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 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, and resulting wastes were fixed into about 20,000 drums of cemented LLW between 1988 and 1990. Vitrification of the HLW 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. Two additional waste canisters were generated when the melter was evacuated. Canisters are in temporary storage in a shielded cell, the former chemical processing cell, in the main plant and are being maintained until a disposal facility becomes available.

Environmental Management System

The Project's "Environmental Management System" (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.

Table 1-1
Elements of the Environmental Management System 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 (NYS) 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	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: • 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.

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

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 refined three commitments under the EPA National Environmental Performance Track. These commitments, and progress toward achieving the objectives, are presented in Table ECS-3.
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.
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. (See "National Environmental Policy Act" in the Environmental Compliance Summary.) Notable community involvement activities by the WVDP personnel in 2005 included the Annual Food Drive, participation in the United Way Day of Caring, and the mentoring program with local schools.
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.

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

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 U.S. Department of Energy (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.

The WVDP EMS satisfies the requirements of 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: "Specification 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 WVDP has been renewed for membership in the EPA's National Environmental Performance Track program for implementation of this EMS. The most recent objectives were developed for the three-year period of 2004–2006. (See National Environmental Performance Track inset in this chapter.)

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. 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.

Implementation of an ISMS at the WVDP, including the EMS, was verified by the DOE Ohio Field Office in November 1998. The most recent self-assessment by WVNSCO, performed in November 2005, verified that the ISMS continues to be effectively implemented at the WVDP. An annual ISMS review by the DOE occurred in December 2005. The DOE specifically evaluated the integration of the EMS into the ISMS and confirmed results of the WVNSCO self-assessment.

National Environmental PerformanceTrack
U.S. Environmental Protection Agency

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. Applications are accepted twice a year: April 1–May 31 and September 1–October 31.

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. The WVDP was approved for renewal for a three-year membership in this program for 2004–2006.

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 requirements. This act governs diverse occupational hazards.

Any person working at the WVDP who has a personal photo badge 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
- 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.

Self-Assessments. Self-assessments continued to be conducted in 2005 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.")

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 has reaffirmed its commitment to DOE's VPP and was reviewed as part of the annual ISMS review. The DOE recommended recertification of the WVDP as a DOE-VPP Star site in 2005.

Employees of the WVDP reached 3.7 million safe work hours and three years without a lost-time work accident by the end of 2005. In recognition of this safety record, the WVDP was awarded the Washington Group President's Award for Safety for the third consecutive year.

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 ra-

diation 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 small concentrations in the WVDP environs.

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 30 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 B CD for the schedule of samples and radionuclides measured and Appendix K CD for a listing of the half-lives of radionuclides measured in WVDP samples and related DOE protection standards, such as the derived concentration guides [DCGs]. See also the discussion of 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 B CD for the schedule of sample locations and analytical requirements, Chapter 3 for a discussion of nonradiological program information, and Appendices C CD through G CD 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 system, which does not contain added radioactive material, is managed in a separate system.)

The treated process water is held, sampled, and analyzed before its release through a New York State Pollutant Discharge Elimination System (SPDES)-permitted outfall. In 2005, about 13.6 million gallons (51.4 million liters) of water were treated in the LLWTF system and discharged through outfall 001, the lagoon 3 weir. The total

2005 discharge waters contained the following estimated releases of radioactivity as compared to the previous 10-year average. (See "Overview of Water Effluent and Ambient Surface Water Monitoring" in Chapter 2.)

Table 1-2. 2005 Radioactivity Releases Versus 10-Year Averages

Radionuclide	10-Year Average Curies	2005 Curies	% of 10-Year Average
Aqueous Discharge LLWTF			
Tritium	0.36	0.063	17%
Gross Alpha and Beta	0.018	0.023	130%
Airborne Discharge ANSTACK			
Gaseous			
Tritium	0.038	0.0011	2.8%
Iodine-129	0.0018	0.000027	1.5%
Particulate			
Gross Alpha and Beta	0.00028	0.000041	14.5%

Note that although the 10-year average was exceeded by 30% at the LLWTF, the waterborne dose from all sources decreased slightly from 0.047 mrem in 2004 to 0.046 mrem in 2005 as shown in the 2004 ASER and in Chapter 2.

North Plateau Groundwater Recovery System (NPGRS). The NPGRS operated throughout 2005, recovering groundwater from an area near the leading edge of the strontium-90 plume on the north plateau. Approximately 4.1 million gallons (16 million liters) were recovered during 2005. For a more-detailed discussion of the plume and the NPGRS, see "Northeast Swamp and North Swamp Drainage" in Chapter 2 and "Sand and Gravel Unit on the North Plateau" and "Special Groundwater Activities" 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 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 pretreatment 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 2005. Approximately 401,000 gallons (1,520,000 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 NDA Interceptor Trench" and in Chapter 4 under "Results of Monitoring at the NDA."

Environmental Management of Airborne Radioactive Emissions. Ventilated air from the various WVDP facilities is continuously sampled during operations for particulate matter and for gaseous radioactivity. In addition to monitors that alarm if particulate matter radioactivity increases above preset levels, the sample media are analyzed in the laboratory for the specific radionuclides that are present in the radioactive materials being handled.

Air used to ventilate the facilities undergoing radioactive material cleanup is passed through filtration devices before being emitted to the atmosphere. These filtration devices 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 [as hydrogen tritium oxide] 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 limit 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 2005 compared to the previous 10-year averages. (See Chapter 2 for a discussion of iodine-129 emissions from the main plant stack.) As expected, these 2005 values are quite low in comparison with the 10-year average, which includes the entire duration of the vitrification system operation.

Environmental Management of Radiological 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 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 2005 Environmental Monitoring Program. As a result of a comprehensive, systematic evaluation, which included comparison of monitoring locations and parameter sampling durations and frequencies with those at other DOE and commercial sites and consideration for radiological risk reduction as site cleanup progresses, numerous modifications to the environmental monitoring program were made in 2005. Changes to analytical parameters, sample collection frequencies, and sampling locations were incorporated to maximize the program's efficiency and cost-effectiveness. In a few instances, sample collection frequency was reduced to biennial or triennial and therefore no data are available for 2005. These reductions include the nine off-site residential wells which will be sampled and analyzed biennially for indicator parameters. Also, the soil samples collected near the six off-site air sampling stations will be collected once every three years for radioisotopic analyses. In January 2005, the SPDES permit was modified by the New York State Department of Environmental Conservation (NYSDEC) to include requirements for monitoring storm water discharges. (See Appendix B for a detailed summary of the program changes and the sample points and parameters measured in 2005.)

2005 Activities at the WVDP

Significant components, initiatives, and accomplishments at the WVDP in 2005 are summarized below.

Vitrification Cell Dismantlement. Decontamination of the equipment in the vitrification cell began in 2004 and dismantlement activities were completed on July 31, 2005. This, the nation's first dismantlement of a vitrification system, was completed using totally remote equipment and methods to remove approximately 25,000 cubic feet of waste, package 240 containers with dismantled equipment and debris, and package and remove oversized equipment, including the 54-ton melter.

Remote-Handled Waste Facility (RHWF) Operation. Construction of the RHWF was completed in 2004, with the DOE authorizing the startup of radioactive processing in June 2004. In the RHWF, wastes were characterized, sorted, processed as necessary, and packaged to meet regulatory requirements for transportation off site for disposal. Remote mixed waste processing in the facility continued in 2005. A total of 39 containers holding approximately 3,250 cubic feet (92 cubic meters) of waste materials were processed by the end of the year, including four legacy waste boxes removed from the chemical process cell waste storage area.

Reduction of Infrastructure Footprint. Infrastructure reduction activities began in 2004 with the removal of several office and storage trailers. During 2005, the site's infrastructure capacity was significantly reduced, as employees were relocated to the Ashford Office Complex and a few consolidated areas on site. The equivalent of 115 trailer units were removed from service and dismantled or moved off site.

Low-Level Radioactive Waste Shipping Program. In 1997, the LLW shipping program was initiated to reduce the inventory of legacy and newly-generated waste stored on site. Most waste was sent to commercial disposal facilities until July 2001, when the WVDP was approved to ship LLW to the Nevada Test Site, a DOE facility. During calendar year (CY) 2005, 280 truck shipments and three rail shipments containing more than 300,000 cubic feet (8,500 cubic meters) were safely shipped for off-site disposal. LLW shipping will continue during 2006.

Reduction of Risks Associated With Radioactive Materials. In November 2005, the DOE approved the downgrade of the WVDP to a Category 3 nuclear facility, marking the first time in the site's history that it has been assigned the least of the three DOE nuclear facility designations. The categorization is based on the amounts, types, and configuration of nuclear materials at the site and their potential risks.

Criticality Control Zones (CCZs) were eliminated in September 2005 for all waste storage areas. The purpose of CCZs was to ensure that fissile materials were not stored in a configuration that could cause a potential criticality incident. A Nuclear Criticality Safety Evaluation was performed on 1,300 waste containers. Results of this evaluation demonstrated that the stringent storage requirements associated with CCZs were not necessary for the materials being stored.

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 a tool 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. One of the most important pieces 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 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 1996 through 2005 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.")

SPDES Permit Limit Exceptions. Effective operation of the site wastewater treatment facilities is indicated by compliance with the applicable discharge permit limits. Approximately 60 chemical and water quality constituents are monitored regu-

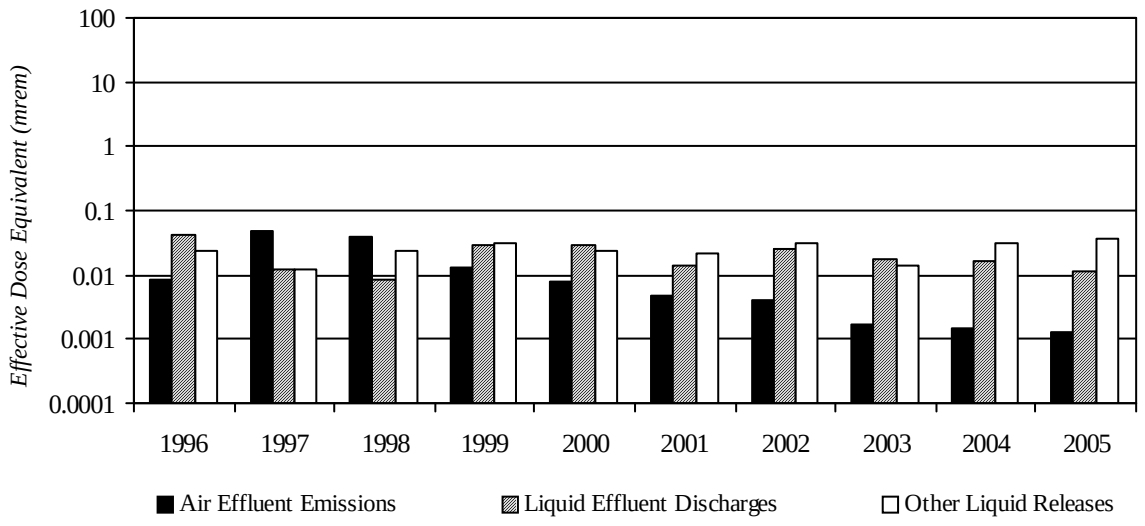

Figure 1-1. Annual Effective Dose Equivalent to the Maximally Exposed Off-Site Individual

larly 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. A Water Task Team, composed of WVDP personnel with expertise in wastewater engineering, treatment plant operations and process monitoring, and National Pollutant Discharge Elimination System/ SPDES permitting and compliance, was formed in 1995 to address the causes of these exceptions. All SPDES permit limit exceptions are evaluated to determine their cause and to identify corrective measures.

There were no SPDES-effluent limit exceptions during 2005. (See Fig. 1-2.) Historical limit exceptions are discussed in previous ASERs.

Although exceptions are not always related to operating deficiencies, corrective 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

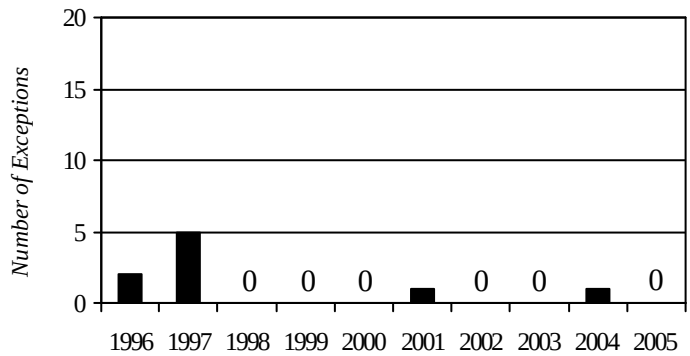

Figure 1-2. Annual SPDES Effluent Limit Exceptions

micrograms per liter (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 a method detection level of 0.2 µg/L) and by newer, more-sensitive EPA Method 1631E. Results of the comparison are reported to NYSDEC on a semi-annual basis. Results from EPA Method 1631E in CY 2005 were consistent with those from EPA Method 245.1. (See "Mercury Analytical Method Study," in Chapter 3 for a discussion of this study.)

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. This is done by placing emphasis on good business practices, source reduction, and recycling. (See also the "Waste Minimization and Pollution Prevention" section in 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 1999, the WVDP set cumulative waste-reduction goals for fiscal year (FY) 2000 and beyond, using quantities of routine waste generated in 1993 as a baseline. Since 2002, all WVDP pollution prevention goals are in alignment with the DOE's pollution prevention goals, which are based on the federal FY.

In 2005, WVNSCO continued its program of reducing and eliminating the amount of waste generated from site activities. The cumulative nonvitrification waste-reduction goals for FY 2005 are presented in Table ECS-3 in the "Environmental Compliance Summary." To demonstrate effectiveness of the waste minimization program, a graph of the percentage of waste reduction achieved above or below the annual goal for each category is presented on Figure 1-3 for CYs 1996 through 2005.

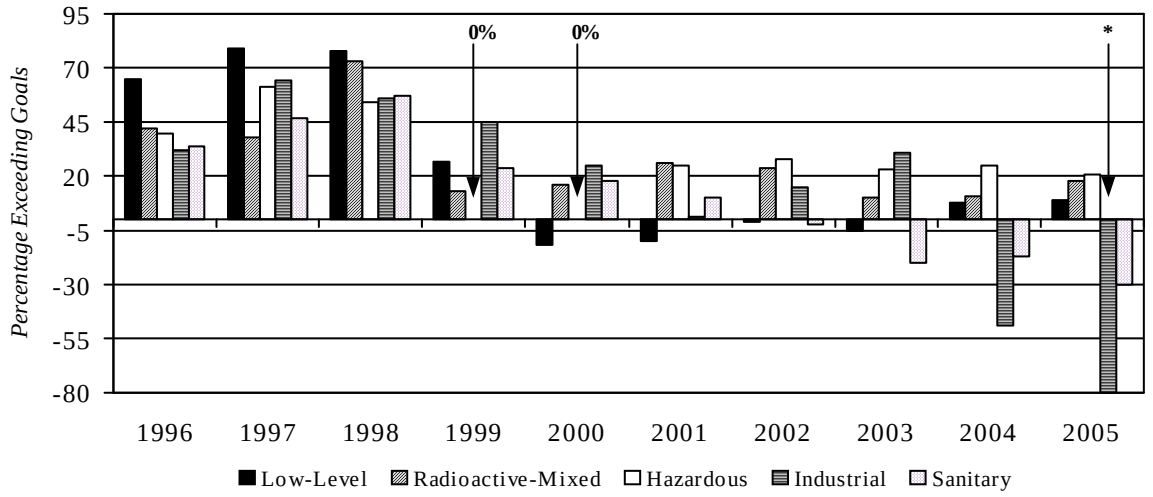

Figure 1-3. Percentage of Waste-Reduction-Exceeding Goals

* Increased industrial and sanitary waste generation was due to activities supporting site milestones for CY 2005 and infrastructure reduction.

All but two of the waste-reduction goals were exceeded in FY 2005. The generation of industrial and sanitary wastes (e.g., paper, glass, plastic, and wood) did not meet the goal due to activities in support of site closure milestones such as the infrastructure reduction activities, relocation of office employees, and efforts to eliminate unnecessary paper. (See Table ECS-3 for specifics of waste management at the WVDP.)

Pollution Prevention Awareness Program. The WVDP's Pollution Prevention (P2) Awareness Program is a significant part of the Project's waste minimization program. The goal of the program is to make all employees aware of the importance of pollution prevention both at work and at home.

A component of the P2 Awareness Program at the WVDP is the Pollution Prevention Coordinators group. This group communicates, shares, and publicizes prevention, reduction, reuse, and recycling information to all departments at the WVDP. The P2 Coordinators identify and facilitate the implementation of effective source reduction, reuse, recycling, and procurement of recycled products. The WVDP employs an incentive-based program (the Bright Ideas Program) to encourage waste stream reduction/elimination, energy savings, and affirmative procurement.

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 2005.

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 in the WVDP's quarterly log. There were no reportable petroleum spills in 2005. Figure 1-4 shows immediately reportable spills from 1996 to 2005.

Prevention is the best means of protection against oil, chemical, and hazardous substance spills or releases. WVDP employees are trained in applicable standard operating procedures for equipment that they use, and 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. This first-line reporting helps to ensure that spills will be properly documented and mitigated in accordance with applicable regulations.

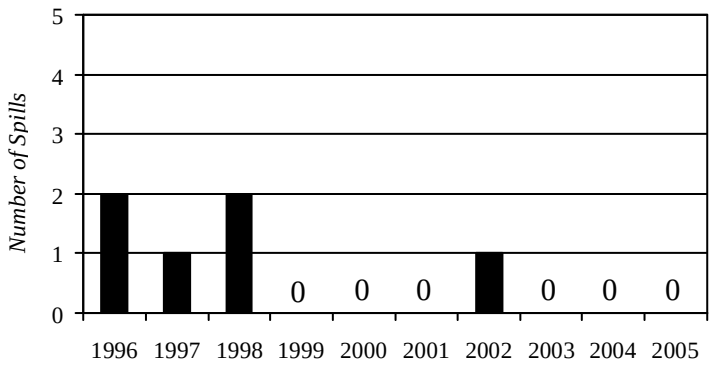

Figure 1-4. Number of Immediately Reportable Spills or Releases

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