

Final Radiological Condition of the
Westinghouse Advanced Reactors Division
Plutonium Fuel Laboratories
Cheswick, Pennsylvania

MAR 20 1985

AGENCY: Office of Operational Safety, Department of Energy

ACTION: Notice of Availability of Archival Information Package

SUMMARY: The Office of Operational Safety of the Department of Energy (DOE) has reviewed documentation relating to the decontamination and decommissioning operations conducted at the Westinghouse Advanced Reactor Division laboratories (buildings 7 and 8) located in Cheswick, Pennsylvania, and has prepared an archival information package to permanently document the results of the action and the site conditions at the time of release. This review is based on post-decontamination survey data and other pertinent documentation which are referenced and/or enclosed in the archival package. The material and documents included in the document demonstrate that the radiological conditions at those portions of the Westinghouse site that were used for Department of Energy contract activities are in compliance with standards and guidelines used to determine if a site is acceptable for release. Several areas of the site were used for commercial activities under Nuclear Regulatory Commission (NRC) license. These portions of the site were being decontaminated by Westinghouse with overview being provided by NRC. These activities are not addressed in this notice and are not covered in detail in the archival information package.

The results of the Department's review of activities at the Westinghouse site as recorded in the archival information package are being made available to interested parties at the DOE Public Document Room in Washington, D.C. For further information contact:

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U.S. Department of Energy
Germantown, Maryland 20545

SUPPLEMENTARY INFORMATION: In order to create a permanent accessible record of the history, decontamination, and final radiological condition of the portions of the Westinghouse facility used under DOE contract, the Department, through the Office of Operational Safety within the Office of Policy, Safety and Environment, has reviewed the past activities associated with the Westinghouse Advanced Reactors Division, Cheswick, Pennsylvania and has prepared an archival information package. The package summarizes historical operations and decontamination activities and contains published reports and unpublished documents related to the site's radiological condition and suitability for release.

The Westinghouse Advanced Reactors Division (W-ARD) located in Cheswick, Pennsylvania, mixed uranium-plutonium carbide fuel materials and fabricated fuel elements and assemblies for experimental reactors operated by DOE or its predecessor agencies during the 1960s and 1970s. Processing operations ceased about 1979 and the laboratories used by W-ARD (Buildings 7 and 8) were decontaminated from 1979 to 1981. In 1981, Argonne National Laboratory conducted a radiological assessment of the facilities at Cheswick to determine if any radioactive contamination remained following decontamination and decommissioning activities. The assessment indicated that most surfaces in the two buildings were below guidelines with the exception of two areas in building 8 and one in building 7. The contaminated portions of building 8 were subsequently cleaned by Westinghouse as confirmed by radiological surveys conducted for NRC by Oak Ridge Associated Universities during 1983-1984. Contamination remains in the drain system of building 7 and any activity necessitating disturbing of the drain lines must be accompanied by health physics procedures. It should be noted that some soil in a general area along the east fenceline of building 7 is contaminated with cobalt-60. However, this activity has been traced to on-going operations at building 9 used to repair pumps from nuclear submarines. This contamination presents no immediate hazard to site occupants and will be removed by Westinghouse personnel operating building 9. It does not affect release of the W-ARD facilities.

The Archival Information Summary for the Westinghouse Advanced Reactors Division Plutonium Fuel Laboratories, Cheswick, Pennsylvania is to be archived by DOE through the Assistant Secretary for Management and Administration and will be available through either the DOE Records Office or the DOE Historian's Office. Copies of the information package will be available for public review between 8:00 a.m. and 4:00 p.m., Monday through Friday (except Federal holidays), in the Department of Energy Public Document Room located in Room 1E-190 of the Forrestal Building, 1000 Independence Avenue, S.W., Washington, D.C.

REVISED

MAR 29 1985

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ARCHIVAL INFORMATION SUMMARY

WESTINGHOUSE ELECTRIC CORPORATION
ADVANCED REACTORS DIVISION FUEL LABORATORIES
CHESWICK, PENNSYLVANIA

Department of Energy
Office of Policy, Safety and Environment
Office of Operational Safety
Environmental Protection Division

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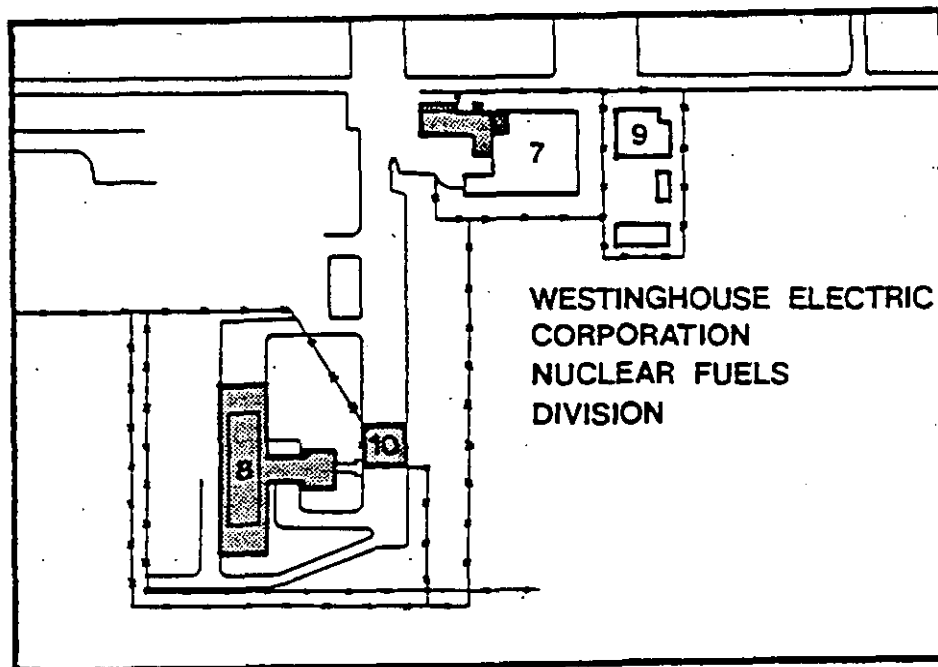
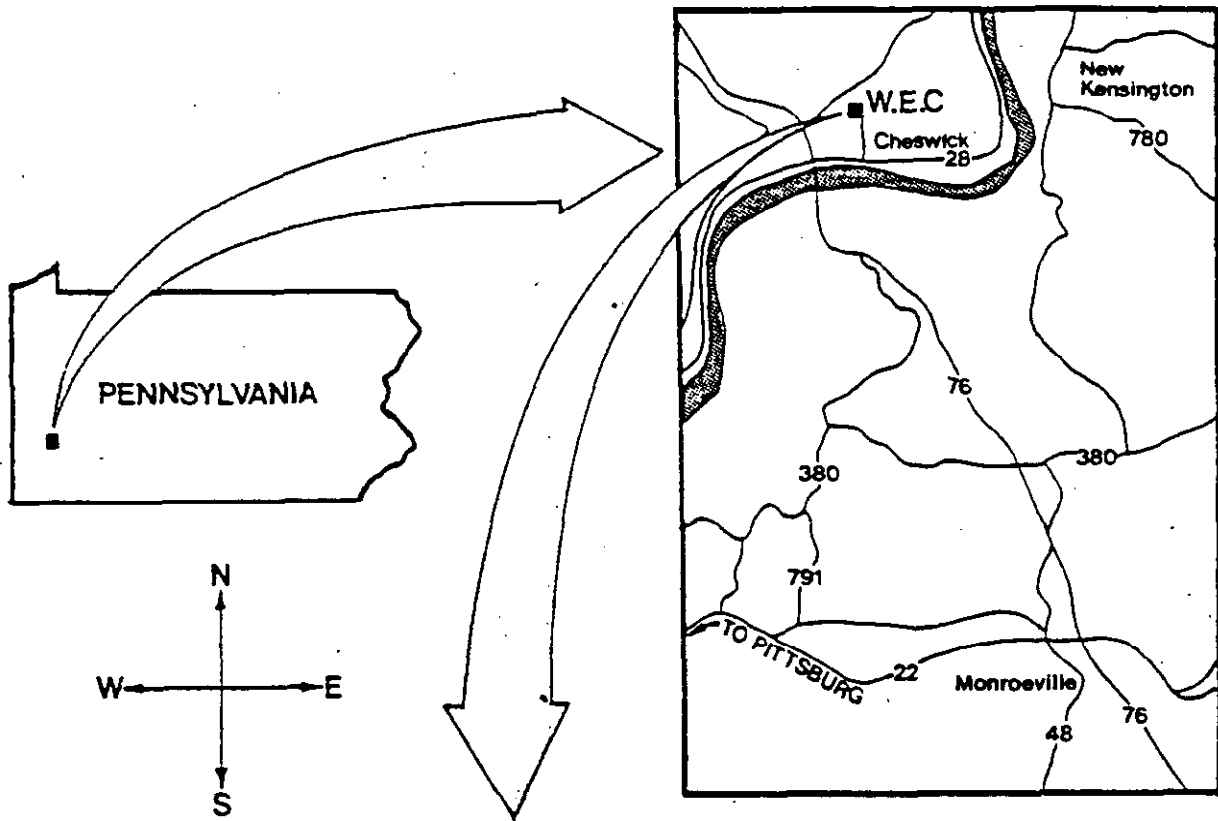
This summary reviews activities at the site and references published reports and unpublished documents containing information on the site's final radiological condition and supporting the site's release with the restriction that any activities that require disturbing building 7 drain lines be accompanied by the use of health physics practices. Water and sludge samples collected from several access points indicated the presence of uranium, plutonium, and americium. The entire system is, therefore, assumed to be contaminated with small quantities of these substances.

This summary, together with the referenced documents, is to be archived by DOE through the Assistant Secretary for Management and Administration and will be available through either the DOE Records Office or the DOE Historian Office. Copies of the information package will be available for public review at the DOE Public Document Room in Washington, D.C.

PROPERTY IDENTIFICATION AND SITE DESCRIPTION

As Figure 1 illustrates, the location of the Cheswick site is about 10 miles northeast of Pittsburgh, Pennsylvania. The site is located west of Cheswick, approximately three-quarters of a mile north of the Allegheny River in Harman Township, Allegheny County. The 113-acre site is bounded by the Cheswick and Harman Railroad to the north and west, and by Low Grade Road to the east and the Borough of Acmetonia to the south.

The Plutonium Laboratory occupied most of building 7 (Figure 2). The Nuclear Fuels Division operated the Uranium Oxide Laboratory in the northwest corner of the building. The Advanced Fuels Laboratory was located at the south end of building 8 (known as the Plutonium Fuels Development Laboratory) (Figure 3). The remainder of the building was devoted to Nuclear Fuels Division activities. All Nuclear Fuels Division work was done under license and the facilities



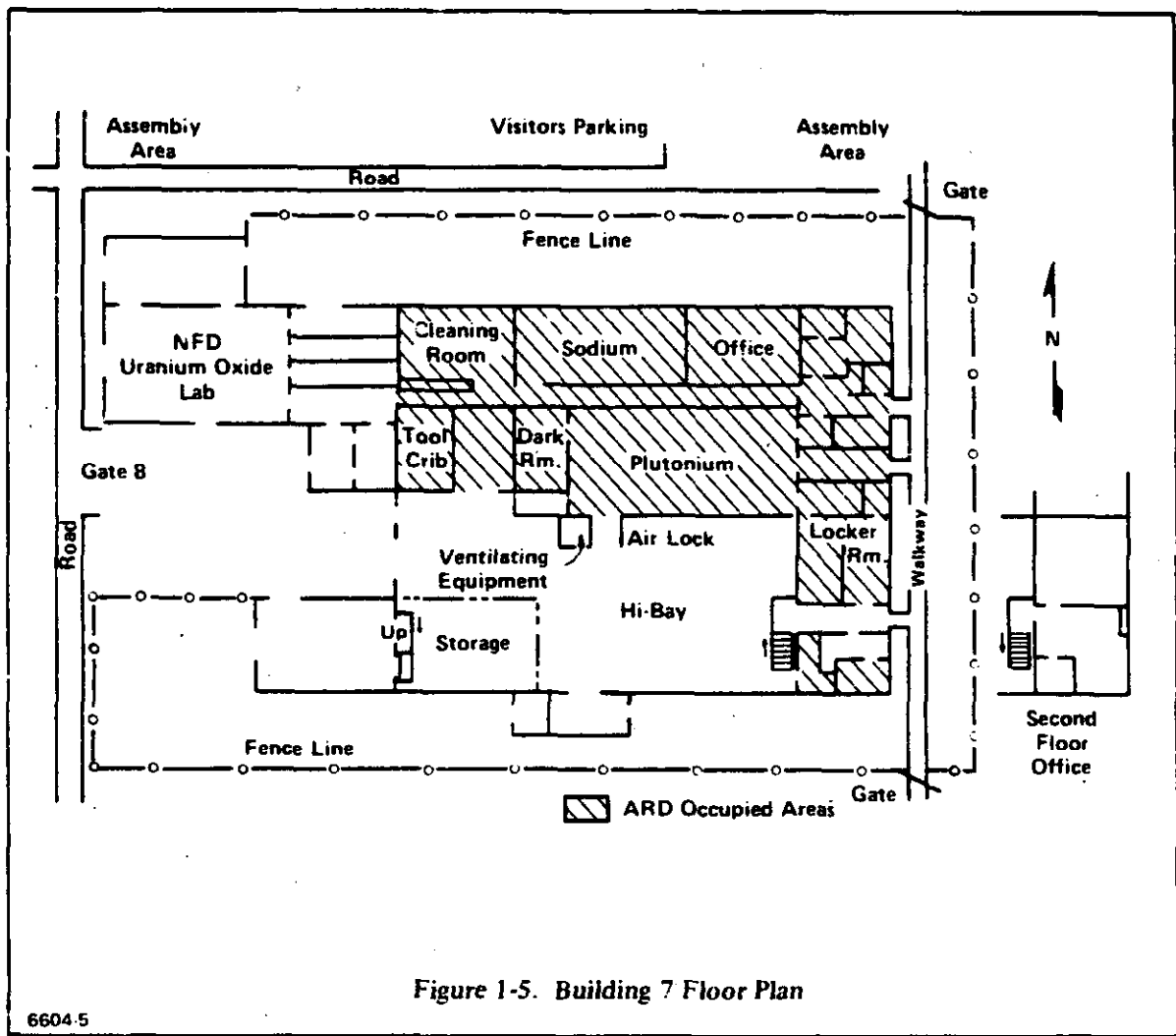


Figure 2. Building 7 Floor Plan

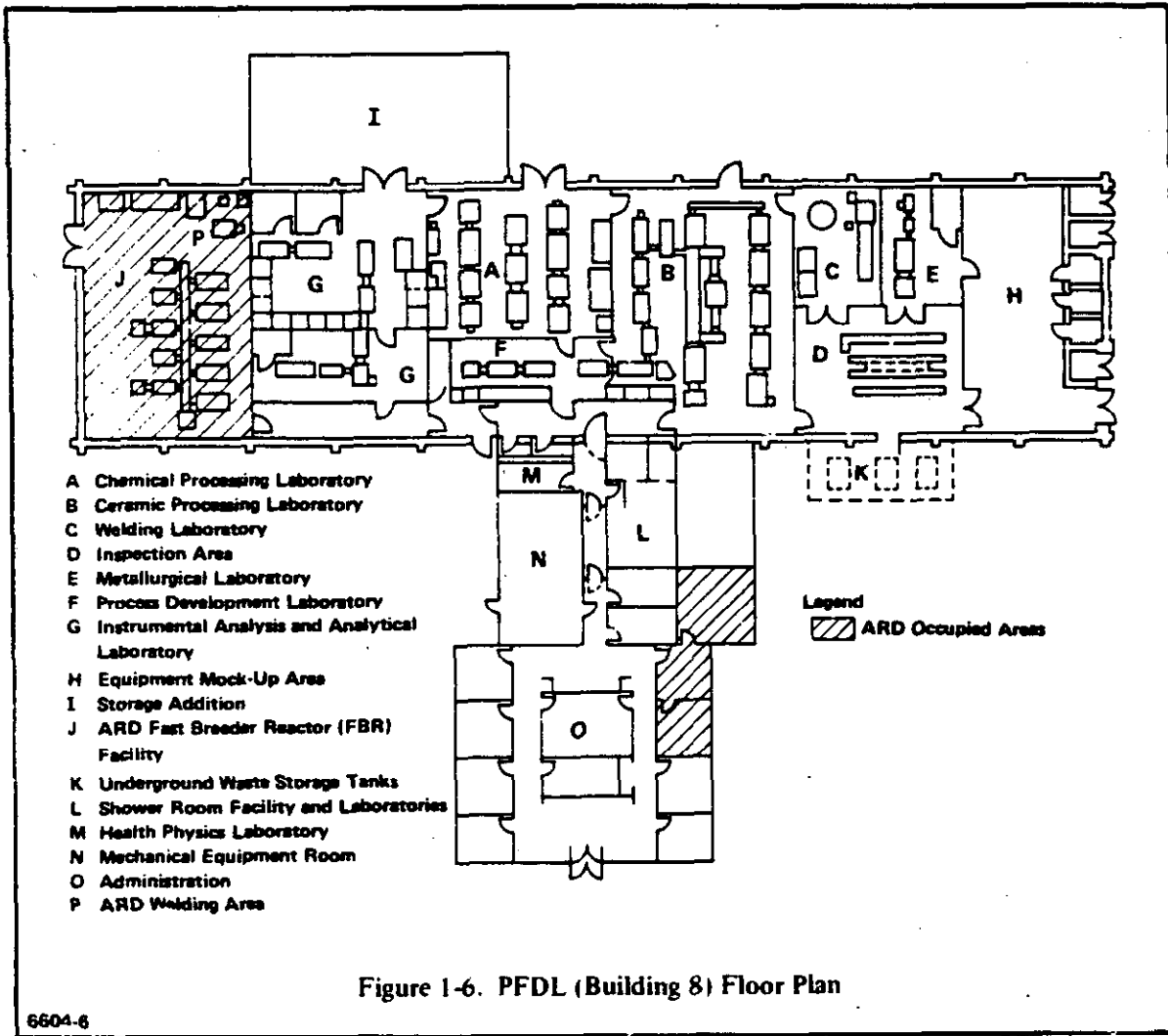


Figure 3. Plutonium Fuels Development Laboratory (Building 8) Floor Plan

involved are not covered in this summary. The Nuclear Regulatory Commission (NRC) is responsible for assuring that post-decontamination conditions at these facilities meet applicable release criteria.

SUMMARY OF ACTIVITIES AT
THE WESTINGHOUSE ADVANCED REACTORS DIVISION
FUEL LABORATORIES
CHESWICK, PENNSYLVANIA

SITE FUNCTION AND HISTORY

The Advanced Reactors Division was one of two divisions operating at the Westinghouse Electric Corporation's Cheswick, Pennsylvania, site (Figure 4). This facility was constructed to fabricate demonstration uranium-plutonium fuel and develop equipment and techniques for fabrication of advanced plutonium-bearing fuels and rod assemblies. The W-ARD portion of the facility supported DOE predecessor research on and production of fast breeder reactors. It operated in parts of buildings 7 (the Plutonium Laboratory) and 8 (the Advanced Fuels Laboratory). The other (Nuclear Fuels) division primarily worked on commercial projects involving development and fabrication of recycled light water reactor fuel. Overview of the decontamination of the facilities used by the Nuclear Fuels Division is the responsibility of NRC under the license program and is not addressed in this package.

The Plutonium Laboratory in building 7 was established in 1966 for process and fabrication development and characterization of mixed uranium-plutonium carbide fuel materials and fuel elements. Sodium-bonded fuel pins were fabricated under contract to the Atomic Energy Commission (AEC) from 1967 to 1969 for irradiation testing in the General Electric Test Reactor and in the Experimental Breeder Reactor-II (EBR-II).

In 1969, AEC began to phase out Government support of carbide fuel for the Liquid Metal Fast Breeder Reactor (LMFBR) applications and instead emphasized oxide fuel for the Fast Flux Test Facility (FFTF)

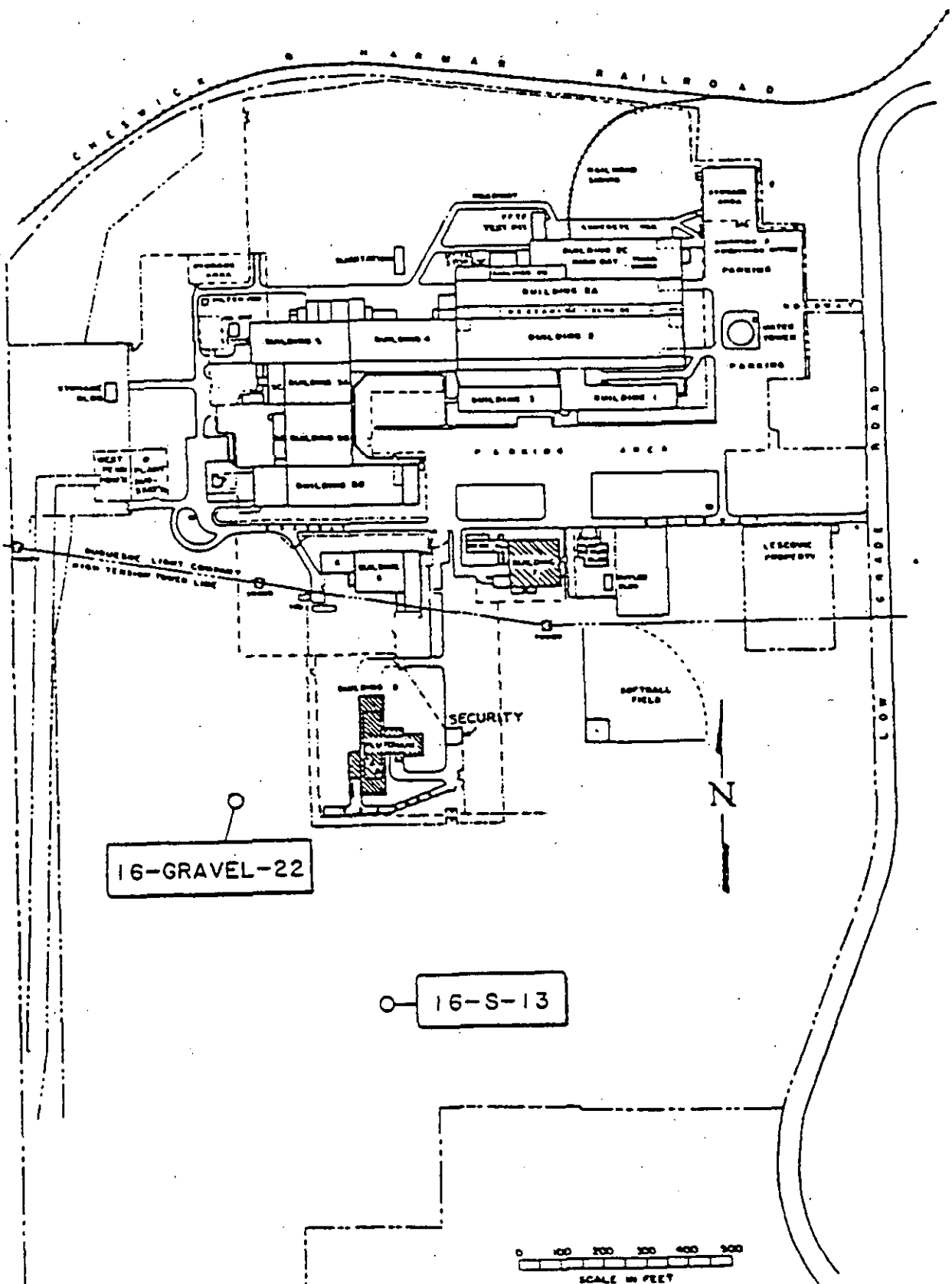


Figure 4. Overall Site Plan

and the Clinch River Breeder Reactor Plant (CRBRP). To support FFTF and CRBRP, an Oxide Fabrication Line was established in building 8. A significant number of uranium, plutonium oxide fuel assemblies were fabricated in this facility under AEC contracts from 1969 to 1973 for irradiation testing in EBR-II.

W-ARD became a participant in the LMFBR Advanced Fuels Program in 1974. Extensive facility modifications were made primarily in the Building 8 fabrication area to facilitate fabrication of the uranium, plutonium carbide material. Approximately 250 fuel pins containing uranium-plutonium carbide fuel were fabricated for testing in EBR-II from 1974 through 1979. Fabrication of an initial complement of pins for testing in the Fast Test Reactor (FTR) was also completed toward the end of this time period.

In addition, a separate fuel fabrication facility also had been established for fabricating blanket fuel rods. During the last two years of operation, sufficient blanket rods for five assemblies had been fabricated--two assemblies for testing in EBR-II, and three for testing in FTR.

Toward the end of 1979 W-ARD operations began focusing on the decontamination effort. Work to package fuel for shipment off-site and cleaning of the glove boxes was initiated. Gross decontamination and removal of glove boxes was completed in 1980 and the final survey work and decontamination was accomplished in September 1981.

OWNER HISTORY

The facilities located in Cheswick, Pennsylvania, are owned and operated by Westinghouse Electric Corporation.

RADIOLOGICAL HISTORY AND STATUS

During decontamination of W-ARD facilities, Westinghouse monitored the operation and conducted decontamination surveys to ensure that the site met applicable guidelines and standards. All wastes were disposed of at approved burial sites. The final site condition was documented in report DOE/ET/37247-1, published February 1982.

A post-remedial action verification survey was conducted by the ANL Radiological Survey Group in October 1981 after Westinghouse completed its decontamination and decommissioning efforts. Most measurements revealed near-background levels of radioactivity in the W-ARD facilities. Nine locations exhibited elevated levels, six in building 7 and three in building 8. Westinghouse performed additional decontamination on four of the locations prior to the departure of the survey team. ANL re-examined these spots and found them to be below appropriate limits. The remaining areas of elevated activity were: (1) exhaust ductwork in the Advanced Fuels Laboratory (building 8), (2) north wall of the Advanced Fuels Laboratory, (3) the floor drain system of the Plutonium Laboratory (building 7), (4) concrete slab and gravel below the shower room floor (building 7), and (5) soil east of building 7 along the fence.

Westinghouse attended to the two remaining elevated areas in building 8 during its decontamination of the Nuclear Fuels Division facilities. The exhaust system in building 8 was dismantled and disposed of as radioactive waste. All interior walls of building 8 (including the north wall of the Advanced Fuels Laboratory) were decontaminated, surveyed, and dismantled. These activities are documented in the June 1984 Westinghouse report. Oak Ridge Associated Universities (ORAU) performed a verification survey of building 8 in December 1983 and found all surfaces adequately decontaminated for unrestricted release. The building was subsequently demolished. ORAU conducted another survey of the exposed soil areas in May 1984 and found them acceptable for release.

In building 7, ANL found the drain lines were sufficiently contaminated to be unsuitable for release for unrestricted use. Radiochemical analysis of water and dirt/sludge samples collected from accessible low-bay, high-bay, shower room, and sodium laboratory drains revealed uranium concentrations as high as 4,000 micrograms per gram, total plutonium concentrations as high as 910 femtocuries per gram (fCi/g) and americium (^{241}Am) concentrations up to 110 fCi/g.

Cobalt (^{60}Co) contamination was found under the floor of the shower room and in soil corings along the fence east of the building. The highest concentration associated with the area under the shower room floor was 1.0 picocurie per gram (pCi/g), above background, but well within permissible limits for release. The maximum soil concentration along the fence was 279 pCi/g. The exposure rate in this location was 0.3 milliroentgen per hour. Both instances of the ^{60}Co contamination were attributed to activities conducted at building 9, which continues to be used to refurbish pumps from nuclear submarines. This activity was unrelated to the Advanced Reactors Division operations and, hence, cleanup would be the responsibility of another group. The contamination presents no hazard to occupants of building 7 and therefore does not affect the facility's suitability for release.

ANL also noted that the 5-10 centimeter (cm) profile of one soil coring taken west of building 8 indicated transuranic contamination (315 fCi/g total plutonium and 160 fCi/g ^{241}Am). While these levels are within acceptable limits, it was not possible to determine the extent or magnitude of the contamination from the ANL data. However, ORAU sampled the area thoroughly in May 1984. The highest total plutonium concentration found in composite samples of surface soil (0-15 cm) was 370 fCi/g. The highest ^{241}Am concentration was 970

fCi/g. These concentrations are within standards* The ORAU survey confirmed the presence of residual ⁶⁰Co contamination in a general area along the east fenceline of building 7.

In summary, the Office of Operational Safety, Environmental Protection Division's review indicates that the facilities utilized under contract to DOE and its predecessor agencies have been adequately decontaminated with the exception of the drain lines in building 7. The facilities are released with the requirement that health physics practices accompany any activity that disturbs the drain lines. If the drain system is removed, it is to be disposed of as radioactive waste.

*U.S. Department of Energy Interim Planning Guidelines and Criteria for Residual Radioactive Materials at Formerly Utilized Sites Remedial Action Program (FUSRAP) and Remote Surplus Facilities Management Program (SFMP) Sites, October 1984, draft.

DOCUMENTS ON THE RADIOLOGICAL CONDITION OF THE
WESTINGHOUSE ADVANCED REACTORS DIVISION
FUEL LABORATORIES
CHESWICK, PENNSYLVANIA

Adams, G.A., W.C. Bowen, P.M. Cromer, J.C. Cwynar, W.R. Jacoby, and H.G. Woodsum (Westinghouse Electric Corporation, Advanced Reactors Division), "Decontamination and Decommissioning," (DOE/ET/37247-1), February 1982.

This report describes the decontamination, decommissioning, and Westinghouse post-remedial action survey of the Advanced Reactors Division facilities in buildings 7 and 8.

Argonne National Laboratory, "Post-Remedial Action Radiological Survey of the Westinghouse Advanced Reactors Division Plutonium Fuel Laboratories, Cheswick, Pennsylvania, October 1-8, 1981," (DOE/EV-005/36 and ANL-OHS/HP-84-100), January 1984.

This report describes the results of a survey conducted to determine if any radioactive material contamination remained following the Westinghouse decontamination and decommissioning activities.

Zimmer, J.L. (Department of Energy), to P.A. Blevins (Westinghouse Electric Corporation), "Contract No. DE-AC02-80ET37247, Post-Remedial Action Radiological Survey of the Westinghouse Advanced Reactors Division Plutonium Fuel Laboratories, Cheswick, Pennsylvania," letter dated April 26, 1984.

This letter offers recommendations for qualifying the Westinghouse facilities to be released for unrestricted use.

Stafford, M.W. (Oak Ridge Associated Universities), "Confirmatory Radiological Survey of the Plutonium Fuels Development Laboratory, Westinghouse Nuclear Fuel Division, Cheswick, Pennsylvania," May 1984.

This report presents the results of a confirmatory survey of building 8 conducted by Oak Ridge Associated Universities during December 1983.

Denero, J.V., R.A. Lange, M.L. Ray, J.L. Shoulders, and H.C. Woodsum (Westinghouse Electric Corporation, Nuclear Energy Systems), "Decontamination and Decommissioning of the Westinghouse Nuclear Fuel Facility at Cheswick, Pennsylvania," Vol. 1 and 2 for United States Department of Energy Contract No. DE-AC06-82RL10363," June 1984.

This document describes the decontamination and decommissioning of the Plutonium Fuel Development Laboratory (building 8). The facility and its operations, along with non-destructive assay techniques, the management of transuranic waste, and the equipment required for dismantling and packaging these wastes, are described. The construction and use of a sectioning facility for large contaminated items is also discussed, and the results of the radiological survey are summarized. Although most of the work described in this report pertains only to the Nuclear Fuels Division facilities, it does cover decommissioning of the duct work and north wall of the W-ARD Advanced Fuel Laboratory that remained problems at the end of the ANL survey in 1981.

Boerner, A.J. (Oak Ridge Associated Universities), "Confirmatory Radiological Surveys of Building 10 and Outside Areas Associated with Buildings 7 and 8, Westinghouse Nuclear Fuel Division, Cheswick, Pennsylvania," November 1984.

This report presents the results of confirmatory radiological surveys of building 10, a small section of building 7, and outside areas associated with buildings 7 and 8.