EA-0767; Environmental Assessment Construction and Experiment of an Industrial Solid Waste Landfill at Portsmouth Gaseous Diffusion Plant October 1995

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ABBREVIATIONS AND ACRONYMS

CFR
: Code of Federal Regulations

DOE
: Department of Energy

EA
: environmental assessment

EPA
: Environmental Protection Agency

F
: Fahrenheit

FEMA
: Federal Emergency Management Agency

ft
: feet (foot)

FWS
: U.S. Fish and Wildlife Service

FY
: Fiscal Year

GCL

geosynthetic clay liner

in.
: inch(es)

m2
: square meter(s)

LMES
: Lockheed Martin Energy Systems, Inc. (formerly Martin Marietta Energy Systems, Inc.)

MMES
: Martin Marietta Energy Systems, Inc.

NEPA
: National Environmental Policy Act

NPDES
: National Pollutant Discharge Elimination System

OAC
: Ohio Administrative Code

PCB
: polychlorinated biphenyl

pH
: negative logarithm of the effective hydrogen ion concentration (acid or base)

PORTS
: Portsmouth Gaseous Diffusion Plant

PTI
: permit-to-install

PTO
: permit-to-operate

sec
: second

SHPO
: State Historic Preservation Officer

TSS
: total suspended solids

235U
: uranium-235 isotope

UF6
: uranium hexafluoride

USDA
: United States Department of Agriculture

yd3
: cubic yard(s)

SUMMARY

The U.S. Department of Energy (DOE), Office of Waste Management, proposes to construct and operate a solid waste landfill within the boundary of the Portsmouth Gaseous Diffusion Plant (PORTS), Piketon, Ohio. The purpose of the proposed action is to provide PORTS with additional landfill capacity for non-hazardous and asbestos wastes. The proposed action is needed to support continued operation of PORTS, which generates non-hazardous waste on a daily basis and asbestos waste intermittently.

Three alternatives are evaluated in this environmental assessment (EA): the proposed action (construction and operation of the X-737 landfill), no-action, and offsite shipment of industrial solid wastes for disposal. Construction of the X-737 landfill and subsequent operation would comply with State of Ohio Solid Waste Disposal Regulations (OAC Rule 3745-29) and applicable DOE Orders. Regulations require

- a recompacted soil liner,
- a flexible membrane liner,
- a leachate management system,
- surface water control measures,
- permanent benchmarks,
- access roads,
- groundwater monitoring and control structures,
- explosive gas monitoring and control systems, and
- interim and final cap systems.

If no action is taken, the existing X-735 landfill would continue to operate until it has reached capacity; at the current waste generation rate, this is estimated to be late in 1996. At that time, X-735 would be closed, and PORTS would lack a disposal facility for its non-hazardous and asbestos wastes. (Closure of X-735 is would be the subject of a future environmental review and is not part of this proposed action.) Offsite disposal would require that wastes be shipped separately to a non-hazardous waste disposal facility and an asbestos disposal facility. A potential drawback to offsite shipment is that PORTS wastes must be screened for specific contaminants prior to shipment in order to meet offsite facility disposal criteria.

This environmental assessment describes the resources in the environment of PORTS that could be impacted by the proposed action. Results of impacts analyses are as follows:

Land Use

No impacts. The landfill would be constructed and operated in an industrial area.

Geology and Soils

Development of the landfill would alter local topography. No prime farmland would be affected.

Air Quality

Fugitive dust and gaseous exhaust would result from construction and operation of the landfill. Impacts would be short-term, sporadic, and localized.

Water Resources

Minor erosion and sedimentation could occur from soils disturbance. Siltation could temporarily increase suspended solids in Little Beaver Creek and nearby tributaries. The proposed landfill would be lined and would have a leachate collection system, in accordance with State of Ohio regulations. Therefore, leachate migration to surface waters and groundwater would not be expected.

Biota

Less than 1% of forested land within a 5-mile radius of PORTS would be removed by the proposed action. Wildlife at the proposed landfill site would be displaced to nearby similar habitat, which is abundant. No threatened or endangered species or critical habitat would be affected by the proposed action. Concurrence of the U.S. Fish and Wildlife Service was obtained.

Floodplain/Wetlands

The proposed site is not located within a floodplain, and no wetlands would be affected.

Cultural Resources

The proposed project would not affect any sites on or eligible for the National Register of Historic Places or

archaeological resources. Concurrence of the State Historic Preservation Officer was obtained.

Socioeconomics

The local economy and infrastructure would not be impacted by the proposed action because the labor force would come from the local labor pool and the current PORTS work force.

Environmental Justice

The proposed action would not disproportionately affect minority populations in the Portsmouth vicinity.

Health and Safety

PORTS workers would be exposed to standard industrial hazards associated with the operation of heavy machinery and landfill equipment. The proposed action would not present any unique hazards to occupational health and safety.

1. INTRODUCTION

The U.S. Department of Energy (DOE) proposes to construct and operate an industrial solid waste landfill on a 40-acre site within the boundary of the Portsmouth Gaseous Diffusion Plant (PORTS) in Piketon, Ohio. PORTS is owned by DOE and managed and operated by Lockheed Martin Energy Systems, Inc. (LMES). The proposed landfill would be designed to satisfy State of Ohio Environmental Protection Agency [(EPA) 3745-29 *et seq*] and applicable DOE Orders. PORTS industrial wastes consist of paper products, demolition debris, plastic items, garbage, yard wastes, wood, fly ash, and asbestos.

PORTS is located on a 6.3 square-mile site approximately 1 mile east of the Scioto River Valley. Site elevation is approximately 120 ft above the Scioto River floodplain. The new landfill, identified as X-737, would be located directly east across the North Access Road from the existing X-735 sanitary landfill and would be entirely within the boundary of PORTS (see Fig. 1). The preferred site for the proposed industrial solid waste landfill is described further in Section 3.

1.1 PURPOSE OF AND NEED FOR ACTION

The purpose of the proposed action is to provide PORTS with additional landfill capacity for non-hazardous and asbestos wastes. The proposed action is needed to support continued operation of PORTS, which generates non-hazardous waste on a daily basis and asbestos waste intermittently. According to the *Conceptual Design Report for New Solid Waste Landfill* (Lockwood Greene, 1992), the remaining disposal area at the X-735 landfill is expected to be exhausted by December 1996, despite the recycling of aluminum cans and cardboard and waste compaction. This estimate is based on an average monthly, non-hazardous, compacted waste generation rate of approximately 7,000 yd3 per year (Table 1). (Asbestos waste generation rates are variable as they are dependent on ongoing and planned construction projects.)

1.2 BACKGROUND

PORTS, in operation since 1954, has a primary mission of enriching uranium for commercial purposes. This is accomplished through the separation of uranium isotopes by gaseous diffusion. Separation is accomplished in a series of three process buildings. The enrichment process begins with the initial input of low-assay uranium hexafluoride (UF6) or the feed stock at the X-333 process building and continues through to the X-330 and X-326 process buildings by a series of tie-lines that permit the flow to move uninterrupted to the final destination for product withdrawal. The UF6 is fed through a series of converters and compressors to yield a product enriched from the 0.711% 235U isotope found naturally in uranium to 4 to 7% (with the capability of enriching to 97%) of the more commercially valuable 235U.

Figure 1. PORTS site map showing proposed landfill site and five alternate sites.

Table 1. Annual estimated volumes of non-hazardous wasten streams from the Portsmouth Gaseous Diffusion Plant.

WASTE STREAM	VOLUME (YD3)
Paper	2,330
Non-construction wood and waste	3,370
Asbestos	100
Routine maintenance waste	20
Construction/ demolition debris	950
Yearly total (uncompacted)	6,700
Total with 20% contingency factor (uncompacted)	8,000
Total with 20% contingency factor (compacted)	7,000

Source: Lockwood Greene, 1992.

1.3 SCOPE OF ENVIRONMENTAL ASSESSMENT

This EA has been prepared by DOE to comply with the National Environmental Policy Act (NEPA) of 1969, in accordance with the President's Council on Environmental Quality regulations that implement NEPA [40 Code of Federal Regulations (CFR) Parts 1500 through 1508] and the DOE NEPA Rule (10 CFR 1021). This EA will provide the basis for determining the significance of environmental impacts. If impacts are potentially significant, an environmental impact statement will be prepared. If not, DOE will issue a finding of no significant impact for the proposed action.

The impacts analysis in this EA focuses on the potential environmental impacts of the proposed action, no action, and offsite shipment of wastes for disposal. For

the reasons given, the following are not expected to be impacted and are dismissed from the scope of analysis:

Effects on floodplains: PORTS facilities are located beyond the 100-year and 500-year floodplain of the Scioto River and its tributaries at PORTS (FEMA, 1988).

Effects on wetlands: The U.S. Army Corps of Engineers has concurred that there are no jurisdictional wetlands present on the PORTS reservation or in the immediate vicinity (see Appendix A).

Effects on Wild and Scenic Rivers: There are no wild and scenic rivers within a 50-mile radius of PORTS (MMES, 1991).

Effects on threatened and endangered species and critical habitat: The U.S. Fish and Wildlife Service has advised DOE that no adverse impacts would be expected from the proposed action (see Appendix A).

Effects on prime farmland: The Pike County District Conservation Officer has determined that the proposed landfill site is of marginal significance, i.e., of low fertility (USDA 1990) (see Appendix A).

Effects on socioeconomic resources: Construction and operation of the proposed industrial solid waste landfill would not adversely affect the local community because would be drawn from the existing PORTS workforce. The project duration would be approximately seven to fourteen months, and 75 workers would be needed.

Environmental justice: Because construction and operation of the proposed facilities would not adversely impact socioeconomic resources, there would be no disproportionate adverse impacts to minority and economically disadvantaged populations.

Effects on archaeological/historical resources: The Ohio State Historic Preservation Office (SHPO) has advised DOE that Adena and Hopewell Indian Mounds have been found in the region. However, the location of the proposed industrial solid waste landfill is not in an area of cultural and archaeological concern (see Appendix A). The current National Register of Historic Places lists no structures of historical significance within the boundary of PORTS.

1.4 CONSULTATION WITH AGENCIES

In accordance with 10 CFR 1021.301(d), DOE will provide the EA to the State of Ohio for review prior to a decision on the significance of impacts. During the preparation of this EA, DOE has consulted with the Ohio Department of Natural Resources, Division of Natural Areas and Preserves; the U.S. Fish and Wildlife Service; the Ohio State Historic Preservation Officer; the U.S. Army Corps of Engineers; the Pike County Soil Conservation Office; and the Native American Indian Center at Selma, Ohio. (For a complete list of persons and agencies consulted, see Section 6.)

2. THE PROPOSED ACTION AND ALTERNATIVES

2.1 PROPOSED ACTION (PREFERRED ALTERNATIVE)

The preferred alternative is the construction and operation of a new industrial solid waste landfill (X-737). The landfill would be developed using an area-fill design with a phased approach. As each phase of the landfill is filled, an interim cap would be placed over that area. When capacity is reached, the landfill would be capped with a multilayer final cap.

Some facilities at the existing X-735 landfill would continue to be used, including a garage for repair and storage of equipment, administrative offices, conference room, record-keeping facilities, and shower facilities. A receiving portal, storage shed, truck scales, and leachate storage/pumping facility would be constructed to support landfill operation. The receiving portal would house the receiving clerk, who would monitor incoming refuse and maintain landfill records. The equipment shed would be used for storage, cleaning, and light maintenance of landfill earth-moving equipment such as bulldozers, landfill compactors, trucks, and other equipment required for landfill operations. Electrical service would be provided by a combination of overhead lines and underground ductbanks.

Surface water controls, utilities, groundwater monitoring wells, fencing, and a 20-ft-wide access road with a maximum grade of 12% would be developed.

Site preparation would commence during the second quarter of FY 96; the landfill would be completed and ready to receive wastes in December 1996. A labor force of 75 would be staffed locally by the PORTS work force.

2.1.1 Site Selection

DOE evaluated six sites according to OAC 3745-29-06 and 3745-29-07 standards for new industrial solid waste disposal facilities (see Appendix B):

South site (# 1), which is an old earthen spoils area created during the PORTS construction. Its most significant feature is a stream that borders the site. Because of the nearby stream and the high groundwater table, this site was rejected.

South site (# 2), which is located inside the perimeter road at the site of an old air strip. This site is extremely long and narrow, and the configuration does not lend itself well to a landfill layout. In addition, the required capacity would not be available.

East site, which is located southwest of the plant outside of the perimeter road and at the top of a ridge near the

property line. There are several streams in the vicinity. This site was rejected because of its steep topography.

West site, which is the site of a demolished building located on a knoll to the west of PORTS and just outside of the perimeter road. This site was rejected because it is divided by an easement for high-voltage electric transmission lines.

Borrow area site, which is used as a source of soil and clay for building projects at PORTS. It is located in PORTS' northeast quadrant. Removal of soil and clay has decreased the elevation of much of the site, and in some areas, bedrock has been encountered. With regrading and the addition of extensive fill from offsite areas, the borrow area site is a feasible location for the landfill.

North site, which is located north of PORTS main facilities along the North Access Road. In comparison with the other five sites, this area has a relatively low groundwater table. To make the site suitable, some fill would be imported, but the volume required would be less than that of the other sites.

The north site was determined to be the most suitable for development of the new landfill because of its hydrology. In addition, it would require the least amount of site preparation, which would reduce construction costs (Lockwood Greene, 1992).

2.1.2 Landfill Design and Construction

Landfill design would follow the requirements of OAC, Chapter 3745-29, *Solid Waste Disposal Regulations* and would include the following:

- a recompacted soil liner,
- a flexible membrane liner,
- a leachate management system,
- surface water controls,
- benchmarks,
- access roads,
- groundwater monitoring and control structures,
- explosive gas monitoring and control systems, and
- interim and final cap systems.

Using the area-fill approach, the X-737 landfill would evolve in phases, each of which would have a multimedia liner system, consisting of a recompacted soil liner and a flexible membrane liner, in the bottom and on the interior slopes. Before the recompacted soil liner is constructed, the water table elevation would be determined. OAC regulations require no less than a 15-ft buffer zone between the uppermost aquifer and the bottom of the liner. Given the approximate water table elevation at PORTS, it is expected that waste would be placed above the existing grade.

2.1.2.1 Liners

Before installation of various protective layers, soils would be tested in accordance with American Society for Testing and Materials methods to determine their physical properties, such as permeability, moisture content and density, grain size distribution, granular drainage material, and chemical compatibility.

In accordance with OAC 3745-29-08, the recompacted liner would consist of soils having a specified gradation. Each soil lift (layer) would be compacted to at least 95% of the maximum "Standard Proctor Density" or at least 90% of the maximum "Modified Proctor Density". Each lift would be compacted at the optimum moisture content. The total thickness of the liner would be a minimum of 5 ft or a minimum of 3 ft if used in conjunction with a geosynthetic clay liner (GCL) layer. The thickness and hydraulic conductivity of the geologic stratum beneath the soil liner would have to be determined before the alternative thickness could be determined. Use of the alternative thickness in conjunction with a GCL would require approval by the Director of the Ohio EPA. The minimum bottom slope of the liner would be 2%; the maximum slope would be based on compaction equipment limitations, slope stability, maximum friction angle between both natural and geosynthetic materials used in the construction, and the geosynthetic resistance to

tensile forces (OAC 3745-29-08). If old boreholes are encountered during liner placement, they would be plugged with a cement grout mixture to inhibit water movement.

A flexible membrane liner would be placed on the entire surface area of the recompacted soil liner. Its installation would be based on the maximum friction angle between materials used in construction. The flexible membrane liner would be physically and chemically resistant to degradation. For example, a very-low-density polyethylene liner with fusion-welded seams would meet regulatory requirements.

An additional layer of soil would be placed over the recompacted soil liner, flexible membrane liner, and drainage layer to protect them from the intrusion of objects during construction and operation.

2.1.2.2 Leachate Management System

A leachate collection system would be installed over the geomembrane (liners). The system would contain a network of drains and pipes that would collect and transport leachate to a central storage/pumping facility. Before the drainage layer is placed, a geotextile would be placed on the geomembrane for added protection.

The central leachate storage/pumping facility, to be located near the landfill perimeter road, would consist of two storage tanks, each with a minimum one-week storage capacity (OAC 3745-29-11), and a lift station. Automatic high-level sensors would activate indicator lights when the tanks are three-fourths full. Pumps would then be used to transfer leachate from the storage tanks to a tanker truck. A diked, concrete containment pad would be used during tank-to-truck transfer. The truck would transport the leachate to a National Pollutant Discharge Elimination System

(NPDES)-permitted onsite wastewater treatment facility.

2.1.2.3 Surface Water Controls

Structures would be installed to divert water from the site, manage concentrated onsite flow caused by development, and prevent sediment-laden runoff from leaving the site. All would be designed to limit flow velocity to minimize erosion. Silt fences and other temporary forms of sediment control would be used as erosion control measures and would remain in place until a vegetation cover of perennial grasses was established. Sedimentation pond storage volumes would be based on either the calculated runoff volume of a 10-year, 24-hour storm event or 0.125 acre-ft for each disturbed acre multiplied by the scheduled frequency of cleaning (in years), whichever is greater. A principal spillway would discharge the flow from a 10-year, 24-hour storm event. In addition, an emergency spillway inlet elevation would be established to provide flood storage; no flow would enter the emergency spillway during a 25-year, 24-hour storm event. Spillway lining materials would be fabricated from corrugated metal pipe with anti-seep collars. Rock rip-rap would protect the slope and bottom of the spillway from erosion. The combination of the principal and the emergency spillways would safely discharge flow from a 100-year, 24-hour storm event. Sedimentation pond discharge to a receiving ditch must meet the requirements of PORTS NPDES permits. Secondary filtration is unlikely to be necessary.

2.1.2.4 Groundwater Monitoring

Wells would be installed at appropriate locations and depths to yield samples from the uppermost aquifer and any significant zones of saturation that exist above it. Samples from these wells would be expected to reflect groundwater quality not previously affected by past landfill operations. In addition, the placement of wells would intersect the groundwater passing directly downgradient of the limits of industrial solid waste placement in accordance with OAC 3745-29-10.

2.1.2.5 Interim and Final Caps

An interim cover (cap) would be installed over filled units. Materials would be similar to those used for the liner. A multilayer final cap would be installed when all units of the landfill reach capacity. Prior to the installation of the final

cap, the interim cap would be graded to a minimum of 5% slope. Maximum slope for the capping system would be 25% (4:1). When grading is complete, a gas ventilation layer would be installed. It would consist of a layer of geonet underlain by a layer of geotextile and covered with another layer of geotextile. Gas vents constructed from high-density polyethylene liner piping would intersect this layer and extend a minimum of 3 ft above the surface grade. Gases would be unable to move laterally in the landfill.

The next layer of the final cap would be a recompacted soil barrier having the same gradation and compaction requirements as the recompacted soil liner. The permeability requirement for the cap would be 1x10—6 m2/sec. The first lift of this layer would be a sacrificial cover to protect the geonet from possible damage incurred from "sheep-foot-type" compaction equipment. The total thickness of the barrier would be a minimum of 24 in. (18 in. of low permeability soil at 1x10—6 m2/sec plus 6 in. of sacrificial lift). A drainage layer would be installed over the barrier layer with geotextile placed on both the top and bottom.

The final cap would consist of either an 18 in. layer of native vegetation with 12 in. of sand beneath or 30 in. of vegetative layer with a composite synthetic drainage layer. This layer would be of sufficient thickness and fertility to support a complete and dense vegetative cover. In addition, this layer would protect the soil barrier layer from damage caused by root and frost penetration. The cap system would have a maximum projected erosion rate of five tons per acre per year.

2.1.2.6 Buildings

The equipment maintenance building would be a pre-engineered metal building of open design and would be used for storage of earth-moving equipment. A lean-to structure would enclose a work room for personnel. The open washdown area for equipment would be completed with a concrete slab sloping to a sump drain. The structural design of the equipment storage shed would be in accordance with the provisions stated in DOE Order 6430.1A, *General Design Criteria*. The main equipment area would be 60 ft long with an 18 ft eave-height. The work area would be 10 ft wide by 30 ft long and would include a lockable storage area and workbench. The open washdown area would be 40 ft wide and 60 ft long, with a concrete slab sloping to a sump drain.

The receiving portal would be a modular unit composed of three spaces—an office area, a janitor's room, and a restroom. This structure would also be a pre-fabricated, preassembled unit 17 ft long by 13 ft wide that could easily be transported to future landfill sites. Structural design would also follow DOE Order 6430.1A.

2.1.3 Landfill Operation

Administrative controls would be necessary to ensure that wastes placed in the X-737 landfill meet specific acceptance criteria. Wastes that are radioactive (above 30 picocuries per gram), hazardous (as defined by Resource Conservation Recovery Act), or contaminated with polychlorinated biphenyls (PCBs) or other toxic chemicals (governed by the Toxic Substance Control Act) would be prohibited. The 30 picocuries per gram limit is a standard that has been established by PORTS management based on values obtained from data on natural background radiation in area soils and plant process knowledge (MMES, 1991). Current DOE policy requires that wastes generated at PORTS be free of any radionuclide that has been added as a result of PORTS operations.

Waste would be accepted at the landfill between 7:30 a.m. and 2:30 p.m., Monday through Friday. Waste compaction and covering of the waste materials would continue until 4:00 p.m., after which the access gates would be locked. The landfill would be fenced and posted with "No Trespassing" signs. The landfill would be patrolled by security personnel after operating hours.

Daily cover would consist of soil or a synthetic cover, such as *Fabrisoil* or *Concover*. *Fabrisoil* is a reusable, woven polypropylene panel that is pulled into place at the end of each day's operations. *Concover* is a slurry of earth-based materials and recycled newsprint applied by a diesel-powered sprayer. The slurry eventually hardens to form a complete daily cover. Synthetic covers must be approved by the Ohio EPA.

2.2 NO ACTION

The no-action alternative is considered in this EA, as required by 10 CFR 1021.321, to provide an environmental baseline against which impacts of the proposed action can be compared. If no action is taken, the existing X-735 landfill would continue to operate until it has reached capacity; at the current waste generation rate, the landfill would reach capacity in late 1996. At that time, X-735 would be closed, and PORTS would be without a disposal facility for non-hazardous and asbestos wastes.

2.3 OFFSITE SHIPMENT FOR DISPOSAL

Offsite disposal is a reasonably foreseeable alternative to onsite disposal. It would require that wastes be shipped separately to a nonhazardous waste disposal facility and an asbestos disposal facility. A potential drawback to offsite shipment is that PORTS wastes must be screened for specific contaminants prior to shipment in order to meet offsite facility disposal criteria. About 20% of PORTS industrial wastes is not currently screened for radioactive contamination. Thus, if PORTS chooses to send non-hazardous and asbestos wastes offsite for disposal, new waste examination and assay facilities would be required. Life-cycle cost analysis estimates for onsite disposal expenses are $4.28 million per year. Offsite disposal estimates are $5.57 million per year (MMES, 1992a). Because of the savings of over $1 million, onsite disposal is the preferred alternative for nonhazardous and asbestos waste disposal.

3. AFFECTED ENVIRONMENT

3.1 AIR QUALITY

Pike County lies in the humid continental climate zone, which is situated between the dominating polar front and the tropical climates. Therefore, temperature and precipitation extremes occur.

Precipitation at PORTS varies greatly from year to year and averaged 41.33 in. from 1951 to 1980. Thunderstorms in July and August make them the wettest months, and October and November are the driest months. Winters are moderately cold, with temperatures of 32o F or below on average 99 days per year. In summer temperatures above 90o F occur an average of 26 days per year (MMES, 1992).

The PORTS region is an attainment area for the pollutants listed in the National Ambient Air Quality Standards (40 CFR Part 50) and Ohio EPA air quality standards (OAC 3745-17). The nearest Class I Prevention of Significant Deterioration area designated to restrict the degradation of ambient air quality is the Dolly Sods Wilderness Area is 174 miles east of PORTS in West Virginia.

PORTS continuously monitors airborne discharges from point and non-point sources within and outside of the plant boundary. The onsite point sources are permitted by the Ohio EPA and the U.S. EPA for the controlled release of pollutants into the atmosphere. These pollutants include

- standard industrial emissions such as fly ash,
- sulfur dioxide,
- gasoline and fuel vapors,
- cleaning agents (e.g., nitric acid, ascorbic acid, 1,1-trichloroethane),
- process coolants (chlorofluorocarbons),
- small amounts of radionuclides (radionuclides are daughter products of radioactive materials that have a measurable mean half-life), and
- a gaseous fluoride compound, which is not currently regulated by the Ohio EPA or the U.S. EPA.

PORTS does not maintain particulate matter monitors on the reservation.

3.2 WATER RESOURCES

3.2.1 Surface Water

Current monitoring data indicate that a series of Scioto River tributaries at PORTS discharge to the Ohio River. The largest natural body of water on PORTS is Little Beaver Creek, which is about 2700 ft from the proposed landfill site (Fig. 2).

Figure 2. Surface water map for the proposed landfill site.

The flow in Little Beaver Creek results primarily from effluent originated at PORTS. This tributary drains the northern and northeastern areas of the site before entering Big Beaver Creek offsite (MMES, 1991). Big Beaver Creek enters the Scioto River, which then flows into the Ohio River. The Scioto River does not provide a source of drinking or industrial water downstream from PORTS, and it is not considered to be a recreational area except for of sport fishing (MMES, 1991). The State of Ohio has designated Little Beaver Creek as a warm-water aquatic habitat with the potential to supply water for local industrial and agricultural purposes (OAC 3745-09).

Stormwater discharges from PORTS will be subject to an NPDES permit, for which an application has been made with the Ohio EPA. Non-stormwater liquid effluents (point sources) from PORTS are subject to the limitations in an existing NPDES permit, which requires that total suspended solids (TSS), pH, temperature, and specific chemical constituents be monitored. Under the NPDES permit, PORTS effluents either are discharged to the surface streams (Little Beaver Creek, west drainage ditch, and an unnamed tributary) or are treated and discharged directly to the Scioto River. Little Beaver Creek is monitored in accordance with the NPDES permit.

The proposed site for the X-737 landfill is above the 100- and 500-yr floodplains of onsite surface waters, and wetlands are not present (see Appendix A).

3.2.2 Groundwater

A hydrogeologic site evaluation (Battelle 1981) details the surface and groundwater geology of the Pike County area relative to the PORTS reservation. The surface and near-surface geology at PORTS has been influenced by the effects of glaciation. PORTS is situated in an abandoned river valley of the Portsmouth River that was filled with lacustrine sediments deposited during the existence of a prehistoric lake known as Lake Tight.

Geologic materials underlying PORTS are consolidated rock units of Mississippian age sandstone and shale, and unconsolidated glacial lacustrine deposits of clay, silt, sand, and gravel. The bedrock units underlying PORTS outcrop in the north-south trending hills along the east and west portions of the facility. The topography of the proposed industrial solid waste landfill is characterized by low slopes to level ground.

Groundwater is available in very limited quantities in the bedrock units and the unconsolidated deposits below the site because of the impermeable nature of the geologic materials in which it is contained. The direction of flow and gradient is reflected in the contours of the land surface of ridges and low-lying hills. Within the plant boundary, groundwater in the bedrock is confined to the upper fractured, weathered surface and flows in a north-to-south direction. In the vicinity of streams, groundwater flows toward and into the streams near the contact between the unconsolidated materials and the bedrock surface.

PORTS monitors groundwater quality both on the PORTS site and in the adjacent residential areas. Little Beaver Creek, Big Run Creek, and other local tributaries receive groundwater discharge. Data indicate that operations at PORTS have had no adverse chemical or radiological effects on residential drinking water wells in the area (MMES, 1991).

3.3 GEOLOGY AND SOILS

PORTS is located within the physiographic Appalachian Plateau. The uppermost rock units in this region were deposited in an inland sea during the Paleozoic era. At the end of the Paleozoic era (230 million years ago), the region

was uplifted and gently folded to form a shallow basin that trends parallel to the Appalachian Mountains. Subsequent erosion of the uplifted sediments produced the deeply dissected, knobby terrain that characterizes the region today. The geology within the vicinity is dominated by Paleozoic shales and sandstones that are overlain by Pleistocene fluvial and lacustrine deposits (MMES, 1991).

The soils of the proposed landfill site are Omulga silt loam, with slopes averaging 3 to 8%. These soils are well drained and have a surface layer of dark grayish brown friable silt loam. The underlying soils are approximately 54 in. thick and are distinguished by yellowish brown, mottled, friable silt loam. The lowest horizon is a fragipan of yellowish brown, firm, brittle, silty clay loam. Because this area has been a borrow site for daily cover for the X-735 landfill, the friable silt loam normally present in undisturbed sites has been totally removed, leaving the underlying fragipan exposed (USDA, 1990).

The Pike County Soil Conservation Service has advised DOE that, according to the Soil Survey for Pike County, Ohio, soils within and adjacent to the confines of PORTS are of marginal significance and not prime farmland [i.e., of low fertility as defined by the Soil Survey of Pike County (see Appendix A)].

3.4 ECOLOGY AND LAND USE

3.4.1 Land Use

Pike County consists of farmland (including cropland, woodlot, and pasture) and forest (including Pike State Forest and portions of Wayne National Forest). Urban and suburban areas occupy approximately 1% of the total land area. Lands within or adjacent to the Scioto River floodplain are farmed intensively, particularly with grain crops such as corn and wheat. Other products, such as potatoes, cabbage, and fruits, are also cultivated in the area. Hillside terraces are more commonly used for cattle pasture. Both dairy and beef cattle are raised near the PORTS site. Other farm animals, such as horses, pigs, sheep, goats, and chickens, are raised to a lesser extent. Commercial woodlands (excluding sapling-seedling stands) are predominantly saw timber stands. Pole-timber stands are of lesser proportion.

Approximately 25,000 acres of forest are within a 5-mile radius of the plant. There are also 500 acres in urban areas within the same distance. The distribution of forest property in Pike County is similar to that of surrounding counties. Pike County is also typical to other farming regions in Ohio in productivity.

3.4.2 Vegetation

The vegetation of Pike County is represented by three major forest types, all of them second growth: mixed mesophytic (upland mixed hardwoods), mixed oak (oak-hickory), and bottomland hardwoods. The upland hardwoods areas include green ash, northern red oak, tulip poplar, red maple, and several additional species. The oak-hickory areas include white oak, northern red oak, post oak, shagbark hickory, pignut hickory, and various other associated species. The bottomland hardwoods include sycamore, sugar maple, flowering dogwood, and American beech, as well as less important species. Several areas that once were cleared have been allowed to lie fallow and are now in various stages of succession. Several small plantations of pines are located on the reservation, and several small wetland areas have developed around holding ponds and in ditch lines.

The area within the PORTS security fence is a fully developed industrial area. The grounds surrounding buildings and other fixtures are maintained as lawns and support various species of grasses and herbaceous plant species that are mowed periodically. No unique vegetation types exist within the boundaries of the reservation, and no threatened or endangered species of vegetation are known to be present on the site (see Appendix A).

3.4.3 Wildlife

The fauna of the PORTS site includes mammals, birds, amphibians, fish, reptiles, and several invertebrate phyla. Forty-nine mammals live on or around the plant site. Of these, 22 have been observed onsite. The most abundant mammal species onsite are the white-footed and the short-tailed shrews. Large mammals include the eastern cottontail

rabbit, white-tailed deer, opossum, and woodchuck. In addition, the eastern chipmunk, the fox, the gray squirrel, the northern flying squirrel, and the long-tailed weasel are known to be present on the site.

One hundred sixteen bird species have been observed within the boundaries of the plant reservation. These include year-round residents, winter residents, and migratory species. Ninety-nine species of birds are known to breed within the boundaries of Pike County.

Twenty-eight species of reptiles and thirty species of amphibians live on or around the plant site. Nine species of reptiles and six species of amphibians have been observed on the reservation. The most common reptilian species are the eastern box turtle, the black rat snake, and the northern black racer. The most common species of amphibians are the American toad and the northern dusky salamander.

Fifty-eight species of fish are found in streams (Little Beaver Creek, Big Run Creek, and Big Beaver Creek) in the immediate vicinity of the plant.

A portion of the proposed landfill site was previously disturbed by industrial activities. Approximately two acres in the southeast corner were used as a borrow area for daily soil cover for the present X-735 landfill. As a result, all organic soil layers have been removed, and the area has been reseeded with perennial grasses. The area currently represents a disturbed field in early successional stages, as indicated by the weedy species existing there.

The proposed location has the potential to host a variety of wildlife that occurs naturally within the boundary of PORTS and adjacent areas. However, very few organisms have been observed recently within the affected area because of ongoing industrial activities.

3.4.4 Threatened and Endangered Species

DOE consulted the U.S. Fish and Wildlife Service (FWS) and the Ohio Department of Natural Resources for information on threatened and endangered species in the PORTS area (Appendix A), and was advised of the potential presence of the Indiana bat (*Myotis sodalis*), which is found in limestone caves and is a federally listed endangered species, and two Ohio threatened or endangered species—the river otter (*Lutra canadensis*) and the eastern woodrat (*Neotoma floridana*). A survey of flora and fauna, community types, wetlands, and critical habitats was conducted to determine whether affected state and federally listed endangered and threatened species and rare communities or habitats were present. No threatened or endangered species, critical habitats, or wetlands were located within the affected area. The FWS and Ohio Department of Natural Resources concurred with this finding (see Appendix A).

4. ENVIRONMENTAL CONSEQUENCES

4.1 AIR QUALITY

4.1.1 No Action

Continued operation of the X-735 landfill would continue short-term, sporadic, and localized emissions from gaseous exhaust and fugitive dust. The landfill operates within the guidelines of its air emissions permit-to-install (PTI) and permit-to-operate (PTO). When the landfill reaches capacity, these emissions will cease.

4.1.2 Proposed Action

During construction of the proposed landfill, gaseous exhaust (consisting primarily of carbon monoxide and unburned hydrocarbons) would be emitted from heavy construction equipment; after the landfill was operating, fugitive dust would be emitted from earth-moving equipment.

In accordance with OAC 3745-29 *et seq*, air emission standards for gaseous exhausts and fugitive dust would be

established within the PTI and the PTO for the X-737 landfill. Emissions would be short-term, sporadic, and localized at the landfill site, and off-site impacts to ambient air quality would not result. To minimize fugitive dust, disturbed areas would be regularly spray with water or another dust suppressant as construction progresses.

Waste decay in the landfill could generate explosive gases, primarily methane. The accumulation of explosive gases would be controlled by a passive gas system which would be installed during landfill closure.

4.1.3 Offsite Disposal

Offsite shipment of non-hazardous waste for disposal at commercial facilities would not impact ambient air at PORTS. Gaseous exhaust and fugitive dust would be regulated within the permits for installation and operation of the commercial disposal facility. Emissions would be short-term, sporadic, and localized at the commercial landfill site.

4.2 WATER RESOURCES

4.2.1 No Action

Continued operation of the X-735 landfill until it reaches capacity would result in no adverse effects to water resources. After capacity is reached, PORTS nonhazardous and asbestos wastes would either being stored onsite or shipped offsite for storage/disposal. Thus, water resources at PORTS would not be impacted.

4.2.2 Proposed Action

Sanitary wastes from the receiving portal at the proposed landfill would not adversely affect water resources because they would be discharged to a septic tank and drain field. A revision to PORTS' NPDES permit would not be necessary.

Soil erosion and sediment runoff from heavy precipitation have the potential to degrade surface water quality in Little Beaver Creek and other nearby tributaries, if uncontrolled. The proposed landfill would be constructed as prescribed in OAC Chapter 3745-29 *et seq* to minimize the potential for extensive soil erosion.

Suspended solids from soil and organic debris, trace metals from oxidized scrap metal, and liquids generated from decomposing cafeteria wastes, paper products, and yard wastes could leach through an unlined landfill. The primary concern with decomposing waste leachates is an increase in the biological oxygen demand in streams and tributaries within the affected area. The proposed landfill would be lined in accordance with State of Ohio regulations that require a leachate collection system and a central leachate storage/pumping facility as well as a system of groundwater monitoring wells (see Appendix C). Because of these protective features, the proposed landfill would not be expected to adversely impact water resources.

A groundwater monitoring system with up to 14 sampling wells would be installed prior to construction to sample the uppermost aquifer for baseline groundwater quality data. Wells would be active throughout the life of the landfill and after closure; groundwater samples would be drawn routinely to determine whether any contaminants from the landfill have migrated to area surface waters or percolated to the groundwater. In addition, a sitewide groundwater monitoring program at PORTS, managed in accordance with the Ohio Consent Decree established among DOE, the Ohio EPA, and the U.S. EPA, requires a quarterly report on the groundwater quality at the PORTS site. DOE Order 5400.1 also requires routine groundwater monitoring reports to document the quality of groundwater at PORTS.

PORTS monitors for surface water quality at 21 locations around the reservation and vicinity. The frequency of monitoring and the parameters vary according to location. Monitoring protocols follow the specifications of the NPDES permit; PORTS provides a monthly written report to the Ohio EPA.

4.2.3 Offsite Disposal

Offsite shipment of non-hazardous waste for disposal at commercial facilities would have no impact on the surface and water quality of PORTS and the streams and tributaries in the vicinity. Impacts to offsite groundwater would depend on the facility location. If OAC landfill regulations are met by commercial facilities, no adverse impacts would be expected.

4.3 GEOLOGY AND SOILS

None of the alternatives considered in this EA would adversely affect the geologic structure of the area, other than temporarily modifying local topography as the landfill is developed. Prime farmland soils would not be affected by no action or the proposed action. Offsite disposal impacts to prime farmland would depend on the facility location. If OAC regulations are met by commercial facilities, no adverse impacts would be expected.

4.4 ECOLOGY AND LAND USE

Development of the proposed landfill would remove 40 acres of potential wildlife habitat from active use. This is about 0.2% of the forested area within a 5-mile radius of PORTS. Wildlife that transiently use this area would likely be displaced to similar surrounding habitat. There are no threatened and endangered species of plants or animals known to occur at PORTS; therefore, no action and the proposed action would not adversely affect protected species. Offsite disposal impacts to protected species would depend on the facility location.

4.5 HEALTH AND SAFETY

Public health and safety would not be threatened by the proposed action because no hazardous emissions or effluents would affect offsite areas. Landfill workers would be exposed to standard industrial hazards associated with the operation of heavy equipment and machinery. The proposed action would not present any unique hazards to occupational health and safety.

4.6 CUMULATIVE IMPACTS

Cumulative impacts are those that result from individual actions that collectively may adversely affect the environment. In this EA, the impacts of the proposed action are considered in combination with the impacts of PORTS operations and a proposed UF6 cylinder storage yard.

Land Use. The proposed landfill would remove approximately 40 acres from potential industrial use within the facility boundary. The UF6 cylinder storage yard would remove an additional 11 acres. The cumulative effect of these actions would be the removal of approximately 51 acres from further industrial development; this acreage is 6.4% of the total land available at PORTS for industrial use.

Air Quality. Fugitive dust and gaseous exhaust could affect air quality in combination with emissions from construction and operation of the UF6 cylinder storage yard. These effects would be short-term, sporadic, and localized. Although it is unlikely, it is assumed that construction would be ongoing simultaneously at both the landfill and cylinder yard. Because of their relative location (the landfill would be located in the northern portion of the PORTS site, while the cylinder yard would be located in the southern portion), air quality impacts would be spatially separated, and cumulative effects would not result.

Water Quality. The proposed action could result in some minor sedimentation to Little Beaver Creek and other nearby tributaries. Because of the spatial separation of the proposed action and the cylinder yard construction, cumulative impacts to surface water resources would not occur.

Ecology. The proposed industrial solid waste landfill and the UF6 cylinder yard would remove approximately 51 acres of vegetation and wildlife habitat. Of the surrounding 25,000 acres of forest within a 5-mile radius of the plant, this would account for approximately 0.2% of similar habitat on the PORTS site.

5. ENVIRONMENTAL COMPLIANCE AND PERMIT REQUIREMENTS

The proposed landfill would be designed in accordance with Ohio EPA (3745-29 *et seq*) and DOE Orders. A PTI would be approved prior to construction activity. Air permits for disposal of refuse and asbestos in a landfill, roads, and parking areas would be covered by the PTI and PTO and would be in accordance with 40 CFR Part 61, Subpart M, and OAC 3745-29-09. Water permit(s) would be issued under the new NPDES stormwater regulations (40 CFR Part 122.26). The need for permits would be determined after stormwater samples are analyzed by the Ohio EPA. In addition, a PTI for sediment ponds associated with the landfill may be required and would be included with the PTI package for the industrial solid waste landfill (OAC 3745-29 *et seq*). A permit for asbestos burial would also be included in the PTI application for the proposed landfill (OAC 3745-29 *et seq*).

6. PERSONS AND AGENCIES CONSULTED

- James M. Borchelt, District Conservation Officer, Pike County Soil Conservation Service, Dept. of Agriculture, State Route 104, Waverly, Ohio 45690.
- Pat Jones, Division of Natural Areas and Preserves, Ohio Dept. of Natural Resources, Morse Road, Columbus, Ohio 43224.
- Ken Mueltever, U.S. Fish and Wildlife Service, Americana Parkway, Reynoldsburg, Ohio 43068.
- Terry Skipa, State Historic Preservation Officer, Ohio Archaeological and Historical Society, Ohio Historical Society, Ohio Historical Center, 1982 Velma Ave., Columbus, Ohio 43211-2497.
- David Snyder, Archaeology Reviews Manager, Ohio Archaeological and Historical Society, Ohio Historical Center, 1982 Velma Ave., Columbus, Ohio 43211-2497.
- Selma Walker, Spokesperson, Native American Indian Center, 1862 S. Parsons Ave., Columbus, Ohio 43207.

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APPENDIX A: AGENCY CONSULTATION AND FIELD SURVEYS

An ecological survey was conducted on July 15, 1992, using the modified point-centered quarter sampling technique (Kooser and Rankin). The survey was conducted to identify community types and the presence of areas with the potential to be identified as wetlands. The survey was cross-referenced with topographical maps for Waverly, Waverly South, Lucasville, and Wakefield (Department of Interior, 1987), with *Wetlands Identification: Federal Manual for Identifying and Delineating Jurisdictional Wetlands* (Government Institutes, 1989), and with the endangered and threatened species lists for Ohio. Additionally, the Division of Natural Areas and Preserves, Department of Natural Resources, was consulted.

The Pike County Soil Conservation District Office was consulted to determine whether prime farmland would be affected by the proposed action. According to the District Conservation Officer, the affected soils are considered to be of marginal significance even prior to disturbance.

Letters confirming consultation with these state and federal agencies are included in this appendix.

REFERENCES

Department of Interior, 1987. Topographical Maps for Quadrants: Waverly, Waverly South, Lucasville, and Wakefield. Division of Geological Survey, Ohio, Pike County. 7.5 Minute Series.

Kooser, James G. and Wilson T. Rankin. A Modified Point-Centered Quarter Sampling Technique: A Tool for Plant Community Classification and Evaluation. Division of Natural Areas and Preserves, Ohio Department of Natural Resources, Morse Road, Columbus, Ohio 43224.

Strausbaugh, P.D. and Earl L. Core, 1977. Flora of West Virginia. Seneca Books, Inc., Grantsville, West Virginia.

APPENDIX B: SOLID WASTE LANDFILL DECISION MATRIX

This appendix contains the Solid Waste Landfill Decision Matrix, which was developed by a committee composed of

the Project Management, Engineering, Waste Management, and Environmental Management divisions. The matrix is based on project knowledge and the known hydrology (surface and groundwater) and local topography of each alternative site.

Page1: PORTS Solid Waste Landfill Decision Matrix

Page2: PORTS Solid Waste Landfill Decision Matrix

APPENDIX C: GROUNDWATER MONITORING SYSTEM AND LANDFILL DIAGRAMS

Following are (1) diagrams for the placement of groundwater monitoring wells at the proposed north location and (2) a detailed depiction of the type of groundwater monitoring well that would be installed for the monitoring system. The hydrogeologic and geotechnical investigation for the proposed industrial solid waste landfill has been initiated but not completed. Also included are diagrams from the *Conceptual Design Report for New Solid Waste Landfill*, depicting the general layout and details of construction for the leachate collection system, the other support buildings, the various layers necessary to line and cap each cell, and the orientation of cells.