PORTSMOUTH GASEOUS DIFFUSION PLANT, X-710 TECHNICAL SERVICES BUILDING 3930 U.S. Route 23 South Piketon vicinity Pike County Ohio HAER OH-142-X HAER OH-142-X

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD National Park Service U.S. Department of the Interior 1849 C Street NW Washington, DC 20240

HISTORIC AMERICAN ENGINEERING RECORD

PORTSMOUTH GASEOUS DIFFUSION PLANT, X-710 TECHNICAL SERVICES BUILDING

HAER No. OH-142-X

| Location: | Portsmouth Gaseous Diffusion Plant (PORTS), 3930 U.S. Route 23 South, Piketon vicinity, Scioto Township, Pike County, Ohio |
|-----------------------|--|
| | The X-710 Technical Services Building is located at Ohio State Plane South coordinates at easting 1826906.493089 ft, northing 367871.106517806 ft and at Universal Transverse Mercator Zone 17N easting 326978.8068 m, northing 4319670.722 m. The coordinate represents the approximate center of the X-710 Technical Services Building. This coordinate was obtained on June 19, 2019 by plotting its location in EnviroInsite 10.0.0.37. The accuracy of the coordinates is +/- 12 meters. The coordinate datum is North American Datum 1983. |
| Date of Construction: | 1955 |
| Designer/Builder: | Peter Kiewit Sons' Construction Company |
| Previous Owner: | N/A |
| Present Owner: | The Atomic Energy Commission (AEC) oversaw construction and operation of PORTS until 1974, when the Energy Research and Development Administration was established with responsibility for research and development duties from 1974-1977. In 1977, the U.S. Department of Energy was established, overseeing operations at PORTS. |
| Present Use: | Environmental testing and monitoring |
| <u>Significance:</u> | The X-710 Technical Services Building housed the plant's laboratory for testing, research, and development associated with uranium enrichment, cascade testing and evaluation, and other mission-related purposes. This building is part of PORTS, which was a part of the U.S. Cold War nuclear weapons complex. PORTS' primary Cold War era mission was the production of highly enriched uranium by the gaseous diffusion process for defense/military purposes. |
| Project Information: | Fluor-BWXT Portsmouth LLC photographed the site in August 2014 and in November 2017. Gray & Pape, Inc., Cincinnati, Ohio, served as the primary author of the historical narrative and resource descriptions drawing from numerous historical records and reports, drawings, photographs and plans. For additional contextual information, see Portsmouth Gaseous Diffusion Plant, HAER no. OH-142. This X-710 Technical Services Building HAER was completed in 2021. |

Part I. Historical Information

In support of this report, there are three appendices that are provided: Appendix A through C, which consist of survey photographs, historical photographs, and historical drawings, respectively.

Construction History of the X-710 Technical Services Building:

The James Leck and Steenberg Construction Company, of Minneapolis, Minnesota, received the construction subcontract for the X-710 Technical Services Building. Union Carbide, of Houston, Texas, and Peter Kiewit Sons' Construction Company installed certain special equipment in the building, while Leck and Steenberg handled the general excavation and construction of the facility. When excavation began in August 1953, construction crews found unsuitable bearing soil, which necessitated placement of concrete backfill for the concrete footings to rest upon. In total, nearly 9,000 cubic yards of earth were excavated. Excavation work finished in May 1954. Concrete pouring for the building footings began in August 1953, with the first building columns poured in October 1953. The columns were completed in May 1954 (Appendix B, Figure 6). Construction crews placed a total of 6,150 cubic yards of concrete in the X-710 Technical Services Building and its related facilities and laid 155,000 concrete blocks. Mechanical and electrical work began in early November 1953 and was completed with equipment installation in January 1955 (Figures 7 through 10). The building was officially completed in April 1955, although it was partially occupied prior to this date.

Historical drawings of building plans are provided in Appendix C (Figures 11 through 20).

Part II. Site Information

Description of the X-710 Technical Services Building:

The X-710 Technical Services Building, located near the center of the site, is roughly 300' east of the X-326 Process Building and roughly 150' south of the X-300 Plant Control Facility. The X-710 Technical Services Building houses the main laboratory for PORTS. For much of its history, plant scientists and technicians carried out research and development within the X-710 Technical Services Building. Activity conducted here included material sampling and testing, chemical analysis and laboratory services, information services and management, instrumentation development and testing, cascade testing and evaluation, development testing and evaluation and fabrication. The building also houses numerous offices, including those for technical services management, equipment repair and fabrication shops, a store room, and a mechanical equipment room. With the decline of uranium enrichment operations at the site, activities within the X-710 Technical Services Building shifted toward environmental testing and monitoring. The X-710 Technical Services Building also includes the X-710A Gas Manifold Building, X-710B Explosion Test Facility, and a neutralization pit.

Built of reinforced concrete, the X-710 Technical Services Building is a rather generic, utilitarian type building with a flat roof and exposed concrete framing and cinderblock infill (Figures 1 through 5). Window openings with galvanized steel industrial sash are located on the north and east façades. As completed in 1955, the original portion of the building measured 179', 8" by 290', 7" and housed 109,000 square feet of floor space. In 1975, Goodyear Atomic extended the south end of the building an additional 80', giving the X-710 Technical Services Building another 30,000 square feet of floor space. The addition is clad in vertical aluminum sheathing. The building's cinderblock bays total 13 on the east and west sides of the building, with another 10 bays dividing the north and south sides of the building. A projecting wing is located near the center of the original building on the east façade. The wing features a recessed porch on the southeast corner.

PORTSMOUTH GASEOUS DIFFUSION PLANT, X-710 TECHNICAL SERVICES BUILDING HAER No. OH-142-X (Page 3)

The interior of the building is divided into cinder block partitions in general areas and movable metal partitions in the laboratory areas to provide for adjustment in laboratory room sizes. All interior finishes are utilitarian and provide for functionality and cleanliness control. In the laboratory spaces, electrical and mechanical installations are concealed above metal pan ceilings, and exposed masonry walls are plastered and painted with acid-proof paint to allow for cleaning and decontamination operations. Floors in corridors and laboratories are coated with vinyl plastic tile to allow for cleanup and decontamination. Power is distributed to four substations within the X-710 Technical Services Building, each controlling separate functions within the facility. Additionally, a 90-kilowatt diesel generator provides power to the building for emergency use in the event of an outage from the X-530 Switchyard.

The X-710A Gas Manifold Shed is located just west of the X-710 Technical Services Building, and constitutes the facility for receiving, storing, and distributing oxygen, hydrogen, and bottled gas to the X-710 Technical Services Building. The building sits on a 37' by 26' concrete pad and consists of a corrugated cement asbestos panel roof supported by steel framing and enclosed by a metal fence. A 6'-wide loading dock is on one side of the structure. The X-710B Explosion Test Facility is located approximately 75' west of the X-710 Technical Services Building and consists of a reinforced concrete reaction cell 8' in diameter by 10' high, and a 12' by 14' adjacent work area of similar construction. The X-710B Building was built to conduct experiments involving unstable compounds that could potentially result in explosions. The X-710B Explosion Test Facility design meets AEC criteria for blast proof construction to withstand 750 pounds per square foot.

Part III. Sources of Information

Department of Energy. *The Role of the Portsmouth Gaseous Diffusion Plant in Cold War History*. Piketon, OH: U.S. Department of Energy, 2017.

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

Department of Energy. *National Historic Preservation Act Section 110 Survey of Architectural Properties at the Portsmouth Gaseous Diffusion Plant in Scioto and Seal Townships, Piketon, Ohio,* DOE/PPPO/03-0147&D1. Piketon, OH: U.S. Department of Energy, January 2011.

Giffels & Vallet, Inc. *Gaseous Diffusion Plant at Portsmouth, Ohio, Project History and Completion Report* (Redacted). Washington, D.C.: U.S. Atomic Energy Commission, 1957.

LEGEND X-710 Technical Services Building Location and Orientation of Exterior Images 2-5 25 Meters 0 50 Feet

Appendix A: Survey Photographs

Figure 1: Location and Orientation of Exterior Photographs (2 through 5)

PORTSMOUTH GASEOUS DIFFUSION PLANT, X-710 TECHNICAL SERVICES BUILDING HAER No. OH-142-X (Page 6)



Figure 2: North Side of the X-710 Technical Services Building, August 2014, Facing Southwest



Figure 3: North Side of the X-710 Technical Services Building, August 2014, Facing Southeast

PORTSMOUTH GASEOUS DIFFUSION PLANT, X-710 TECHNICAL SERVICES BUILDING HAER No. OH-142-X (Page 7)



Figure 4: South Side of the X-710 Technical Services Building, November 2017, Facing Northeast



Figure 5: South Side of the X-710 Technical Services Building, November 2017, Facing Northwest

Appendix B: Historical Photographs



Figure 6: The X-710 Technical Services Building Construction Site, February 1953



Figure 7: Interior View of the X-710 Technical Services Building Construction, February 1953



Figure 8: North End of the X-710 Technical Services Building, May 1954



Figure 9: Interior View of the X-710 Technical Services Building, May 1955



Figure 10: Interior View of the X-710 Technical Services Building, May 1955





Figure 11: Loading Dock Details

PORTSMOUTH GASEOUS DIFFUSION PLANT, X-710 TECHNICAL SERVICES BUILDING HAER No. OH-142-X





Figure 12: Exterior Door Installation

PORTSMOUTH GASEOUS DIFFUSION PLANT, X-710 TECHNICAL SERVICES BUILDING HAER No. OH-142-X (Page 13)



Figure 13: Core Modifications

PORTSMOUTH GASEOUS DIFFUSION PLANT, X-710 TECHNICAL SERVICES BUILDING HAER No. OH-142-X (Page 14)



Figure 14: South and West Elevations

PORTSMOUTH GASEOUS DIFFUSION PLANT, X-710 TECHNICAL SERVICES BUILDING HAER No. OH-142-X (Page 15)



Figure 15: North and East Elevations

PORTSMOUTH GASEOUS DIFFUSION PLANT, X-710 TECHNICAL SERVICES BUILDING HAER No. OH-142-X (Page 16)



Figure 16: Second Floor Plan Part B

PORTSMOUTH GASEOUS DIFFUSION PLANT, X-710 TECHNICAL SERVICES BUILDING HAER No. OH-142-X (Page 17)



Figure 17: Second Floor Plan Part A

PORTSMOUTH GASEOUS DIFFUSION PLANT, X-710 TECHNICAL SERVICES BUILDING HAER No. OH-142-X (Page 18)



Figure 18: First Floor Plan Part B

PORTSMOUTH GASEOUS DIFFUSION PLANT, X-710 TECHNICAL SERVICES BUILDING HAER No. OH-142-X (Page 19)



Figure 19: First Floor Plan Part A

PORTSMOUTH GASEOUS DIFFUSION PLANT, X-710 TECHNICAL SERVICES BUILDING HAER No. OH-142-X (Page 20)



Figure 20: Title Sheet and Plot Plan