
ENVIRONMENTAL MANAGEMENT SYSTEM

Introduction

The vitrified high-level radioactive waste (HLW) presently stored at the Western New York Nuclear Service Center (WNYNSC) on the West Valley Demonstration Project (WVDP or Project) premises is the by-product of the reprocessing of spent nuclear fuel during the late 1960s and early 1970s. At that time, the WNYNSC was leased by Nuclear Fuel Services, Inc. (NFS) for a commercial nuclear fuel reprocessing facility.

As the WNYNSC is no longer an active nuclear fuel reprocessing facility, the environmental monitoring program at the WVDP focuses on measuring radioactivity and chemical constituents associated with the aged residual by-products of the former NFS operations, the Project's former HLW treatment operations, and the Project's operations for management of HLW, transuranic waste, and low-level radioactive waste (LLW).

Completion of Vitrification

HLW from NFS operations was originally stored in two of four underground tanks (tanks 8D-2 and 8D-4). Contents in the tanks were pretreated to remove sodium salts and sulfates and most of the radioactive cesium. Resulting liquid wastes were fixed into about 20,000 drums of cemented LLW

between 1988 and 1990 and stored on site in the drum cell. Vitrification of the HLW solids began in 1996 and continued through September 2002. (See the 2002 WVDP Annual Site Environmental Report [ASER] [West Valley Nuclear Services Company (WVNSCO) and URS, 2003] for a complete description of the vitrification process.)

Over the course of vitrification, more than 12.2 million cesium/strontium curies were transferred to the vitrification facility and 275 canisters were filled with radioactive glass. Two additional waste canisters were generated when the melter was evacuated. Canisters are in temporary storage in the main plant in a shielded cell and are being maintained until a disposal facility becomes available.

Environmental Management System

The WVDP environmental management system (EMS) satisfies the requirements of Department of Energy (DOE) Order 450.1, "Environmental Protection Program." (See the discussion of DOE Order 450.1 in the "Environmental Compliance Summary.") The EMS is also in compliance with the "Code of Environmental Management Principles" (CEMP) for federal agencies and International Organization for Standardization 14001, Environmental Management Systems: "Specifica-

tion for Guidance and Use,” which is being implemented worldwide. Following the principles and performance objectives of the CEMP helps to ensure that a federal facility’s environmental performance is proactive, flexible, cost-effective, and sustainable.

The Project’s EMS provides the basic policy and direction for work at the WVDP through procedures that support proactive management, environmental stewardship, and the integration of appropriate technologies throughout all aspects of work. The environmental monitoring program is an important component of the EMS and the accomplishment of its mission. EMS implementation is summarized in Table 1-1.

Integrated Safety Management System (ISMS) Implementation. A plan to integrate environmental, safety, and health (ES&H) management programs at the WVDP was developed and initiated in 1998. During this development, the EMS was identified as an integral part of the ISMS. Implementation of an ISMS at the WVDP was verified by the DOE Ohio Field Office in November 1998. Environmental subject matter experts participate in a sitewide work review group to review work plans, identify ES&H concerns, and specify practices that ensure work is performed safely.

WVNSCO continues to improve implementation of ISMS. In addition to document and process reviews, the 2006 ISMS annual assessment utilized an employee survey based on safety culture attributes contained in the ISMS draft manual. The survey results provided a starting point for worker management discussions that clarified prospective roles and responsibilities and worker involvement. Employees and management have taken actions to increase employee involvement in work planning.

In 2006, the DOE reviewed the WVDP’s ISMS. Although areas for improvement were noted, the

DOE team concluded that the WVDP ISMS is implemented and effective.

Occupational Safety and Environmental Training. The safety of personnel who are involved in industrial operations under DOE cognizance is protected by standards mandated by DOE Order 440.1A, “Worker Protection Management for DOE Federal and Contractor Employees,” which directs compliance with specific Occupational Safety and Health Act (OSHA) requirements. This act governs diverse occupational hazards.

Any person working at the WVDP who has a personal photo badge allowing unescorted access to administrative areas of the site receives general employee training that covers health and safety, emergency response, and environmental compliance issues. All visitors to the WVDP receive a site-specific briefing on safety and emergency procedures before being admitted to the site.

Hazardous waste operations and emergency response regulations require that employees at treatment, storage, and disposal facilities receive training appropriate to their job function and responsibilities. The WVDP environmental, health, and safety training matrix identifies the specific training requirements for such employees.

Training programs at the WVDP include, but are not limited to:

- 24-hour/40-hour hazardous waste operations
- emergency spill-response training
- decontamination techniques
- waste minimization and pollution prevention
- the WVDP environmental management program

Table 1-1
Elements of the Environmental Management System (EMS) at the WVDP

Environmental Policy	The environmental policy for the WVDP is to conduct all activities, including design, construction, testing, startup, commissioning, operation, maintenance, and decontamination and decommissioning in a manner appropriate to the nature, scale, and environmental impacts of these activities. The WVDP management is committed to full compliance with applicable federal and New York State laws and regulations for the protection of the environment, continual improvement, the prevention and/or minimization of pollution, and public outreach, including stakeholder involvement.
Environmental Aspects and Impacts	<p>When operations have an environmental aspect, WVNSCO implements the EMS to minimize or eliminate any adverse potential impact. The EMS is a prerequisite for the United States (U.S.) Environmental Protection Agency (EPA) National Environmental Performance Track awarded by the EPA to the WVDP. Using the EMS, WVDP employees evaluate operations, identify the aspects of operations that can impact the environment, and determine those impacts that are significant. The following operational aspects have been determined to have the potential to affect the environment:</p> <ul style="list-style-type: none"> • Waste generation and management • Atmospheric emissions • Liquid effluents • Storage or use of chemicals and radioactive materials • Natural resource usage - power and water consumption • Noise • Soil disturbance • Disturbances to endangered species/protected habitats • Contamination areas from historical operations • Facility operations, maintenance, and decontamination activities • Other facility-specific compliance aspects.
Legal and Other Requirements	WVNSCO has implemented an environmental regulatory review and assessment process to deliver WVDP-level requirements and guidance to all staff. New or revised requirements (e.g., new regulations) are analyzed to determine their applicability to the WVDP and to identify whether actions are required to achieve compliance. This may involve developing or revising WVDP documents or operating procedures, implementing administrative controls, providing training, installing engineered controls, or increasing monitoring.
Objectives and Targets	The performance-based management system is designed to develop, align, balance, and implement the strategic objectives for the WVDP, including environmental objectives. Objectives and targets are developed by calendar year (CY). For the three-year period of CY 2004–2006, WVNSCO defined three commitments under the EPA National Environmental Performance Track (P-Track). These commitments, and progress toward achieving the objectives, are presented in the Environmental Compliance Summary under "EPA National Environmental Performance Track."
Environmental Management Program	A pollution prevention program to conserve resources and minimize waste generation is implemented at the WVDP. The budgeting system is designed to ensure that priorities are balanced and that resources essential to the implementation and control of the EMS are provided.
Structure and Responsibility	All employees at the WVDP have specific roles and responsibilities in key areas, including environmental protection. Environmental and waste management technical support personnel assist the line organization with their environmental responsibilities.

Table 1-1 (concluded)
Elements of the Environmental Management System at the WVDP

Training, Awareness, and Competence	Training on EMS requirements has been provided to staff whose responsibilities include environmental protection. The training program includes general environmental awareness for all employees, regulatory compliance training for select staff, and specific courses for managers, internal assessors, EMS implementation teams, and operations personnel whose work can impact the environment.
Communication and Community Involvement	The WVDP representatives continue to improve processes for internal and external communications on environmental issues. Communications with the local community include monthly meetings with the local Citizen Task Force and meetings with the general public on a quarterly basis. Project information, including this entire ASER, is available on the internet at http://www.wv.doe.gov . Notable community involvement activities by the WVDP personnel in 2006 included participation in the United Way Day of Caring, and the mentoring program with local schools. (See “National Environmental Policy Act” in the Environmental Compliance Summary.)
EMS Documentation	Comprehensive, up-to-date environmental policies are written to describe the EMS. These procedures and manuals inform staff how to control processes and perform work at the WVDP in a manner that protects the environment.
Document Control	A comprehensive electronic document control system to ensure the effective management of procedural documents is maintained. When facilities require additional procedures to control their work, document-control protocols are implemented to ensure that workers have access to the current version of procedures.
Operational Control	Operations are evaluated for the adequacy of current controls to prevent impacts to the environment. As needed, additional administrative or engineered controls are identified and plans for upgrades and improvements are developed and implemented.
Emergency Preparedness and Response	An emergency preparedness and response program with specialized staff provides timely response to hazardous material releases or other environmental emergencies. This program includes procedures for preventing, as well as responding to, emergencies.
Monitoring and Measurement	Liquid effluent and air-emission monitoring helps ensure the effectiveness of controls, adherence to regulatory requirements, and timely identification and implementation of corrective measures. A comprehensive, sitewide environmental monitoring program is in place at the WVDP. Results are reported to regulatory agencies and summarized in this ASER. In addition, monitoring data are assessed for adverse trends to determine site performance, impacts from site conditions, and the need for proactive or corrective measures.
Nonconformance and Corrective and Preventive Actions	The WVDP employees continue to implement processes that identify and correct problems. This includes a lessons learned program to prevent recurrences, robust self-assessment and environmental assessment programs, and an electronic action tracking system.
Records	EMS-related records, including audit and training records, are maintained to ensure integrity, facilitate retrieval, and protect from loss.
EMS Audit	To periodically verify that the EMS is operating as intended, assessments are conducted by the DOE and its contractors. These assessments are designed to ensure that nonconformances are identified and addressed. In addition, compliance with regulatory requirements is verified through routine inspections, operational evaluations, and periodic assessments and self-assessments.
Management Review	In addition to audits, a management review process has been established to involve top management in the overall assessment of environmental performance, the EMS, and progress toward achieving environmental goals. This review also identifies, as necessary, the need for changes to and continual improvement of the EMS.

- radiation hazards and warnings
- dosimetry and respiratory protection
- medical emergency response training
- electrical safety and fire protection

Training programs have evolved into a comprehensive curriculum of knowledge and skills necessary to maintain the health and safety of employees and ensure the continued compliance of the WVDP with applicable regulations and requirements.

Safety-Trained Supervisor (STS) Program. In November 2003, WVNSCO initiated an STS certification program whereby employees complete an extensive program to become safety-certified. Certification and renewal requirements include at least 30 hours of safety-related training and successful completion of a certification exam. Standards, established by the Council on Certification of Health, Environmental, and Safety Technologists, ensure that certified individuals have a broad understanding of industrial safety. The benefits at the site include increased safety awareness among employees, an improved site safety culture, and increased confidence when dealing with safety and health matters during the planning and field phases of work. WVNSCO achieved its goal of 100 certified safety-trained supervisors in July of 2006.

10 Code of Federal Regulations (CFR) 851, "Worker Safety and Health Program." 10 CFR 851 is a new law that was issued by the DOE in February 2006 and became effective, implemented, and enforced at DOE sites in February 2007. This law establishes worker safety and health requirements that govern the conduct of DOE contractors at nuclear and non-nuclear sites. It applies to all contractors, workers, and their subcontractors who have a responsibility to perform work at a DOE site.

Similar to OSHA, the law requires that DOE contractors provide workers with a safe and healthful workplace that is free from recognized hazards that can cause death or serious physical harm. To accomplish this objective, the law establishes program requirements specific to management responsibilities, worker rights, hazard identification and prevention, safety and health standards, required training, recordkeeping, and reporting.

To ensure compliance, WVNSCO personnel have revised procedures and programs to comply with 10 CFR 851. Any modification, addition, or deletion that could invalidate a portion of the worker health and safety program requires approval by the DOE. The significant impacts to the workforce are: (1) WVNSCO is subject to inspection by the DOE and can be cited and fined for any violation, (2) fire protection inspection frequencies will increase to weekly or monthly from the current schedule, (3) the creation of WVDP-310, Addendum 1, "Worker Safety and Health Plan," describes how the WVDP complies with 10 CFR 851, (4) violations to 10 CFR 851 will be tracked.

Self-Assessments. Self-assessments continued to be conducted in 2006 to review the management and effectiveness of the WVDP environmental protection and monitoring programs. Results of these self-assessments are evaluated and corrective actions are tracked through to completion. Overall, self-assessments confirmed that the WVDP employees continued to implement quality requirements and, in some cases, improve the quality of the environmental protection and monitoring program. (See the "Environmental Compliance Summary" and Chapter 5, "Quality Assurance.")

National Environmental Performance Track. The WVDP has been recognized by the EPA as a charter member of the Performance Track (P-Track) Program for implementation of its EMS.



Performance Track is a partnership that recognizes top environmental performance among participating U.S. facilities of all types, sizes, and complexity, public and private. Program partners are providing leadership in many areas, including preventing pollution at its source. Currently, the program has about 400 members and welcomes all qualifying facilities.

The logo identifies those facilities that qualify for Achievement Track membership. Achievement Track facilities can participate in a peer exchange network to share experience, benchmark each other's performance, share information on successful practices and strategies, and receive recognition for their work at state and local levels. WVNSCO, in conjunction with the DOE, has applied for renewal for a three-year membership in this program for 2007–2009.

The site is currently completing its second round of environmental commitments. These commitments have resulted in the elimination of Halon 1303, the reduction of total energy usage by 25% from the 2003 baseline year, and an approximate 13% reduction in total curies released in wastewater discharges in 2006, as compared with the 2003 baseline.

Voluntary Protection Program (VPP) STAR Status. On May 5, 2000 the WVDP received VPP STAR status. This prestigious award was granted

in recognition of excellent worker safety and health programs at the WVDP. (See also the “Environmental Compliance Summary.”)

The WVDP was recertified in late July 2006 for VPP STAR status in recognition of an exemplary worker safety program. The WVDP continues to emphasize safety in the workplace as transitions in personnel, management, and work scopes create an atmosphere of uncertainty. The WVNSCO safety policy is to conduct its business at the WVDP in a manner that ensures the safety and well-being of employees and subcontractors. The goals are zero unsafe acts, injuries, occupational illnesses, unsafe conditions, environmental insults, or radiological contaminations. By the end of 2006, the Project’s workers had logged more than 4.5 million consecutive safe work hours over a period of more than four years. These safety records confirm the attention workers pay to completing tasks safely. On several occasions during 2006, a “safety time out” was taken to evaluate whether a course of action was safe.

Environmental Monitoring Program Overview

Human beings are exposed to radioactivity from site activities primarily through air, water, and food. All three pathways are monitored at the WVDP, but air and surface water pathways are the two primary means by which radioactive material can move off site. For detailed information about radiation and radioactivity, measurement of radioactivity, measurement of dose, and reporting of radiological data, see the “Useful Information” section later in this report.

Site geology (types of soil and bedrock), hydrology (location and flow of surface water and groundwater), and meteorology (wind speed, patterns, and direction) are all considered when evaluating potential exposure through the major pathways.

The on-site and off-site monitoring program at the WVDP includes measuring the concentration of alpha and beta radioactivity, conventionally referred to as “gross alpha” and “gross beta,” in air and water effluents. Measuring the total alpha and beta radioactivity from key locations produces a comprehensive picture of on-site and off-site levels of radioactivity from all sources. For a DOE site such as the WVDP, frequent updating and tracking of the overall radioactivity levels in effluents is an important tool in maintaining acceptable operations.

More-detailed measurements are also made for specific radionuclides. Strontium-90 and cesium-137 are measured because they have been previously detected in WVDP waste materials. Radiation from other important radionuclides, such as tritium or iodine-129, is not sufficiently energetic to be detected by gross measurement techniques, so these must be analyzed separately using methods with greater sensitivity. Heavy elements, such as uranium, plutonium, and americium, require special analysis because they exist in such low concentrations at the WVDP.

The radionuclides monitored at the Project are those that might produce relatively higher doses or that are most abundant in air and water effluents. Because man-made sources of radiation at the Project have been decaying for more than 35 years, the monitoring program does not routinely include short-lived radionuclides, that is, isotopes with a half-life of less than two years, which would be present at less than 1/1,000 of the original radioactivity levels. (See Appendix B⁶⁰ for the schedule of samples collected and radionuclides measured. See Table UI-1 in the “Useful Information” section for a listing of the half-lives of radionuclides measured in WVDP samples and related DOE protection standards. See also the discussion of the derived concentration guides [DCGs] in the “Useful Information” section, later in this report.)

The WVDP monitoring program includes nonradiological wastewater discharge and storm water monitoring for water quality and chemical constituents. Permit discharge limits, water quality standards, guidelines, maximum contaminant level goals, and soil cleanup criteria reference values are provided, where available, for comparison purposes. (See Appendix B⁶⁰ for the schedule of sample locations and analytical requirements, Chapter 3 for a discussion of nonradiological program information, and Appendices C⁶⁰ through G⁶⁰ for data presentations.)

Environmental Management of Aqueous Radioactive Waste. Water containing radioactive material from site process operations is collected and treated in the low-level waste treatment facility (LLWTF), which includes the LLW treatment building and associated holding lagoons. (Water from the sanitary sewer is managed in a separate, nonradiological system.)

Treated process water is held, sampled, and analyzed before its release through a New York State Pollutant Discharge Elimination System (SPDES)-permitted outfall. In 2006, about 10.4 million gallons (39.3 million liters) of water were treated in the LLWTF system and discharged through outfall 001, the lagoon 3 weir. Table 1-2 summarizes the estimated releases of radioactivity in the 2006 discharge waters, as compared to the previous 10-year average. (Also, see “Water Effluent and Ambient Surface Water Monitoring” in Chapter 2.) Note that releases of both tritium and gross alpha and beta activity were below the 10-year averages.

Table 1-2. 2006 Radioactivity Releases Versus 10-Year Averages^a

<i>Radionuclide</i>	<i>10-Year Average Curies</i>	<i>2006 Curies</i>	<i>% of 10-Year Average</i>
<i>Aqueous Discharge LLWTF</i>			
Tritium	0.23	0.050	22%
Gross Alpha and Beta	0.018	0.013	71%
<i>Airborne Discharge ANSTACK</i>			
<i>Gaseous</i>			
Tritium	0.035	0.0012	3.5%
Iodine-129	0.0018	0.000023	1.3%
<i>Particulate</i>			
Gross Alpha and Beta	0.00025	0.0000099	3.9%

^a All numbers were rounded to two significant digits after calculations were complete. Percentages based on the above total curie values may not exactly match those in the table.

North Plateau Groundwater Recovery System (NPGRS). The NPGRS operated throughout 2006, recovering groundwater from an area near the leading edge of the strontium-90 plume on the north plateau. Approximately 3.3 million gallons (12.5 million liters) were recovered during 2006. For a more-detailed discussion of the plume and the NPGRS, see “Northeast Swamp and North Swamp Drainage” in Chapter 2 and “Monitoring the Sand and Gravel Unit on the North Plateau” and “Additional Monitoring and Investigations” in Chapter 4.

Nuclear Regulatory Commission-Licensed Disposal Area (NDA) Interceptor Trench and Pretreatment System. Radioactively contaminated n-dodecane, in combination with tributyl phosphate (TBP), was discovered in groundwater at the northern boundary of the NDA in 1983, shortly after the DOE assumed control of the WVDP. To

contain subsurface migration of this radioactive organic mixture, an interceptor trench and liquid pre-treatment system (LPS) were installed.

As in previous years, n-dodecane/TBP contamination was not detected in the trench water; therefore no water was pre-treated by the LPS in 2006. Approximately 458,000 gallons (1,740,000 liters) of radiologically-contaminated water were transferred from the interceptor trench to the LLWTF during the year. Results of surface and groundwater monitoring in the vicinity of the trench are discussed in Chapter 2 under “South Plateau Surface Water and Nuclear Regulatory Commission (NRC)-Licensed Disposal Area (NDA) Interceptor Trench” and in Chapter 4 under “Monitoring on the South Plateau: Weathered Lavery Till and the NDA.”

Environmental Management of Airborne Radioactive Emissions. During operations, ventilated air from the various WVDP facilities is continuously sampled for radioactivity in gases and particulate matter. Ventilated air is monitored and an alarm is activated if particulate matter radioactivity increases above preset levels. Samples are analyzed in the laboratory for the specific radionuclides that are present in the radioactive materials being handled. (See “Air Emission and Ambient Air Monitoring” in Chapter 2.)

Ventilation air through facilities undergoing radioactive material cleanup passes through high-efficiency filters before being released to the atmosphere. The filters are generally more effective for particulate matter than for gaseous radioactivity. For this reason, facility air treatment tends to remove a lesser percentage of gaseous radioactivity (e.g., tritium and iodine-129) than radioactivity associated with particulate matter (e.g., strontium-90 and cesium-137). However, gaseous radionuclide emissions still remain so far below the most restrictive regulatory limits for public

safety that additional treatment technologies beyond those already provided are not necessary.

Table 1-2 shows the gaseous and particulate matter radioactivity emissions from the main plant in 2006 compared to averages from the previous 10-year period. These 2006 values are low in comparison with the 10-year average that includes several years when the vitrification system was operating.

Environmental Management of Radiation Exposure. Environmental radiation is measured with thermoluminescent dosimeters (TLDs) at on-site and off-site locations. (See Figs. A-12 through A-15 for the locations of on-site and off-site TLD monitoring points.) Although exposure rates at most on-site locations in 2006 were elevated with respect to background, results from perimeter TLDs that would be more representative of exposure to the public were statistically indistinguishable from background results. (See “Direct Environmental Radiation Monitoring” in Chapter 2.)

Changes in the 2006 Environmental Monitoring Program. Effective September 1, 2006, the New York State Department of Conservation (NYSDEC) issued a modified SPDES permit for control of discharges of treated process and sanitary wastewater and storm water. Minimum monitoring requirements for 17 chemical parameters at outfall 001 were reduced in collection frequency. The permit no longer specifies a pH limit for storm water runoff; the requirement was reduced to monitoring only. NYSDEC incorporated a policy change for the control of mercury that modified requirements to utilize only “ultra clean” EPA Method 1631 for low-level detection of total mercury for compliance monitoring and reporting. Consequently, units used to define the limits were changed from micrograms per liter ($\mu\text{g/L}$) to nanograms per liter (ng/L) (although the limits themselves were not changed). The measurement units

to express the enforcement discharge compliance limit for total mercury concentration was revised from 0.2 $\mu\text{g/L}$ to 200 ng/L at outfall WNSP001 and from 10 $\mu\text{g/L}$ to 10,000.0 ng/L at outfall WNSP01B.

2006 Activities at the WVDP

Significant components, initiatives, and accomplishments at the WVDP in 2006 are summarized below.

The Decommissioning, Decontamination, Dismantlement, and Demolition (D4) Project.

Four major D4 Project efforts in the main plant were completed in 2006. Systems and components within the processing building were identified, taken apart, packaged, and shipped off site for disposal. Some of the equipment had not operated in years, including equipment that was part of the original design when the plant was reprocessing nuclear fuel. Components removed included the old utility room boilers, the cement solidification system, the fuel receiving and storage decontamination station, and items from the former vitrification chemistry laboratory.

Environmental Assessment (EA). On September 14, 2006, the DOE finalized DOE/EA-1552, an assessment report, which evaluated the proposed decontamination, demolition, and removal of 36 unneeded facilities at the WVDP. These facilities are, or within the next four years will be, no longer required to safely monitor, maintain, or support future removal of the vitrified high-level radioactive waste, or the closure of other site facilities. Since the EA was issued, 11 WVDP structures have been taken out of service and removed. “Green space” on site has been increased and resources are being conserved as a result of no longer having to maintain the obsolete structures. (See the discussions of the EA and the Notice of Finding of No Significant Impact in the “National

Environmental Policy Act [NEPA]” section of the “Environmental Compliance Summary.”)

Waste Management and Shipping Activities.

In 2006, materials in a number of areas were sorted, consolidated, recycled, reused, or disposed. Demolition debris, excess items, and legacy radioactive and nonradioactive waste accounted for approximately 225,000 cubic feet (6,400 cubic meters) of waste eliminated from the WVDP. That amount, combined with the waste removed from the main plant, brought the total amount of LLW and industrial waste disposed in 2006 to about 400,000 cubic feet (11,300 cubic meters). (See Table ECS-3 for further breakdown of waste types.)

Since July 2001, the WVDP has been approved to ship LLW to the Nevada Test Site (NTS), a DOE facility. During calendar year 2006, 118 truck shipments of LLW were safely shipped off site to NTS or EnergySolutions for disposal. LLW shipping will continue during 2007.

Performance Measures

Performance measures can be used to evaluate effectiveness, efficiency, quality, timeliness, productivity, safety, or other areas that reflect achievements related to organization or process goals, and can be used as tools to identify the need to institute changes.

The performance measures applicable to operations conducted at the WVDP reflect process performance related to (1) the potential radiological dose received by the maximally exposed off-site individual (MEOSI), (2) wastewater treatment in the LLWTF, (3) the reduction in waste generation, and (4) the identification of spills and releases.

Radiation Doses to the Maximally Exposed Off-Site Individual. An important piece of information derived from environmental monitoring

program data is the potential radiological dose to an off-site individual from on-site activities. As an overall assessment of Project activities and the effectiveness of the as-low-as-reasonably-achievable concept, the low potential radiological dose to the MEOSI is an indicator of well-managed radiological operations. The effective dose equivalents for air effluent emissions, liquid effluent discharges, and other liquid releases (such as swamp drainage) from 1997 through 2006 are graphed on Figure 1-1. Note that the sum of these values is well below the DOE standard of 100 mrem per year. The consistently low effluent results indicate that radiological activities at the site are well-controlled. (See also Table 2-3 in Chapter 2, “Environmental Radiological Protection Program and Dose Assessment.”)

Improvements in Wastewater Treatment at the Low-Level Waste Treatment Facility.

Under the P-Track program, the WVDP committed to achieve reduction in the total annual radiological curies released in wastewater from the LLWTF by 10% with respect to a 2003 baseline over the three-year period from 2004 through 2006. After excellent performance in 2004, performance in 2005 declined to a level short of the goal, although well within DOE discharge requirements. A process improvement to the low-level radioactive wastewater process was identified and implemented in late 2005. Corrective actions included more rigorous system breakthrough monitoring, expedited response change-out of spent columns, and rehabilitation of treatment components. In 2006, the modifications identified by the process improvement supported achievement of the EPA Performance Track Goal, and resulted in a 13% reduction of curies discharged from outfall 001 with respect to the 2003 baseline.

SPDES Permit Limit Exceptions. Effective operation of the site wastewater treatment facilities is indicated by compliance with the applicable dis-

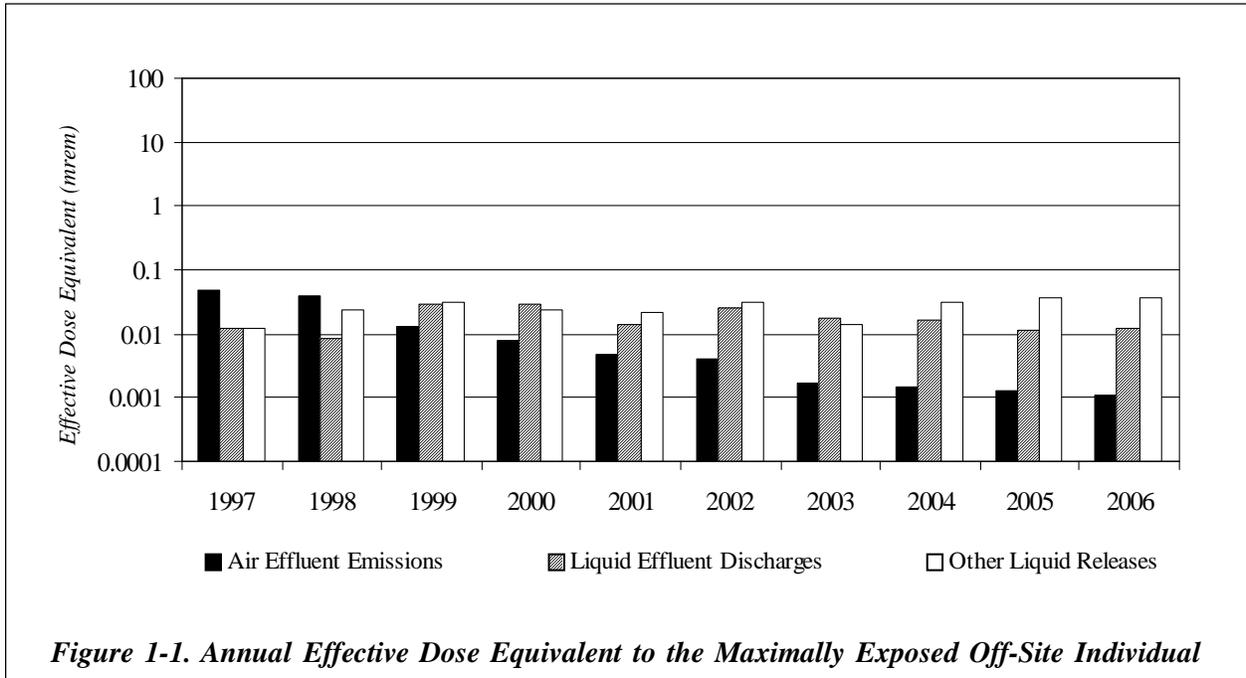


Figure 1-1. Annual Effective Dose Equivalent to the Maximally Exposed Off-Site Individual

charge permit limits. Approximately 60 chemical and water quality constituents are monitored regularly as part of the SPDES permit requirements. The analytical results are reported to NYSDEC via Discharge Monitoring Reports, required under the SPDES program.

Although the goal of the LLWTF and wastewater treatment facility operations is to maintain effluent water quality consistently within the permit requirements, occasionally SPDES permit limit exceptions do occur. SPDES permit limit exceptions are evaluated to determine their cause and to identify corrective measures.

There were no SPDES effluent limit exceptions during 2006. (See Fig. 1-2.) Historical limit exceptions are discussed in previous ASERs.

Although exceptions are not always related to operating deficiencies, cor-

rective actions may include improved operation or treatment techniques. In 1997, the DOE notified NYSDEC of the presence of mercury in the influent wastewater to the LLWTF and of its likely presence at outfall 001 at concentrations below the detectable level of 0.2 µg/L. In 2002, a modification to the SPDES permit required that samples being collected for measurement of mercury be analyzed in duplicate by EPA Method 245.1 (with

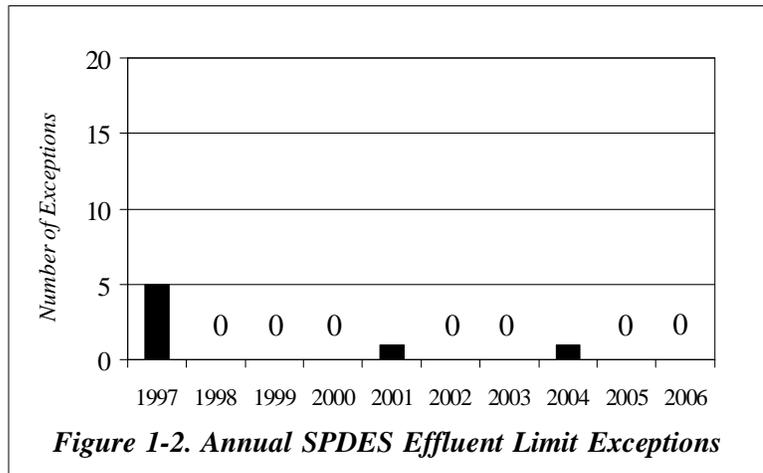


Figure 1-2. Annual SPDES Effluent Limit Exceptions

a practical quantitation limit of 0.2 µg/L) and by newer, more-sensitive “ultra-clean” EPA Method 1631 (with a minimum level of 0.5 ng/L, which is equivalent to 0.0005 µg/L). Results from both methods, which have been consistent with each other, have been reported to NYSDEC on a semiannual basis. (See “Mercury Analytical Method Study” in Chapter 3 for a discussion of this study.)

On September 1, 2006, NYSDEC issued a modified SPDES permit which replaced the requirement to perform mercury analysis using EPA Method 245.1 with a requirement to use the “ultra-clean” Method 1631 only and eliminated a requirement to report comparison results.

Waste Minimization and Pollution Prevention. The WVDP formalized a waste minimization program in 1991 to reduce the generation of LLW, mixed waste, hazardous waste, and industrial and sanitary waste (e.g., paper, plastic, wood, and scrap metal). This program is a comprehensive and continual effort to prevent or minimize pollution, with the overall goals of reducing health and safety risks, protecting the environment, and complying with all federal and state regulations. The program emphasizes good business practices, source reduction, and recycling. (See also the “Waste Minimization and Pollution Prevention” discussion under the “Resource Conservation and Recovery Act [RCRA]” section of the “Environmental Compliance Summary.”)

Hazardous waste and industrial waste volumes have been tracked separately for vitrification-related and nonvitrification-related waste streams since vitrification began in 1996.

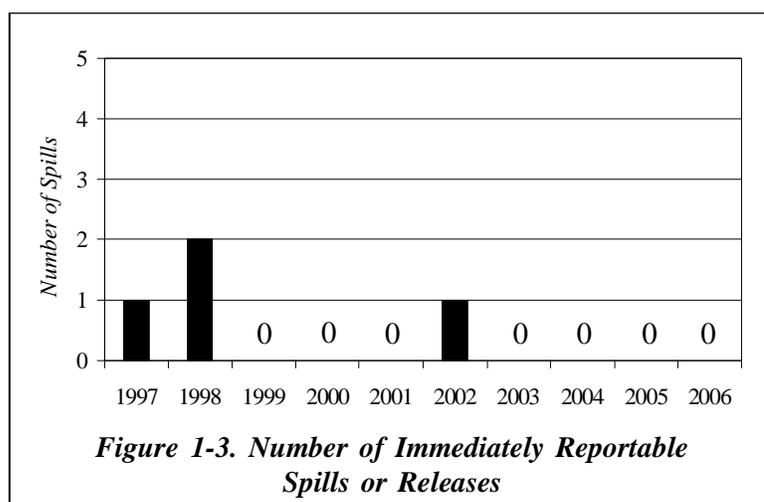
In 2006, WVNSCO continued its program of reducing and eliminat-

ing the amount of waste generated from site activities. The cumulative nonvitrification waste-recycling quantities for fiscal year 2006 are presented in Table ECS-5 in the “Environmental Compliance Summary.”

Pollution Prevention Awareness Program. The WVDP’s Pollution Prevention Awareness Program is a significant part of the Project’s waste minimization program. The plan establishes the strategic framework for integrating waste minimization and pollution prevention into waste generation and reduction activities, procuring recycled products, reusing existing products, and conserving energy. A main goal of the program is to make all employees aware of the importance of pollution prevention both at work and at home.

Spills and Releases. Chemical spills greater than the applicable reportable quantity must be reported immediately to NYSDEC, the National Response Center, and other agencies as required. There were no reportable chemical spills during 2006.

Petroleum spills greater than five gallons – or of any amount that travel to waters of the state – must be reported immediately to the NYSDEC spill hotline and entered into the WVDP’s quarterly log. There were no reportable petroleum spills



in 2006. Figure 1-3 shows immediately reportable spills from 1997 to 2006.

Prevention is the best means of protection against spills or releases of oil, chemicals, and hazardous substances. To this end, WVDP employees are trained to use equipment in accordance with standard operating procedures. Best management practices have been developed that identify potential spill sources and preventive measures that will reduce the likelihood of releases. Spill training, notification, and reporting policies have also been developed to emphasize the responsibility of each employee to report spills immediately upon discovery. First-line reporting helps to ensure that spills will be properly documented and mitigated in accordance with applicable regulations.

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