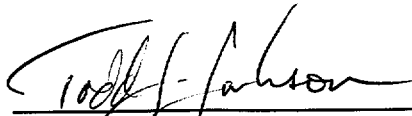
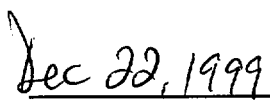
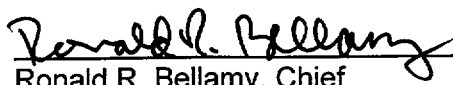
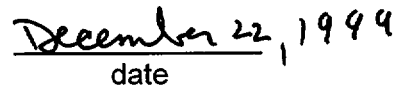


U.S. NUCLEAR REGULATORY COMMISSION  
REGION I

MONITORING REPORT

Report No. 99-03  
Site Visited: U.S. Department of Energy  
West Valley Demonstration Project  
Location: 10282 Rock Spring Road  
West Valley, NY 14171-0191  
Visit Dates: December 6 - 10, 1999

Monitor:   
Todd J. Jackson, CHP  
Health Physicist  
  
date

Approved By:   
Ronald R. Bellamy, Chief  
Decommissioning and Laboratory Branch  
Division of Nuclear Materials Safety  
  
date

## **EXECUTIVE SUMMARY**

US Department of Energy  
West Valley Demonstration Project  
NRC Monitoring Report No. 99-03

A routine monitoring visit was conducted December 6-10, 1999, to observe site operations and current project status at the West Valley Demonstration Project. Operational areas reviewed included recent site events, vitrification operations, high level waste tank operations, head end cell work, decommissioning projects, and radioactive waste management. As a result of this review, the monitor determined that the Department of Energy's contractor has established and maintained controls, processes, and programs which are adequate to protect public health and safety.

## REPORT DETAILS

### **I. Introduction**

This report documents the routine monitoring visit of December 1999 to observe site operations and current project status at the West Valley Demonstration Project (WVDP). The monitor observed activities in progress, held discussions with Department of Energy (DOE) and West Valley Nuclear Services (WVNS) personnel, and reviewed related documentation. DOE and WVNS personnel presented status briefings on site activities since the last monitoring visit in August 1999, with emphasis on the following:

- Organization Changes
- Recent Site Events (Reportable and Non-Reportable)
- High Level Radioactive Waste Operations
- Site Operations and Facility Closure Projects
- Radioactive Waste Management
- Spent Fuel Project
- Year 2000 Turnover Preparations

### **II. Organization Changes**

DOE and WVNS personnel described the staff and supervisory changes made in the organizations since August 1999. There were no changes among senior management in the West Valley DOE Office of the Director, or in WVNS.

### **III. Recent Site Events**

Documentation of recent operational and performance issues and events were reviewed by the monitor, with focus on the thoroughness and completeness of investigations and effectiveness of corrective actions. Events occurring since the last visit in August 1999 had limited consequences, were investigated to correct specific problem areas, and were documented for lessons-learned value. Details of selected recent events at the site were reviewed by the monitor.

#### Level Indication Lines Filled with Radioactive Liquid (OH-WV-WVNS-VFS-1999-0005)

This event occurred on August 10, 1999, while operators were trying to blow down the level/density probes for the Concentrator Feed Make-Up Tank (CFMT) in the Vitrification Facility (VF). As a result of operator actions, a vacuum was created in the steam supply line and high level radioactive waste (HLW) was drawn into the steam line. Radiation levels in the vicinity of the steam lines, in the lower west operating aisle of the VF, had immediately increased to general area exposure rates of about 500 mR/h and activated area radiation alarms. Steam line contact exposure rates reached 12 R/h. Personnel evacuated the VF quickly, and no personnel contamination or radiation exposure occurred.

DOE and WVNS convened independent investigation teams, both of which have completed their

reports and which were provided to the monitor for review. While there are some differences in the details of the two reports, they both conclude that the root cause of the event was the lack of rigorous application and enforcement by the High Level Waste Operations organization of the standards, policies, and administrative controls for the conduct of operations. Specific Conduct of Operations (ConOps) principles found to be inadequate included procedure adequacy and compliance, control of system status, shift turnover, and logkeeping. Contributing causes were also identified, and a total of 59 corrective actions determined to be necessary. Completion of the corrective action plan was actively in progress during this monitoring visit, and WVNS described the status of the corrective actions to the monitor.

A focus of the DOE investigation was on similarities between this event and the HLW event in the VF that occurred in November 1996. One of the DOE investigation conclusions following the August 1999 event was that the "long-term corrective actions following the November 1996 event in the area of procedural compliance had lost rigor over time". DOE and WVNS also noted that personnel practice had deviated from the applicable procedure and become routine, and that personnel had failed to identify the need to revise the procedure to reflect the practice. This observation was also valid at the time of the November 1996 event, and WVNS had devoted significant resources during the interim period to rectify that condition of procedure incorrectness. Understanding of the reasons for the recurrence of this discrepancy is key for preventing it in the future. The monitor noted some significant differences from the November 1996 event, including immediate application of corrective actions to all site operating organizations, not only Vitrification Operations. Additionally, the site self-assessment (SA) process is more complete and mature than it was in early 1997, and SA Program improvements are integral to the corrective actions for the most recent event.

On December 8, 1999, WVNS was informed that the DOE Office of Enforcement and Investigation (EH-10) issued a Preliminary Notice of Violation to WVNS for violations of nuclear safety requirements during the August 10, 1999 event. No civil penalty was assessed, and EH-10 expressed concern that multiple failures in formality of operations led to the event, and that many of the related deficiencies were known to exist prior to the event.

#### Loss of Site Telephone Communications (Critique CM 99023)

Site telephones were out of service for approximately eight hours on September 9, 1999, due to the failure of the primary power supply and subsequent failure of backup batteries for the system. Batteries did not perform as expected because of a related additional equipment failure. Maintenance testing of the equipment prior to the system failure had not indicated any problem, and early equipment trouble data from the system did not adequately indicate the nature of the problem, thereby leading to extended troubleshooting and premature depletion of the backup batteries before system repairs could be completed. System maintenance practices and component inventories were modified in response to this event, and future reliance on the automated features of the system to signal equipment trouble will be reduced. Followup to the event also identified improvements necessary for logkeeping in the Main Plant, which was addressed in conjunction with corrective actions taken in response to the August 10, 1999, VF event.

### Smoke in Vitrification Laboratory (Critique CM 99031)

On November 10, 1999, personnel in the Main Plant Vitrification (VIT) Lab evacuated the lab upon noticing smoke entering through ceiling panels. The Main Plant Operations Shift Supervisor made a site-wide pager announcement ordering an evacuation of the Main Plant, and site security notified the local fire department as required by procedure whenever there is an onsite report of a fire. After evacuating the Main Plant, it was determined that there was no fire, and the smoke had been caused by filter testing equipment in use in the Main Plant. Local fire department personnel responded to the site and confirmed the cause of the smoke to be polyalphaolefin (PAO) from the filter testing, and that there was no fire.

Subsequent investigation of the event determined that personnel error in set-up and use of the filter testing equipment had caused liquid PAO to contact hot surfaces on the equipment exterior, thereby generating the smoke that made its way into the VIT lab. Procedure revisions to clarify equipment set-up and additional staff training are planned by WVNS as part of the corrective actions in response to this event.

### Waste Transfer Made Without Proper Approvals and Fissile Material Analysis (OH-V-WVNS-LWTS-1999-03)

On September 20, 1999, a WVNS manager identified through logbook review that analytical results for a tank containing liquid with fissile material were not current before the tank was transferred into another partially filled tank. Representative sampling and analysis are required by procedure prior to transfer to assure no criticality can occur. Immediate corrective action was to sample the tank that received the liquid waste to assure no chance of criticality, which was demonstrated. Personnel indicated to the monitor that typically there is a low concentration of fissile material in the tanks involved and the procedures for criticality control are in place to assure that no problem develops. Corrective action, completed by October 29, 1999, was to revise the transfer procedure to eliminate ambiguity in the method to determine whether sample results are representative of the current tank contents prior to transfer.

## **IV. High-Level Waste Operations**

### Vitrification

The melter was feeding and pouring for a one-day period during this monitoring visit, and was shut down due to an equipment problem. Since the last monitoring visit in August 1999 the melter has been in idle for most of the time. WVNS efforts continued to focus on removing high level waste (HLW) heels from the HLW storage tanks. A total of 242 canisters of vitrified HLW have been filled, with about 11 million curies <sup>137</sup>Cs and <sup>90</sup>Sr transferred to date from tank 8D-2 to the concentrator feed makeup tank (CFMT). Radioactivity remaining in the tanks is shown in the following table, provided by WVNS:

Curies Remaining*	Tank 8D-1	Tank 8D-2	Combined Total
<sup>137</sup> Cs	317,000	187,000	504,000
<sup>90</sup> Sr	<5,000	62,000	~65,000
<b>Total</b>	~320,000	249,000	~570,000

\*As of November 5, 1999 (based on 1/1/96 activity estimate).

The Vitrification Expended Materials Processing (VEMP) system has been put into use to reduce the size of in-cell components that are expended and considered waste materials. Some of the components are highly contaminated with HLW, and others may be decontaminated for disposal. WVNS demonstrated the feasibility of decontamination through the processing and removal of a container of size-reduced materials from the Vitrification cell which had a contact exposure rate of 6 mR/h. This container is being stored as low level radwaste on-site. Additional expended material, currently stored in the Chemical Process Cell along with the filled canisters of vitrified HLW, will be moved back into the Vit cell for processing with VEMP.

## V. Site Operations and Facility Closure Projects

### Head-End Cells

Preparations were continuing to enable more extensive work in the head end cells, and had included refurbishment of the shield windows in the Process Mechanical Cell (PMC) and the General Purpose Cell (GPC). Windows being refurbished are those deemed necessary to use for viewing during the decontamination work, and those windows not considered necessary are being left as found. Windows have required refurbishment because they have become opaque without routine maintenance being performed in the years since plant shutdown.

Construction work has begun on the enclosure to support access into the PMC Crane Room, and included excavation for placement of a construction crane base pad adjacent to the Main Plant, with associated retaining walls for the crane pad foundation. Engineering design work has begun on the enclosure to support access into the General Crane Room (GCR). A mockup of the GCR was built to enable workers to practice assigned tasks before going into the GCR. Work in the GCR is complicated by the failure of the cell's 50-ton shield door in the partially opened position. When closed, the door provides shielding in the GCR from radiation in the GPC.

### Year 2000 Preparations

WVNS and DOE have been working to assure minimal problems associated with the turnover to year 2000 (known as the Y2K issue) on January 1, 2000. Mission-critical systems and computers have been checked and verified to be ready. Preparation activities have recently emphasized readiness in case there should be a loss of offsite electric power or other utilities. Staffing will be available during the transition in case of any contingencies, and the site will also be prepared by actions such as topping off of site fuel storage tanks.

## Other Projects

Four roofs were replaced during the 1999 season, continuing the roof replacement project begun several years ago to address increasing leaks. More than 51% of the site building roofs have been replaced so far in this project. Some of the roofs yet to be replaced include areas near the Main Plant exhaust stack and will present additional contamination challenges when they are replaced. The project will continue during the 2000 construction season.

Evaluation of structural problems was a continuing focus at the existing Buttermilk Creek railroad overpass culvert. Identified repair alternatives are being evaluated in order to make the culvert structurally sound. This repair work is important because the site rail line crosses over this culvert, and it must be in good condition to use the rail line for shipping spent fuel or waste from the site. Related work to upgrade the site rail spur was in progress, including removal of soil to expose the rails. The work to make the spur useable is expected to be completed in January, 2000.

## **VI. Waste, Fuel, and Environmental Projects**

### Radioactive Waste Management

Thirty six shipments of low-level radwaste were made in FY1999 through September 30, 1999, totaling 35,630 cubic feet. Replacement of the cloth cover-structure on the LSA-4 waste storage building with a more permanent metal structure had been completed ahead of schedule. The monitor observed ongoing construction of the shipping depot adjacent to LSA-4, which is expected to be completed in April 2000.

### Spent Fuel Project

The monitor observed ongoing work to refurbish the Fuel Receiving Structure (FRS) overhead crane in preparation for cask movements necessary to support future shipments of spent fuel from the site.

### Other Projects

Installation of the pilot permeable treatment wall on the north plateau had been successfully completed. The monitor observed the installation location, as well as the ongoing installation of monitoring wells to determine the effectiveness of the wall in removing <sup>90</sup>Sr from groundwater that flows through the treatment wall.

WVNS had awarded a contract for construction of the remote-handling waste facility. Plans call for the structure to be built over the next 3.5 year period, which will then enable handling and packaging of waste that cannot currently be handled in existing facilities.

The monitor reviewed WVNS methods for managing contaminated soil at the site, including WVDP-304, "Technical Basis for Contaminated Soil Management". The Soil Management Plan identifies radionuclide concentration guidelines that establish threshold values. Soil containing

less than the guideline concentration is acceptable to be returned to an on-site excavation, and soil greater than the guideline is segregated and disposed of as low-level radwaste.

## **VII. Exit Meeting**

The monitor presented the results of this visit to senior DOE management on December 9, and to WVNS management on December 10, 1999.



## PARTIAL LIST OF PERSONS CONTACTED

### Department of Energy, Ohio Field Office-West Valley Demonstration Project

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Bill Hamel, High Level Waste Projects Team Leader  
Ken O'Connor, Engineer

### West Valley Nuclear Services

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Karl Sanders, High-Level Waste Operations  
Joe Jablonski, Main Plant Operations Manager  
Mae Wright, Waste Management Services Manager  
Ken Schneider, Head End Cells Project Manager  
Robert Keel, Operations Support Manager  
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