
EXECUTIVE SUMMARY

Purpose of This Report

The Annual Site Environmental Report for the West Valley Demonstration Project (WVDP or Project) is published to provide information about environmental conditions at the WVDP to members of the public living near the site and to other interested stakeholders. The WVDP is located in western New York State, about 30 miles (50 km) south of Buffalo, within the New York State-owned Western New York Nuclear Service Center. In accordance with U.S. Department of Energy (DOE) Order 231.1A, "Environment, Safety, and Health Reporting," this report summarizes calendar year (CY) 2004 environmental monitoring data so as to describe the performance of the WVDP's environmental management system (EMS), confirm compliance with standards and regulations, and highlight important programs. Activities at the WVDP are being conducted in conjunction with the New York State Energy Research and Development Authority.

Major Site Programs

The WVDP is located on the site of a former commercial nuclear fuel reprocessing plant, which was shut down in 1976. In 1980, Public Law 96-368 (the WVDP Act) was passed. This Act authorized the DOE to demonstrate a method for so-

lidifying 600,000 gallons (2.3 million liters) of liquid high-level radioactive waste (HLW) that remained at the West Valley site. Vitrification of the HLW, begun in 1996, was completed in September 2002. Activities for decontaminating the vitrification and support facilities and for disposing of wastes were then initiated and continued through CY 2004. Major activities that occurred in 2004 were as follows.

Operation of the Remote-Handled Waste Facility (RHWF). Construction of the RHWF, a facility used to prepare higher-activity wastes for shipment and disposal, was completed in early 2004. Extensive start-up/readiness reviews were performed to assess readiness to begin radioactive operations. In June 2004 the facility began processing radioactive waste.

Decontamination of Facilities. Decontamination of three major cells in the main plant (the process mechanical cell, the general purpose cell, and extraction cell 2), including removal of equipment, vessels, and process piping, was completed in

A reader opinion survey has been inserted in this report. If it is missing, please contact the Community Relations Department at (716) 942-2152. Additional Project information is available on the internet at <http://www.wv.doe.gov>.

2004. Major vessels were removed from the vitrification cell and packaged in secure containers. Decontamination activities in the vitrification cell continue.

Waste Management. Management of HLW, transuranic waste, mixed waste (i.e., waste that is both hazardous and radioactive), low-level radioactive waste (LLW), hazardous waste, and non-hazardous regulated waste continued to be a priority at the WVDP in 2004. Processing of LLW continued, and sodium-bearing waste originally from the waste tank farm and stored in the main process plant was solidified with cement into 17 containers that are currently stored on site.

In preparation for future waste shipments by rail, the on-site railroad spur was repaired in the summer of 2004.

No mixed or hazardous waste was shipped in 2004, however, 104,427 cubic feet (about 3,000 cubic meters) of LLW were sent off site. Approximately 20 tons (18 metric tons) of nonradioactive, non-hazardous material were sent off site to solid waste management facilities in 2004. Of this amount, about one ton was recycled. The WVDP also shipped 1,070 tons (971 metric tons) of digested sludge and treated wastewater from the site sanitary and industrial wastewater treatment facility to the Buffalo Sewer Authority for disposal.

In 2004, as part of the site's EMS, the WVDP continued a long-term waste minimization and pollution prevention program to promote affirmative procurement and minimize the generation of LLW, mixed waste, hazardous waste, industrial waste, and sanitary waste.

Preparation for Eventual Site Closure. In 2004, preparation of the Decommissioning and/or Long-Term Stewardship Environmental Impact Statement continued. To reduce the site "footprint,"

several temporary office trailers and other structures that were no longer needed were dismantled and moved off site.

Environmental Monitoring. As part of the EMS, the WVDP continued to monitor the environment on and near the site to detect and evaluate changes in the environment resulting from Project (or pre-Project) activities and to assess the effect of any such changes on the environment or human population.

Key Initiatives

Environmental Performance Indicators. In 2004, the WVDP re-applied to the U.S. Environmental Protection Agency for continued membership in the National Environmental Performance Track program. The WVDP renewal request was accepted in December 2004. Three new commitments were established for the three-year period of CY 2004–2006: (1) elimination of halon 1301 from fire-suppression systems on site, (2) a 10% reduction in total energy usage, and (3) a 10% reduction in total radiological curies discharged in wastewater. The first commitment was completed in 2004. The other commitments are on track to be met during the three-year period.

Pollution Prevention/Waste Minimization Goals. In 2004, the WVDP continued its program of reducing and eliminating the amount of waste generated from site activities. Emphasis on good business practices, source reduction, and recycling continued to reduce the generation of LLW, mixed waste, hazardous waste, sanitary wastes, and industrial wastes (such as paper, glass, plastic, wood, and scrap metal). Waste minimization goals for 2004 in three of the above five waste categories (LLW, mixed, and hazardous) were met or exceeded. Although generation of both industrial waste and sanitary waste was reduced in 2004, target reductions from the 1993 baselines were

not met. (The industrial reduction target was 60%; actual reduction was 11%. The sanitary waste reduction target was 75%; actual reduction was 58%.)

Environmental Management System

The WVDP EMS satisfies the requirements of DOE Order 450.1, Environmental Protection Program. The WVDP EMS is an integral part of the WVDP Integrated Safety Management System. In 2004, the WVDP continued to demonstrate its commitment to an all-inclusive approach to safety, coordinating the EMS with other safety management and work planning processes through the integrated environmental, health, and safety management program.

Recognition and Awards. The DOE's Legacy of Stars Award was presented to the WVDP by the Voluntary Protection Program (VPP) Participants Association in 2004. The WVDP is the first (and only) site to receive the Legacy of Stars designation, which is given to sites in recognition of the continuance of three consecutive years as a Star of Excellence contractor. The Star of Excellence, the highest VPP award for safety, is awarded to sites that have full commitment to maintaining quality, safety, and health programs.

In 2004, the West Valley Nuclear Services Company was recognized by its parent company, Washington Group International, with a Safe Project of the Year Award. Both awards were given in a year that saw the WVDP achieve its best safety record in more than 20 years, reaching more than 2.5 million consecutive work hours without a lost time work injury or illness.

Compliance. Management at the WVDP continued to provide strong support for environmental compliance in 2004. DOE Orders and applicable

state and federal statutes and regulations are integrated into the Project's compliance program.

In CY 2004:

- no notices of violation or inspection findings from any environmental regulatory agencies were received by the WVDP.
- inspections by the New York State Department of Environmental Conservation and the local department of health verified Project compliance with the applicable environmental and health regulations.
- the WVDP continued to successfully monitor waste management areas at the site to comply with the Resource Conservation and Recovery Act §3008(h) Administrative Order on Consent.
- the Project met the requirements of the Emergency Planning and Community Right-to-Know Act by collecting information about hazardous materials used at the Project and making this information available to the local community.
- an updated New York State Pollutant Discharge Elimination System (SPDES) permit was received. The updated permit, which took effect on January 1, 2005, added 20 storm water monitoring points to the five effluent points already included in the permit. In May 2004, one exceedence of a permit limit occurred when total suspended solids exceeded the daily maximum limit.

Environmental Monitoring. As part of the EMS, the WVDP monitors on-site facilities and the surrounding environment. Radionuclides present at the WVDP are primarily residues from the reprocessing of commercial nuclear fuel during the 1960s and early 1970s. A very small fraction of these radionuclides is released off site during the year through ventilation systems and liquid dis-

charges. Potential pathways of exposure include inhalation of gases and particulates, ingestion of locally-grown food products, consumption of fish, beef, and venison, and exposure to external penetrating radiation emitted from contaminated materials. These exposure pathways are routinely monitored at the WVDP.

Radiological Releases. The primary source of airborne radionuclide emissions at the WVDP is the main stack of the process building.

The largest single source of waterborne radioactivity in effluents from the WVDP is lagoon 3, from which treated water is released in batches. Eight batches totaling approximately 15.0 million gallons (56.6 million liters) were released from the Project in 2004. Seepage of groundwater contaminated with strontium-90 from pre-Project operations across the north plateau in an elongated plume was another waterborne source of radioactivity in 2004.

Estimated Dose. In 2004, the estimated dose to a maximally exposed off-site individual (MEOSI) from airborne emissions at the WVDP was 0.0015 mrem (0.000015 mSv), about 0.02% of the 10 mrem EPA standard. Estimated dose from waterborne sources in 2004 was about 0.047 mrem (0.00047 mSv), with 0.016 mrem attributable to liquid effluent releases and 0.031 mrem attributable to the north plateau drainage.

Total estimated dose to the MEOSI from both airborne and waterborne sources in 2004 was 0.049 mrem (0.00049 mSv), about 0.05% of the annual 100 mrem DOE standard. In comparison, the typical dose to a member of the public from natural background sources is 295 mrem per year. Estimated dose to the population within a 50-mile (80-kilometer) radius of the WVDP from DOE activities in 2004 was 0.20 person-rem (0.002 person-Sv). This same population would have received

approximately 453,000 person-rem from natural background radiation in 2004.

Dose to Biota. An evaluation of dose to biota for CY 2004, as part of the WVDP environmental monitoring program, resulted in the conclusion that populations of aquatic and terrestrial biota (both plants and animals) are not being exposed to doses in excess of the existing DOE dose standard for aquatic animals and the recommended standards for terrestrial biota.

Nonradiological Releases. Nonradiological releases from Project waste water were measured under the site's SPDES permit. In 2004, one measurement for total suspended solids exceeded the maximum daily limit.

Groundwater Monitoring. Monitoring of groundwater at the WVDP continued in 2004, including evaluation of new wells installed around the RHWF. Also, monitoring of strontium-90 activity in and around the groundwater plume on the north plateau continued.

Quality Assurance. In 2004, the WVDP continued to implement a quality assurance program for activities supporting the environmental monitoring program. As part of this ongoing effort, on-site and subcontract laboratories that analyze environmental samples for the WVDP participated in independent performance evaluation studies for both radiological and nonradiological constituents. In these studies, test environmental samples with concentrations known by the testing agency, but unknown by the laboratory, are analyzed. Of 101 radiological performance evaluation samples analyzed by and for the WVDP, a total of 96% fell within acceptance limits. Of 80 nonradiological performance evaluation samples analyzed, about 98% were acceptable.

Several inspections, audits, and assessments of components of the environmental monitoring program were conducted in 2004. Although actions were recommended to improve the program, nothing was found that would compromise the quality of the data in this report or the environmental monitoring program in general.

Conclusion

In addition to demonstrating compliance with environmental regulations and directives, evaluation of data collected in 2004 continued to indicate that WVDP activities pose no threat to public health or safety or to the environment.

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