Center has 25 licensed beds (ODSA 2016a). No other acute care facilities are located in Pike County. Adena Health Center and Southern Ohio Medical Center both operate an urgent care facility in Waverly, approximately 8 miles north of PORTS. Piketon and Waverly Family Health Centers, both located north of PORTS, are also available during working hours for minor emergencies (DOE 2007).

Law Enforcement, Fire Fighting, and Other Public Services. Several state, county, and local police departments provide law enforcement in the ROI. Pike County, where PORTS is located, has 16 officers and provides law enforcement services to the PORTS site. The other counties in the ROI have a total of approximately 101 full-time officers: 14 in Jackson County, 44 in Ross County, and 43 in Scioto County (*Crime in the United States* 2016).

According to the U.S. Fire Administration (USFA) National Fire Department Census Database, there are 46 career and volunteer fire departments in the ROI (USFA 2010). The career fire departments include the Portsmouth Fire Department, which has three engine houses containing four engines, two ladder vehicles, and one rescue vehicle (Portsmouth 2016). In addition, the Chillicothe Fire Department consists of three units with a total authorized staff of 49 people (Chillicothe Fire Department 2016). PORTS also has an on-site fire department. The department has several firefighting vehicles and associated equipment to contain most fires that would occur at PORTS. Mutual aid agreements with local off-site fire departments are in place for events that are beyond the capability of the on-site fire department.

Fiscal Characteristics. Each of the counties in the ROI assesses a 7.25 percent total sales tax, which includes a 1.5 percent local assessment and a 5.75 percent state assessment (Ohio Department of Taxation 2016). The State of Ohio also imposes an income tax and a commercial activity tax, a portion of which is returned to the county of origin (Ohio Department of Taxation 2016).

3.7.1.2 Environmental justice

On February 11, 1994, the President signed Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which directs all federal agencies to develop strategies for considering environmental justice in their programs, policies, and activities. Environmental justice is described in the Executive Order as "identifying and addressing,

as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." On December 10, 1997, the Council on Environmental Quality issued Environmental Justice Guidance Under the National Environmental Policy Act (CEQ 1997a). The Council developed this guidance to "...further assist federal agencies with their National Environmental Policy Act procedures."

Minority populations included in the federal census are identified as Black or African American, American Indian and Alaska Native, Asian, Native Hawaiian and other Pacific Islander, other race, of two or more races, and Hispanic or Latino (CEQ 1997a). A minority population exists where either the minority population of the affected area exceeds 50 percent or the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis. Low-income populations are identified using statistical poverty thresholds from the U.S. Census Bureau. The 2014 poverty threshold was defined as a 2014 annual income less than $12,316 for an individual and $24,008 for a family of four (two adults and two children) (U.S. Census Bureau 2016a).

The minority and low-income population data presented in this section were obtained from the U.S. Census Bureau. They include data on minority populations and estimated low-income population data from the American Community Survey (2010-2014) (U.S. Census Bureau 2016b). These data were obtained for each census tract (a geographical subdivision within a county) in the four-county PORTS ROI. Table 13 presents these data by census tract and identifies the county in which each census tract is located. The minority and low-income population data are presented by census tract because this is the geographic subdivision at which disproportionate impacts on minority and low-income populations would be most noticeable.

Table 13. Minority and Low-income Populations in the PORTS ROI

Minority			Low-income		
Census Tract	Location	Percent Minority	Census Tract	Location	Percent Below Poverty Level
9572	Jackson County, Ohio	4.3	9572	Jackson County, Ohio	19.9
9573	Jackson County, Ohio	2.9	9573	Jackson County, Ohio	28.2
9574	Jackson County, Ohio	2.7	9574	Jackson County, Ohio	24.5
9575	Jackson County, Ohio	4.1	9575	Jackson County, Ohio	21.8
9576	Jackson County, Ohio	1.3	9576	Jackson County, Ohio	22.9
9577	Jackson County, Ohio	2.9	9577	Jackson County, Ohio	25.1
9578	Jackson County, Ohio	2.6	9578	Jackson County, Ohio	24.2
9522	Pike County, Ohio	4.2	9522	Pike County, Ohio	27.6
9523	Pike County, Ohio	3.8	9523	Pike County, Ohio	23.8
9524	Pike County, Ohio	6.3	9524	Pike County, Ohio	14.6
9525	Pike County, Ohio	0.3	9525	Pike County, Ohio	23.2
9526	Pike County, Ohio	3.3	9526	Pike County, Ohio	28.0
9527	Pike County, Ohio	3.9	9527	Pike County, Ohio	22.7

Table 13. Minority and Low-income Populations in the PORTS ROI (Continued)

Minority			Low-income		
Census Tract	Location	Percent Minority	Census Tract	Location	Percent Below Poverty Level
9555	Ross County, Ohio	3.2	9555	Ross County, Ohio	12.8
9556.01	Ross County, Ohio	2.6	9556.01	Ross County, Ohio	14.3
9556.02	Ross County, Ohio	43.5	9556.02	Ross County, Ohio	23.1
9556.03	Ross County, Ohio	2.5	9556.03	Ross County, Ohio	21.2
9557	Ross County, Ohio	5.5	9557	Ross County, Ohio	16.6
9558	Ross County, Ohio	5.7	9558	Ross County, Ohio	19.8
9559	Ross County, Ohio	12.9	9559	Ross County, Ohio	7.0
9560	Ross County, Ohio	7.9	9560	Ross County, Ohio	27.1
9561	Ross County, Ohio	11.5	9561	Ross County, Ohio	17.7
9562	Ross County, Ohio	24.4	9562	Ross County, Ohio	24.2
9563	Ross County, Ohio	13.8	9563	Ross County, Ohio	20.1
9564	Ross County, Ohio	8.2	9564	Ross County, Ohio	31.4
9565	Ross County, Ohio	12.6	9565	Ross County, Ohio	33.6
9566	Ross County, Ohio	3.0	9566	Ross County, Ohio	10.9
9567	Ross County, Ohio	5.7	9567	Ross County, Ohio	13.6
9568	Ross County, Ohio	4.3	9568	Ross County, Ohio	22.4
9569	Ross County, Ohio	3.8	9569	Ross County, Ohio	22.2
0021	Scioto County, Ohio	2.7	0021	Scioto County, Ohio	20.4
0022	Scioto County, Ohio	16.7	0022	Scioto County, Ohio	22.5
0023	Scioto County, Ohio	3.6	0023	Scioto County, Ohio	32.4
0024	Scioto County, Ohio	1.5	0024	Scioto County, Ohio	23.0
0025	Scioto County, Ohio	1.5	0025	Scioto County, Ohio	19.3
0026	Scioto County, Ohio	3.1	0026	Scioto County, Ohio	22.3
0027	Scioto County, Ohio	2.1	0027	Scioto County, Ohio	6.8
0028	Scioto County, Ohio	5.1	0028	Scioto County, Ohio	30.9
0029	Scioto County, Ohio	3.2	0029	Scioto County, Ohio	17.6
0030	Scioto County, Ohio	1.1	0030	Scioto County, Ohio	30.6
0031	Scioto County, Ohio	1.6	0031	Scioto County, Ohio	33.0
0032	Scioto County, Ohio	3.5	0032	Scioto County, Ohio	38.7
0033	Scioto County, Ohio	15.1	0033	Scioto County, Ohio	17.8
0034	Scioto County, Ohio	11.5	0034	Scioto County, Ohio	30.3
0035	Scioto County, Ohio	4.2	0035	Scioto County, Ohio	45.5
0036	Scioto County, Ohio	9.4	0036	Scioto County, Ohio	57.9
0037	Scioto County, Ohio	22.0	0037	Scioto County, Ohio	37.7
0038	Scioto County, Ohio	3.9	0038	Scioto County, Ohio	15.2
0039	Scioto County, Ohio	6.1	0039	Scioto County, Ohio	17.3
0040	Scioto County, Ohio	1.7	0040	Scioto County, Ohio	16.2

Table 13. Minority and Low-income Populations in the PORTS ROI (Continued)

Minority			Low-income		
Census Tract	Location	Percent Minority	Census Tract	Location	Percent Below Poverty Level
NA	Ohio	17.4	NA	Ohio	15.9
NA	United States	26.2	NA	United States	15.6

Source: U.S. Census Bureau 2016b

Notes:
Shaded rows indicate census tracts with minority or low-income populations that exceed the percentages of minority or low-income populations in Ohio. For this analysis, individual census tracts are assumed to contain disproportionately high percentages of minority or low-income populations if the percentage of minority or low-income persons in the tract exceeds the state percentage.

Percentages have been rounded to one decimal place.

NA = not applicable

Fifty census tracts are present in the four-county ROI. PORTS is located in the far western portion of Census Tract 9522. Other census tracts in close proximity to PORTS are Census Tract 9523 to the north, Census Tract 0022 to the south, Census Tract 0023 to the southwest, and Census Tract 9527 to the west.

Table 13 also lists minority and low-income population statistics for Ohio and the United States. The significance thresholds for environmental justice impacts are established at the state level. For a determination of baseline conditions in the affected environment, an individual census tract is assumed to contain disproportionately high percentages of minority or low-income populations if the percentage of minority or low-income persons in the tract exceeds the state percentage. The percentage of minority populations in Ohio in 2014 was 17.4 percent, and the percentage of persons below the poverty level in Ohio in the same year was 15.9 percent.

In the 2014 data, three census tracts in the ROI had minority population percentages that exceeded the percentage of minority populations in the state of Ohio: Census Tract 9556.02 in Ross County, Census Tract 9562 in Ross County, and Census Tract 0037 in Scioto County. These census tracts are shaded in Table 13.

For the period 2010–2014, 43 of the 50 census tracts in the ROI had percentages of their overall populations living below the poverty level that exceeded the percentage of the population living below the poverty level in Ohio. These census tracts are shaded in Table 13. With the exception of Census Tract 9524 located in northern Pike County, all of the census tracts that border Census Tract 9522 (the census tract containing PORTS) had residents living below the poverty level, and the percentages of these residents exceeded the state percentage.

3.7.2 Environmental Consequences

3.7.2.1 Proposed Action

This section assesses the potential socioeconomic impacts of the transfer of real property at PORTS. These impacts would depend on a number of factors, among them the success of the chosen recruiting strategy and the types of commercial businesses and industries recruited. Given the competitive nature of business and industrial recruiting, the willingness of commercial companies to locate at the new development is not assured, although it has been assumed for the analysis below. The characteristics of the actual occupants would be unknown, but examples of commercial and industrial uses considered are presented in Section 2.1.

Socioeconomic impacts are not only important in themselves, but also for the secondary environmental or distributional impacts they may have. For example, certain types of economic growth can attract enough new people to an area that it places pressure on housing, schools, water supply, and other infrastructure. Environmental impacts of any new construction, facility improvements required, or infrastructure overloads that result from such a population increase should also be evaluated as induced impacts of the development. The purpose here is not to forecast economic activity, but to make sure reasonably foreseeable indirect impacts are appropriately identified and considered.

Major employers in the Southern Ohio region are engaged in medical services and telecommunications (Joint Economic Development Initiative of Southern Ohio 2016). For this analysis, employment numbers for two hypothetical businesses, a retail store employing 100 workers or a large paper manufacturing company employing 1,500 workers, were used. This analysis assumes that the Proposed Action could create 100 to 1,500 long-term jobs. It is also assumed that all direct and indirect jobs created would be filled by employees who reside within the ROI. This represents an upper bound on potential impacts.

It is anticipated that socioeconomic impacts from forestry/wildlife management and conservation uses would be less than those from industrial uses because of the small number of jobs necessary to support these uses. Any socioeconomic impacts from construction-related activities related to these land uses would be short in duration. The number of employees required to support these uses would be small compared to the historical workforce, and this would be a negative impact compared to the industrial/commercial uses.

Employment and Income. This analysis assumes that the Proposed Action could create 100 to 1,500 long-term jobs during operations. These figures represent an increase of less than 0.2 percent to 2 percent compared to the 2010 total employment shown in Table 9. There would also be indirect, positive impacts which would depend, to a large extent, on the specific businesses recruited and the extent to which the ROI can supply the goods and services those industries use. For example, the U.S. Bureau of Economic Analysis reports target industries could result in an employment multiplier between 1 and 2.6 times the actual employment. Ohio University conducted an economic impact analysis (Ohio University 2011) for various possible future use scenarios at PORTS. Their modeling indicated an employment multiplier of 1.1 to 1.6 depending on the scenario. Therefore, assuming the Proposed Action could create 100 to 1,500 direct, long-term jobs as discussed above and using the multipliers from the Ohio University analysis, approximately 10 to 900 indirect jobs may be created for a total of 110 to 2,400 jobs. This figure represents a less than 0.2 percent to almost 3 percent change from the 2010 ROI employment. Changes in regional income from the Proposed Action would depend on the actual compensation paid, but are expected to be proportional to the number of jobs generated.

Population. Based on the number of estimated jobs created and the assumption that all direct and indirect jobs created would be primarily filled by employees in the ROI labor force, the impact on population would be minimal.

Fiscal Impacts. Beneficial impacts include increased local revenue from real estate, commercial activities, or sales taxes if the land is sold to private, taxable corporations. The actual size of the impact is unknown at this time. However, it should result in positive, yet limited changes in regional employment and income. The positive impacts will be somewhat offset by the decrease in employment as D&D and environmental cleanup at PORTS is completed.

Pike County would generate additional revenue from the transfer of the property and from the improvement of the property. The ROI would benefit from the additional jobs. The State of Ohio and Pike County would receive additional revenue through state income and sales taxes.

Environmental Justice. Although current assumptions suggest there would be no high and adverse human health or environmental impacts, the actual circumstances would depend on specific choices made at the time of development. There are three census tracts within the ROI where the minority population exceeds the percentage of minority populations for the state (see Table 13). Census tract 0037, located in Scioto County, is approximately 17 miles south of PORTS, and Census tracts 9562 and 9956.02 are located in Ross County, approximately 25 miles north of PORTS. No disproportionate impacts on minority populations are anticipated.

Many of the tracts in the ROI meet the definition of low-income populations, especially the tracts nearest the site in Pike County. However, these populations are also scattered among higher income populations. Any impacts that affect the low-income tracts are also likely to affect the higher income populations. This EA has not identified any human health or environmental impacts that would adversely affect minority or low-income populations. The Proposed Action would not result in disproportionately high and adverse impacts on minority or low-income populations, but rather would generate potentially positive impacts through job creation for all population sectors.

Impacts to environmental justice populations from forestry/wildlife management and conservation use would be negligible. During any construction related to these land uses, it is anticipated that environmental, health, and occupational safety impacts would be minimal, temporary, and confined to the PORTS site. Therefore, there would not be disproportionately high and adverse human health impacts or environmental impacts to minority or low-income populations.

3.7.2.2 No Action Alternative

Under the No Action Alternative, there would be no major change in anticipated population, employment, income, or fiscal characteristics, and no disproportionate impact on minority or low-income populations within the ROI. The D&D action will restore PORTS to a condition potentially suitable for industrial land use and the future use could create jobs to offset the loss of D&D jobs at PORTS (DOE 2014b). D&D will take several years and the initial beneficial socioeconomic impacts will diminish as the D&D work is completed. The waste disposal action and remediation of the site will have a short-term socioeconomic impact associated with the hiring of workers for remediation, construction, and operation of an on-site waste facility.

3.8 INFRASTRUCTURE AND TRANSPORTATION

Descriptions of the infrastructure and support services environment at PORTS and in its vicinity are provided in this section. These descriptions are followed by an assessment of the potential impacts the Proposed Action and No Action Alternative would have on infrastructure and support services.

3.8.1 Affected Environment

3.8.1.1 Public utilities

Potable water is supplied to the public in the vicinity of the property by Pike Water, Inc. The Pike Water Treatment Facility is located near Jasper on the west side of the Scioto River. The treatment capacity of the plant is 3.2 million gal/day, and the current daily demand is 1.5 million gal/day. The water system storage capacity is 3.4 million gal. An 8-in. main is located along Wakefield Mound Road west of the site, and there is a 10-in. main north of State Route 32 along Shyville Road.

Electricity is supplied to the area by American Electric Power, and natural gas is supplied by Pike Natural Gas.

3.8.1.2 Site utilities

PORTS has access to large, reliable supplies of water. The site is the largest industrial user of water in the vicinity and it obtains its water supply from the on-site X-611 Water Treatment Facility, which draws water from two well fields located along the Scioto River. The well fields draw groundwater from the Scioto River buried aquifer and are located in the Scioto River alluvium within the Scioto River floodplain. Recharge of the aquifer occurs from river and stream flow as well as precipitation. The maximum potential production associated with the well fields is 13 million gal/day. Production is approximately 2.5 to 3 million gal/day.

Electricity is supplied to the site by Ohio Valley Electric Corporation (OVEC). Its combined generating capacity is comparable to the site design load of 2,260 megawatts. Electrical power from the OVEC external 345-kV power grid flowed through switchyards to substations around the site where the electrical power was stepped down in voltage to 13.8 kV for distribution to the process and other support buildings. One switchyard, the X-533 switchyard, was demolished in 2010/2011 under the American Recovery and Reinvestment Act. The plant currently uses between 20 and 40 megawatts hourly.

Natural gas service is available from the Pike Natural Gas Company main gas line near Zahn's Corner, Ohio, approximately 5 miles north of the site. A natural gas main (6-in.-diameter pipe rated at 350 to 400 lb/sq in. gauge) was installed from the main line near Zahn's Corner to the East Access Road reducing station to support a hot water boiler system in the X-3002 building. Another line was installed for a natural gas boiler system that replaced the X-600 Steam Plant.

3.8.1.3 Transportation

Activities at PORTS are supported by a network of roads, rail, barge, and airports, as discussed below.

Roads. Two of southern Ohio's major highway systems, U.S. Route 23 and State Route 32/124, provide access to PORTS (Figure 1). Both routes are four lanes, with U.S. Route 23 traversing north-south and State Route 32 traversing east-west. The plant is 3.5 miles from the U.S. Route 23 and State Route 32/124 interchange. State Route 32 runs approximately 190 miles east-west from Cincinnati through Piketon to Parkersburg, West Virginia. To the west, State Route 32 provides access to Cincinnati's three interstate highways (I-71, I-74, and I-75). To the east, State Route 32 and U.S. Route 50 provide access to I-77. Approximately 70 miles north of the plant, U.S. Route 23 intersects I-70, I-71, and I-270. Vehicles also may access I-64 approximately 35 miles southeast of Portsmouth.

The main access road for PORTS has a four-lane interchange with U.S. Route 23. The main access road connects to Perimeter Road, which encircles the fenced portion of the plant. Perimeter Road can also be accessed via county roads such as Shyville Road from the north, Dutch Run Road from the east, Big Run Road from the south, and Wakefield Mound Road to the west. Smaller roads that intersect with Perimeter Road from four directions provide access to inner portions of the plant. The buildings and facilities are serviced with a system of roads and streets, which generally follow a north-south grid. This system is in generally good condition.

As discussed above, there are two access roads to PORTS, U.S. Route 23 and State Route 32. Table 14 provides the annual average daily traffic (ADT) for these roads. Load limits on these routes (85,000 lb) are controlled by the *Ohio Revised Code* gross vehicle weight.

Table 14. Traffic Conditions on Access Roads to PORTS

Access Road	Annual Average Daily Traffic
U.S. Route 23, entrance to PORTS	14,490
State Route 32 and U.S. Route 23	7,700

Source: ODOT 2011

ODOT = Ohio Department of Transportation
PORTS = Portsmouth Gaseous Diffusion Plant

Except during plant shift changes, traffic levels on the site access roads and Perimeter Road are low. Peak traffic flows occur at shift changes, and the principal traffic problem areas during peak morning/afternoon traffic are locations where parking lot access roads meet Perimeter Road.

Rail. Two railroad carriers, CSX and Norfolk Southern, serve Pike County. The Norfolk Southern system has direct access to PORTS and provides access to other rail carriers. Railroad tracks in the vicinity of Piketon allow a maximum train speed of 60 mph.

A railroad system located at PORTS connects with the Norfolk Southern railroad via a main rail spur entering the northwest portion of PORTS. Approximately 17 miles of track lie within the boundaries of PORTS. However, only approximately one-third of the tracks are currently in service. Several track configurations (switching capabilities) are possible within the site. The on-site railroad system is used infrequently (DOE 2004b).

Barge. The PORTS facility can be served indirectly by barge transportation on the Ohio River. However, use of the Ohio River barge terminals would require initial transportation of loads over public roads leading from PORTS to the barge terminal in the city of Portsmouth. The bulk materials handling facility at the Portsmouth Barge Terminal is available for transporting bulk materials and heavy unit loads. All heavy-unit loading is done by mobile crane or barge-mounted crane at the open-air terminal. The Ohio River provides barge access to the Gulf of Mexico via the Mississippi River or the Tennessee-Tombigbee Waterway. Travel time to New Orleans is 14 to 16 days. A barge trip to St. Louis takes 7 to 9 days, and a trip to Pittsburgh takes 3 to 4 days.

Airports. Because of the relatively isolated location of PORTS, commercial air service is limited. The nearest airport is the Greater Portsmouth Regional Airport, located approximately 15 miles south of the site. This airport, which has dual runways and T-hangers and is operated by Chasteen Aviation, Inc., mostly serves private aircraft owners and business travelers. There are no regularly scheduled commercial flights; however, charter service is available. Another nearby airport, the Pike County Airport, is located just north of Waverly. This facility is similar in size and makeup to the Greater Portsmouth Regional Airport. Three international airports are located within a two-hour drive of the site: Cincinnati/Northern Kentucky International Airport, Dayton International Airport, and Port Columbus International Airport.

3.8.2 Environmental Consequences

3.8.2.1 Proposed Action

Utilities. New development on transferred property would most likely connect to existing municipal or site systems. Existing utility systems at PORTS that are owned by DOE may also be transferred. In that case, DOE would become the customer and the transferee would provide the utility services to DOE to meet their needs, typically via a contract. Some new utility infrastructure construction is expected in

order to provide utility service to new facilities that may be built. Removal of the existing site utilities is currently planned under the D&D program. However, under the Proposed Action, DOE and a transferee may work together to identify utility systems, or portions of utility systems, that could remain. In that case, new utility infrastructure would be limited to connections with the existing electrical, water, and gas lines located on the site. Utility impacts associated with any new development are not expected to exceed the capacities of any of the existing utility systems. The Pike Water Treatment Facility has a treatment capacity of 3.2 million gal/day and current daily demand, at 1.5 million gal/day, is less than half of that.

Transportation. Materials and equipment associated with any construction activities to accomplish any proposed development would be transported over regional and local roadways to the site. Development would also likely be phased over time, and no adverse impacts are expected. The additional vehicle and truck traffic from operations associated with any new development would have a negligible impact on existing traffic since the affected roadways presently have sufficient design capacity. A minor increase in the amount of traffic should also not substantially increase the chance of accidents.

Use of the PORTS site for forestry/wildlife management and conservation uses would mean less utility use and less traffic on local roadways. Impacts to infrastructure and transportation for these uses in either the developed or undeveloped areas of the site would be negligible.

3.8.2.2 No Action Alternative

Under the No Action Alternative, there would be impacts to utilities as site utilities are planned to be removed under the D&D program. Little or no change is expected from the baseline level of vehicle trips or the potential for accidents involving vehicles in the vicinity of the property until the D&D and environmental cleanup is completed. At the baseline level of activity, traffic volume is considered to be well within the capacity of the existing transportation infrastructure.

3.9 WASTE MANAGEMENT

A description of waste management at PORTS is provided in this section. This description is followed by an assessment of the potential impacts the Proposed Action and No Action Alternative would have on waste management.

3.9.1 Affected Environment

The DOE Waste Management Program directs the safe storage, treatment, and disposal of waste generated by past and present operations. Decontamination, decommissioning, and cleanup activities are the primary source of waste at PORTS. Waste managed under the program is divided into seven categories, which are defined as follows:

- *Low-level (radioactive) waste (LLW)* – radioactive waste not classified as high level or transuranic waste

- *Hazardous (RCRA) waste* – waste listed under RCRA or waste that exhibits one or more of the four RCRA hazardous characteristics: ignitability, corrosivity, reactivity, and toxicity. Universal waste, which includes common items such as batteries and light bulbs, is a subset of RCRA waste that is subject to reduced requirements for storage, transportation, and disposal or recycling.

- *PCB wastes* – waste containing PCBs, a class of synthetic organic chemicals. Disposal of PCB-contaminated materials is regulated under the Toxic Substances Control Act of 1976 (TSCA).

- *RCRA/low-level (radioactive) mixed waste* – waste containing both hazardous and radioactive components. The waste is subject to RCRA, which governs the hazardous components, and to the Atomic Energy Act, which governs the radioactive components.

- *PCB/low-level (radioactive) mixed waste* – waste containing both PCB and radioactive components. The waste is subject to the TSCA regulations that govern PCB components, and to the Atomic Energy Act, which governs radioactive components.

- *PCB/RCRA/low-level (radioactive) mixed waste* – waste containing PCB and radioactive components that are also RCRA hazardous waste. The waste is subject to the RCRA regulations, the TSCA regulations that govern PCBs, and the Atomic Energy Act, which governs radioactive components.

- *Solid waste* – Waste that includes construction and demolition debris, industrial waste, and sanitary waste, as defined by Ohio regulations. These wastes can include waste from construction or demolition activity and office waste. Waste contaminated with asbestos may also be included in this category if it is not included in any of the categories listed above (PCB, RCRA, and/or LLW).

In 2014, approximately 8,900 tons of material from DOE activities at PORTS were shipped to off-site facilities for treatment, disposal, recycling, or reuse (DOE 2016a). Approximately 10 tons of PCB waste was generated in 2014 and 2 tons of PCB waste was shipped for disposal in 2014. Wastes contaminated with PCBs were generated during 2014 through activities in the X-330 and X-333 Process Buildings and other areas (DOE 2016a).

DOE evaluated the waste anticipated to be produced by D&D of buildings and structures at PORTS, including the three major process buildings (the X-326, X-330, and X-333) that previously enriched uranium. The Waste Disposition RI/FS report concluded that without disposal of the waste from the buildings and structures at PORTS, there would be an unacceptable future risk to human health, safety, and the environment; therefore, an action was needed. Under the selected alternative (DOE 2015b), the majority of D&D wastes would remain at PORTS in a state-of-the-art OSWDF designed to safely isolate the contaminants present in the waste and to prevent them from being released to the environment. Any waste that cannot meet the waste acceptance criteria for the OSWDF would be sent off site for disposal. The on-site facility will be designed to have a total waste capacity of approximately 5 million cubic yards. About 100 acres will be dedicated to the OSWDF (DOE 2015b).

3.9.2 Environmental Consequences

3.9.2.1 Proposed Action

Specific details about the wastes that may be generated by companies locating at any transferred property are not available; however, the types of uses that are anticipated would produce wastes typical of other industrial, research, commercial, and office park operations in the region. These wastes would be handled by the individual companies or by contracted waste management services providers and would not enter into existing PORTS waste management systems, except possibly process wastewater that would meet pretreatment standards. The companies would also be expected to practice waste minimization, source reduction, recycling, etc. Quantities of solid, nonhazardous waste generated by the companies would be recycled or transported to off-site sanitation landfills (privately contracted landfills) for disposal. This solid waste could also include construction and demolition debris such as construction materials for buildings, concrete and asphalt rubble, and land-clearing debris.

Only minor quantities of hazardous waste and hazardous materials are anticipated to be handled or generated. If individual companies generate sufficient quantities to require reporting status, they would

likely qualify as conditionally exempt, small-quantity generators. If a future use included a waste or chemical treatment facility that handles sufficient quantities of potentially hazardous materials, that facility would be subject to appropriate permitting or licensing. In any instance, the transferees will obtain their own permits. These wastes would be handled and stored according to applicable state and federal regulations and transported to an approved, licensed facility for further treatment and/or disposal. It is also possible that some companies may stabilize, test, and treat these wastes on-site as part of their operations. Petroleum, oils, lubricants, and chemicals would be managed in accordance with permits or licenses issued by the State of Ohio and in a way that would minimize the potential for contamination and adverse environmental impacts. For facilities licensed by the NRC or the State of Ohio, radioactive materials and wastes would be handled according to the conditions of the license. This might include returning the materials and waste to the manufacturer, when required, or stabilizing, testing, and transporting them to a licensed off-site facility for disposal.

Impacts from accidental spills would be addressed by individual operating entities through their safety procedures and spill prevention plans. If required by state or federal law, companies locating within the development would have a spill prevention, control, and countermeasures plan and/or an emergency response plan, should a release of hazardous materials to any environmental medium—air, surface water, groundwater, or soils—occur.

Forestry/wildlife management and conservation uses would generate less waste than industrial and commercial uses. Therefore, these uses would not have adverse impacts on the waste management capabilities of the site or the region.

3.9.2.2 No Action Alternative

Under the No Action Alternative, property would not be transferred and would remain under DOE control. There would be no additional waste management impacts other than those anticipated from the D&D and remedial action program activities.

3.10 HUMAN HEALTH AND SAFETY

3.10.1 Affected Environment

Past activities at PORTS have resulted in releases of radionuclides and chemicals to the environment. DOE releases a site environmental report each year on the surveillance of radiological and nonradiological contaminants in the environment around the site. The 2014 annual site environmental report is the most recent report publicly available (http://energy.gov/pppo/downloads/portsmouth-annual-site-environmental-reports). A description of existing radiological and chemical exposures at PORTS and in its vicinity is provided in this section. This description is followed by an assessment of the potential impacts the Proposed Action and No Action Alternative would have on such exposures.

Radionuclides that are most likely to be sources of exposure include isotopes of uranium and technetium-99. Present at much lower levels are transuranic radionuclides (americium-241, plutonium-238, and plutonium-239/240). Thorium-230 is also potentially present in soil near the enrichment facilities and in debris generated from demolition. Some of these radionuclides might be present in the area due to historic atmospheric fallout from nuclear testing. Some of the chemicals that could most likely be present across the site and during D&D include hydrogen fluoride, VOCs, and PCBs. The 2014 annual site environmental report (DOE 2016a) indicates that current levels of these contaminants in the environment around PORTS are low.

Environmental monitoring at PORTS measures both radiological and chemical parameters in air, water, soil, sediment, and biota (animals, vegetation, and crops). Data collected for environmental monitoring

programs in 2014 are consistent with data collected in previous years and indicate releases of chemicals, metals, and radionuclides have a minimal effect on human health and the environment (DOE 2016a). This impact from radionuclides, called a dose, can be caused by radionuclides released to air and/or water, or radiation emanating directly from buildings or other objects at the site. Under DOE Order 458.1, *Radiation Protection of the Public and the Environment*, the dose limit for a member of the public from all exposure pathways and all radionuclide releases from PORTS cannot exceed a 100-mrem effective dose equivalent in a calendar year.

The maximum dose a member of the public could have received from radiation released by PORTS in 2014 or detected by environmental monitoring programs is 0.91 mrem/year. This dose is based on a maximum dose of 0.017 mrem from airborne radionuclides, 0.0015 mrem from radionuclides released to the Scioto River, 0.81 mrem of external radiation as measured at monitoring station A29 (located near OVEC), and 0.077 mrem based on exposure to radionuclides detected at off-site monitoring locations in 2014. This dose (0.91 mrem) is significantly less than the 100-mrem/year limit set by DOE for the dose to a member of the public from radionuclides from all potential pathways.

Nonradiological (chemical) environmental monitoring at PORTS includes air, water, sediment, and fish. Discharges of chemical air pollutants, primarily sulfur dioxide and nitrogen oxides, from PORTS-permitted emission sources have decreased over the past few years due to demolition of the steam plant complex in 2013. Surface water discharges in 2014 were similar to previous years (DOE 2016a). The overall compliance rate for the permitted discharges exceeded 99 percent. More than half of the exceedances at permitted discharges were exceedances of total suspended solids and total dissolved solids related to precipitation events. Trihalomethanes and VOCs are sporadically detected in surface water and groundwater as part of the exit pathway monitoring program. The detections of trichloroethene in the exit pathway monitoring wells were well below the drinking water standard (5 µg/L) (DOE 2016a).

None of the detections of PCBs in sediment around PORTS were above the risk-based regional screening level for PCB. PCBs were detected in fish collected from the Scioto River at concentrations ranging from 24.4 to 47.6 µg/kg and also in a bluegill sample from Little Beaver Creek at 235 µg/kg. The concentrations of PCBs detected in the samples collected from the Scioto River are less than the unrestricted limit (50 µg/kg). The concentration of PCBs detected in the bluegill caught on site in Little Beaver Creek was above the 1/week maximum limit (220 µg/kg).

Current activities at PORTS include surveillance and maintenance of facilities; D&D of buildings including demolition of above- and below-grade structures; environmental restoration/cleanup activities, and conversion of DUF_6. The types of accidents that have occurred in recent years include trips, falls, cuts, contusions/ abrasions, sprains, chemical exposures, burns, heat exhaustion, insect bites, and allergic reactions to poison ivy exposure.

3.10.2 Environmental Consequences

3.10.2.1 Proposed Action

Construction workers would be subject to typical hazards and occupational exposures faced at other industrial construction sites. Falls, spills, vehicle accidents, confined-space incidents, and injuries from tool and machinery operation could occur. Similar accidents could occur at facilities during operation. Accidents could result from operator error, equipment malfunction, or from natural phenomena (e.g., earthquakes, tornadoes, flooding, fire, etc.). Potential hazards from the operation of facilities could include electrical energy, flammable material, toxic/corrosive/reactive materials, and radiation sources. Other hazards include kinetic energy and stored energy. Examples of kinetic energy hazards include moving ventilation system components, forklifts, and other drum- or box-handling equipment.

Stored energy hazards include elevated structures and equipment, stacked drums, and boxes. Workers would be expected to receive applicable training, be protected through appropriate controls and oversight, and be afforded the same level of safety and health protection found at similar developments. The property developers and the individual companies that would operate on the property would also be required to follow applicable Occupational Safety and Health Act of 1970 requirements.

The potential for fires and any resulting adverse impacts would likely be mitigated by the following: (1) most new building construction would consist of steel frames, concrete floors, noncombustible exterior walls, and metal roofs; (2) building design and materials would comply with all applicable National Fire Protection Association codes and standards; (3) buildings would be equipped with fire detection systems and fire-suppression equipment as applicable (e.g., fire alarms, portable fire extinguishers, and sprinkler systems); and (4) appropriate fire safety and emergency policies and procedures, including proper training, would be implemented.

It is expected that commercial businesses and industries would have occupational hazards, emissions, and effluents common to other industrial sites. These businesses and industries would be required to follow appropriate environmental regulations and obtain applicable permits that are intended to protect human health and the environment.

No unique occupational health and safety hazards are expected, and it would be the responsibility of each company to operate in a safe and protective manner. Issues related to public and worker exposures to effluents and emissions from industrial operations would be addressed by permits and regulations under the State of Ohio. If required by state and federal law, companies would be required to have an emergency response plan for the accidental release of hazardous materials. The *Emergency Planning and Community Right-To-Know Act* of 1986, also referred to as the *Superfund Amendments and Reauthorization Act* Title III, requires reporting of emergency planning information, hazardous chemical inventories, and releases to the environment.

For industries that could handle radioactive material (e.g., radioactive waste treatment and metals decontamination/recycling), no unique radiological emissions would be anticipated. The NRC and the state of Ohio would regulate and inspect these facilities for compliance with the terms and conditions of their radioactive materials licenses, if applicable.

Intentionally destructive acts could occur at industries that would operate at PORTS. The potential consequences of intentional destructive acts would be highly dependent on the specific industries, the types and amounts of hazardous materials that would be used, and the distance to the site boundary and the surrounding population. Because of uncertainties associated with these factors, consequences cannot be quantified. However, security features would be incorporated in facility design and operation, as necessary and relevant, to prevent and reduce the impacts of intentionally destructive acts.

Use of PORTS real property for forestry/wildlife management and conservation would involve very little construction, if any. Human health risks for this use would be those associated with the maintenance of these areas and, for the public, those risks associated with outdoor activities. DOE does not expect there would be any unique occupational health and safety hazards for these types of land uses.

3.10.2.2 No Action Alternative

There would be no impact to human health and safety under the No Action Alternative, other than that anticipated from the implementation of the D&D and remedial action program activities, since property

would not be transferred and developed. DOE would continue to own the property, and changes associated with transferee activities would not occur.

3.10.2.3 Intentionally destructive acts

In each EA or EIS it prepares, DOE is required to consider the potential environmental impacts from intentional destructive acts ranging from vandalism and theft to sabotage and acts of terrorism. The most likely intentional destructive acts to occur with regard to the Proposed Action would be vandalism and theft. Physical barriers (e.g., fences) and security measures at PORTS would discourage incidences of both. While it is possible that random acts of vandalism could happen (as in any other location), DOE expects future industrial or commercial users would implement physical barriers and security measures typical of small industrial parks and other commercial developments. Therefore, environmental impacts from vandalism of equipment would be minimal.

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4. CUMULATIVE IMPACTS

The CEQ regulations that implement the procedural provisions of NEPA define cumulative impacts as the "impact on the environment which results from the incremental impact of the action when added to past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 *CFR* 1508.7). Therefore, the cumulative impacts of an action can be viewed as the total impacts on a resource, ecosystem, or human community of that action and all other activities affecting that resource no matter what entity is taking the actions. The cumulative impact analysis in this section is based on continued DOE EM program activities at PORTS, other actions associated with the site, and the Proposed Action.

4.1 METHODOLOGY AND ANALYTICAL BASELINE

The analysis has been conducted in accordance with CEQ NEPA regulations and the CEQ handbook, "Considering Cumulative Effects under the National Environmental Policy Act" (CEQ 1997b) on the preparation of cumulative impact assessments. The cumulative impact assessment is based on both geographic (spatial) and time (temporal) considerations. Historical and ongoing impacts at PORTS are captured in the existing No Action Alternative. Future impacts will be analyzed for the same timeframe as the alternatives analyzed in this EA, which assumes all property transfers would generally occur within an approximately 30-year period and all construction associated with any future uses would also generally occur within that period.

4.2 POTENTIALLY CUMULATIVE ACTIONS

This section describes current actions as well as reasonably foreseeable future actions considered pertinent to the analysis of cumulative impacts for the Proposed Action. The potentially cumulative actions discussed below are those that may contribute to cumulative impacts on or in the vicinity of PORTS.

PORTS D&D and Remediation Project. DOE has developed and issued a ROD for the D&D of more than 250 buildings and/or structures and infrastructure systems at PORTS (DOE 2015a). Most are located within the centrally developed area of PORTS inside Perimeter Road. The D&D project includes the removal of stored waste, materials, hazards, and equipment within the buildings and includes demolition of the buildings and structures (including slabs and residual soils) and infrastructure; demolition of subsurface features and infrastructure, if required; and packaging of the waste for final disposition. The potential environmental impacts from this D&D remedial action are already known and have been documented in the Process Buildings RI/FS report (DOE 2014b). Other, less contaminated facilities at PORTS are being remediated as removal actions under Action Memoranda. Remediation of environmental media (e.g., soil and groundwater) will be implemented under RCRA decisions (a 1989 Ohio Consent Decree and the 1989 EPA Administrative Order by Consent [as amended in 1994 and 1997] requires cleanup of environmental media at PORTS in accordance with RCRA). The goals of D&D and remediation are to reduce risk and make real property and associated assets available for transfer.

On-site Waste Disposal Facility. Under the Site-wide Waste Disposition Evaluation Project, DOE evaluated alternatives for disposition of the wastes that would be generated by D&D of the process buildings and complex facilities at PORTS. The Waste Disposition ROD selected Alternative 2, which included the construction and operation of an engineered disposal facility with a waste capacity of up to 5 million cy. Any waste that cannot meet the waste acceptance criteria for this facility would be sent off site for disposal. DOE will follow all applicable or relevant and appropriate requirements including

DOE Order 435.1, *Radioactive Waste Management*. The OSWDF has been selected for use as a reasonably foreseeable future action in the cumulative impacts assessment for this EA because it would be a large construction and waste disposal project at PORTS. This project would proceed in parallel with the Proposed Action. The potential environmental impacts from this project are already known and have been documented in the Waste Disposition RI/FS report. The OSWDF construction will impact soils and geology, land use and visual resources, water resources, one historic property, and ecological resources. The footprint of the waste disposal facility and a buffer area around it (approximately 100 acres) would not be available for transfer.

DUF_6 Conversion Project. The DUF_6 Conversion Facility became fully operational in October 2011. It will convert more than 250,000 metric tons of depleted uranium into uranium oxide (the most stable chemical form of uranium) and hydrofluoric acid. The uranium oxide will be repackaged for beneficial use, reuse, and/or disposal at a permitted waste disposal site. The hydrofluoric acid is produced in aqueous form and has commercial value (before it can be released it must meet the requirements of DOE Order 458.1, *Radiation Protection of the Public and the Environment*). It is estimated to take approximately 18 years to convert the existing inventory of depleted uranium at PORTS (DOE 2016c). This project is creating approximately 160 jobs in the Piketon area. The potential environmental impacts of the project were evaluated in the *Final Environmental Impact Statement for Construction and Operation of a Depleted Uranium Hexafluoride Conversion Facility at the Portsmouth, Ohio, Site* (DOE 2004b). The ROD was issued in July 2004.

This action was selected for the cumulative impact analysis because the DUF_6 Conversion Facility was constructed in recent years and is now operating at PORTS. In addition, the environmental impacts from this action are already known and have been documented in an EIS.

Regional Industrial Developments (Industrial Parks). Several industrial parks and sites are under development throughout the PORTS ROI (Table 15). Many of these industrial developments are relatively new and are considered together as parts of a single project for the purposes of cumulative impacts assessment. Because industrial parks tend to fill up slowly over time rather than all at once, these collective developments outside of PORTS can be viewed primarily as current and reasonably foreseeable future projects. Potential reindustrialization of the PORTS site is another reasonably foreseeable future industrial development that is considered in the cumulative impacts assessment along with this group of off-site industrial developments.

Table 15. Additional Industrial Parks in the PORTS ROI

County	Site Name	Number of Acres
Jackson	Sarah James Industrial Park	50
	Gettles Industrial Park	70
Pike	Zahn's Corner Industrial Park	320
	Pike County Manufacturing Center	400
Ross	Gateway Industrial Park	90
Scioto	Bob Walton Sr. Industrial Park	70
	Haverhill Industrial Park	1,065
	522 Site/Industrial Park	172

If successful, the current and future resident industries in these developments would have the potential to increase employment and associated per capita income in the ROI. However, the full and specific

potential for new job and income creation among all of the industrial developments is unknown at this time. This would depend on the total number of jobs eventually created by these industries throughout the ROI and the wages paid by the industries that decide to locate in these developments.

The full range of potential cumulative impacts that could occur as a result of these regional industrial developments is not known. However, collectively, they represent the most significant economic activity that is occurring now and would be occurring during the foreseeable future, and they offer the potential for socioeconomic impacts that could combine with those from the Proposed Action to yield cumulative impacts on the regional economy and its underlying social structure.

4.3 CUMULATIVE IMPACTS BY RESOURCE AREA

Land Use. The title transfer of up to 3,677 acres would remove this property from DOE ownership and make it available for new development. The DUF_6 Conversion Facility is located within the industrialized portion of PORTS and has no impact to off-site land use; its industrial nature is consistent with the existing land use. Continued and future D&D at PORTS will have a positive cumulative land use impact by completing the remediation to the agreed-upon industrial use end state. Transfer of DOE real property reduces the need to develop new, undeveloped areas off site for industrial or commercial uses. The other regional industrial developments are in the process of being developed. Cumulative impacts from all actions on land use would be minimal.

Visual. The visual character of the portions of PORTS that are outside of Perimeter Road and consist primarily of mowed grass and scattered woodlands could change from largely undeveloped to developed industrial land use. Because all portions of PORTS are not equally developable, other complementary uses (e.g., open space, recreational elements) may be able to be incorporated in the future development. Cumulative changes to the visual environment at PORTS would occur as a result of building D&D and construction of the OSWDF. Continued and future D&D at PORTS would have a positive cumulative visual impact via the removal of aging and deteriorating facilities, making land available for transfer and reducing the need to develop other undeveloped areas in the site vicinity. The DUF_6 Conversion Facility is located within the industrialized portion of PORTS and its operations have created minimal visual impacts with its cylinder yards (many of the cylinder yards existed prior to the action). For the regional industrial developments, cumulative impacts on visual resources at off-site locations would be minimal. The cumulative impacts of the Proposed Action on visual resources at off-site locations would also be minimal because the land use (industrial) would be similar to the current land use.

Air Quality. All six of the evaluated actions could contribute to cumulative fugitive dust emissions, but these emissions would be sporadic, temporary, and localized and would be mitigated. As a result, cumulative impacts from fugitive dust emissions would be minimal. However, cumulative impacts on air quality from heavy equipment, truck, and commuter vehicle emissions would occur as a result of all actions. Particulate emissions and greenhouse gas emissions would increase. With regard to greenhouse gases, a cumulative increase in the emission of CO_2 would occur in the ROI, principally as a result of combined commuter vehicle emissions. Because current operations at PORTS from employee transportation contribute only approximately 0.01 percent of the state-wide CO_2 emissions in Ohio, there would be no significant cumulative impact related to greenhouse gas emissions with projected future employment.

Noise. Cumulative impacts from noise would occur from the Proposed Action (primarily during construction of facilities), building and complex facilities D&D, and construction and operation of the OSWDF at PORTS. Construction and operation of the OSWDF at PORTS will increase the sound levels in the vicinity of the disposal facility, but the noise would be attenuated to acceptable levels at

nearby residences due to distance and topography. The DUF_6 Conversion Facility is located within the industrialized portion of PORTS and its operations have not created any significant new noise impacts. Development associated with the Proposed Action would add to the noise levels from site activities; however, noise levels from construction activities or operation of new facilities would not cause harm to these residents, but may cause some annoyance. Future industries on the PORTS site and those in the regional industrial parks would not contribute to these cumulative noise impacts because of their displacement in time and the distances of the industrial parks from PORTS. Overall, cumulative impacts from noise would be negligible to minimal.

Geology and Soils. The most frequent impact of surface disturbance with regard to soil in this region is accelerated erosion. Implementation of past, current, and reasonably foreseeable future projects would add to the total acreage of soil disturbed and would permanently alter the soil within the footprint of the projects. However, many of the actions are within areas where similar construction has occurred or has been planned. As long as all construction projects comply with state and federal laws and regulations, measures would be implemented to minimize erosion and sedimentation impacts. Revegetation of disturbed areas that would serve to stabilize soil on the projects has been completed. These actions would minimize the cumulative impacts of construction projects in the region that may otherwise result in accelerated erosion. As a result, cumulative impacts on geology would be minimal.

Water Resources. The most frequent impact of surface disturbance in this region associated with surface water is increased surface water runoff, which may affect downstream water bodies by contributing sediment (via erosion) or increasing flooding. The primary cumulative impacts on surface water would result from an increase in the acreage of earthmoving activities and increased impervious areas, which have the potential to increase sediment delivery and surface water runoff downstream. As long as construction projects comply with state and federal laws and regulations, measures would be implemented to minimize erosion from construction activities and sediment delivery to nearby surface water. This would minimize the cumulative impacts of construction projects in the region that may otherwise result in increased sediment delivery. The addition of new impervious surfaces would likely result in a cumulative increase in the rate and volume of storm water flow; however, the overall change in existing land cover would be minimal. The use of temporary or permanent storm water controls such as detention or retention basins and other structures, and stabilization of disturbed areas through landscaping and vegetation, would attenuate increases in surface water runoff and increase groundwater recharge through direct percolation, thus offsetting the loss of pervious surface due to construction in the region and minimizing downstream cumulative impacts.

Construction of the DUF_6 storage yards at PORTS would affect the permeability of the surface soil and its ability to transmit water as groundwater recharge to the underlying aquifers. However, impacts to groundwater recharge would be negligible because the total area of land that would be permanently altered by construction of the cylinder yards would be very small (about 0.2 percent of the total site area). Impacts to groundwater could occur as a result of a fuel or hazardous material spill and subsequent migration of contaminants to the groundwater table. The use of permits, safety procedures, spill prevention plans, and spill response plans in accordance with applicable laws would minimize the severity of potential impacts from such accidents. Groundwater resources could also be degraded by disposal cell leachate that migrates to groundwater. Engineered controls, use of a leachate collection system, and monitoring would reduce the potential for impact to groundwater resources that could result from the disposal cell.

Floodplains and Wetlands. Because the entire site is located outside the 100-year floodplain, with the exception of a small area in the northwest portion of the site associated with Little Beaver Creek,

no significant cumulative floodplain impacts should be associated with any actions, including property transfers and ultimate development. Ohio EPA and USACE jointly regulate wetlands-related activities. Any proposed activities by a transferee that would affect wetlands or other waters of the United States or the State of Ohio would require a Section 404 permit from USACE and a Section 401 Water Quality Certification from the state. (Deeds of transfer include a clause that explains that compliance with all federal state and local laws and regulations is required on the transferred real property.) The new owners and/or occupants would be responsible for securing these prior to initiating work in any wetlands. The transferee's permit conditions would stipulate which activities could occur in or around the affected wetlands. Regulatory permits would also specify all mitigation measures required of the transferee.

Ecological Resources. The DUF_6 Conversion Facility is located within the industrialized portion of PORTS and its operations have not created any significant new impacts on ecological resources. Future D&D at PORTS could have an ecological impact as wildlife may be displaced by noise and heavy equipment activity, but no other impacts to terrestrial biota or habitat are expected from building and facility demolition. Although there is a potential for species to infrequently roost in a building or man-made structure, enough alternate and preferable habitat (i.e., trees) is available. Construction of the OSWDF includes tree removal and this would damage or cause the death of vegetation such as grasses, displace wildlife, and impact small animals. This Proposed Action would remove property from DOE ownership, and the potential development of this land would impact ecological resources on the site. Avoiding development of the most sensitive ecological areas of the site, minimizing the amount of disturbance, and blending development with the natural setting would reduce impacts to biological resources. Natural habitat around areas of development could be left as a buffer zone between the developed areas and other undeveloped portions of the site to further minimize cumulative impacts. This is consistent with the eco-industrial park and sustainability interests of modern industrial park development, where natural areas are valued as amenities. Because of the abundance of forest and native non-RTE species in the vicinity of PORTS, these cumulative impacts would be minimal. Cumulative impacts on aquatic resources would be minimal.

Cultural Resources. The DUF_6 Conversion Facility is located within the industrialized portion of PORTS and its operations have not created any new impacts to historic properties. Future D&D and waste management activities at PORTS will be performed in accordance with the NHPA mitigation measures committed to in the CERCLA RODs (DOE 2015a, 2015b). The mitigation measures were designed to be comprehensive, considering the entire site as the area of potential affect. The Proposed Action of transfer of PORTS real property would be evaluated on a case-by-case (transfer-by-transfer) basis and would follow the NHPA Section 106 process wherein the proposed transfer is an undertaking per 36 *CFR* 800. Archaeological surveys have been performed for all of PORTS and four archaeological historic properties were identified. Three sites are extant; one was mitigated pursuant to the Waste Disposition ROD. Of the remaining three sites, one would not be appropriate for transfer due to its proximity to the OSWDF. Only two extant historic properties could be impacted by real property transfer. In those instances, DOE would include restrictions in the deed that would be protective of the historic property and would indicate to the transferee that, if they propose an action that would cause adverse impacts to the historic property, they would need to comply with the Section 106 process.

Socioeconomics and Environmental Justice. The Proposed Action and five other actions would have cumulative beneficial impacts on employment, per capita income, and tax revenues. Actual employment and income impacts from cumulative development would depend on the success of any developments and the overall rate at which development proceeds, both of which are uncertain. Developers may also scale back or advance plans for their projects based on current market conditions. Property tax revenue would depend on the value of the properties, future tax rates, and any tax abatements that may

be negotiated. The transfer of DOE real property will create taxable real property, a socioeconomic benefit. After a number of years, completion of PORTS D&D, waste disposal at the OSWDF, and DUF_6 conversion activities would result in a cumulative loss of some of these benefits. Cumulative impacts on population growth and public services would be minimal. Collectively, the Proposed Action and the five other actions would have no disproportionately high and adverse cumulative impacts on minority or low-income populations.

Infrastructure. Addition of the identified reasonably foreseeable future projects would result in incremental increases in utility usage. PORTS D&D would remove a large portion of the site infrastructure. Some systems would remain to service the DUF_6 Conversion Facility and other remaining facilities. However, sufficient excess capacity currently exists with both public and DOE utility systems, if they can be utilized, to meet the demand. Continued upgrades and improvements in the local and regional utility systems would offset and accommodate any potential utility use increases. Development projects are also being implemented in phases over the course of several years, enabling the utilization of new, more energy-efficient technologies to minimize energy consumption and to provide sufficient opportunity for utility systems to meet demand through upgrades and improvements. As a result, the cumulative impact on local and regional infrastructure is expected to be minimal.

Transportation. Cumulative transportation impacts in the region could occur from increased development and growth. These potential impacts could be combined with future environmental restoration and D&D activities at PORTS. The main transportation impact of commercial and industrial development would be an increase in ADT volumes. Associated with increases in traffic is the potential for increased accidents, additional noise and air pollution, and road deterioration and damage. The increase in ADT volumes could result in inconveniences for other vehicles (personal and commercial) on affected routes and connecting roads. Commercial operations could suffer temporarily reduced business while customers avoid affected areas because of traffic delays. Increased pavement deterioration and damage could increase costs associated with maintaining or resurfacing roads and highways. Although noise associated with increases in traffic is normally not harmful to hearing, increased traffic noise is considered by the public to be a nuisance. Increased accidents put an additional strain on local emergency response personnel. Increased vehicular traffic also has the greatest potential to increase air pollution in the local area because emissions from motor vehicles are poorly regulated.

Waste Management. The cumulative activities within the region will generate solid waste requiring disposal. However, specific quantities of wastes cannot be estimated. The waste soil and sediment from the PORTS remediation combined with that from process buildings and complex facilities D&D would generate a large quantity of waste, but an OSWDF would be able to effectively manage the combined quantities of waste that would actually be generated at PORTS. Because the specific timing of some projects is unknown, the extent of project overlap that would occur between the potential cumulative actions and the Proposed Action in this EA is unclear. If projects occur in the same timeframe, there could be a potential adverse cumulative impact on other municipal and/or commercial landfills in the region. However, it is anticipated that the projects would be phased over a long period, and landfill capacity is assumed to be adequate to handle the anticipated amounts of solid waste requiring disposal. Therefore, this cumulative impact would be minimal.

Human Health. Cumulative public and occupational health impacts would be expected to be equal to or less than those that currently exist in and around PORTS. Actions that involve environmental remediation and D&D usually have a positive impact by eliminating or reducing potential exposures to existing contamination. However, a certain amount of risk and potential exposure is involved for the workers who participate in the implementation of such actions. Emissions and effluents released from

new industrial developments are not expected to be major sources of potential exposures and would be controlled through the use of proper engineering and administrative controls and the requirements of any permits that would need to be obtained by the transferee. Standard industrial accidents would increase proportional to the increase in new facilities in the area.

Prior to any transfer of DOE property, the CERCLA 120(h) due diligence process would be completed and the transfer(s) would need to be protective of human health and the environment (e.g., within the CERCLA risk range for industrial worker exposures). Further development of surrounding land could cause an increase in the number of people who could be exposed to off-site releases from large accidents. However, the potential accidents from previous and existing conditions (e.g., cylinder yards, feed and withdrawal operations, and waste management activities) should be reduced from environmental restoration and D&D activities at PORTS and the operation of the DUF_6 Conversion Facility. The human health and safety impacts of the Proposed Action would not contribute to cumulative impacts on human health and safety in the ROI.

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