**OAK RIDGE
NATIONAL
LABORATORY**

LOCKHEED MARTIN

LIQUID AND GASEOUS WASTE OPERATIONS SECTION

ANNUAL OPERATING REPORT

CY 1997

Date Published: March 1998

J. J. Maddox
C. B. Scott

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Prepared by
Oak Ridge National Laboratory
Oak Ridge, Tennessee 37831
managed by
Lockheed Martin Energy Research, Inc.
for the
Department of Energy
under Contract No. DE-AC05-96OR22464

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ACRONYMS

AHA	Activity Hazard Analysis
ALARA	As Low As Reasonably Achievable
BCP	Baseline Change Proposal
CAT	Collection and Transfer
CY	Calendar Year
DAS	Data Acquisition System
DCD	Document Change Directive
DCS	Distributed Control System
DMC	Documentation Management Center
DOE-ORO	Department of Energy - Oak Ridge Operations
FFA	Federal Facility Agreement
FPSC	Fixed Price Subcontractor
FY	Fiscal Year
gpm	Gallons per Minute
GPP	General Plant Project
HEPA	High Efficiency Particulate Air
HFIR	High Flux Isotope Reactor
HOG	Hot Off-Gas
I&C	Instrumentation and Controls
LCO	Laboratory Certification Official
LERC	Laboratory Emergency Response Center
LGWO	Liquid and Gaseous Waste Operations
LLW	Liquid Low-Level Waste
LMER	Lockheed Martin Energy Research, Inc.
LMES	Lockheed Martin Energy Systems, Inc.
LO/TO	Lockout/Tagout
MCS	Monitoring and Control Station
MV	Melton Valley
MVST-CI	Melton Valley Storage Tanks - Capacity Increase
NHF	New Hydrofracture Facility
ORNL	Oak Ridge National Laboratory
OTE	Out-of-Tank Evaporation
P&E	Plant and Equipment
PC	Personal Computer
PCB	Polychlorinated Biphenyls
PS	Pumping Station
PSET	Plant Safety Evaluation Team
PW	Process Waste
PWTP	Process Waste Treatment Plant
RCRA	Resource Conservation and Recovery Act
REDC	Radiochemical Engineering Development Center

ACRONYMS (continued)

RH	Remote-Handled
RSA	Readiness Self-Assessment
SARUP	Safety Analysis Report Update Program
SWSA	Solid Waste Storage Area
TRU	Transuranic
TSCA	Toxic Substance Control Act
TWRF	Transported Waste Receiving Facility
USQD	Unreviewed Safety Question Determination
WMRAD	Waste Management and Remedial Action Division
WOCC	Waste Operations Control Center

**LIQUID AND GASEOUS WASTE OPERATIONS (LGWO) SECTION
ANNUAL OPERATING REPORT
CALENDAR YEAR 1997**

1.0 OPERATING ACTIVITIES

1.1 PROCESS WASTE SYSTEM

A total of 7.39×10^7 gallons (gal) of liquid waste was decontaminated by the Process Waste Treatment Complex - Building 3544 (formerly known as the Process Waste Treatment Plant (PWTP)) ion exchange system during calendar year (CY) 1997. This averaged to 141 gpm throughout the year. When necessary, a wastewater side stream of 50-80 gallons per minute (gpm) was treated through the use of a natural zeolite treatment system. An additional 0.64×10^7 gal (average of 12 gpm throughout the year) were treated by the zeolite system. Therefore, the total flow treated at Building 3544 for CY 1997 was 8.04×10^7 gal (an average of 153 gpm). During the year, the regeneration of the ion exchange resins resulted in the generation of 4.78×10^3 gal of Liquid Low-Level Waste (LLLW). The head-end softening process (precipitation/clarification) generated 297 drums (2.18×10^3 ft³) of solid low-level waste sludge. The decrease in sludge generation was a result of the head-end softening process at Building 3544 being placed in standby in June 1997 and the operation being relocated to Building 3608 to provide increased treatment capacity. See Table 1 for a monthly summary of activities at Building 3544. Figure 1 shows a diagram of the Process Waste Collection and Transfer System and Figure 2 shows a diagram of the Building 3544 treatment process. Figures 3, 4 5, and 6 show a comparison of operations at Building 3544 in 1997 with previous years. Figure 7 shows a comparison of annual rainfall at Oak Ridge National Laboratory (ORNL) since 1992.

A total of 1.85×10^8 gal of liquid waste (average of 352 gpm throughout the year) was treated at the Process Waste Treatment Complex - Building 3608 (formerly known as the Nonradiological Wastewater Treatment Plant). Of this amount, 2.20×10^7 gal was treated by the precipitation/clarification process for removal of heavy metals. The large increase in volume processed for removal of heavy metals was due to the usage of nonmetals wastewater to test the precipitation/clarification process modification in early 1997 to allow for the relocation of the water softening process from Building 3544 to Building 3608. Thirty-eight boxes (3.65×10^3 ft³) of solid sludge generated by the precipitation/clarification process were removed from the filter press room. Building 3608 receives wastewater from Building 3544, the metals/nonmetals pumping station (collects wastewater from the 1505 and 2000 areas), the 190 pumping station (collects wastewater from the 4500 complex area), and the Melton Valley (MV) process waste collection tanks. Building 3608 removes particulates, heavy metals, and organics, as well as adjusts the pH of the wastewater, before discharge to White Oak Creek. In addition, the softening process (precipitation/clarification) for water requiring radiological treatment at Building 3544 is located at this facility. This new treatment process resulted in the large increase of solid sludge generated at the facility this year. See Table 2

for a monthly summary of activities at Building 3608. Figure 8 shows a diagram of the Building 3608 treatment process. Figures 9 and 10 show a comparison of operations at Building 3608 in 1997 with previous years.

1.2 LIQUID LOW-LEVEL WASTE (LLLW) SYSTEM

The A2 and 2A2 evaporator systems operated normally during the year. A total of 1.06×10^5 gal of LLLW was processed through the A2 evaporator system and 4.41×10^5 gal of LLLW was processed through the 2A2 evaporator system. There was 6.38×10^3 gal of concentrate transferred from the A2 system and 10.97×10^3 gal concentrate transferred from the 2A2 system to the waste storage tanks. Figure 11 shows a diagram of the LLLW Collection and Transfer System. See Table 3 for a monthly summary of activities at the evaporator systems. Figure 12 shows a graphical representation of the amount of concentrate presently stored at ORNL awaiting disposal. See Figure 13 (for a graphical comparison of the generation of LLLW at ORNL over the last five years) and Figures 14 through 29 for a comparison of the generation of LLLW by individual sources over the last five years.

1.3 GASEOUS WASTE SYSTEM

The gaseous waste system operated normally during the reporting period. Normal operations means that continuous ventilation service was provided to all customer facilities except during scheduled maintenance periods. A schematic of the Gaseous Waste System is shown in Figure 30.

2.0 UPGRADE ACTIVITIES

Several upgrade activities were underway during the year. Because many of the upgrades were to existing Liquid and Gaseous Waste Operations (LGWO) operating facilities, coordination between LGWO and construction personnel was a priority; with several LGWO technical staff personnel being involved in daily planning of construction coordination activities. Upgrades to Building 3544 and the 3039 Stack Ventilation System, which are operated 24 hours a day, 365 days per year, were completed with minimal outages of the treatment systems for tie-ins. A new LLLW collection facility for the Radiochemical Engineering Complex which met all of the Federal Facility Agreement requirements for the LLLW System was also placed in service by the scheduled date of September 30. Descriptions of the various construction activities are given in the following sections, with a month by month description of activities immediately following the project description.

Personnel continued efforts to maintain LGWO procedures as up-to-date, usable documents. Sixty-eight revisions were approved and issued during the year to existing LGWO procedures. Four new procedures were issued and three procedures were canceled. Nine document change directives were issued for LGWO procedures and an additional twenty-two procedures underwent their scheduled two-year review but did not require any revisions.

2.1 Process Waste (PW) System

2.1.1 PWTP Upgrades Line Item (Capacity Increase phase)

The PWTP Upgrades Line Item was a reforecast line item that was a compilation of several General Plant Projects (GPP) that had been identified at Building 3544. This project is being performed in several phases, with the final major activities having been performed during the calendar year.

System functional testing was completed with the support of Chemical Technology Division personnel to optimize the water-softening process. The work at Buildings 3544 and 3608 involved installation of a new valve box and piping from the south parking lot at Building 3608 to Building 3544 as well as modifications to the existing water-softening process (including the installation of new tanks and pumps) by having the water-softening process being moved to the spare clarifier at Building 3608 and having the softened water then transferred back to Building 3544 for treatment through the ion-exchange system. The modifications were placed in service in June 1997. Personnel completed this line item with only minor impacts to treatment operations due to the coordination provided by LGWO personnel.

January

Continued preparation of the revised procedures and issued them for review and walkdown by operations personnel. Continued with functional testing at Building 3608. Testing activities would continue for the next several weeks. Completed the functional testing of the J-1051B ferric sulfate pump after P&E personnel repaired the pump. Testing of the J-1051A ferric sulfate pump would resume upon repair of the cracked pump head. Testing was initiated on the F-1006 Clarifier system at Building 3608. Initial runs revealed that the polymer tubing had not been properly connected by construction personnel. P&E corrected the connections and preoperational testing of the clarifier was underway. Initial sample results indicate insufficient softening taking place in F-1006. Further lab work was underway to verify process chemistry.

February

Functional testing at Building 3608 resumed utilizing metals wastewater after the ferric sulfate addition system was repaired. Revised operating procedures were completed and issued approved. One Document Change Directive for operations at Building 3544 was completed and issued approved. Chemical Technology personnel believed they had identified the cause of the high hardness numbers encountered during earlier tests and were consistently achieving single digit parts per million numbers in the jar tests. An addendum to the testing procedure was issued to allow personnel to use process wastewater in the functional testing. Completion of the operating procedures allowed work to begin on the development of required reading and appropriate training modules.

March

Functional testing at Building 3608 continued utilizing metals wastewater. Problems continued with plugging of the F-1006 to F-1070 sludge recycle line. Additional pressure indicators were installed in an attempt to further isolate the problem area. Preoperational testing with process wastewater would not proceed until problems with the sludge recycle line were resolved. Testing with process wastewater would introduce low levels of radioactive contamination to the sludge recycle system, greatly increasing the difficulty and cost of repairs/modifications. All but one operating procedure modification was completed and work was initiated on the development of training modules. The one remaining operating procedure could not be finished until after the completion of preoperational testing.

April

Functional testing at Building 3608 continued, with personnel completing the first phase of testing utilizing metals wastewater and began testing utilizing process wastewater. Preoperational testing with process wastewater began after problems with the sludge recycle line were resolved. Testing with process wastewater introduced low levels of radioactive

contamination to the sludge recycle system. The final operating procedures for operations was approved during the month (WM-LGWO-604.2.12).

May

The final phase of preoperational testing utilizing process wastewater continued, with personnel conducting several tests to determine the proper chemistry for optimum water softening. Personnel placed the L-1 clarifier at Building 3544 into standby and began bypassing it with the wastewater being softened at Building 3608. Issued a revision to one 3608 procedure.

June

The final phase of preoperational testing utilizing process wastewater continued. Supported the Readiness Self-Assessment (RSA) for this project by issuing letters to document completion of operational items; and by writing up a summary of the project and testing to include in the RSA. Also worked to enter the new equipments' vending literature into the LGWO file room.

July

LGWO personnel met with Tennessee Department of Environment and Conservation to begin their review of the project prior to completion of the test phase. Testing activities were wrapping up with the preparation of the final testing report. Also worked to enter the new equipments' vending literature into the LGWO file room.

August

Testing activities were wrapping up with the preparation of the final testing report. Readiness Self Assessment Activities and the independent review of the evidence file were completed.

September

Final approval to start operations was received from the Tennessee Department of the Environment and Conservation, and all Readiness Self Assessment Activities were completed. This phase of the project provided an increase in the treatment capacity at Building 3544 by using the higher capacity spare clarifier at Building 3608 for the water softening operation that had been done at Building 3544 and then transferring the softened effluent to Building 3544 for treatment in the existing ion-exchange system. Completion of these activities marked the completion of this FY 1991 line item project.

2.1.2 Miscellaneous

January

Upgrade Sanitary Sewer System Line Item - Construction activities on the Upgrade Sanitary Sewer System Project line item were completed. Transmitted project completion documentation to Department of Energy - Oak Ridge Operations (DOE-ORO) personnel.

February

2600 Area Grating - Riggers and iron workers began work at Building 2600 replacing the existing grating with new galvanized grating. This project was being performed from expense funds and was done as general maintenance of the 2600 area. Additional benefits of using the new galvanized grating included: eliminating the future need to paint the grating; providing a surface that is less likely to form crud collection areas, and provide for a more aesthetical area.

March

2600 Area Grating - Riggers and iron workers completed replacing the existing grating with new galvanized grating at Building 2600.

Met with Engineering personnel to discuss plans to upgrade the radiation monitor in the ion-exchange column room at Building 3544. This radiation monitor is used to monitor the treated effluent from the ion-exchange columns. The current system is over twenty years old and has been problematic. A cost/benefit analysis determined the system should not be replaced. The existing system will be removed.

October

Attended two meetings to review the current Reengineering activities associated with relocation of the radioactive waste treatment operations from Building 3544 to Building 3608. Design considerations of the proposed zeolite addition at Building 3608 were considered in a meeting with Engineering and Chem Tech personnel to compile information for the initiation of a feasibility study which will determine how to best combine the treatment functions of Buildings 3544 and 3608 at Building 3608.

November

Attended four meetings with Engineering personnel and kicked off a study of a proposed upgrade to the Process Waste Treatment Complex. This study is evaluating the cost and feasibility of replacing carbon in two of the Granular Activated Carbon columns at Building 3608 with zeolite resin. This would allow for treatment of radioactive constituents at

Building 3608; thus eliminating the necessity of operations at Building 3544. Engineering personnel were also given a tour of Building 3608 to support this study.

December

Began tie-in of the new steam turbine-driven pump at the Influent Pumping Station (F-4001) to the Process Waste Collection and Transfer System. This new pump will allow personnel to continue transferring process wastewater from Bethel Valley operations to the Process Waste Storage Tanks (Building 2600) in the event of a total electrical power outage (normal and diesel generator backup).

Reviewed and provided comments to engineering personnel on a cost estimate for installing a zeolite system in Building 3608. Attended a meeting later in the month to discuss potential options for reengineering activities. This is in support of the Re-engineering effort at ORNL.

Reviewed and commented on a liquid waste management flow sheet for Chem Tech personnel.

2.2 Liquid Low-Level Waste System

2.2.1 Bethel Valley LLLW Collection and Transfer (CAT) Line Item (Building 2649)

The Transported Waste Receiving Facility (TWRF, Building 2649) which provides a double-contained facility to empty transported LLLW waste containers (both tankers and LLLW bottle packages) to a new collection tank, and also provided a new transfer system to the LLLW Central Waste Collection Header, was declared operational in late December 1997 after undergoing the Lockheed Martin Energy Research (LMER) and DOE-ORO readiness review process throughout the year. Building 2649 was constructed to provide a facility for unloading transported LLLW packages that meets the requirements of the Federal Facility Agreement (FFA) for the LLLW System.

January

LGWO personnel assumed Facility Manager responsibilities for Building 2649 on January 15. LGWO personnel supported the independent readiness assessment team reviewing Building 2649 operations in preparation for its being declared operational. The team was scheduled to issue its report to the Waste Management and Remedial Action Division (WMRAD) Director by February 7, 1997. The readiness assessment by DOE-ORO personnel would be held soon after this report was issued. Team activities during the month included several interviews of LGWO personnel and a demonstration of the Bottle Evacuation and Decontamination Assembly system.

February

Supported the independent readiness assessment team reviewing Building 2649 operations in preparation for its being declared operational. The team issued its report to the WMRAD Director on February 7. No prestart findings and only one post start finding was identified in the report. The readiness assessment by DOE-ORO personnel was to be held soon after this report was issued. Team activities included several interviews of LGWO personnel and a demonstration of the LLLW Tanker unloading system.

March

DOE-ORO approved the Plan Of Action for the TWRF. The line management readiness review and the independent readiness review were completed. A request was submitted by DOE-ORO personnel to DOE headquarters personnel requesting an exemption from several of the DOE responsibilities for a full-scale operational readiness review. At the end of the month LGWO personnel were waiting on a schedule of activities from DOE-ORO personnel for their review.

April

Received notification that DOE-ORO had approved the *Operational Readiness Review Plan of Action for the Oak Ridge National Laboratory Transported Waste Receiving Facility: Building 2649*.

May

Provided a walk-thru of the facility to DOE-ORO personnel who will be participating in this summer's Readiness Review for start-up of this facility.

June

Began preparations for the DOE-ORO Operational Readiness Review Team to begin activities in early July.

July

Participated in the DOE-ORO Readiness Review of Building 2649 and the LR-56 LLLW Tanker. Personnel provided several demonstrations and walked down large portions of the facility for DOE personnel. Provided information to DOE-ORO personnel on radiological protection at Building 2649 and began review of the draft findings and observations generated by the DOE-ORO review. At the end of the review LGWO personnel met with DOE-ORO representatives to discuss the draft findings and observations generated by the DOE-ORO review. LGWO personnel continued activities to address the draft findings and

observations so that closure of the findings can be completed in the near future. Personnel completed a video inspection of the pipe trench in an effort to determine whether liquid that was recently detected in the pipe trench was due to condensation or a leak from the piping system. No evidence of leakage from the piping system was detected.

August

Continued participation with the DOE-ORO Readiness Review (step 3) of Building 2649 and the LR-56 LLLW Tanker. Transmitted a response to the findings and observations generated by the DOE-ORO review. After these findings were closed the DOE-ORO Independent Team began performing the fourth step of the Operational Readiness Review process. LGWO personnel provided several demonstrations of operations at Building 2649 and spent considerable time coordinating interviews of LGWO and support personnel. After the one-week review, LGWO personnel began work resolving the draft findings identified during the step 4 review. Several of the prestart findings required LGWO personnel to work with site program personnel for resolution.

September

Continued participation with the DOE-ORO Readiness Review of Building 2649 and the LR-56 LLLW Tanker. The DOE-ORO Independent Team is performing the fourth step of the Operational Readiness Review process. Efforts to close the pre-start findings continued, including performing a root cause analysis of the findings. Received the approved Fire Hazards Analysis for the facility and performed an Unreviewed Safety Question Determination (USQD) Screening to revise portions of the Safety Analysis Report to reflect changes in the Waste Acceptance Criteria which was revised. Presented the objective evidence for several of the findings to DOE-ORO. Closure of one finding was rejected and supplemental activities to complete closure were scheduled for October 7.

October

Continued participation with the DOE-ORO Readiness Review of Building 2649 and the LR-56 LLLW Tanker. Performed a formal Job Hazard Analysis of several operations within Building 2649 and continued efforts to document this analysis.

November

Continued participation with the DOE-ORO Readiness Review of Building 2649 and the LR-56 LLLW Tanker. Transmitted a copy of the Job Hazards Analysis to the DOE ORR team for review. Received preliminary indication from DOE that the closure documentation for the remaining pre-start finding is acceptable.

December

Continued activities to close the DOE-ORO Readiness Review of Building 2649 and the LR-56 LLLW Tanker.

2.2.2 Bethel Valley LLLW CAT Line Item (Building 3544)

Construction of a new LLLW transfer system to the existing chemical unloading station at Building 3544 was completed during the year and was placed in service in October after the existing single-contained LLLW line connecting Building 3544 to the LLLW Evaporator Facility was taken out of service by the FFA Program. A connection to the existing interconnecting pipeline between Bethel and Melton Valleys was originally planned several years ago but rising construction costs associated with providing a connection to a Category 2 nuclear facility led to a redesign of the connection. Use of the existing unloading station allowed construction costs to be reduced and allowed personnel to not have to perform any excavation work with this project.

January

LGWO personnel met with Engineering personnel to discuss providing a tie-in to the new loading station while still allowing personnel to use the underground transfer line from Building 3544 to the LLLW Evaporator Facility until the line must be removed from service (end of FY97) per the FFA.

February

Completed the Line Management Readiness Self Assessment for the 3544 LLLW Tanker Loading Station portion of the Bethel Valley LLLW CAT Line Item Project. Authorization was then received to complete the tie-ins associated with the new loading station. A meeting was held with Engineering and LGWO personnel to discuss logistics for the tie-in. Efforts to perform the tie-ins were then initiated.

March

Completed tie-ins associated with the 3544 LLLW Tanker Loading Station portion of the Bethel Valley LLLW CAT Line Item Project. Met with Engineering personnel to discuss the coating in the new diked area in the ion-exchange column room at Building 3544. The new coating was showing signs of deterioration. Operations requested a coating identical to the existing coating on the floor be used. The existing coating had been in place for approximately 5 years and had proven to be very good for the application. It stands up well to its environment and it has a non porous surface which facilitates clean-up. This portion of the project will provide an interface to transport LLLW concentrate from this facility to the

LLW Collection and Transfer System that meets the requirements of the Federal Facility Agreement for the LLLW System.

2.2.3 Bethel Valley LLLW CAT Line Item (Building 3025E Phase)

Began construction of the Building 3025E upgrades during the year. This phase of the project is installing a new collection tank and drain system for Building 3025E that will be operated by Building 3025E personnel. A new double-contained transfer line from the collection tank was also being installed to Valve Box 1A so that the LLLW could be transferred to the Central Waste Collection Header in a system that meets requirements of the FFA for the LLLW System.

February

Held construction kick-off meeting for the Building 3025E upgrade portion of the Bethel Valley LLLW CAT Line Item Project. The construction fixed price subcontractor then mobilized for the Building 3025E upgrade portion of the Bethel Valley LLLW CAT Line Item Project.

March

Personnel began site preparations for the installation of the new transfer line from Building 3025E by removing several trees in the area to be excavated and identifying the areas of roadway and sidewalk that will have to be removed for the excavation. Building 3025E personnel conducted training to allow unescorted access for nonoccupants of Building 3025E.

April

Construction activities inside and outside the building were initiated. Excavation for the installation of the external piping resulted in personnel closing down the road at the construction site for the next several weeks.

May

Installation of piping inside of Building 3025E continued. Excavation for the collection tank foundation continued. The excavation for the filter housing outside Building 3025E was completed.

June

Installation of piping inside of Building 3025E continued.

July

Installation of piping in the trench was started. On-site welding and coating of piping was continuing.

August

On-site welding and coating of piping continued. Work within Building 3025E continued with pouring of footers.

September

Work within Building 3025E continued with the installation of the tank liner. Hand-digging at Valve Box 1A was started. The concrete for the first section of the filter area slabs was poured. Installation of the cathodic protection ribbon was started. Personnel at the end of the month were beginning activities to complete the excavation to Valve Box 1A.

October

Completed the installation of form work on the patio of Building 3025E and poured concrete for the cell ventilation equipment. Started installation of form work for above ground enclosure on the patio of Building 3025E. Continued with effort to complete the excavation to Valve Box 1A. Installation of the new collection tank in Building 3025E continued with welding of tank supports to the containment liner.

November

Continued excavation from Hillside Street to Valve Box 1A. A verification of the cathodic protection installation was planned for next month. At Building 3525, personnel poured concrete to form the aboveground enclosure on the patio and began installation of the filter boxes. Installation of the duct work from the new collection tank to the High Efficiency Particulate Air (HEPA) filters was on-going.

December

Excavation and installation of piping from Hillside Street to Valve Box 1A continued. The east west run along Hillside was installed. Installation of the duct work from the new collection tank to HEPA filters continued. Efforts to verify the cathodic protection installation were initiated with saw cutting and removal of concrete to allow verification of the cathodic protection installation beginning. The location of a short in the cathodic protection system was located and repaired.

2.2.4 Bethel Valley Federal Facility Agreement Line Item (Buildings 2537 and 2568)

Construction of a new above-ground cell ventilation and off-gas HEPA filter building (Building 2658) for the LLLW Evaporator Facility continued throughout the year. This will allow the existing below-grade pits which collect inleakage which must be treated as LLLW to be removed from service. It will also provide a filter system that meets current inspection requirements for in-place testing of the filters.

Relocation of the steam control station for the evaporator service tanks from inside Building 2537 to the outside east wall of Building 2537 and replacement of the instrument cabinets at Building 2537 was completed. Relocation of the steam control station will prevent steam leaks from damaging the new instrumentation and control equipment located inside the building. Personnel provided detailed oversight and coordination of construction and test/checkout activities to ensure that these upgrades did not affect the sludge mobilization project which was also being conducted at the facility. The successful completion of all of these activities was accomplished using daily oversight of work by LGWO personnel as up to three separate construction projects were occurring at the facility simultaneously.

January

Construction personnel continued excavation activities on the east side of the LLLW Evaporator Facility in preparation for installation of the new above-ground filter pit. Construction personnel also continued installation of the new steam control station at Building 2537 and began preparations for replacement of the existing control consoles at the facility. The new control console was received by Engineering and was stored at Building 2649 temporarily to provide adequate protection from the elements until its installation later in the year.

February

Completed installation of the identified water line reroutes for the new filter pit. Testing of the rerouted water lines was completed. Personnel continued installation of the new steam control station at Building 2537.

March

Construction personnel completed the final tie-ins for the steam, condensate, and instrument air piping for the Building 2537 upgrade. The tie-ins were satisfactorily inspected and the existing systems were then returned to service. The first of the three temporary control panels was then installed and tested. Work continued on the second temporary panel at the end of the month. Construction personnel also continued work on the new Building 2568 aboveground filter pit that will service the LLLW Evaporator Facility and service tanks. Tie-in of the process and fire water lines was completed. Excavation and shoring

(approximately 15 feet deep) was completed for installation of the new 12" off-gas line and most of this new line connecting the existing system to the new filter pit was installed, welded, inspected, and tapecoated.

April

Continued construction activities by the fixed price subcontractor. During the month personnel reviewed the latest construction schedule and provided comments back to construction on the planned durations for several activities.

May

Personnel prepared for several planned electrical outages at Building 2537 for personnel to connect the temporary control panels at the facility. These tie-ins required close coordination between LGWO, Engineering, Instrumentation and Controls (I&C), and construction personnel to avoid impacts to operations. After the tie-ins, personnel tested the temporary steam control panels at the facility. Excavation for the 24" duct was in progress. Transfer of the instrumentation from the existing instrument panels to the temporary instrument panels was started.

June

Completed transfer of the instrumentation from the existing instrument panels to the temporary instrument panels. Installation of the 24" duct was initiated. Coordinated repairs of a damaged telemetry conduit on the east side of Building 2531 with Plant and Equipment (P&E) personnel and Engineering personnel to minimize impacts to operations. Construction personnel completed backfilling an excavation on the east side of Building 2531 to support the damaged telemetry conduit and to allow P&E personnel access to repair the conduit.

July

Construction personnel completed backfilling an excavation on the east side of Building 2531 to support the damaged telemetry conduit and which allowed P&E personnel access to complete repairs on the conduit. Installation of the new 24" duct was continuing.

August

Installation of the 24" duct continued. I&C personnel completed connection of the new transfer pump controls to the existing pumps. Personnel then confirmed proper rotation of the transfer pumps.

September

Installation of the 24" duct was nearing completion. Excavation for the slab support footings was started.

October

Installation of form work in preparation for the pouring of concrete was done. Installation of the form work and rebar for the east and west walls is continuing. The east and west footings have been poured.

November

Continued construction activities by the fixed price subcontractor at the LLLW Evaporator Facility. Installation of the form work and rebar for the east, south, and west walls was continuing. Half the concrete floor for the control room was poured.

December

Installation of the form work and rebar for the south walls was completed and the concrete for the south wall was poured. Completed pouring of concrete for the control room floor. The roof for the new filter pit's control room was installed. Installation of electrical wiring within the control room was initiated.

Supported construction personnel in the repair of leaking steam lines at Building 2537 (two Lockout/Tagouts (LO/TOs) were installed in support of the project). These leaks were in the new steam station recently installed by the line item at Building 2537.

2.2.5 Bethel Valley Federal Facility Agreement Line Item (Hot Off-Gas (HOG) Pot Upgrades Phase)

This phase of the line began construction in February and was completed in late December with the tie-in of the new HOG condensate collection tank to the off-gas duct. This project provided a new HOG condensate collection tank at the off-gas system's lowpoint in the 3500 area as well as a transfer system to the Process Waste Collection System so that the existing system, which was connected to the LLLW System, could be removed from service by the FFA Program. Sample analysis had shown that the condensate could be characterized as Process Waste.

February

Held construction kick-off meeting for the HOG Pot condensate collection tank installation.

March

MK-Ferguson and its subcontractors continued excavating on the south side of Building 3504 in preparation for the installation of a below-ground process waste tank to receive condensate from the underground HOG ventilation system ductwork and a new transfer system to the Process Waste System.

April

Excavation for the new underground tank was completed. The concrete pad upon which the underground tank would be placed was poured. Personnel were awaiting delivery of the underground tank.

May

The concrete pad upon which the underground tank would be located was placed in the excavation. The collection tank and some of the piping for connecting the tank to the process waste system was received.

June

Preparations for the installation of the collection tank continued with the welding of the piping to the collection tank. Hydro testing of the collection tank was being performed.

July

Hydro testing of the collection tank was being performed. Excavation for tie-in points was on-going.

August

The piping which passes under the road between the new collection tank and the process waste manhole was installed and the excavation backfilled. Final tie-ins to the systems were tentatively expected to occur during September.

September

The excavation for the new collection tank was back filled. Fabrication and installation of the steam station was completed. Insulation was being placed around the steam station piping.

October

Engineering, Waste Management, the fixed price sub-contractor, and other personnel walked down the construction site to generate a punch list for items needing resolution. Personnel were working to fix punch list items resulting from the walkdown at the end of the month.

November

Test and checkout of the steam jets and electronics for the HOG Pot was initiated. At the end of the month personnel were awaiting delivery of parts needed to correct problems identified during test and checkout.

December

Completed punch list items related to the level detectors installed in the new collection tank. Completed the test and checkout of the steam jets and electronics for the HOG Pot. The final connection between the new collection tank and the existing HOG header was completed and placed in service.

2.2.6 Bethel Valley LLLW CAT Line Item (Building 3092 phase)

This phase of the line item, which was placed in service in late 1996, required some piping modifications to eliminate problems identified after startup. This phase included the installation of a new scrubber solution tank and associated transfer system to the Central Waste Collection Header that met requirements of the FFA.

January

Personnel worked with construction personnel to resolve several items that were identified after placing the new system in service. This included providing additional heat tracing to the pH monitoring system and modifying the piping arrangement to prevent buildup of liquid in the demister at Building 3092.

July

Completed installation of the new scrubber solution drain line from the off-gas scrubber to the scrubber solution tank at Building 3092 and placed the scrubber back in service. The modification was made to resolve a drainage problem associated with the new piping that had been installed a few months earlier.

2.2.7 Melton Valley Liquid Low Level Waste Collection and Transfer System Upgrade Line Item (Monitoring and Control Station (MCS) Building 7966 phase)

This line item project provided a new collection tank to service Buildings 7920 and 7930 and a new double-contained transfer line from the 7900 area to the South Parking lot valve box that meets FFA requirements. This replaced the existing single-contained transfer line and transfer system. Additional work included upgrades to the LLLW piping at Buildings 7920 and 7930 and disconnection of Building 7900 from the LLLW Collection and Transfer System. LGWO personnel coordinated functional testing of the MCS (Building 7966) and its associated transfer line during the year and worked with Engineering and craft personnel to resolve the list of punchlist items identified during the testing. Personnel completed readiness self-assessment activities in September 1997. The facility was then declared operational in late September 1997, meeting the FFA commitment date of October 1 to remove the old system from service.

January

Received the rough draft of the functional test and checkout plan from Engineering personnel for review and comment. Began preparation of draft operating procedures for the facility and developed valve descriptors so that valve tags could be ordered. I&C personnel continued calibration and testing of equipment at the facility.

February

Issued the System Safety Analysis for Building 7966 to WMRAD personnel for approval. This document was scheduled to be presented to the Plant Safety Evaluation Team (PSET) on March 10 for approval prior to transmittal to DOE-ORO personnel for review/approval. This document would be the approved safety authorization basis for the new LLLW collection tank for Buildings 7920 and 7930 that was being constructed to meet requirements of the FFA for the LLLW System.

March

Transmitted the System Safety Analysis for Building 7966 to DOE-ORO for review/approval after the document was approved by LMER personnel.

May

LGWO provided support to Engineering personnel verifying the alignment of the two positive-displacement pumps installed at Building 7966 for the Radiochemical Engineering Development Center (REDC) in Melton Valley. Based on the tests, P&E personnel performed an alignment of pump J-1800. LGWO provided coordination for installation of the temporary test fixture in the South Parking Lot Valve Box. The fixture allowed personnel

to transfer clean water from the new Building 7966 through the new Melton Valley to Bethel Valley transfer header. This transfer provided an operational transfer of the new positive displacement pumps and allowed personnel to verify transfer rates at various pump speeds. LGWO personnel received vending literature on the mechanical equipment in the facility and worked with P&E personnel to develop a programmed maintenance program for the facility. Provided comments to Engineering personnel on the draft functional test plan for Building 7966. Also reviewed the Fire Hazards Analysis for Building 7966 and provided comments to Engineering personnel.

June

Emptied several thousand gallons of water from the new tank at Building 7966 (Monitoring and Control Station for the REDC Complex) using the new positive displacement pumps at the facility. This transfer, which was made to assist I&C personnel with calibration of the tank's level instrumentation, allowed personnel to test the pumps by transferring water from the new facility through the new transfer line over Haw Ridge to the South Parking Lot Valve Box in Bethel Valley. Minor problems were identified and repaired with the pumps' variable speed controllers. Issued the draft operating procedures (WM-LGWO-610.2.8 Rev. 0 and -610.3.5 Rev. 0) for review for Building 7966. The procedures were being issued to allow for review during functional testing which would begin in the near future. Approved the utility systems and distributed control system test procedures for Building 7966. Provided comments on the test plan for the Distributed Control System portion of the test. Began walkdowns of the facility and began hanging valve identification tags to allow personnel to gain familiarity with the new facility. Began testing of the utility systems (instrument air and process water) at Building 7966.

July

Continued functional testing of the utility systems (instrument air and process water) at Building 7966. Received PSET approval of the LMER response to DOE-ORO's comments on the System Safety Analysis document for this facility and transmitted the responses back to DOE-ORO personnel. Approved the operating procedures (WM-LGWO-610.2.8 Rev. 0, WM-LGWO-610.3.5 Rev. 0) for Building 7966 that services the REDC. WMRAD Training personnel prepared training materials for this facility and issued them for approval.

August

Continued functional testing of the utility systems at Building 7966, with personnel awaiting completion of installation of the vault plugs prior to performing the ventilation system balancing (last item to be tested as part of the formal testing program). Other activities to be completed included connection of the annulus pressurization system for the Building 7966 inlet line to the existing nitrogen manifold, rework of the pressure relief valves on the Moyno pump discharge piping after problems were identified during the month, and tightening up

loose flange connections in the pump and valve vault. Also provided a review of the facility to the division Radiation Control Officer/Safety Officer to develop a job hazard analysis for work at the facility. Personnel completed testing of the transfer system to Bethel Valley during the month. P&E personnel made changes to the prime water supply's pressure regulators and cleared a blockage from the tank vault sump's steam jet.

September

Completed tie-in of the new transfer line from Building 7966 (Monitoring and Collection Station) to the existing intervalley transfer lines at the South Parking Lot Valve Box. P&E personnel reworked the pressure relief valves on the positive displacement pump discharge piping after problems were identified and tightened up loose flange connections in the pump and valve vault. P&E personnel installed the vault plugs at Building 7966 and Engineering personnel completed balancing the HVAC system. As part of the readiness self-assessment activities, the line management and independent reviewer did a walkthrough of the facility and also reviewed several readiness reviews and readiness self-assessment reports from the past year to determine if any of the findings identified were applicable to Building 7966. Also provided a review of the facility to the division Radiation Control Officer/Safety Officer to develop a job hazard analysis for work at the facility. Completed connection of the annulus pressurization system for the Building 7966 (Monitoring and Collection Station servicing Buildings 7920 and 7930) inlet line to the existing nitrogen manifold. Personnel also completed a successful pressure decay test on the annulus and primary piping from Building 7966 to the LLLW Evaporator Facility Service Tanks (Building 2537). The line management completed the Readiness Self-Assessment activities and forwarded their recommendation to place the facility in service to the independent reviewer. The independent reviewer completed the Readiness Self-Assessment activities and forwarded his recommendation to place Building 7966 (Monitoring and Control Station servicing the Radiochemical Engineering Complex) in service to the WMRAD Director, who concurred with the team's recommendations on September 29, 1997. This allowed operations personnel to place the new facility and associated transfer piping on September 30, meeting the Federal Facility Agreement for the LLLW System's commitment to remove the existing collection and transfer system from active service by October 1, 1997. This facility provided a collection system for REDC that meets requirements of the FFA for the LLLW System.

2.2.8 Melton Valley Storage Tanks Capacity Increase (MVST-CI) Line Item

This line item will provide LGWO with an additional 450,000 gallons of usable storage capacity for LLLW concentrate generated at the LLLW Evaporator Facility and from Environmental Restoration activities planned during the upcoming years. The six new 100,000 gallon tanks are being built near the existing Melton Valley Storage Tanks (Building 7830). Activities during the year included the continuation of construction activities with a goal of construction completion by March, 1998. Personnel at the end of the year were

beginning preparation activities for loop checkout and functional testing activities in the spring of 1998.

January

The Main Facility subcontractor continued with construction activities. Fabrication activities for the pre-cast roof panels for the tank vault continued. Concrete was placed for the west half of the north and center walls for the pump and valve vault. Installation of the underground LLLW valve box continued. Installation of the liner plate was underway in the valve box. Installation of piping, pipe supports, and HVAC components was underway in all vaults. Installation of shield beams was underway for vaults 32 and 33. Work continued on the installation of grounding and underground electrical runs for the control room. Contractor claims regarding the need for a larger crane and the delay in delivery of the storage tanks were settled. These claims represented \$855k and 42 schedule days in addition to the original contract. The current contractual end date for the fixed-price subcontractor was 3/2/98. Work continued on the development of Baseline Change Proposals (BCPs) for the proposed scope addition. This addition would provide the capability to transfer LLLW between Building 7856 and Building 7877 without going through Building 7830. This capability would enable supernate decant operations between Building 7830 and Building 7856 and also enable the use of Building 7877 treatment modules (Out-of-Tank Evaporation (OTE), Cesium Removal) after Building 7830 is turned over to an outside company as part of the Transuranic (TRU) Program's privatization activities.

Participated in a meeting with Engineering personnel at the request of DOE-ORO personnel to consider potential interfaces with Building 7830 when it is turned over to an outside company as part of the TRU Program's privatization activities. Discussions included how to provide a possible connection from Building 7830 to the privatization company's treatment system without affecting operations at Building 7877 or at the MVST-CI facility when it is operational.

February

The Main Facility subcontractor continued with construction activities. The following activities were completed: fabrication and installation activities for the pre-cast roof panels for the tank vault, installation of shield beams for the tank vault, concrete placement for the pump and valve vault walls, and prefabrication of roof panels for the pump and valve vault. Installation of the liner plate in the pump and valve vault was underway. Installation of piping, pipe supports, and HVAC components continued in all vaults. Work continued on the installation of grounding and underground electrical runs for the control room. BCP 4 for the proposed scope addition was approved internally and transmitted to DOE for approval. BCP 4 provides only for the required modifications to the current construction activities. This scope addition would provide the capability to transfer LLLW between Building 7856 and Building 7877 without going through Building 7830. This capability

would enable supernate decant operations between Building 7830 and Building 7856 and also enable the use of Building 7877 treatment modules (OTE, Cesium Removal) after Building 7830 is turned over to an outside company as part of the TRU Program's privatization activities. Two meetings were held to discuss the loop testing and functional testing to be conducted by Engineering and LGWO personnel. A general outline of the test plan was agreed to and several comments were received dealing with testing sequence, duration of testing, and prerequisites for specific tests.

March

The Main Facility subcontractor continued with construction activities. Form work for the concrete pump and valve vault walls was removed. Installation of form work for the roof and equipment room concrete slabs was underway. Installation of the liner plate in the pump and valve vault continued. Installation of piping, pipe supports, and HVAC components continued in all vaults. Work continued on the installation of grounding and underground electrical runs for the control room. BCP 4 for the proposed scope addition was at DOE awaiting their approval. BCP 4 provided only for the required modifications to the current construction activities. A draft of BCP 5 was issued for comment. BCP 5 provided for all necessary LLLW system modifications outside of the current construction scope to make the transfer capability fully functional.

April

The Main Facility subcontractor continued with construction activities. Installation of form work for the roof and equipment room concrete slabs was underway. Installation of form work for the truck unloading station and the north side filter slab was completed. Concrete was placed for the truck unloading station and the north side filter slab. Work was initiated on concrete block installation for the control room and the equipment room. Installation of the liner plate in the pump and valve vault continued. Installation of the piping in the vaults for tanks W-36 and W-37 was completed except for thermal wells. Work continued on the remaining piping for the other tanks. Installation of instrument piping in the roof continued. BCP 4 for the proposed scope addition is at DOE awaiting their approval. A draft of BCP 5 was issued for comment.

May

The Main Facility subcontractor continued with construction activities. Installation of masonry walls for the control room and the equipment room was completed. Installation of the liner plate in the pump and valve vault was completed. Installation of the piping in tank vaults 36 and 37 was completed except for thermowells. Work continued on the remaining piping for the other tanks. Installation of instrument piping in the roof continued. Concrete was placed for the roof slabs of vaults 37 and 35. Installation of concrete forms and reinforcing steel for the roof slabs of vaults 34 and 36 continued. BCP 4 for the proposed

scope addition was approved by the DOE Program Manager and forwarded to the DOE configuration control board.

A meeting was held with LGWO, MVST-CI project team, and AEA Technologies personnel to discuss the possibility of installing a sludge mobilization system in the new MVST-CI tanks that is similar in design to the one planned for installation at Building 2537 later this summer. Potential interferences and modifications to support the system were identified to the sludge mobilization personnel during this meeting.

June

The Main Facility subcontractor continued with construction activities. Work continued on the remaining piping for the other tanks. Installation of instrument piping and inbeds in the roof continued. Installation of concrete forms and reinforcing steel for the roof slabs of vaults 32, 34, and 36 continued. Installation of concrete forms and reinforcing steel for the equipment/control room roof, the pump and valve vault roof slab, and the truck unloading station walls continued.

July

The Main Facility subcontractor continued with construction activities. Work continued on the remaining piping for tank vaults 32 through 35. Installation of instrument piping and inbeds in the roof continued. All tank vault roof slabs were completed. Concrete was placed for all of the pump and valve vault except for the blockouts for installation of the valve extensions. Installation of concrete forms and reinforcing steel for the control/equipment room roof slab continued. BCP 4 for the proposed scope addition was approved by the DOE configuration control board.

August

The Main Facility subcontractor continued with construction activities. Work continued on the remaining piping for tank vaults 32 through 35. The fixed price subcontractor has submitted the upper area of tank vault 37 for acceptance inspection. Initial inspection of tank vault 37 has identified several punchlist activities that are currently being worked. Installation of piping, valves and supports continues in the pump and valve vault. Installation of filter banks 7 & 8 and ductwork continued on the North filter slab. Electrical work in the control room continued. Installation of the air compressor in the equipment room continued. Forming and reinforcing steel work continued for the precast concrete access plugs.

September

The Main Facility subcontractor continued with construction activities. Work continued on the remaining piping for tank vaults 32 through 35. Initial inspection of tank vault 37 last

month identified several punchlist activities that were being worked. Installation of piping, valves and supports continued in the pump and valve vault. Installation of filter banks 7 & 8 and ductwork continued on the North HVAC slab. Electrical work in the control room continued. Painting was underway in the control room and equipment room. BCP 5 was approved by LMER/LMES and was submitted to the DOE configuration control board.

October

The facility subcontractor continued with construction activities. The fixed price subcontractor (FPSC) resubmitted the upper area of tank vault 37 for acceptance inspection. Installation of piping, valves and supports continued in the pump and valve vault. Installation of filter banks 7 & 8 and ductwork continued on the North HVAC slab. Electrical work in the control room continued. Painting continued in the control room and equipment room.

A meeting was held on 10/8/97 with DOE-ORO personnel to discuss the appropriate level of readiness activities to support the start of operations for the facility in FY 1998. DOE-ORO provided direction that the project would conduct a Readiness Assessment to verify that the facility is ready to begin operations. As a result of the FPSC employee fall accident (occurred the week of October 20), all work on the roof except for the flagged-off fabrication area and all work involving fall protection above the six-foot height was suspended. The FPSC was conducting specific safety awareness meetings and an assessment of other work at heights. MK-Ferguson formed an accident investigation team, and the FPSC was developing a Restart Plan and a revised Activity Hazard Analysis (AHA). The FPSC conducted specific safety awareness meetings and an assessment of other work at heights. The FPSC revised applicable AHA's and submitted a restart plan for approval. Due to the nature of these activities, there was no specific schedule or forecast date for restart of suspended activities at this time.

November

The Main Facility subcontractor continued with construction activities. After review, comment and revision, the FPSC's Restart Plan was approved by MK-Ferguson. Review and comment included participation by LMER, LMES, and DOE personnel after initial draft review by MK-Ferguson. Work above the six-foot level or requiring the use of fall protection had been suspended, and work on the roof had been restricted. These suspensions and restrictions were removed. As part of the restart activities, the permanent hatch covers would be placed over all but one opening in each of the six tank vaults. These permanent covers required a crane lift for removal. The one remaining temporary hatch cover at each vault would be bolted in place. A new AHA was developed for "Hatch Cover Installation/Removal". The positive displacement pumps were set in place and the installation of piping, valves and supports continued in the pump and valve vault. Installation of filter banks 7 & 8 and ductwork continued on the North HVAC slab. Electrical work in the control room continued. Instrumentation cabinets and tubing work continued on the roof.

Several meetings were held to discuss the testing and checkout activities associated with the startup of this facility. Personnel were focusing attention on obtaining early completion of specific construction activities so that personnel could begin test and checkout at an early date.

December

The Main Facility subcontractor continued with construction activities. The FPSC submitted the mezzanine area of all tank vaults for acceptance inspection. Those areas were being reviewed at the end of the month and punchlist items generated. Punchlist items for the mezzanine of vault 37 were completed and scaffold removal was underway. The installation of piping, valves and supports continued in the pump and valve vault. Installation of HVAC equipment continued. Electrical work in the control room continued and power supply wire pulls were underway. Instrumentation cabinets and tubing work continues on the roof. BCP 5 was approved by the DOE configuration control board.

2.2.9 New Hydrofracture Facility (NHF) Cell Plugs Enclosures General Plant Project

These enclosures were installed to eliminate inleakage of storm water to the cells containing the ventilation filters at Buildings 7830 and 7860.

January

Started construction of the NHF Cell Plugs Enclosures GPP. Assembly of the metal building to cover the T-13 vault and fabrication of the individual cell plugs on top of the Melton Valley Storage Tanks was underway at the end of the month. Delivery of the individual covers for the cell plugs on top of the Melton Valley Storage Tanks was expected in early February.

February

Assembly of the metal building to cover the T-13 vault was completed. Installation of the individual cell plugs on top of the Melton Valley Storage Tanks was continuing.

March

Continued installation of the covers for the individual cell plugs on top of the Melton Valley Storage Tanks.

April

Construction activities were on hold while personnel were waiting for the arrival of several covers for the individual cell plugs on top of the Melton Valley Storage Tanks. The covers

had to be modified to match field conditions. Assembly of the metal building to cover the T-13 vault was completed.

May

Completed construction activities for the NHF Cell Plugs Enclosures GPP. A walk-down of the construction site was scheduled for next month. Individual cell plug covers on Building 7860 were installed. Assembly of the metal building to cover the T-13 vault was completed. Completed installation of the covers for the individual cell plugs on top of the Melton Valley Storage Tanks.

June

Completed construction activities for the NHF Cell Plugs Enclosures GPP with: 1) installation of individual cell plug covers and coverage of the T-13 vault at Building 7860, and 2) installation of the covers for the individual cell plugs on top of the Melton Valley Storage Tanks (Building 7830). Conducted a walk-down of the construction site. A short punch list was generated during the walk-down.

2.2.10 Cesium Removal Demonstration Project

This project was a joint effort between WMRAD and Chemical Technology Division personnel to demonstrate an effective system to remove cesium from supernate at the Melton Valley Storage Tanks in an effort to reduce worker exposures during future activities.

February

Completed the management self-assessment activities associated with the recently completed crane upgrades and obtained permission from the WMRAD Director to resume operations. The crane was upgraded to allow for remote operation as an As Low As Reasonably Achievable (ALARA) activity.

March

Completed run three of the cesium removal system. To date approximately 15,500 gallons of LLLW supernate had been processed, and approximately 513 curies of ^{137}Cs were removed. Personnel were in the process of moving three columns of spent sorbent resin to Solid Waste Operations prior to conducting the next run. During this period, additional supernate would be transferred into the feed tank at Building 7830 to support the fourth run of the system.

April

Collected a sample of LLLW supernate from tank W-30 and delivered to laboratory personnel for analysis. Personnel then transferred approximately 2,500 gallons of LLLW from W-30 to W-24 to provide adequate storage capacity and 6,300 gallons of LLLW from W-25 to W-30 at Building 7830 to provide additional feed for additional operation of the Cesium Removal Demonstration Project. Personnel also transported samples from Building 7877 to laboratory personnel for analysis.

May

Completed supernate processing operations at the Cesium Removal Demonstration Project, with run 4 being terminated after processing approximately 15,000 gallons of supernate. Curies of Cesium-137 removed during run 4 were estimate at 631. Totals for the project were over 30,000 gallons of supernate processed and over 1,100 curies of Cesium-137 removed. Following transfer of the last three containers spent sorbent to Solid Waste Storage Area (SWSA) 6, the system will be decontaminated, disassembled, and removed from Building 7877.

2.2.11 AEA Sludge Mobilization Demonstration

This demonstration used technology provided by AEA Technologies to show the effectiveness in mobilizing the settled sludges in evaporator service tank W-21. Once the sludges were mobilized, they were transferred to the Melton Valley Storage Tanks. The first sludge transfer occurred in September 1997. At the end of the year, personnel were preparing to add nitric acid to tank W-21 in an effort to dissolve the remaining sludges prior to the final transfer by AEA in January 1998. Personnel were also beginning preparations to then connect the system to tank W-22 and begin a one-month campaign to remove its sludges.

July

The AEA Sludge Mobilization demonstration project personnel arrived on-site and mobilized to begin installation of the sludge mobilization equipment in the pump/valve vault at Building 2537 (Evaporator Service Tanks). LGWO personnel supported the work by decontaminating piping in the pump/valve vault in preparation for construction personnel to enter the vault. AEA personnel then installed the shielding and the 18 quick disconnect flanges in the vault. The charge vessel was installed and connected and personnel reinstalled the shield plugs over the vault. The AEA skids, including the jet pump skid, were mounted and connected. AEA then began commissioning of the system and anticipated that taking several weeks to complete.

August

The AEA Sludge Mobilization demonstration project personnel continued work by beginning commissioning activities associated with the equipment. An Unreviewed Safety Question and Operational Safety Requirements page change were approved by Lockheed Martin and submitted to DOE-ORO for review and approval. These revisions were required due to AEA being a prime contractor to DOE-ORO and not being able to operate under all of the safety programs for Lockheed Martin. Several meetings were held to discuss interfaces between Lockheed Martin and AEA programs and personnel and personnel began development of changes to the LLLW System safety documentation to address AEA activities as a prime contractor to DOE-ORO. The schedule had the first sludge transfer occurring in September 1997.

September

AEA personnel were trained and began operation of the sludge mobilization system in tank W-21 on Sept. 5, 1997. AEA personnel completed operation of the sludge mobilization system's first cycle in tank W-21 on Sept. 16 with LGWO personnel transferring approximately 36,270 gallons from tank W-21 to tanks at Building 7830 (35,670 gallons to W-24, and 600 gallons to W-25) and 1,672 gallons to tank W-23 at Building 2537 after sampling to determine the percent suspended solids met transfer guidelines. W-21 was video inspected on Sept. 19. The video inspection showed approximately 60% to 70% of the sludge was suspended and transferred out of the tank. It was then decided to refill the tank to approximately 14% volume with LLLW supernate and start the second cycle of the AEA System on Sept. 22. AEA personnel completed operation of the sludge mobilization system's second cycle in tank W-21 during on Sept. 26 with LGWO personnel transferring approximately 7,000 gallons from tank W-21 to tank W-25 at Building 7830 after sampling to determine the percent suspended solids met transfer guidelines. After the transfer to W-25, personnel transferred additional liquid into tank W-21 and placed the AEA system back in service. AEA personnel continued cycle 3 of the sludge mobilization system at the end of the month, with LGWO personnel on Sept. 29 sampling to determine the percent suspended solids met transfer guidelines. After receipt of the sample results, it was decided to continue the sludge mobilization operations and to resample the tank in early October.

October

AEA personnel completed operation of the sludge mobilization system's third, fourth, and fifth cycles in tank W-21 during the month, with LGWO personnel transferring approximately 23,000 gallons from W-21 to Building 7830 (Melton Valley Storage Tanks). After the fourth and fifth transfers the tank walls were sluiced to remove sludge buildup and supernate was then transferred into W-21 (approximately 7,440 gallons total). AEA personnel were then demobilized until early 1998 while LGWO personnel evaluated using nitric acid to dissolve the remaining sludge volume in W-21.

Held a meeting with Engineering, MK-F and AEA personnel to discuss the design for the sludge mobilization system for the C1 and C2 tanks (located at Building 2531). As the discussion progressed, several suggestions were made to AEA which they were to consider as they finalize their design. The current outlook would likely have the mobilization task starting around the latter part of FY98 (at the earliest).

2.2.12 WC-14 Remediation

Worked to remove and dewater the sludge in LLLW tank WC-14. The sludge, which is a remote-handled (RH) transuranic (TRU) waste containing TSCA (PCBs), and RCRA contaminants, must be removed from the tank by June 30, 1998, as a time critical removal action under CERCLA. After removal and dewatering, the sludge will be stored in Building 7883, the RH TRU Storage Bunker. Although 7883 is not permitted as a TSCA storage facility, waivers have been obtained from the Environmental Protection Agency to allow storage of the WC-14 waste.

October

Worked with vendor personnel to develop a process and supporting documentation for removal and dewatering of the sludge in LLLW tank WC-14.

November

WC-14 Remediation - The vendor was mobilized and began setup of their field equipment for removal and dewatering of the sludge in LLLW tank WC-14 while LGWO personnel continued readiness self-assessment activities associated with the beginning of hot operations.

December

WC-14 Remediation - Vendor personnel completed assembly and functional testing of the field system and project personnel completed the management self-assessment closure activities for Phase 1 activities. Phase 1 included mobilization and recirculation of the sludge to produce a uniform slurry for bench-scale testing to determine proper filter media size. Samples of the slurry were obtained on Dec. 17 and bench-scale testing was on-going at the end of the year.

2.2.13 Miscellaneous

February

Filled LLLW tanks WC-5, -6, -8 with grout to isolate these tanks in accordance with requirements from FFA personnel

Provided support to a subcontractor to the DOE-ORO performing a survey on the LLLW and PW piping at the new TWRF building. The purpose of this survey was to obtain a sonic "signature " of the piping in the hope that future surveys will be able to detect leaks in these systems.

July

Bethel Valley LLLW CAT Line Item (Building 3047 proposed scope addition) - LGWO personnel participated in two meetings with Engineering and Chemical Technology Division personnel to discuss installation and justification for a new LLLW transfer line from Building 3047 to the Central Waste Collection Header to support future planned projects at the facility.

Tank Riser Installation - Personnel installed and welded the risers on tanks W-21, W-22, and W-23 at the Evaporator Service Tanks (Building 2537) and then performed the necessary cutouts for tank access. The new risers will provide additional access to the tanks in support of sampling and other activities.

September

C-1 and C-2 Riser Installation - Personnel installed the new concrete beams over tanks C-1 and C-2 which have penetrations for installation of the new risers. Industrial Hygiene sampled the free space in the tanks to ensure no flammable or combustible gases were present prior to the start of welding activities. The welding personnel were then mobilized and installed two of the four new risers. LGWO personnel then used the two new tank access risers to collect samples of the tanks' contents for analysis. Development of a sludge mobilization system for these tanks will be dependent upon the amount of sludge found in the tanks. The new risers will provide access for personnel to be able to sample the contents of the tanks.

Spare Evaporator vessel - Received the new spare Evaporator vessel from the manufacturer after a long three year procurement process. Final arrangements for inspection and storage were almost completed.

October

C-1 and C-2 Riser Installation - Personnel completed installation of the final two new access risers to tanks C-1 and C-2 at Building 2531. The new risers were mounted on the tanks, welded on, and then the cutouts were made in the tank shell to provide access to the tanks. The shield plugs and covers for the extensions were also installed. The new risers provided access for personnel to be able to sample the contents of the tanks. Sludge samples were taken from the tanks shortly after completion of the riser installation.

November

Out-of-Tank Evaporation (OTE) - Personnel completed review of the draft procedure (WM-LGWO-608.13, Rev. 0) and incorporated reviewer comments. The procedure was then approved to facilitate operator training. Members of the management self-assessment team visited Building 7877 (LLLW Solidification Facility) where the OTE will be conducted and provided comments to Chem Tech personnel on the operations. Also began closure activities with several of the self-assessment activities. The OTE process will be conducted to provide additional LLLW concentrate storage capacity in the Melton Valley Storage Tanks (Building 7830).

December

The first campaign for OTE operations (98-1) began late on Thursday, December 4 after completion of the internal readiness self-assessment activities and receiving approval from the WMRAD Director. OTE Campaign 98-1 operations were completed on Dec. 16. Roughly 23,860 gallons of supernate from W-29 were processed, generating about 9,600 gallons of distillate and 14,200 gallons of concentrate. Decontamination factors of $5.0E+6$ were achieved. During the campaign a few maintenance activities were conducted: 1) a malfunctioning valve actuator was repaired on Dec. 5; 2) a problem with the electrical breakers for the feed and concentrate pumps was corrected and the malfunctioning manual valves for the decant pump were repaired on Dec. 8.

2.3 WOCC Data Acquisition System (DAS) and Distributed Control System (DCS)

2.3.1 WOCC DAS Interim Upgrades

This upgrade was done to ensure the existing WOCC DAS will remain functional and serviceable until a complete replacement is procured. This replacement is due to the fact that the existing WOCC DAS was developed in the early 1980's and that obsolescence of the existing hardware and software as well as a lack of adequately available spare parts is forcing personnel to upgrade the system to ensure its continued reliability.

January

This upgrade was on hold until software upgrades for Fortran were received. The system was running the RSX-11M operating system with the majority of the hardware tested and working. Upon receipt of the Fortran upgrades the conversion of the WOCC DAS software programs would be attempted.

February

Continued to keep this project on hold pending arrival of software upgrades necessary for the project.

Attended meetings between the LGWO, I&C, US Navy personnel, and an outside company to discover if a working relationship can be developed so that a new platform for the WOCC/Laboratory Emergency Response Center (LERC) could be generated. This would be a trial project to develop a state of the art DAS with multiple capabilities that could be used in a variety of applications and areas.

March

Received Fortran software upgrade from the vendor during the month. This software upgrade allowed personnel to resume work on the DAS upgrades to complete the software installation and to load the current DAS operating programs to the PDP 11/94 system. Personnel would then begin verification of the new hardware to confirm compatibility and operator functions.

April

Personnel continued loading of support software for these upgrades. Also placed orders for custom key labels for the new consoles to mimic the existing consoles.

May

Personnel continued loading of support software for these upgrades. Continued to review configuration changes to replace the existing consoles due to difficulty in maintenance procuring spare parts (due to obsolescence of the existing consoles). The consoles were expected to be replaced with a personal computer, a 21" monitor, and a standard 101 key keyboard.

June

Reviewed procedures to determine what revisions will be required when the upgrades are performed. Initiated the configuration change memo to document the proposed upgrades.

July

Replacement of the WOCC displays was in progress. Changes to procedures were identified. Configuration changes were evaluated with the configuration change control form completed and signed. Equipment was tested and functional. At the end of the month personnel were awaiting scheduling with instrument personnel for change out.

September

Installed sound cards in the new consoles to increase volume of audible alarm annunciators. No software was needed since the sound cards were connected directly to the speaker output of the central process unit.

October

Attempted to obtain the source code for the Terminal Emulator Program recently installed to provide new display terminals at the WOCC. Receipt of the source code would allow personnel to determine if the code can be edited to make the color (cyan) more distinguishable on monitor.

November

Continued efforts to obtain the source code for the Terminal Emulator Program recently installed to provide new display terminals at the WOCC. Efforts (including e-mail to their technical support group) had not received a response. Receipt of the source code would allow personnel to determine if the code can be edited to make the color (cyan) more distinguishable on monitor.

2.3.2 Distributed Control System Console Replacement

This replacement was being done to provide a user-friendly, open architecture type system that will provide greater flexibility for personnel performing future upgrades.

January

Staged one of the replacement consoles at Building 7966 to allow I&C and Engineering personnel the ability to trouble-shoot the DCS software in the field during functional testing of the facility. This also allowed operating personnel to gain experience using the new consoles.

February

Received an evaluation copy of recently completed upgrades to the replacement Distributed Control System's operating console software. Comments identifying areas for further development work were transmitted back to the company, along with a description of how LGWO personnel recommended the upgrades should function.

March

Continued evaluation of the upgraded console operating software. Personnel would meet in early April to develop a formal response on the system's compatibility with existing capabilities and any areas that do not meet the procurement specifications.

April

Continued evaluation of the upgraded console operating software. Personnel met in early April to develop a formal response on the system's compatibility with existing capabilities and identified several areas that are felt do not adequately meet the procurement specifications.

May

Transmitted a formal response on the system's compatibility with existing capabilities and identified several areas that are felt do not adequately meet the procurement specifications.

September

Two LGWO and one I&C personnel attended a kickoff meeting in Baltimore for upgrades to the replacement Distributed Control System consoles. The proposed modifications to provide automatic display of response duties to annunciated alarms were found acceptable and personnel were directed to begin revisions to the consoles' software.

December

Received the software upgrades from the vendor for evaluation. After loading of the software, several problems were identified with the operating system. The vendor was notified of the problems and was working on patches at the end of the month.

2.3.3 Miscellaneous

January

Personal Computer (PC) Support - Responded to several calls concerning PC hang ups. Mostly operator error.

March

Began review of LGWO operating procedures and documentation to determine which documentation would require modification due to the WOCC DAS Interim Upgrades and the

Distributed Control System console replacement projects. Any changes would be documented as part of the LGWO's configuration management program.

Continued evaluating excess personal computing resources within LGWO. Goal was to use the excess computers to upgrade older systems within WMRAD instead of procuring new hardware or software.

April

Continued evaluating excess personal computing resources within LGWO.

May

Continued evaluating excess personal computing resources within LGWO.

Assisted I&C personnel with change to the DCS configuration for the polymer pumps 1 & 2 circuit drawings and programming at Building 7966. Also began verification and reprinting of all DCS configuration drawings. When completed, updated drawings would be located at the WOCC, with the LGWO computer system administrators, and with the I&C personnel responsible for maintaining and configuring the system.

July

Documentation Management Center (DMC) - Completed hardware configuration of scanner and PC running under Windows 95. Software configuration downloading and subsequent testing by the DMC group would occur in the near future. Hardware had to be specific for both the scanner, PC, and image scanning software to run on Windows 95. Installed a SCSI device adapter and had to upgrade the scanner's SCSI interface EPROM. Received one at no cost from the scanner manufacturer and the PC was to be turned over for operation to the DMC by the end of the month.

Spare Parts Database - Assigned task of Database Administrator for a proprietary maintenance and inventory tracking software program. Received class study guides from personnel and began learning how to administer the software. Learned that the majority of software functions would not be used and that there was no support for the software from the manufacturer. Our version of the program was three revision levels below the current level and a support contract would cost approximately \$1,800.00 a year. Supervision was considering not using the program and instead having a simple inventory database using Microsoft's Access which was common to LMER and can be supported by most LMER computer support personnel constructed by LGWO Technical Staff personnel.

Assisted WMRAD personnel with additional PC checkouts and the salvaging of older systems. Also salvaged several PC control cards that I&C had left in the offices of WMRAD personnel during prior upgrading of their computer systems.

September

DCS Displays and Software Configuration (Building 7966) - completed the signal (tag) database for Building 7966, including programming alarm comment messages into the system. Designed several screens for usage on the Operator Interface Stations. At the end of the month, personnel were developing interlock summary screens to assist operating personnel with trouble-shooting the system.

DCS Displays and Software Configuration (Building 2537) - entered the individual signals into the database on the Engineering workstation in preparation for display generation in October.

October

DCS Displays and Software Configuration (Building 7966) - Continued becoming familiar with programming the OIS20 console with on-the-job training by working on display screens for building 7966. Completed a couple of graphic screens and interlock displays and will begin generating faceplate displays in early November.

PC Support - Worked on several personal computers during the month. A PC with Win95 was set up and returned to the Procedures and Data Services group to allow them to operate a scanner. The scanner was then tested and found to function properly, however, there still seemed to be a problem with the connection to the network since the EHP02 system showed no disk space. LGWO personnel were working to solve this problem. In addition, various personnel in WMRAD had purchased thumb ball mice to provide better ergonomic working conditions. Installation of these mice had shown that the software accompanying these devices does not work well with Windows 95. The best solution found to date was to delete the software and use a generic mouse driver.

Spare Parts Database - Converted data from an earlier propriety database into a Microsoft Access format that will allow personnel to tailor the database to meet specific LGWO needs. Next activity was to meet with LGWO maintenance personnel to determine what features were required from the new database.

November

DCS Displays and Software Configuration (Building 7966) - Continued becoming familiar with programming the OIS20 console with on-the-job training by working on display screens for building 7966. Completed the graphic screens, interlock displays, and faceplate displays.

Added an external zip drive to the system to allow for easier system backup and updates. Configured an additional personal computer to allow programming personnel to develop additional programming skills while away from the office. This will also allow personnel to perform software displays and database upgrades from off-site locations.

PC Support - Worked on several personal computers during the month. A problem with the connection to the network EHP02 system showing no disk space was solved after it was discovered that the network software did not support hard drives greater than 1.5 gigabytes. A software upgrade was ordered to remove this limitation. A spare scanner was returned to the Procedures and Data Services group after it was restored to working order.

December

Personal Computer Support for WMRAD personnel - returned a scanner to the Procedures and Data Services group with a personal computer and software to run on Windows 95 platform. A problem still existed that the current version of software would not recognize hard drives over 2 megabytes in capacity. Personnel will resolve the problem with a software patch or by procuring an upgrade to the operating system.

Ordered and received new backup drives for the Distributed Control System's work station. The new drives provide additional flexibility in ensuring the adequate backup of the software for the DCS.

Began development of trend and faceplate displays for Buildings 3092, 2537, and 2568 with completion scheduled for January.

Met with Engineering and LGWO personnel to walk through the DAS' data concentrator facilities for migration of the existing WOCC DAS over to the DCS. Personnel are beginning work to identify existing commercially available DCS systems and their compatibility with existing field hardware and software.

2.4 Occurrence Reporting

July

ORO--LMES-X10WSTEMRA-1997-0001, contamination-personnel, Building 2537, off-normal occurrence, July 10, 1997.

ORO--LMES-X10WSTEMRA-1997-0002, Contamination discovered on company supplied work shoes, Building 7935, off-normal occurrence, July 25, 1997.

August

ORO--LMES-X10WSTEMRA-1997-0003, discovery of incorrectly derived limiting condition of operation, LLLW System, unusual occurrence, August 27, 1997.

2.5 Safety Analysis Documentation

The Safety Analysis Report Update Program (SARUP) continued throughout the year and culminated with the transmittal of draft Safety Analysis Reports and Technical Safety Requirements documents to DOE-ORO personnel for the LLLW System and the LLLW Solidification Facility (Building 7877) operations. This was the result of over 5 years of efforts to develop safety documentation that met requirements of the DOE Orders. At the end of the year personnel were awaiting comments from DOE-ORO reviewers.

Several other major activities were conducted during the year. These activities included:

- Development of 19 Unreviewed Safety Question Determinations (USQDs) for LGWO facilities; four of which were determined to be Unreviewed Safety Questions and were transmitted to DOE-ORO personnel. Two were approved and implemented during the year and two others were still in review at the end of the calendar year.
- Received approval of 2 Operational Safety Requirement revisions for the LLLW System by DOE-ORO personnel and transmitted a third draft revision at the end of the year for review/approval.
- Received DOE-ORO approval of the System Safety Analysis document for the new Bldg. 7966 to support its being placed in service.
- Received DOE-ORO approval of a revision to the System Safety Analysis and Technical Safety Requirements document for the Out-of-Tank Evaporation project being conducted at Bldg. 7877.
- Received DOE-ORO approval of a page change revision for the Technical Safety Requirement document for the Transported Waste Receiving Facility (Bldg. 2649).
- Transmittal of the annual update revision of the Basis for Interim Operation for the LLLW System to DOE-ORO personnel. At the end of the year, approval of the document had been received but personnel were working to resolve inconsistent statements in the Safety Evaluation Report prior to implementing the revisions.

January

Provided comments on the draft Auditable Safety Analysis for the Process Waste Treatment Complex to System Safety Engineering personnel. The document was then finalized and presented to the PSET, who approved the document after minor comments were incorporated. This type of document was required to be developed as the facility authorization basis for radiological facilities.

Completed the annual review of twenty-four LGWO safety documents due in the 2nd quarter of FY97 and forwarded the review documentation to the Office of Operational Readiness and Facility Safety.

February

Reviewed the draft Technical Safety Requirements for the LLLW System that were being developed. Comments were provided to System Safety Engineering personnel and the revised Technical Safety Requirements are expected to be received in early March for a second review.

Received WMRAD approval of the System Safety Analysis for the Monitoring and Control Station (Building 7966) being constructed in Melton Valley to provide LLLW collection services for Buildings 7920 and 7930. Based on the analysis within the document, no Technical Safety Requirement controls would be required for the new system.

March

Presented the System Safety Analysis for Building 7966 to the PSET, who voted for approval of the document. The document was transmitted to DOE-ORO personnel for review and approval. This document provides the DOE-ORO approved safety basis for the new collection tank and transfer system for Buildings 7920 and 7930 that meets requirements of the FFA for the LLLW System.

Transmitted the page change for the Building 2649 Technical Safety Requirements document to DOE-ORO personnel for review/approval after receiving approval from LMER personnel. This would clear up the grammatical structure of one requirement in the document.

Completed the annual review of the Out-of-Tank Evaporation Project's DOE-ORO approved safety basis and transmitted a copy of the review documents to DOE-ORO personnel as required by the safety documentation.

Received the draft copy of the proposed Technical Safety Requirements for the LLLW System. This document was generated as part of the SARUP to replace the existing

Operational Safety Requirements for the LLLW System. The Facility Safety Evaluation Team members would spend the next several weeks reviewing this document.

Received the draft copy of the proposed safety analysis for Building 7877. This document was generated as part of the Safety Analysis Report Update Program to develop a Safety Analysis Report for the facility. The Facility Safety Evaluation Team members would spend the next several weeks reviewing this document.

April

Cancelled the Preliminary Hazard Screening for the Building 3001 2nd floor storage area after LGWO personnel had completed the permanent removal of all materials LGWO had stored at the facility.

Issued the draft Safety Analysis Report and Technical Safety Requirements for the LLLW System to WMRAD and ORNL site personnel for review and comment during the next month. This document was the culmination of over five years work in the Safety Analysis Report Upgrade Program to produce an up-to-date document that will be approved by DOE-ORO personnel.

May

Received PSET approval of the revised System Safety Analysis and Technical Safety Requirements documents for the Out-of-Tank Evaporation System. These revisions were then transmitted to DOE-ORO personnel for review/approval. These revisions would assist the upcoming campaign scheduled for early FY98.

June

Received comments on the draft Safety Analysis Report for the LLLW System and began meetings to resolve the comments. Also began a review of all approved Unreviewed Safety Question Determinations to ensure that they had been incorporated into the document. This document is the final product of the SAR Update Program and was to be issued to DOE-ORO personnel for review and approval by the end of fiscal year 1997.

July

Received comments on the draft Safety Analysis Report for the LLLW System and began meetings to resolve the comments. Also began a review of all approved Unreviewed Safety Question Determinations to ensure that they had been incorporated into the document.

Received the approved page change for the Building 2649 Technical Safety Requirements document (WM-LGWO-2649-TSR, Rev. 2) from Department of Energy - Oak Ridge

Operations personnel. This revision had been made to correct minor grammatical structure problems with one statement within the document.

Approved two Preliminary Hazard Screening document revisions for Buildings 3130 and 3518.

Presented a minor page change for the LLLW System Operational Safety Requirements (WM-LGWO-LLLW-OSR, Rev. 6) to the PSET. The change was approved and personnel transmitted the document to DOE-ORO personnel for review/approval.

August

Received the DOE-ORO approved System Safety Analysis and Technical Safety Requirements revisions for the Out-of-Tank Evaporation System installed at Building 7877. Also received the DOE-ORO approved System Safety Analysis for the new Monitoring and Control Station (Building 7966) that services the REDC.

Received the approved Nuclear Criticality Safety Approval document (#60) for the upcoming AEA Technologies sludge mobilization project.

Presented a page change for the LLLW System Operational Safety Requirements (WM-LGWO-LLLW-OSR, Rev. 7) to the PSET to allow the AEA Technologies personnel to operate the sludge mobilization system being installed at Building 2537. The change was approved and personnel transmitted the document to DOE-ORO personnel for review/approval.

September

Received LMER approval of the LLLW System Basis for Interim Operation Rev. 1 that incorporated changes made during the first six months of the document. The document was transmitted to DOE-ORO personnel for review and approval.

Received PSET approval of revision 2 of the LLLW System Hazard Screening document to make it consistent with the LLLW System's draft Safety Analysis Report.

Received PSET approval of the Safety Analysis Reports and Technical Safety Requirements documents for the LLLW System and Building 7877 operations. These documents, which were the culmination of 5 years of work in the SARUP to develop documents that meet the requirements of DOE Orders 5480.22 and 5480.23, were then transmitted to DOE-ORO personnel for review and approval.

Completed the annual review of several facility authorization basis documents: the Basis for Interim Operations documents for the LLLW System and Building 7877; the System Safety

Analysis and Technical Safety Requirements for the Cesium Removal Demonstration Project; and the LLLW System Operational Safety Requirements. Documentation of the reviews was completed and transmitted to DOE-ORO personnel as required by the documents.

October

Prepared and received approval of Unreviewed Safety Question Determination packages for sluicing operations that were to be conducted at Building 2537 in tank W-21 as part of the AEA Sludge Mobilization Project.

November

Issued the draft Operational Safety Requirements for the LLLW System (WM-LGWO-LLLW-OSR, Rev. 8) for review and approval. This revision will eliminate several requirements for facilities that had been removed from active service and would complete a corrective action to correct an incorrectly derived Operational Safety Requirements control that was identified and reported earlier this year.

December

Received PSET approval of the Operational Safety Requirements for the LLLW System (WM-LGWO-LLLW-OSR, Rev. 8) and two supporting Unreviewed Safety Question Determinations. Personnel then transmitted the documents to DOE for review/approval.

Provided comments on the draft System Safety Analysis and Technical Safety Requirements documents for the Melton Valley Storage Tanks Capacity Increase Project (Building 7856) to System Safety Engineering personnel.

2.6 3039 Stack Area

See discussions of Building 3092 upgrades in Section 2.2.6.

Upgrade Hot Off-Gas System at 3039 Stack General Plant Project - This GPP replaced the primary and backup fans that provide off-gas to the main ORNL Complex from the 3039 Stack Ventilation System in an effort to ensure the continued reliability of service to ventilation system customers. This upgrade was completed with minimal impact on customer operations.

January

Verified delivery of the two blower fans and electric motor for the Upgrade Hot Off-Gas System at 3039 Stack GPP. Inspection of the equipment of indicated that one of the blower fans would have to be returned to the manufacturer and modified.

February

Returned the blower motor for the Upgrade Hot Off-Gas System at 3039 Stack to the manufacturer for modification.

March

Held meeting to review the status and scope of the Upgrade Hot Off-Gas System at 3039 Stack GPP.

April

Continued preparations for construction for the Upgrade Hot Off-Gas System at 3039 Stack GPP. The new blower, which had been returned to the manufacturer for rework due to unacceptable operating conditions, was received.

May

Completed removal of asbestos from piping which will be affected by the Upgrade Hot Off-Gas System at 3039 Stack GPP.

June

Continued preparation activities for the beginning of construction.

July

Identified various tubes and wiring which needed to be rerouted for the beginning of this project and began removal of abandoned instrument tubing and steam tracing which would be affected by the upgrade.

August

Continued preparation activities for the Upgrade Hot Off-Gas System at 3039 Stack GPP. Preparation activities included bench testing of the new recirculation valve and a fit-check of the mocked-up equipment (y-pipe, fittings, flanges) at MK-Ferguson's shop.

September

Continued preparation activities for the Upgrade Hot Off-Gas System at 3039 Stack GPP. Parts necessary to complete the project were received. Parts fabricated by the construction contractor were placed at the site. Notified off-gas customers of the upcoming outage of the off-gas system during portions of this upgrade. The first phase of the construction activities for this project was scheduled to begin October 7.

October

Completed the first of three construction phases for the Upgrade Hot Off-Gas System at 3039 Stack GPP. The first phase involved the installation of a new Y-pipe, with isolation valves, between the snubber and the two blowers of the hot off-gas system. Elbows with isolation valves were installed upstream of the blowers. A new recycle valve and electronic recycle valve control system was also installed. The hot-off gas system was shutdown for approximately twelve hours and successfully brought back on-line in support of this activity. Continued effort to prepare for the second phase of construction for the Upgrade Hot Off-Gas System at 3039 Stack GPP. A representative of the turbine/blower manufacturer inspected the blower and determined that reworking of the internal components will be necessary prior to installation. Installation of the steam turbine and blower was planned for the second week of November, but the schedule could be impacted by the reworking of the equipment.

November

Continued effort to prepare for the second phase of construction for the Upgrade Hot Off-Gas System at 3039 Stack GPP. The internal components of the blower were reworked by the manufacturer and returned to ORNL. Personnel then began the installation phase of the system upgrade which required a partial outage during which the HOG system operated on the electric driven blower with no backup for approximately 2 weeks. Installation began with the existing foundation for the steam turbine and blower being removed and replaced with a new concrete foundation. Personnel then started installation of the new blower and steam turbine. Several punch list items were completed prior to attempting to install the new electric motor and blower. MK-Ferguson personnel then successfully installed the new T-6 turbine and blower of the central off gas system. Back up power for the system was then connected and the turbine was hot run tested and appeared to be in good condition. An extended hot run of the steam turbine would be performed prior to the installation of the new electric motor and blower in December.

December

Continued effort to verify the adequacy of the new steam turbine and blower installed during the second phase of construction for the Upgrade Hot Off-Gas System at 3039 Stack GPP. An extended hot run of the steam turbine was performed. Completed efforts to install the

new electric motor and blower for the Upgrade Hot Off-Gas System at 3039 Stack GPP. During this installation the new steam turbine and blower operated without back-up.

2.7 TRU Program Integration

January

The draft "Sludge (Slurry) Transfer Request Application" was distributed for review and comment. This application would be used for making sludge transfers from the Gunitite Tanks, the Old Hydrofracture Tanks, and the Bethel Valley Evaporator Service Tanks to the Melton Valley Storage Tanks. Sludge transfers were scheduled to occur starting in FY 98 and will be completed in FY 00.

Participated in a week long review with contractor personnel and DOE-ORO representatives on safety documentation and risk management for the upcoming sludge mobilization demonstration project planned at Building 2537. The meeting examined the differences and similarities between the European and American approaches to these issues.

February

Several meetings were held with project personnel during the month. A review of the sludge mobilization system to be installed at Building 2537 was performed with Engineering personnel. Began development of schedules to determine potential conflicts between TRU Program activities and capital improvement projects presently underway at LGWO facilities.

May

The second "Status Review Meeting for Sludge Mobilization and Related Activities" was held on May 21. This meeting provides the opportunity for the major sludge mobilization projects (i.e. Gunitite And Associated Tanks, Old Hydrofracture Tanks, and Bethel Valley Evaporator Service Tanks) to present the status of their respective projects. In addition, the status of other auxiliary tasks and activities that either support sludge mobilization activities or that may affect the scheduling of sludge mobilization activities were also presented. All major sludge mobilization activities appeared to be on schedule. The only concern identified related to the Melton Valley Storage Tank Capacity Increase Line Item. Initial scheduling assumed a full blown operational readiness review would not be necessary, however, this now appears unlikely. Potential impacts to sludge transfer schedules were being evaluated; however, it was apparent that the start of operations for the MVST-CI facility would be a key element in the transfer schedule. Several unknowns could delay the start of operations for the MVST-CI including: construction delays/impacts associated with BCPs' 4 and 5, schedule delays/impacts associated with the possibility that DOE may be pursuing a direct contract for the installation of a sludge mobilization system to be installed on the MVST-CI

tanks prior to the start of operations, and schedule delays/impacts associated with the resolution of significant problems that might be encountered during preoperational testing.

June

The third "Status Review Meeting for Sludge Mobilization and Related Activities" was held. This meeting provides the opportunity for the major sludge mobilization projects (i.e. Gunite And Associated Tanks, Old Hydrofracture Tanks, and Bethel Valley Evaporator Service Tanks) to present the status of their respective projects. In addition, the status of other auxiliary tasks and activities that either support sludge mobilization activities or that may affect the scheduling of sludge mobilization activities are also presented. All major sludge mobilization activities appeared to be on schedule. The only concern related to the Melton Valley Storage Tank Capacity Increase Line Item. Initial scheduling assumed a full blown operational readiness review would not be necessary, however, this now appears unlikely. Potential impacts to sludge transfer schedules were being evaluated.

July

The fourth "Status Review Meeting for Sludge Mobilization and Related Activities" was held. This meeting provides the opportunity for the major sludge mobilization projects (i.e. Gunite And Associated Tanks, Old Hydrofracture Tanks, and Bethel Valley Evaporator Service Tanks) to present the status of their respective projects. In addition, the status of other auxiliary tasks and activities that either support sludge mobilization activities or that may affect the scheduling of sludge mobilization activities are also presented. All major sludge mobilization activities appear to be on schedule. The only concern presently relates to the Melton Valley Storage Tank Capacity Increase Line Item. Initial scheduling assumed that construction would be completed by December 1997; however, construction delays have resulted in a revised completion delay of early March 1998. An additional scheduling assumption was that a full blown operational readiness review would not be necessary, but recent evaluations have indicated that this was not a valid assumption. Potential impacts to sludge transfer schedules were being evaluated.

October

Held the sixth monthly coordination meeting between LGWO personnel and various projects that will involve the LLLW System during the next 2 years. Began update of the sludge transfer schedule working document. Identified to personnel that one transfer pump at Building 7830 had failed and that until the pump is replaced, LGWO would be operating without a spare pump in service. If the other pump fails, there would be severe impacts to upcoming transfers involving the LLLW System.

2.8 Liquid Waste Certification Official

Assumed full responsibility for Liquid Waste Certification Official activities in October 1997.

September

Supported the Liquid Waste Laboratory Certification Official (LCO) in preparation for transitioning the LCO responsibilities to the LGWO. Data was entered and totaled for the 2nd and 3rd FY quarter of this year. Along with this data, total LLW processed for the same two quarters was determined and forwarded on to be used in reports which support the Nevada Test Site requirements.

October

Presented revisions of the Waste Acceptance Criteria for Liquid Wastes to the ORNL Directors Review Committee. The Committee was considering these changes to determine if they affected an upper tier document titled *ORNL Environmental Protection Procedure*.

Revised the ORNL Procedure for Discharging Waste to the Oak Ridge National Laboratory LLLW, Process Waste Treatment Complex - Building 3544 and the Process Waste Treatment Complex - Building 3608.

Provided approval signature to the new ORNL Liquid Waste Certification procedure and reviewed the *Current and Projected Liquid Low-Level Waste Generation at ORNL* document for Chem Tech personnel and provided comments. Also updated the data logs on the Ion Exchange Columns at Building 3544 and for the LLLW generation at ORNL.

Assisted three generators in the correct disposal of several liters of non-radioactive liquids.

Approved one variance request and forwarded it onto plant Environmental Compliance personnel for their review/approval.

November

1) Approved one Variance Request for disposal of liquids into the LLW system and took the Variance Request to Environment Compliance for final approval. 2) Approved in conjunction with the Sewage Treatment Plant Facility Manager a variance/Memorandum of Understanding for the disposal of liquids into the Sewage Treatment Plant. 3) Assisted the WMRAD Training Department in establishing the training requirements for one of the Liquid Generation Characterization Officials and submitted an exemption request for the Nevada Test Site training for this individual since their waste does not interface with waste streams destined for the NTS. 4) Acquired final approval on one variance request for disposal of cell window wash down solutions to the LLW system. 5) Received a request for disposal of

glycol solutions and initiated an memorandum of understanding with Sewage Treatment Plant personnel to accomplish this. 6) Prepared the LLW Quarterly Report and forwarded it to the ORNL Waste Certification Official. 7) Provided Liquid Waste Certification Official services to five generators to assist in the disposal of their liquid wastes.

December

Received three new requests for assistance in disposal of wastes to the Sewage Treatment Plant. Initiated Memorandums of Understanding (MOU) for two of the requests and obtained approval from the STP Facility Manager pending additional documentation from the waste generator for the third request. Also completed two additional MOUs during the month.

Prepared/programmed an Excel worksheet to facilitate completion of Waste Item Descriptions for the LGWO Solid Waste disposal activities.

2.9 Configuration Control

During the year, eighteen changes were classified as meeting the requirements of a Configuration Change. In addition, ten changes to LGWO facilities had been classified as meeting requirements of an Equipment Change (a change that does not meet the ORNL definition of a Configuration Change, but which the LGWO has determined should be documented).

2.10 Miscellaneous

January

Approved a Document Change Directive (DCD) for procedure WM-LGWO-602.2.5 Rev. 6 that provided direction for transferring LLLW to the new trucked waste connection instead of to the LLLW Evaporator Facility. The existing underground transfer line will be removed from service by the end of FY 97 as part of the Federal Facility Agreement for the LLLW System.

February

Approved a revision to the Building 2649 operating procedure (WM-LGWO-610.2.7).

Approved revisions to 15 LGWO procedures for operations at Buildings 3544 and 3608 (Process Waste Treatment Complex facilities). This will allow personnel to undergo training on the recently installed upgrades to increase the treatment capacity of Building 3544.

Completed the 2-year review of 7 LGWO procedures. No revisions were identified for any of these documents.

Completed sink and drain survey forms for approximately 50 LGWO facilities and transmitted them to ORNL Compliance personnel. This places LGWO approximately 3 months ahead of the schedule generated by ORNL personnel. The remaining LGWO facilities will be reviewed and drains will be traced either by inspection or dye-testing in the upcoming months.

March

Cathodic Protection Systems Upgrade - Completed most of the upgrade of system 14 (The LLLW line from South Parking Lot valve box over to Building 7830). All underground work for system 14 was completed and inspection and testing of the system was scheduled for early April.

Approved the LGWO's Annual Operating Report for CY1996 and sent the report to Laboratory Records for reproduction and distribution. This completed two Performance Tracking System milestones to complete the annual report by March 31, 1997.

Approved one DCD for operations associated with the capacity increase upgrades underway at Buildings 3544 and 3608.

Approved revisions to six LGWO operating procedures (WM-LGWO-603.3.4 R3, -606.2 R7, -606.11 R1, -609.2.1 R18, -610.2.1 R13, and -612.3.1 R6).

April

Completed the two-year review of several LGWO operating procedures. Nine procedures did not require revisions. Three procedures were cancelled (WM-LGWO-606.9, -605.2, and -605.6). Six other procedures were identified as requiring revisions. Three of these procedures were updated and approved (WM-LGWO-603.2.1.1 R5, -603.2.2.6 R4, -606.10 R1). The other three were to be completed in May.

Approved a new procedure (WM-LGWO-604.2.12) for operation of the F-1006 clarifier at Building 3608 after the completion of upgrades at the facility.

Continued work during the month to prepare a consolidated work schedule for projects affecting LGWO facilities during the next two years.

Provided several updates to the ORNL stack and vent database as requested by Environmental Compliance personnel to support Title V air permitting requirements.

May

Approved an editorial change to one LGWO procedure for operations at Building 3544.

June

Approved revisions to fourteen LGWO procedures: ten procedures for operations at the Process Waste Treatment Complex (WM-LGWO-602.2.1, -602.2.3, -602.2.10, -603.2.2.2, -603.2.2.4, -603.2.2.5, -604.2.4, -604.2.5, -604.2.10, -604.2.12) and four procedures for LLLW operations (WM-LGWO-608.7.1, -608.12 Rev. 2, -610.2.7 Rev. 2, and WM-LGWO-610.2.3 Rev. 9).

July

Approved revisions to seventeen LGWO operating procedures during the month: one procedure for operations at the Waste Operations Control Center (WM-LGWO-609.2.1 Rev. 19); one procedure for operations in the Bethel Valley LLLW Collection System (WM-LGWO-610.2.1 Rev. 14); one procedure for Logbook entries (WM-LGWO-606.1 Rev. 6); one procedure for pickup of bottled LLLW packages (WM-LGWO-608.5 Rev. 6); two procedures and one Document Change Directive for operations at the Process Waste Treatment Complex - Building 3544 (WM-LGWO-602.2.4 Rev. 9, -602.2.5 Rev. 6, -602.2.5R6-DCD1); one procedure for operations at the Process Waste Treatment Complex - Building 3608 (WM-LGWO-604.2.2 Rev. 10); three procedures for operations at the LLLW Evaporator Facility (WM-LGWO-611.2.3 Rev. 4, -611.2.4 Rev. 9, and -611.3.1 Rev. 7); and six procedures for the 3039 Stack Ventilation System (WM-LGWO-612.2.1 Rev. 6, -612.2.2 Rev. 7, -612.2.3 Rev. 7, -612.2.4 Rev. 6, -612.2.5 Rev. 6, and -612.6 Rev. 5).

Canceled the LGWO As Low As Reasonably Achievable (ALARA) Plan and replaced it with the LGWO ALARA Program Administrative Guide (WM-LGWO-ADMIN-2, Rev. 0).

Completed effort on collecting/organizing/redlining the Process Waste Treatment Complex - Building 3608 piping drawings and submitted them to the DMC. These submittals included the recently completed upgrades at the facility and various configuration changes that were completed during the last year.

August

Approved revisions to three LGWO procedures: two procedures for operations at the Transported Waste Receiving Facility (WM-LGWO-610.2.7 Rev. 3, -610.3.4 Rev. 1) and one procedure for operation of the LR-56 LLLW Tanker (WM-LGWO-608.12 Rev. 3).

Approved two Document Change Directives for the LLLW System procedures (WM-LGWO-610.2.1R14-DCD1 and WM-LGWO-610.2.3R8-DCD1).

Submitted the updated electrical and piping drawings for the Process Waste Treatment Complex - Building 3608 to the WMRAD Documentation Management Center for controlled distribution.

September

Completed preliminary hazard screening questionnaires for fifty LGWO facilities and turned them in to the team leader for use in the Necessary and Sufficient process review underway for LGWO and SWO facilities.

Provided documentation for completion of Performance Tracking System milestones 320131, 320132, and 325125. These milestones were for safe and compliant operation of the LLLW Collection and Transfer System, the Process Waste Collection and Transfer System, and the 3039 Stack Ventilation System during Fiscal Year 1997.

Revised two procedures for operations at the LLLW Evaporator Facility (WM-LGWO-611.2.2 Rev. 5 and -611.2.6 Rev. 5) to require independent verification of valve lineups associated with operation of the Moyno transfer pumps (3P-1 and 3P-2).

Approved revisions to two LGWO procedures for operations at Building 7966 (WM-LGWO-610.2.8 Rev. 1 and -610.3.5 Rev. 1).

Approved revisions to three LGWO procedures for operations at Building 2649 (WM-LGWO-610.2.7 R4 and -610.3.4 R2) and the LR-56 LLLW Tanker (WM-LGWO-608.12 R4).

Approved a revision to the LGWO implementing guide for Chapter 10 of the Conduct of Operations program (WM-LGWO-CO10, Rev. 3).

Assisted Chemical Technology Division personnel in development of the operating procedures for the upcoming Out-of-Tank Evaporation System operation to be conducted at Building 7877. Also approved the training plan for the upcoming activity.

October

Approved the Necessary and Sufficient report for WMRAD's radiological and industrial category facilities and submitted the report for validation.

Submitted preliminary hazard screening information for LGWO's nuclear facilities and then approved the Necessary and Sufficient report for WMRAD's nuclear facilities. This report was then submitted for validation.

Submitted the following updated drawing packets to the DMC for distribution as controlled documents: Architectural and Electrical drawings for Building 3130 (Waste Operations Control Center); drawings for Building 7567 (Central Pumping Station); Ventilation and Electrical drawings for Building 2099 (Monitoring and Control Station servicing Building 2026); Piping and Electrical drawings for Building 7569 (Tank WC-20); Instrumentation drawings for Building 7830 (Melton Valley Storage Tanks); Architectural, Electrical, Ventilation, Piping, and Piping and Instrumentation Diagram drawings for Building 7966; and I&C drawings for Building 2531 (LLLW Evaporator Facility).

Completed the 2-year review of the following procedures (no revisions were identified): WM-LGWO-603.2.1.5 Rev. 2, -604.3.2 Rev. 2, -606.3 Rev. 3, -606.8 Rev. 2, -609.6 Rev. 2, and -611.2.7 Rev. 0.

Two LGWO personnel hosted an exhibit at the Environmental Fair.

November

Approved entry to the WMRAD Procedures and Data Services group the following drawings for LGWO Facilities: Architectural, Civil, and Structural drawings for Building 3608; Architectural, Civil, Electrical, and Structural drawings for recent upgrades at Building 3092; Electrical drawings for Building 7860; and Civil, Electrical, and Piping drawings associated with the intervalley transfer pipeline and the Central Waste Collection Header. This was done to maintain updated drawings for LGWO Facilities that have recently undergone upgrades by Line Item projects and to incorporate redlines from recently completed approved configuration changes.

Provided comments on the draft Environmental Management and Enrichment Facilities Integrated Safety Management System Description that was issued for comment.

December

Cancelled two Document Change Directives (WM-LGWO-611.2.1R4-DCD1 and WM-LGWO-611.2.2-DCD1) for use of temporary control panels at the LLLW Evaporator Service Tanks (Building 2537) since the temporary controls have been removed and the new control panels placed in service.

Cancelled a Document Change Directive (WM-LGWO-602.2.5R7-DCD1) for LLLW transfers from the Process Waste Treatment Complex - Building 3544 to the LLLW Evaporator Service Tanks (Building 2537) since this hard-piped connection has been removed from service per the Federal Facility Agreement for the LLLW System.

Approved a revision to the OTE operating procedures (WM-LGWO-608.13 R1).

Approved a Document Change Directive (WM-LGWO-610.2.2R12-DCD1) to cover operation of the HOG Condensate Collection Tank being installed by the Bethel Valley FFA Line Item.

Approved two Document Change Directives (WM-LGWO-609.2.1R19-DCD1 and WM-LGWO-610.2.1R14-DCD2) to delete LLLW Tank W-12 which was recently grouted by the FFA program for the LLLW System.

Approved a Document Change Directive (WM-LGWO-612.2.6R5-DCD2) for operations at Building 3092 (Off-Gas Scrubber Facility).

Approved the following drawing sets for entry into the WMRAD Procedures and Data Services (formerly DMC) organization for controlled distribution: Building 7830 Electrical Drawings, Building 7877 Piping, Structural, Instrumentation, Civil, Ventilation, Electrical, Piping and Instrumentation Diagram Drawings.

3.0 MAINTENANCE ACTIVITIES

3.1 Process Waste Treatment Complex (Buildings 3544 and 3608) and Collection System

January

Changed out the sulfuric acid feed pump to the air stripper at Building 3608. The sulfuric acid is used to adjust the wastewater's pH to assist in the removal of volatile organics in the air stripping process.

Repaired a seal water leak on the J-2018 jet mixer at Building 7961 (Melton Valley Process Waste Collection Tanks Facility).

Removed spent resin from two zeolite columns at Building 3544 and reloaded the columns with fresh zeolite resin. These columns are used to provide additional throughput capacity at the facility during periods of heavy inflow to the Process Waste Collection and Transfer System.

Repaired some internal piping in zeolite column #1 at Building 3544 and reloaded with zeolite from column #2 so repairs could be made to its internal piping. These columns are used to provide additional throughput capacity during periods of heavy inflow to the Process Waste Collection and Transfer System.

February

Continued work at Pumping Station #1 to upgrade the transfer pumps. This station collects drainage from the North and South Tank Farms and transfers it to the Process Waste Collection and Transfer System for future treatment.

Replaced the discharge valve on the bottom of the 1,000 gallon LLLW Tanker.

March

Upgraded the Pumping Station (PS) #1 transfer system. This upgrade consisted of replacing the existing pumps with those of a larger capacity, putting the new pumps on a backup power system (diesel generator), replacing the 2 ½ inch below ground discharge pipeline with a 3 inch above ground pipeline and installing new level probes (tied into WOCC). These upgrades were completed to help insure the overflow piping from the PS #1 collection system to the Equalization Basin (Building 3524) will not be utilized in the future.

Emptied spent resin from two zeolite columns at Building 3544 and reloaded the columns with fresh zeolite. The zeolite columns are used to provide additional throughput capacity

at Building 3544 during periods of heavy inflow to the Process Waste Collection and Transfer System.

Performed the sulfuric acid cleaning of the air stripper at Building 3608. The air stripper, which is used to remove volatile organics from the wastewater prior to discharge to White Oak Creek, is cleaned with sulfuric acid periodically to remove buildup on the air stripper's media.

Cleaned a buildup of sludge from the precoat tank at Building 3608. This tank supplies material to coat the filter press filters prior to transferring sludge through the filter. This aids in the dewatering of the sludge.

Supported P&E personnel with relabelling equipment at Buildings 3544 and 3608.

Completed installation of the new replacement pumps (J-4001A and B) at the Influent Pumping Station. The existing pumps were replaced due to high maintenance costs. This station transfers process waste collected in the Bethel Valley Complex to the large storage tanks at Building 2600 (Bethel Valley Process Waste Storage Tanks Facility) for future treatment.

Repaired the J-1022B sludge pump at the Process Waste Treatment Complex - Building 3608. This pump is one of two pumps used to transfer sludge from the sludge holding tank to the filter press for dewatering operations.

Completed the annual DOT inspection of the LGWO's 5,000 gallon process waste tankers (five tankers total).

April

Changed out the media in dual media filter F-1010 at the Process Waste Treatment Complex - Building 3608. This filter is used to remove particulates from the wastewater prior to treatment through the air stripper and granular activated carbon columns at the facility.

Cut up and disposed of an old zeolite column from the Process Waste Treatment Complex - Building 3544 operations.

Removed pump J-4001C at the Influent Pumping Station (F-4001) in preparation for its replacement with a steam-driven turbine pump that will provide pumping capability in the event of a failure of electrical services to the other two pumps at this station.

Repaired FCV-634 (the F-1019 Granular Activated Carbon column's drain to the pipe trench valve) at the Process Waste Treatment Complex - Building 3608 after the valve seat had broken.

Completed the five year Department of Transportation inspection of the acid/caustic tanker used to transport sulfuric acid and sodium hydroxide from the storage tanks at Building 3608 to remote LGWO facilities.

Completed several maintenance activities at the Process Waste Treatment Complex - Building 3608. These included replacing the cloths on the filter press used to dewater the sludge and replaced sludge feed pump J-1022A which transfers sludge from the storage tank to the filter press for dewatering.

May

Replaced the level instrumentation for tank F-2101 at Building 2600 (Bethel Valley Process Waste Storage Tanks) after the level instrument's detector failed. These tanks collect process waste from throughout the ORNL Complex and serve as surge tanks for the radiological wastewater treatment operations at Building 3544.

June

Replaced the J-1017A Granular Activated Carbon sump pump after it failed at the Process Waste Treatment Complex - Building 3608. This pump is one of two pumps that transfers wastewater to the carbon columns for removal of organics prior to the wastewater's discharge to White Oak Creek.

Repaired the J-1006C pump after it failed at the Process Waste Treatment Complex - Building 3608. This pump is used to recirculate the sludge generated during the water softening operations at the facility.

Completed the cleanout of the L-1 clarifier at the Process Waste Treatment Complex - Building 3544 and placed the clarifier in standby. The water softening operations were recently relocated to the Process Waste Treatment Complex - Building 3608 as part of a treatment capacity increase upgrade.

July

Performed the scheduled sulfuric wash of the air stripper at the Process Waste Treatment Complex - Building 3608. This cleaning is done to prevent the buildup of algae on the air stripper's packing material.

Repaired an air release valve on Granular Activated Carbon column F-1019 at the Process Waste Treatment Complex - Building 3608 that had been leaking through. This column is one of three columns used to remove organics from the wastewater prior to discharge to the watershed.

Unplugged the sulfuric acid supply line to the air stripper at the Process Waste Treatment Complex - Building 3608 and then recleaned the air stripper. This cleaning is done to prevent the buildup of algae on the air stripper's packing material.

Repaired the J-1006 sludge pump at the Process Waste Treatment Complex - Building 3608. This pump is used to transfer sludge from the clarifier to the sludge holding tank for later dewatering by the filter press operation.

Repaired a failed transfer pump (J-1022A) at the Process Waste Treatment Complex - Building 3608. This pump is one of two pumps used to transfer sludge from the holding tank to the filter press to be dewatered.

Removed trees near Building 3518 (Neutralization Plant) in preparation for the installation of a new steam line to service the steam-turbine driven pump being installed at the Influent Pumping Station (F-4001). This pump will provide additional backup transfer capabilities of process waste to the Bethel Valley Storage Tanks in the event that there is a failure of the two electric transfer pumps or the backup diesel generator.

Replaced the bearings and motor on the S-1 sump pump at the Process Waste Treatment Complex - Building 3544. This pump transfers the facility's sump contents to the Influent Pumping Station for future treatment.

Began painting the L-1 clarifier and its diked area at the Process Waste Treatment Complex - Building 3544 in an effort to reduce the radiation protection postings of the area.

Repaired a failed level probe for the S-1 sump at the Process Waste Treatment Complex - Building 3544.

August

Repaired a leak in the suction line for the J-1026E sulfuric acid pump at the Process Waste Treatment Complex - Building 3608. This pump is used to adjust the pH of softened wastewater prior to transfer to Building 3544 for radiological treatment.

Cleaned up the area around Building 3518 (Neutralization Plant) as part of LGWO's continuing housekeeping activities.

September

Replaced the level instrument on tank F-1050 at the Process Waste Treatment Complex - Building 3608. This tank is a surge tank which receives wastewater from the clarification process at Building 3608 and is then transferred to the Process Waste Treatment Complex - Building 3544 for further treatment.

Changed out spent zeolite resin from the columns at the Process Waste Treatment Complex - Building 3544 and loaded fresh resin. The columns were then placed in standby. The zeolite columns are used for the removal of cesium from the wastewater and to provide additional throughput at Building 3544.

October

Replaced the air release valves on Granular Activated Carbon Columns F-1018 and F-1019 at the Process Waste Treatment Complex - Building 3608.

November

Completed the quarterly sulfuric acid cleaning of the air stripper at the Process Waste Treatment Complex - Building 3608. This cleaning is done to remove any growth on the air stripper's media.

Repaired a bad breaker on pump J-1002A (nonmetals feed pump) at the Process Waste Treatment Complex - Building 3608. This is one of two pumps used to transfer nonmetals wastewater through the treatment process.

December

Repaired the J-1026D sulfuric acid pump at the Process Waste Treatment Complex - Building 3608. This pump supplies acid to neutralize process wastewater at tank F-1050 prior to the wastewater's transfer to the Process Waste Treatment Complex - Building 3544 for further treatment.

Replaced the discharge pressure gauge on pump J-1017B at the Process Waste Treatment Complex - Building 3608.

3.2 Liquid Low-Level Waste System

January

Repaired a leak in the Central Waste Collection Header at Valve Box #1. The leak occurred within the valve box and was confined within the valve box's secondary containment structure. Small leaks in valve boxes are a routine and anticipated maintenance item.

Supported I&C personnel with the scheduled quarterly checkout of the LLLW Evaporator Facility (Building 2531).

Repaired a steam leak at the steam station for LLLW Tanks W-16, -17, and -18. Steam is used as the motive force to transfer the contents of these tanks to the LLLW Collection and Transfer System for future treatment.

Replaced the WC-2 sump pump and repaired the pump's electrical supply after it failed.

Repaired a steam leak on heat tracing and assisted MK-Ferguson personnel in installation of the new steam control station at Building 2537 (LLLW Evaporator Facility Service Tanks Control House).

Supported I&C personnel in the repair of the A-2 steam condensate radiation monitor at Building 2531 (LLLW Evaporator Facility). This monitor measures the level of activity in the steam condensate discharged to the Process Waste Collection and Transfer System.

Supported P&E personnel with the load test of the new gantry crane at Building 2531.

February

Supported I&C personnel in replacing the level instrument for Evaporator Service Tank W-22.

April

Replaced the air dryer filter on the instrument air compressor at Building 7830 (Melton Valley Storage Tanks).

Completed the annual Department of Transportation inspection of the LR-56 LLLW Tanker's trailer.

Provided support to I&C personnel in the quarterly checkout of the LLLW Evaporator Facility (Building 2531).

Provided support to personnel conducting drain surveys at the Transported Waste Receiving Facility (Building 2649).

Replaced the wiring for the leak detection alarm in the pump module at Building 7830 (Melton Valley Storage Tanks). This module is used to transfer supernate from LLLW tanks W-29 and W-30 to Building 7877 for treatment.

Replaced the reach rods for the 3VS21 and 3VS22 sump valves at Building 2537.

May

Cut up and disposed of the old crane trolley from Building 2531 (LLLW Evaporator Facility) that was replaced during a recent maintenance activity.

Supported I&C personnel in the scheduled pressure test of instrumentation on the intervalley transfer header between Buildings 2537 (Evaporator Service Tanks) and Building 7830 (Melton Valley Storage Tanks).

June

Repaired steam valves at Valve Box #2 that were allowing steam to leak through and condense in the valve box's sump. This valve box is part of the Central Waste Collection Header for the LLLW System.

Assisted I&C personnel with work on the liquid level sump probe in the Old Hydrofracture Valve Box.

Installed local alarm indicators for Valves Boxes 1 and 2 sump level alarms. This was done after construction of the new above-ground filter pit damaged the remote telemetry lines to Building 2531. With local indication, the remote alarms can be removed from service temporarily for repairs of the wiring conduit.

Supported the 5-year inspection of fixed ladders in the area of Building 7860 (New Hydrofracture Facility).

Removed the covers from the transfer system at tank W-12 in preparation for removal of shield block that is no longer needed since the tank was removed from service by the Federal Facility Agreement.

July

Completed decontamination work at Building 2537 (Evaporator Service Tanks). Decontamination work had to be performed after a slight contamination incident occurred during decontamination of the pump/valve vault in support of the Sludge Mobilization Project being installed.

Supported MK-Ferguson in the grouting of inactive LLLW tank WC-19 at the request of the Federal Facility Agreement personnel.

Repaired leaking steam supply valves for Evaporator A2 at Building 2531 (LLLW Evaporator Facility).

Supported I&C personnel in the monthly checkout of the LLLW Evaporator Facility (Building 2531).

August

Repaired the steam condensate radiation monitor located in the Evaporator A2 pipe tunnel at Building 2531 (LLLW Evaporator Facility).

Checked the operation of the valves and transfer pumps at the LLLW Evaporator Service Tanks (Building 2537) in preparation for the upcoming AEA Technologies sludge mobilization project. Repairs to the valves were completed.

Replaced a failed sump pump at Valve Box 1A (Building 3133).

Repaired several valve position stops in the valve box near the Old Hydrofracture Facility. This valve box provides the ability for Old Hydrofracture Facility waste to be transferred to the LLLW Evaporator Facility (Building 2531) or directly to the Melton Valley Storage Tanks (Building 7830).

September

Repaired several valves in the Building 7830 (Melton Valley Storage Tanks) pump and valve vault as a maintenance activity in preparation for some upcoming waste transfers.

October

Performed a radiation survey of the pump and valve vault at Building 7830 (Melton Valley Storage Tanks) in preparation for the upcoming maintenance activity on transfer pump 4P-1. Personnel are determining the extent of repairs needed for the pump and whether the pump itself will have to be replaced.

Installed zenith connectors on the existing 1,000 gallon LLLW tanker so that it can be loaded at the Process Waste Treatment Complex - Building 3544 trucking station and unloaded at the Transported Waste Receiving Facility (Building 2649) when it is declared operational.

Supported I&C personnel with the calibration of equipment at Building 2537 (Evaporator Service Tanks).

November

Repaired a slow leak at a fitting in the annulus monitoring tubing at Building 7966 (Monitoring and Control Station for REDC) and then repressurized the transfer line's annulus

from the facility to the South Parking Lot Valve Box. Monitoring of the annulus pressure is used to detect leaks in the primary transfer pipeline or in the secondary containment piping.

Inspected the new transfer line from Building 7966 at the South Parking Lot to determine the cause of the failed cathodic protection tests. Preliminary indications were that the tie-in cross would have to be removed and the gaskets between the flanges replaced to prevent the cathodic protection system from shorting out between the two flange surfaces. Upon further inspection the problem was identified as a damaged outer link seal on the new transfer line that was installed by construction personnel. Personnel would excavate the side of the valve box to provide access early next month.

Replaced the failed transfer pump (4P-1) at Building 7830 (Melton Valley Storage Tanks) with the spare pump. The replacement was done with a minimum of problems by P&E personnel. Personnel also began the procurement process for a replacement spare pump. Lead time for procurement is approximately 3 months. This pump is one of two pumps used for inner tank transfers at the facility and for transfers back to the LLLW Evaporator Facility in Bethel Valley.

Worked on decontaminating Building 2537 (LLLW Evaporator Facility) in an effort to restore the control room to a buffer area. Upon completion of the decontamination efforts, personnel painted the floor to fix in place any remaining residual contamination. Health Physics personnel then rezoned the area to allow routine access.

Supported I&C personnel with the scheduled calibration of the pump discharge pressure transmitters at Building 7830.

December

Replaced the vault plug on the South Parking Lot Valve Box. The plug had been removed to allow personnel to determine the source of a short in the cathodic protection system for the new transfer line from Building 7966 (Monitoring and Control Station for the REDC).

Continued efforts to determine the reason for loss of transfer capability from evaporator feed tank A-1 to evaporator A-2 at the LLLW Evaporator Facility (Building 2531). Nitric acid was added to the lines for steam jets A-1 J-4 and A-1 J-5 in an attempt to dissolve any caustic material that could be plugging the lines but the jets still would not transfer material. At the end of the month personnel had restored operability of both of the transfer jets.

Supported P&E personnel performing scheduled programmed maintenance on the LR-56 LLLW Tanker.

3.3 Gaseous Waste System

January

Replaced the south bank of HEPA filters at Building 3092 (Central Off-gas Scrubber), which were then successfully DOP tested by personnel from Quality Engineering and Inspection. These filters are used to remove particulates from the off-gas ventilation stream prior to its discharge to the environment through the 3039 Stack.

Changed out the demister media on Building 3092's (Off-Gas Scrubber Facility) scrubber system. This facility provides off-gas services to the facilities within the main ORNL Complex in Bethel Valley.

Supported personnel from Environmental Compliance taking flow sampling checks in the 3039 Stack Ventilation System.

Replaced a filter at Building 2099 that had failed a previous DOP test. The new filter was then successfully DOP tested by Quality Engineering and Inspection personnel. This facility serves as the local collection tank for LLLW generated at Building 2026.

February

Replaced the 4507 cell ventilation duct sump pump after the old pump had failed due to age. This sump collects condensation in the cell ventilation duct that is transferred to the Process Waste Collection and Transfer System for future treatment.

March

Repaired a steam leak at the steam control station for the Building 3042 cell ventilation backup steam turbine. Also replaced the bearings on the Building 3042 Cell Ventilation steam turbine and balanced the fan. This turbine provides backup cell ventilation service to Building 3042 from the 3039 Stack System.

Repaired a leak at the steam control station for the Isotope Area Cell Ventilation steam turbine. This turbine provides backup cell ventilation to the Isotope Area.

Changed out the east bank of HEPA off-gas filters at Building 7830. The replacement filters were then successfully DOP tested by personnel from Quality Engineering and Inspection.

April

Completed installation of automatic blowdown valves for the backup steam-driven turbines in the 3039 Stack Area. These turbines provide backup cell ventilation services for the main

ORNL Complex in Bethel Valley. This installation was done after a suggestion from the LGWO Operations Performance Measurement Team.

Repaired several steam leaks in the 3039 Stack Area.

Isolated (capped) three drain lines in the 3039 Stack area that had previously been routed to the LLLW System. This was identified during the ongoing drain survey at ORNL.

Replaced the demister media at Building 3092 after plugging developed with the demister. Building 3092 provides off-gas services to the main ORNL Complex in Bethel Valley.

Completed balancing of the Building 3042 cell ventilation steam-turbine driven fan in the 3039 Stack Area. This fan provides backup cell ventilation services to Building 3042.

May

Conducted scheduled DOP testing of HEPA filters at Buildings 2531, 2537, 7830, 7860, and 7877. All but one set at Building 7860 were successfully tested. The failed set were replaced and then successfully tested by Quality Engineering and Inspection personnel.

Assisted I&C personnel in the operational test of the Central Off-gas System vacuum relief valve. This system provides off-gas services to the main ORNL Complex in Bethel Valley.

June

Completed the scheduled DOP testing of the HEPA filters located in the Building 2531 equipment room.

July

Repaired a blocked instrument air line used to measure the pressure drop across the South Bank of HEPA filters at Building 3092 (Off-gas Scrubber Facility).

Repaired a steam leak on the Central Off-gas turbine. This steam driven turbine provides backup off-gas services to the main ORNL complex in Bethel Valley.

Replaced the belts on the sample pumps located at the 50 foot level of the 3039 Stack as during a routine maintenance activity.

August

Successfully completed DOP testing of the HEPA Filters at Building 2649 (Transported Waste Receiving Facility) and the LR-56 LLLW Tanker.

Successfully completed DOP testing of the HEPA Filters at Building 7966 (Monitoring and Control Station for the REDC) in support of the upcoming startup of this facility as part of the Melton Valley LLLW Collection and Transfer Line Item Project.

September

Performed preventative maintenance on the 4500 Area Cell Ventilation blower at the 3039 Stack Area. This blower provides cell ventilation to the 4500 Area.

Supported I&C personnel in the calibration of several instruments in the 3039 Stack Ventilation System.

October

Replaced the south bank of HEPA filters at Building 3092 (Off-Gas Scrubber Facility) and their associated demisters. The new filters were then successfully DOP tested by personnel from Quality Engineering and Inspection.

Supported P&E personnel with vibration analysis testing of the cell ventilation system in the 3039 Stack Area in an effort to detect alignment problems at an early stage.

November

Replaced the roughing filters for the North and South banks of filters at Building 3092 (Off-gas Scrubber) and repaired the off-gas heater which had been allowing the filters to get wet.

Supported construction personnel in the test running of the new Central off-gas steam-driven turbine at Building 3092. Several valves with steam leaks were repaired during the test. This turbine provides backup off-gas services to facilities throughout the main ORNL Complex in Bethel Valley.

Successfully completed the scheduled DOP testing of the HEPA filters at Buildings 7830 (Melton Valley Storage Tanks), 7860 (New Hydrofracture Facility), and 7877 (LLLW Solidification Facility).

December

Repaired the motor on the east off-gas system fan at Building 7830 (Melton Valley Storage Tanks).

Replaced both banks of HEPA filters at Building 2534 (Off-gas Filter Pit for the LLLW Evaporator Facility). The new filters were then successfully DOP tested by personnel from Quality Engineering and Inspection.

Repaired a crack in the 3500 Area cell ventilation duct work.

4.0 OTHER ACTIVITIES

4.1 Training

January

LGWO personnel attended the quarterly WMRAD Safety Meeting.

One LGWO personnel completed the General Employee Requalification Training.

One LGWO personnel completed the 2-year Radiation Worker II refresher training.

Twelve LGWO personnel completed the annual emergency-squad training.

Four safety meetings were held by WMRAD Safety Officer on lessons learned from Lockout/Tagout.

February

Attended the Nuclear Facility Managers Forum session.

Four LGWO personnel completed the annual 8-hour HAZWOPER refresher training.

One LGWO personnel attended a two-day Work Process Mapping course.

March

All LGWO personnel completed the RCRA refresher course.

Five LGWO personnel completed the 2-year Radiation Worker II refresher training.

Two LGWO personnel attended a two-day Work Process Mapping course.

One LGWO personnel completed the annual 8-hour HAZWOPER refresher training.

One LGWO personnel attended a one-week off-site course on a computerized maintenance program being developed for use with the LR-56 LLLW tanker.

April

Three LGWO personnel completed the two-year Radiation Worker II requalification training.

Four LGWO personnel completed the whole-body counter examination.

One LGWO personnel completed the Generator Interface training.

One LGWO personnel completed the annual respirator fit-testing.

One LGWO personnel completed the General Employee Training.

May

One LGWO personnel completed a 3-day Project Delivery System off-site training course.

Two LGWO personnel completed the annual 8-hour HAZWOPER refresher training.

One LGWO personnel completed a two-week off-site training course on the Distributed Control System.

One LGWO personnel completed the 2-year Radiation Worker II refresher training.

One LGWO personnel completed a two-day course in the use of Eudora software.

One LGWO personnel completed the annual respirator fit training.

June

One LGWO personnel completed the annual 8 hour HAZWOPER refresher training.

LGWO personnel completed the Lockheed Martin Ethics training.

Three LGWO personnel completed the 2-year Radiation Worker II refresher training.

One LGWO personnel completed the two-year Unreviewed Safety Question Determination refresher training.

July

Completed signatures on all 30 of the LGWO operators 2-year requalification programs. All eight LGWO foremen's requalification documentation was also completed and signed. All LGWO operators and foremen are required to complete training on all LGWO facilities and procedures every 2 years.

One LGWO personnel completed the annual 8-hour HAZWOPER refresher training.

One LGWO personnel completed the 2-year Unreviewed Safety Question Determination training.

One LGWO personnel completed a three day training course on the process used to develop Safety Analysis Reports, including various analysis methods.

One LGWO personnel completed the 2-year Radiation Worker II refresher training.

Two LGWO personnel completed the Ethics refresher training.

August

One LGWO personnel completed the annual respirator fit training during the month.

September

Thirteen LGWO personnel completed access training for Buildings. 3019, 3047, and 3517.

Seven LGWO shift foremen and two chemical operators completed training on Building 7966 (Monitoring and Control Station for the REDC).

October

One LGWO personnel completed the two-year General Employee refresher training.

One LGWO personnel completed a 4 day accident investigation course.

November

One LGWO personnel completed training in Confined Space for Supervisors and Nuclear Criticality Safety.

Several LGWO personnel completed training in fire extinguishers.

One LGWO personnel completed the Radiation Worker I training.

One LGWO personnel attended a half day Health and Safety Forum.

December

Eleven LGWO personnel completed the 2-year Radiation Worker II refresher training.

One LGWO personnel completed the annual Emergency Supervisor training.

All LGWO day shift personnel completed training on the Out-of-Tank Evaporator System.

One LGWO personnel completed the annual 8-hour HAZWOPER refresher training.

Two LGWO personnel completed the annual respirator fit-testing.

4.2 Audits/Reviews/Tours

January

Attended a facility escort briefing/orientation session at K-25 for the upcoming Lockheed Martin Corporate Audit of EM&EF activities.

Provided support to personnel participating in the Corporate Audit of Waste Management activities.

Attended a ½ day Safety Workshop sponsored by LMES.

LGWO Head was appointed to a LMER Work Smart Standards committee. This committee would meet daily over a four to five week period.

February

Two LGWO personnel provided an escorted tour of the PWTP Upgrades Line Item modifications at Building 3608 to Tennessee Department of Health and Environment personnel.

March

Provided an approximately 5 hour familiarization tour to the DOE-ORO on-site facility representatives assigned to the WMRAD. This tour is part of their initial qualification training as facility representatives.

Provided an orientation tour of LGWO facilities to a subcontractor who will be providing support to the LGWO's upcoming reengineering effort.

Participated in a surveillance/audit by the Waste Certification Group on two of LGWO's waste certification procedures. The surveillance went well. No findings or observations were anticipated.

April

Completed the annual inspection of all fire extinguishers located within LGWO facilities.

May

Participated in LMES audit of conduct of operations foreman shift turnover and operator duties at Building 3608 for approximately 4 hours. No findings or concerns were identified.

Provided information on LGWO operations to three DOE Headquarters personnel participating in the mid-year review of EMEF budget activities at the request of the Bethel Valley watershed manager.

Provided a tour of the Waste Operations Control Center (Building 3130) and the Process Waste Treatment Complex - Building 3544 to personnel from the Institute of Nuclear Energy Research.

June

Participated in a Tennessee Department of Environmental Compliance inspection of ORNL Clean Water Act/NPDES programs and related activities on June 11 & 12, 1997. No findings or concerns were identified for the NPDES permitted outfall at the Process Waste Treatment Complex - Building 3608.

July

Conducted several tours and demonstrations of operations of the Transported Waste Receiving Facility (Building 2649) to support the DOE-ORO Operational Readiness Review underway to demonstrate the facility's readiness to be placed in service.

August

Provided several tours to personnel participating in the independent DOE-ORO Readiness Review for Building 2649 during the month.

November

Conducted a tour of the Building 7877 (LLW Solidification Facility) operations for DOE-ORO personnel who will be performing the review of the recently submitted Safety Analysis Report and Technical Safety Requirements documents for this facility's operations.

December

Completed OSHA inspection of Building 3518A with no identified findings or concerns.

4.3 Environmental Restoration Support Activities

January

Transferred three tanker loads of process waste from the Building 7500 Canal to the Process Waste tanker. The tanker's contents were then transferred to the Process Waste Collection and Transfer System for future treatment.

Staged pumps at Solid Waste Storage Area 5 to transfer the contents of the ponds to the process waste tanker.

Sampled tanks T-1, T-2, and T-4 at the Old Hydrofracture Site at the request of Federal Facility Agreement and Environmental Restoration personnel.

Collected additional samples from the Old Hydrofracture Site tanks at the request of Environmental Restoration personnel.

Transferred approximately 280,000 gallons of process waste from the Settling Basin (Building 3513) to the Process Waste Collection and Transfer System for future treatment.

Transferred the contents of 22 drums to the treatment system at Building 3608 for future treatment. This was done at the request of Environmental Restoration personnel.

Changed the primary zeolite column at Seep D at the request of Environmental Restoration personnel. This system is operated by LGWO personnel for the Environmental Restoration program.

Unloaded the spent zeolite resin from the spare Seep D zeolite column at the request of Environmental Restoration personnel.

February

Collected 10 sludge samples from tanks T-1, T-2, and T-9 at the Old Hydrofracture Site.

Transferred liquid from Building 3513 (Settling Basin) to the Process Waste Collection and Transfer System for future treatment.

Backwashed the Seep C treatment system barrels. This system is operated by LGWO personnel for Environmental Restoration personnel.

Changed out the filter at the Seep D treatment system.

Transferred nine tanker loads of water from the ponds in SWSA 5 to the Process Waste Tanker. The tanker's contents were then transferred to the Process Waste Collection and Transfer System for future treatment.

Transferred three tanker loads of water from Building 7500 to the Process Waste Tanker. The tanker's contents were then transferred to the Process Waste Collection and Transfer System for future treatment.

March

Transferred 20 tanker loads (approximately 5,000 gallons each) of water from the SWSA 5 steam cleaning pits to the Process Waste. The tanker's contents were then transferred to the Nonradiological Wastewater Collection and Transfer System for future treatment.

Transferred several surface impoundments (Buildings 3524, 3539, 3540, 7906, 7907, and 7908) in Bethel and Melton Valleys to the Environmental Restoration program.

Transferred process waste from the Equalization Basin (Building 3524) to the Process Waste Collection and Transfer System for future treatment.

Transferred approximately 450,000 gallons from the Settling Basin (Building 3513) to the Process Waste Collection and Transfer System for future treatment.

Replaced eight depleted zeolite drums at the Seep C treatment system with drums loaded with fresh zeolite resin.

Transferred 4,164 gallons of LLLW from tank W-1 to the LLLW Collection and Transfer System for future treatment.

April

Transferred one tanker load (approximately 5,000 gallons) of wastewater from the 7500 Canal to the Process Waste Tanker. The tanker's contents were then transferred to the Process Waste Collection and Transfer System for future treatment.

Transferred water from the 3002A tank vault and 3002A tank to the Process Waste Collection and Transfer for future treatment.

Assisted personnel in the changeout of the inlet HEPA filter in the South Tank Farm.

Changed out the filter for the Seep D treatment system and collected samples at the Seep C and Seep D treatment systems.

Collected samples at the Seep C and Seep D treatment systems.

May

Changed out the secondary zeolite column at the Seep D treatment system.

Supported Environmental Restoration personnel checking tanks levels for tanks W-19, W-20, TH-1, TH-2, TH-3, and WC-1.

Transferred the contents of JO3 in the South Tank Farm to the LLLW Tanker. The tanker was then transported to the Central Waste Collection, where its contents were transferred to the LLLW Collection and Transfer System for future treatment.

Transferred the contents of the Solid Waste Storage Area #5 decontamination ponds to the Process Waste tanker. Its contents were then transferred to the Process Waste Collection and Transfer System for future treatment.

Emptied spent resin from the spare zeolite column for the Seep D Treatment System.

Replaced a failed pump at Lift Station #2, which is operated by LGWO personnel at the request of Environmental Restoration personnel.

Removed resin from the demineralized water columns at Building 3004.

Checked the level on the 3003 tank.

Collected the monthly samples at the Seeps C and D treatment systems.

June

Transferred approximately 20,000 gallons from inactive tanks W-3 and W-4 to the LLLW Collection and Transfer System for future treatment.

Transferred two 5,000 gallon tanker loads of process waste from SWSA 6 to the Process Waste Collection and Transfer System for future treatment.

Sampled inactive tank W-10 for PCBs in preparation for a planned transfer of its contents to the LLLW Collection and Transfer System for future treatment.

Rinsed the 7560 tank three times.

Transferred the contents of the Seep C treatment system sump to the Process Waste Collection and Transfer System in preparation for the beginning of some modifications to the treatment system.

Transferred approximately 300,000 gallons of process wastewater from Building 3513 (old Settling Basin) to the Process Waste Collection and Transfer System for future treatment.

July

Replaced a failed transfer pump at the Seep D zeolite treatment system.

Transferred approximately 80,000 gallons of process waste from the Settling Basin (Building 3513) to the Process Waste Collection and Transfer System.

Transferred approximately 6,500 gallons from inactive tank W-4 to the LLLW Collection and Transfer System for future treatment.

Transferred approximately 52,800 gallons of an estimated 80,000 gallons total from inactive tank W-10 to the LLLW Collection and Transfer System for future treatment.

August

Transferred approximately 40,130 gallons from inactive tank W-10 to the LLLW Collection and Transfer System for future treatment. Approximately 91,930 gallons total have been transferred. An additional 4,600 gallons was transferred between inactive tanks W-3 and W-4. Also began transferring from inactive tank W-9 to W-10 and helped Environmental Restoration personnel demonstrate the pumping system from inactive tank W-3 to W-9.

Transferred the contents of a pit in the South Tank Farm area to the LLLW tanker, whose contents were then transferred to the LLLW Collection and Transfer System for future treatment.

Transferred approximately 14,000 gallons to the Old Hydrofracture Facility's Emergency pond to decrease the "shine" from the pond.

Transferred 5 tanker loads (approximately 5,000 gallons each) of process waste from the Old Hydrofracture facility to the Process Waste Collection and Transfer System for future treatment.

September

Transferred approximately 15,600 gallons from inactive tank W-10 to the LLLW Collection and Transfer System for future treatment. Approximately 91,930 gallons total have been transferred.

Transferred approximately 19,123 gallons of LLLW from inactive tank W-8 to the LLLW Collection and Transfer System.

Transferred 5 tanker loads (approximately 5,000 gallons each) of process waste from the Old Hydrofracture facility to the Process Waste Collection and Transfer System for future treatment.

Transferred the contents of a pit in the South Tank Farm area to the LLLW tanker, whose contents were then transferred to the LLLW Collection and Transfer System for future treatment.

Transferred LLLW from inactive tank W-4 to the LLLW Collection and Transfer for future treatment.

Rinsed tanks TH-1, TH-2, and TH-3.

Transferred two tanker loads of process waste from the 3102 area and the Building 7500 pit to the Process Waste Collection and Transfer System for future treatment.

Sampled the west pit in the South Tank Farm and transferred its contents to the Process Waste Collection and Transfer System for future treatment.

October

Transferred approximately 13,900 gallons of LLLW from inactive tank W-8 to the LLLW Collection and Transfer System.

Sampled the west pit in the South Tank Farm and transferred its contents to the Process Waste Collection and Transfer System for future treatment.

Collected the monthly samples from the Seep C and D treatment systems. Also unloaded spent zeolite resin from the spare zeolite column at Seep D and reloaded it with fresh resin.

Transferred one tanker load of Process Waste from the 7500 Canal and transferred the tanker's contents to the Process Waste Collection and Transfer for future treatment.

Changed out the spent zeolite resin drums at Seep C and made piping modifications to assist in future activities.

November

Changed out the spent zeolite resin vessel at Seep D.

Transferred the contents of the 190 Ponds (Buildings 3539 and 3540) to the Process Waste Treatment System for future treatment.

Transferred one tanker load of process waste from the 7500 Area to the Process Waste Collection and Transfer for future treatment.

Transferred one tanker load (approximately 5,000 gallons) of process waste from the 7500 canal to the Process Waste Collection and Transfer for future treatment.

December

Transferred approximately 9" of water into the 190 Ponds (Buildings 3539 and 3540).

Transferred approximately 145,000 gallons of LLLW from inactive tank W-9 to inactive tank W-8.

Received three containers of LLLW from the Tower Shielding Facility and transferred the container contents into the LLLW Collection and Transfer System for future treatment.

Collected samples from the Seeps C and D treatment systems.

Transferred one tanker of Process Waste from the 7500 Canal to the Process Waste Treatment System for future treatment.

4.4 Miscellaneous

January

Collected one LLLW Bottle Package at Building 4501 and transported it to Building 2531 (LLLW Evaporator Facility). Its contents were then transferred to the LLLW Collection and Transfer System for future treatment.

Transferred the contents of several drums collected at the 7000 Area garage to the Process Waste Collection and Transfer System for future treatment at Building 3608.

Transferred the contents of three High Integrity Containers in Solid Waste Storage Area 6 to the Process Waste Tanker. The tanker's contents were then transferred to the Process Waste Collection and Transfer System for future treatment.

Supported the video inspection of LLLW tank WC-19 at the request of FFA personnel.

Supported the video inspection of LLLW tank WC-13 at the request of the generating facility to help identify the source of influent water to the tank.

Emptied LLLW tanks WC-5, -6, -8 in preparation for MK-Ferguson personnel to isolate these tanks and to fill them with grout in accordance with requirements from FFA personnel.

Removed the plug from the 2026A Tank Vault in preparation for sampling this tank. This was being done at the request of FFA personnel.

Collected samples from the 2026A tank at the request of FFA personnel.

Received approximately 3,000 gallons of sulfuric acid at Building 3608 for use in adjusting the pH of the treated wastewater to discharge limits prior to its discharge to White Oak Creek.

Received 3,000 gallons of sodium hydroxide (caustic) at Building 3608 (Nonradiological Wastewater Treatment Plant). Caustic is used to adjust the pH of the wastewater to desirable values prior to discharge to White Oak Creek.

Transferred two loads of sulfuric acid from Building 3608 to Building 3544. The acid is used to adjust the pH of the wastewater prior to discharge to Building 3608 for further treatment.

Received one load of sodium hydroxide at Building 3544. Sodium hydroxide is used to adjust the pH of the wastewater to aid in the water softening process in the L-1 clarifier.

February

Transferred approximately 18,000 gallons of wastewater from tank W-30 to W-27 at the request of Cesium Removal Demonstration Project personnel. This project was a joint effort between WMRAD and Chemical Technology Division personnel to demonstrate an effective system to remove cesium from supernate at the Melton Valley Storage Tanks in an effort to reduce worker exposures during future activities.

Collected one LLLW Bottle Package at Building 4505 and transported it to Building 2531 (LLLW Evaporator Facility). Its contents were then transferred to the LLLW Collection and Transfer System for future treatment.

Collected a sludge sample from LLLW Tank WC-14 and delivered the sample to laboratory personnel for analysis. Also assisted personnel in the video inspection of the interior of the tank in an effort to identify the source of influent to the tank. Personnel were exploring various options to empty the liquids and sludges from this tank in accordance with the FFA for the LLLW System.

Delivered a sample from Cesium Removal Demonstration Project personnel to laboratory personnel for analysis.

Supported FFA personnel in performing the scheduled pressure test of the L-11 transfer line from Building 3544 to the LLLW Evaporator Facility.

Transferred process wastewater from Building 3524 (Equalization Basin) to the Process Waste Collection and Transfer System for future treatment. This pond, which had been removed from active service, is pumped periodically to remove rainwater that is collected in the basin.

Filled the caustic (sodium hydroxide) tank at Building 3092. The caustic is used to maintain the off-gas scrubber solution at a basic pH.

Transferred one load of sulfuric acid from the storage tank at Building 3608 to Building 3544. The acid is used to adjust the pH of the wastewater at Building 3544 prior to discharge to Building 3608 for further treatment.

Received 3,500 gallons of caustic (sodium hydroxide) at Process Waste Treatment Complex - Building 3608. The caustic is used to adjust the pH of the wastewater to assist in the water softening process at this facility and to adjust the pH of the treated wastewater to meet discharge limits prior to discharge to White Oak Creek.

March

Received two dumpster tank loads (approximately 660 gallons total) from Building 3074. The dumpster tank's contents were then transferred to the LLLW Collection and Transfer System for future treatment.

Transferred approximately 250 gallons of LLLW supernate from LLLW Tank WC-14 to a B-25 box filled with Radsorb to generate a solid waste form acceptable for turnover to Solid Waste Operations. This tank's contents, which could not be transferred to the LLLW System due to small amounts of PCBs in the tank, were periodically solidified based on the tank's level.

Assisted personnel performing a video inspection of the interior of LLLW Tank WC-14. This was done at the request of FFA personnel.

Collected a sludge sample from LLLW Tank W-12 and delivered the sample to laboratory personnel for analysis. This sample was collected at the request of FFA personnel.

Transferred the contents of tank F-2103 to F-2102 at Building 2600. Tank F-2103 had been used during recent heavy rainfall events to provide additional storage capacity for process waste due to heavy inflow to the Process Waste Collection and Transfer System.

Transferred approximately 5,000 gallons from High Integrity Containers in SWSA 6 to the Process Waste Collection and Transfer System for future treatment. This was done at the request of Solid Waste Operations personnel.

Transferred the contents of 12 drums to the Process Waste Treatment Complex - Building 3608 for future treatment. The drums were generated at the ORNL garage in the 7000 Area.

Decontaminated a manlift from the 7830 area at the request of P&E personnel.

Received one tanker load of sulfuric acid at Building 3608. Sulfuric acid is used to adjust the pH of the wastewater prior to discharge to White Oak Creek.

Received 3,000 gallons of nitric acid at Building 3544 for use in regeneration of the ion-exchange columns.

Received approximately 3,000 gallons of sodium hydroxide (caustic) at the Process Waste Treatment Complex - Building 3544. Caustic is used to adjust the pH of the wastewater to aid in the water softening operation in the L-1A clarifier.

Transferred the ion-exchange resin previously stored at Building 3001 to Building 7582 (LGWO Spare Parts Facility). This was part of the WMRAD effort to move all operations from Building 3001.

Supported Quality Assurance personnel in performing the sink and drain survey for Building 2000.

April

Transferred the contents of the 4PRS sump at Building 7830 to the LLLW Tanker. The tanker was then transported to the Central Waste Collection Header, where its contents were transferred to the LLLW Collection and Transfer System for future treatment.

Transferred approximately 2,300 gallons from tank T-13 to the LLLW Collection and Transfer System for future treatment.

Transported the 3074 Dumpster Tank to the Central Waste Collection Header, where its contents were transferred to the LLLW Collection and Transfer System for future treatment.

Assisted FFA personnel with a pressure test of the WC-10 tank farm's transfer pipeline.

Assisted personnel performing a video inspection of LLLW Tank WC-10 in an effort to determine the source of inleakage to the tank. This was being performed as part of the FFA activities for the LLLW System.

Completed the cleanup of Building 3594 after the slightly contaminated equipment in the facility was relocated.

May

Delivered samples from the Cesium Removal Demonstration Project being conducted at Building 7877 to laboratory personnel for analysis.

Supported Isotope Circle personnel in conducting drain surveys of their facilities.

Supported Chemical Technology Division personnel performing drain surveys for Buildings 3019 and 3026.

Gathered unused lead for Health Physics survey and then returned the material to the ORNL lead shop. This request for lead was from the Pollution Prevention organization.

Worked on correcting several items identified in recent Management By Walking Around reviews by the LGWO Head.

Pumped one tank for the ORNL laundry so that personnel could perform maintenance on the tank's drain line.

Sampled tank WII at the request of FFA personnel.

Transported the 3074 Dumpster Tank to the Central Waste Collection Header, where its contents were transferred to the LLLW Collection and Transfer System for future treatment.

Collected one LLLW Bottle Package at Building 4501. The bottle's contents were then transferred to the LLLW Collection and Transfer System for future treatment.

Transferred the contents of tank 3002A to the Process Waste Collection and Transfer System in preparations for MK-Ferguson to begin the grouting of this tank for the FFA program.

Transferred the contents of 8 drums from the ORNL garage in the 7000 area to the Process Waste Collection and Transfer System for future treatment at Building 3608.

Collected two containers of Process Waste from 4508 and four containers of Process Waste from 4500N and transferred their contents to the Process Waste Collection and Transfer System for future treatment.

Received one load (approximately 2,000 gallons) of sulfuric acid at the Process Waste Treatment Complex - Building 3608. Sulfuric acid is used to adjust the wastewater's pH prior to discharge to White Oak Creek.

Transferred one load of sulfuric acid from the storage tank at Building 3608 to the Process Waste Treatment Complex - Building 3544. Sulfuric acid is used to adjust the wastewater's pH prior to transfer to Building 3608 for further treatment.

June

Collected 5 LLLW Bottle Packages (3 from Building 4500N, 1 from Building 4500S, and 1 from Building 4501) and transported them to Building 2531 (the LLLW Evaporator Facility), where their contents were transferred to the LLLW Collection and Transfer System for future treatment.

Transferred the contents of the 4PRS sump at Building 7830 (Melton Valley Storage Tanks) to the 1,000 gallon LLLW Tanker truck. The tanker was then transported to the Central Waste Collection Header, where its contents were transferred to the LLLW Collection and Transfer System for future treatment.

Completed transfer of the supernate from inactive LLLW tank WC-14 to a B-25 box containing RadSorb, which would solidify the supernate for storage.

Decontaminated a vehicle for P&E personnel at Building 7935 (Equipment Cleaning Facility).

Transferred liquids from the 3139 pit in support of MK-Ferguson isolating tank WC-19 for the FFA personnel.

Repackaged the metals dumpster in the Building 7830 (Melton Valley Storage Tanks) area due to some construction debris being inadvertently added to the dumpster.

Supported Chemical Technology Division personnel in the survey of several drains in their facilities.

July

Received two loads of LLLW in the Building 3074 (Manipulator Shop) Dumpster Tank. The tank was then taken to the Central Waste Collection Header, where its contents were transferred to the LLLW Collection and Transfer System for future treatment.

Transferred one tanker load of process waste from the collection basin (T-100) at the Equipment Cleaning Facility (Building 7935) to the Process Waste Collection and Transfer System for future treatment.

Decontaminated a backhoe for P&E personnel at Building 7935 (Equipment Cleaning Facility).

Began installation of new lockers at the LGWO Changehouse (Building 2101).

August

Transferred approximately 5,600 gallons (including pipeline flush) from tank W-29 at Building 7830 to tank W-21 at Building 2537 in support of the upcoming AEA Technologies sludge mobilization project.

Transferred approximately 4,480 gallons from tank C-2 at Building 2531 (LLLW Evaporator Facility) to tank W-21 at Building 2537 in support of the upcoming AEA Technologies sludge mobilization project.

Transferred rainwater from the South Parking Lot valve in preparation for an upcoming tie-in of the new intervalley transfer line from Building 7966. P&E personnel then entered the valve box to take several measurements to assist in the upcoming tie-in.

Transferred three loads from the sumps at the Melton Valley Storage Tanks (Building 7830) to the LLLW Tanker. The tanker was transported to the Central Waste Collection Header, where its contents were transferred to the LLLW Collection and Transfer System for future treatment.

Transported two loads from the 3074 Dumpster tank to the Central Waste Collection Header, where its contents were transferred to the LLLW Collection and Transfer System for future treatment.

Collected one bottle of process waste at Building 2024 and transferred its contents to the Process Waste Collection and Transfer System for future treatment.

Completed the quarterly inspection of all LGWO diked areas.

Transferred three loads of sodium hydroxide (caustic) from the storage tank at Building 3608 to Building 3544.

September

Rinsed the interior of LLLW Tank W-12 in preparation for the upcoming grouting of the tank by the FFA for the LLLW System personnel.

Transferred the following amounts from the Melton Valley Storage Tanks (Building 7830) to the LLLW Evaporator Facility (Building 2531) in preparation for several upcoming transfers associated with the AEA Technologies Sludge Mobilization Project: 1,350 gallons from tank W-25 to C-2; 12,904 gallons from tank W-29 to C-2; 30,998 gallons from tank W-28 to C-1; 2,549 gallons from W-29 to C-1; and 8,261 gallons from tank W-30 to C-1. These amounts included process water used to flush the transfer pipe after the transfer.

Transferred the following amounts between the Melton Valley Storage Tanks (Building 7830) in preparation for the upcoming Out-of-Tank Evaporation Campaign: 15,320 gallons from W-24 to W-29; 1,798 gallons from W-25 to W-29; 1,220 gallons from W-25 to W-27; 14,980 gallons from W-25 to W-28; and 2,304 gallons from W-25 to W-31.

Transported the 3074 Dumpster tank to the Central Waste Collection Header, where its contents were transferred to the LLLW Collection and Transfer System for future treatment.

Collected two tankers of process waste from Buildings. 3001, 3002, and 3102 and transferred their contents to the Process Waste Collection and Transfer System for further treatment.

Transferred the contents of six containers to the Process Waste Collection and Transfer System for future treatment.

Transferred the contents of six drums to the Process Waste Treatment Complex - Building 3608 for future treatment.

Received one load of sodium hydroxide (caustic) at Building 3608. Caustic is used to adjust the pH of the wastewater to assist in the water softening operations at this facility.

Began completion of the annual freeze protection checksheets for all LGWO facilities.

October

Transported the concentrate from the Building 3544 evaporator in the existing 1,000 gallon LLLW Tanker to the Central Waste Collection Header, where it was then transferred to the LLLW Collection and Transfer System for future treatment.

Transferred one tanker load of process waste from SWSA #5 to the Process Waste Collection and Transfer System for future treatment. This was done at the request of Solid Waste Operations personnel.

Assisted Solid Waste Operations personnel with transferring the contents of a well in Solid Waste Storage Area 6 to the Process Waste tanker. The tanker's contents were then transferred to the Process Waste Collection and Transfer System for future treatment.

Collected samples from the west side of tanks C-1 and C-2 at Building 2531 (LLW Evaporator Facility) and submitted them for analysis.

Collected liquid sample from the midpoint of tank C-2 at Building 2531 (LLW Evaporator Facility) and submitted it for analysis.

Collected sludge sample from inactive LLW Tank WC-2 and submitted it for analysis. This sample was collected at the request of FFA personnel.

Assisted in the video inspection of LLW Tank WC-2 at the request of FFA for the LLW System personnel.

Began cleanup of the filter press room at the Process Waste Treatment Complex - Building 3544 as part of the ongoing effort to reduce contamination zones.

November

Supported the video inspection of tank F-201 for personnel from the FFA for the LLW System.

Supported FFA personnel with the video inspection and sampling of the High Flux Isotope Reactor (HFIR) LLW tank that services Building 7900 (High Flux Isotope Reactor). The tank was undergoing leak testing prior to its potential turnover to HFIR personnel.

Received a load of sodium hydroxide at the Process Waste Treatment Complex - Buildings 3544 and 3608. Sodium hydroxide is used to adjust the pH of the wastewater to aid in the water softening operations and to adjust the pH of the wastewater to within required limits prior to discharge.

Completed corrective actions at LGWO facilities near Building 3524 (Equalization Basin) that were identified during Facility Excellence walkthroughs.

Repacked several B-25 boxes at Building 3518 (Acid Neutralization Facility) and sent in the paperwork for disposal.

December

Sampled tank F-201 at the request of FFA for the LLLW System personnel.

Transferred LLLW from tank W-24 to tank W-29 at Building 7830 (Melton Valley Storage Tanks) in preparation for the Out-of-Tank Evaporation Campaign 98-2. The waste was allowed to settle for approximately 1 week prior to being sampled for TSR compliance.

Sampled tank W-29 at Building 7830 (Melton Valley Storage Tanks) in preparation for the Out-of-Tank Evaporation Campaign 98-2.

Transferred concentrate from the nitric acid recovery evaporator system at the Process Waste Treatment Complex - Building 3544 to the LLLW Tanker, whose contents were then transferred to tank W-21 at the Evaporator Service Tanks (Building 2537). This acidic waste is being used to dissolve the remaining sludge in W-21 in preparation for the final sludge transfer using the AEA Technologies sludge mobilization system in early 1998.

Received two tanker load of process waste from the Out-of-Tank Evaporation operations presently underway (OTE Campaign 98-1). The wastewater was transferred to the Process Waste Collection and Transfer System for future treatment.

Transferred one load of sodium hydroxide (caustic) from the storage tank at the Process Waste Treatment Complex - Building 3608 to the tank at Building 7961 (Melton Valley Process Waste Collection Tank Facility). Caustic is used to maintain the collected wastewater at a basic pH prior to transfer to the Bethel Valley Storage Tanks (Building 2600).

Decontaminated a crane for P&E personnel.

Completed the semi-annual review of LGWO's Administrative Control Tag Logbook.

5.0 APPENDIX

5.1 TABLES

1. Process Waste Treatment Complex - Bldg. 3544 operations.
2. Process Waste Treatment Complex - Bldg. 3608 operations.
3. LLLW operations.
4. Rainfall at ORNL.

5.2 FIGURES

1. Diagram of the Process Waste Collection and Transfer System. (ORNL-DWG. 96-3390R1)
2. Flow diagram of Bldg. 3544. (ORNL-DWG. 96-3391R1)
3. Process waste treated at ORNL. (ORNL-DWG. 97-5448R1)
4. Sludge generation at Bldg. 3544. (ORNL-DWG. 97-5449R1)
5. Dilute LLLW from Bldg. 3544. (ORNL-DWG. 97-5450R1)
6. LLLW concentrate from Bldg. 3544. (ORNL-DWG. 97-5451R1)
7. Rainfall at ORNL. (ORNL-DWG. 97-5452R1)
8. Flow diagram of Bldg. 3608. (ORNL-DWG. 96-3397R1)
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26. WC-5 Pump Pit (tank WC-9) LLLW generation. (ORNL-DWG. 97-5474R1)
27. HFIR (Building 7900) LLLW generation. (ORNL-DWG. 97-5475R1)
28. Building 7920 LLLW generation. (ORNL-DWG. 97-5476R1)
29. Abandoned tank W-1A LLLW generation. (ORNL-DWG. 97-5477R1)
30. Diagram of the Gaseous Waste System. (ORNL-DWG. 96-3528)

TABLE 1 PROCESS WASTE TREATMENT COMPLEX - BLDG. 3544 OPERATIONS

	Waste treated by ion-exchange (gal)	Waste treated by zeolite (gal)	Total Process Waste treated (gal)	Sludge generated		3544 generated LLLW concentrate to storage (gal)	3544 generated LLLW feed (gal)
				Drums	Ft ³		
January	6.31 x 10 ⁶	2.28 x 10 ⁶	8.59 x 10 ⁶	46	338.19	340	200
February	5.70 x 10 ⁶	1.25 x 10 ⁶	6.95 x 10 ⁶	62	455.82	0	0
March	6.22 x 10 ⁶	1.82 x 10 ⁶	8.04 x 10 ⁶	60	441.12	280	120
April	5.43 x 10 ⁶	0.79 x 10 ⁶	6.22 x 10 ⁶	59	433.77	300	224
May	6.36 x 10 ⁶	0.30 x 10 ⁶	6.66 x 10 ⁶	59	433.77	640	260
June	7.85 x 10 ⁶	0	7.85 x 10 ⁶	11*	80.87	890	400
July	6.03 x 10 ⁶	0	6.03 x 10 ⁶	0	0	540	200
August	5.91 x 10 ⁶	0	5.91 x 10 ⁶	0	0	1,120	310
September	5.73 x 10 ⁶	0	5.73 x 10 ⁶	0	0	0	369
October	6.20 x 10 ⁶	0	6.20 x 10 ⁶	0	0	0	460
November	6.23 x 10 ⁶	0	6.23 x 10 ⁶	0	0	0	0
December	5.93 x 10 ⁶	0	5.93 x 10 ⁶	0	0	667	0
1997 Totals	73.90 x 10 ⁶	6.44 x 10 ⁶	80.34 x 10 ⁶	297	2,183.54	4,777	2,543

*Water-softening for radiologically contaminated wastewater was transferred to Bldg. 3608 from Bldg. 3544 in June, with the water-softening system at 3544 being placed in standby.

TABLE 2 PROCESS WASTE TREATMENT COMPLEX - BLDG. 3608 OPERATIONS

	Metals Wastewater treated (gal)	Nonmetals Wastewater treated (gal)	Total Wastewater treated (gal)	Sludge generated	
				Boxes	Ft ³
January*	51.50 x 10 ⁵	1.18 x 10 ⁷	1.69 x 10 ⁷	0	0
February*	37.40 x 10 ⁵	0.94 x 10 ⁷	1.31 x 10 ⁷	0	0
March*	64.20 x 10 ⁵	1.01 x 10 ⁷	1.65 x 10 ⁷	3	288
April*	33.90 x 10 ⁵	0.99 x 10 ⁷	1.33 x 10 ⁷	3	288
May	3.90 x 10 ⁵	1.64 x 10 ⁷	1.68 x 10 ⁷	2	192
June	5.70 x 10 ⁵	1.77 x 10 ⁷	1.83 x 10 ⁷	2	192
July	3.30 x 10 ⁵	1.57 x 10 ⁷	1.60 x 10 ⁷	6	576
August	3.40 x 10 ⁵	1.61 x 10 ⁷	1.64 x 10 ⁷	4	384
September	4.60 x 10 ⁵	1.40 x 10 ⁷	1.45 x 10 ⁷	4	384
October	2.90 x 10 ⁵	1.42 x 10 ⁷	1.45 x 10 ⁷	5	480
November	3.60 x 10 ⁵	1.35 x 10 ⁷	1.39 x 10 ⁷	5	480
December	5.80 x 10 ⁵	1.42 x 10 ⁷	1.48 x 10 ⁷	4	384
1997 Totals	220.20 x 10 ⁵	16.30 x 10 ⁷	18.50 x 10 ⁷	38	3,648

*Increase in metals wastewater treated due to the usage of this tank for testing of the water-softening modifications installed as part of the PWTP Capacity Increase Line Item.

**Water-softening for radiologically contaminated wastewater was transferred to Bldg. 3608 from Bldg. 3544 in June. This resulted in the increased volume of sludge generated at Bldg. 3608.

TABLE 3 LLLW OPERATIONS

	LLLW treated by Evaporator A2 (gal)	LLLW treated by Evaporator 2A2 (gal)	Concentrate transferred from A2 (gal)	Concentrate transferred from 2A2 (gal)
January	1.15×10^4	2.60×10^4	0	0
February	0.94×10^4	1.58×10^4	0	0
March	0.76×10^4	3.00×10^4	1,280	1,070
April	0.95×10^4	3.00×10^4	0	0
May	0.38×10^4	3.41×10^4	0	0
June	2.18×10^4	5.17×10^4	0	1,710
July	2.74×10^4	6.13×10^4	1,233	570
August	0.07×10^4	7.56×10^4	710	1,328
September	0.33×10^4	5.40×10^4	750	2,150
October	0	3.42×10^4	0	2,470
November	0	2.07×10^4	2,408	0
December	0.52×10^4	0.75×10^4	0	1,672
1997 Totals	10.64×10^4	44.09×10^4	6,381	10,970

TABLE 4. RAINFALL AT ORNL
(Data collected at the ORNL Steam Plant, all results are in inches)

Year	January	February	March	April	May	June	July	August	September	October	November	December	Total
1989	8.04	5.17	5.36	0.00	6.34	0.00	4.26	4.26	11.02	1.93	5.25	2.96	54.59
1990	6.09	8.08	5.13	3.05	8.53	1.81	8.28	6.54	1.74	4.55	2.20	12.27	68.27
1991	2.93	9.01	7.56	3.56	4.41	6.57	4.20	3.75	2.14	1.73	3.85	9.75	59.46
1992	3.82	3.45	3.64	3.03	6.23	2.70	4.31	6.17	4.06	3.56	2.84	6.82	50.63
1993	4.08	3.65	5.75	4.54	3.35	2.89	1.45	4.42	4.72	2.67	3.74	7.89	49.15
1994	6.94	8.77	10.81	8.86	3.52	7.20	4.75	5.65	3.09	2.54	3.96	2.87	68.96
1995	7.02	4.37	3.53	2.65	6.86	2.78	3.05	2.84	3.41	4.30	6.80	5.62	53.23
1996	7.62	3.40	6.74	4.28	9.30	5.10	8.48	3.29	5.33	1.64	8.32	6.06	69.56
1997	5.51	5.00	6.60	5.79	6.92	5.99	3.59	3.01	3.46	3.44	2.69	3.29	55.29
Average	5.79	5.66	6.13	3.98	6.16	3.89	4.71	4.44	4.33	2.93	4.41	6.39	58.79

ORNL PROCESS WASTE SYSTEM

Figure 1. Diagram of the Process Waste Collection and Transfer System.
(ORNL-DWG. 96-3390R1)

BLDG. 3544 FLOW DIAGRAM

Figure 2. Flow diagram of Bldg. 3544. (ORNL-DWG. 96-3391R1)

Figure 3. Process waste treated at ORNL. (ORNL-DWG. 97-5448R1)

Figure 4. Sludge generation at Bldg. 3544. (ORNL-DWG. 97-5449R1)

Figure 5. Dilute LLLW from Bldg. 3544. (ORNL-DWG. 97-5450R1)

Figure 6. LLLW concentrate from Bldg. 3544. (ORNL-DWG. 97-5451R1)

Figure 7. Rainfall at ORNL. (ORNL-DWG. 97-5452R1)

Figure 8. Flow Diagram of Bldg. 3608. (ORNL-DWG. 96-3397R1)

Figure 9. Nonradiological waste treated at ORNL. (ORNL-DWG. 97-5453R1)

Figure 10. Sludge generation at Bldg. 3608. (ORNL-DWG. 97-5454R1)

LLLW SYSTEM FLOW DIAGRAM

Figure 11. Diagram of the LLLW Collection and Transfer System.
(ORNL-DWG. 96-3400R1)

USED STORAGE SPACE VS TIME

The Available Storage uses the maximum allowable volume in each tank of 47,500 gallons (per the OSR). The OSR Limit is the Available Storage (570,000 gallons) less the 50,000 gallons required by the OSR to be kept empty at all times. The Actual Stored Volume is the Total from the Evaporator Storage Tank Volumes Table (Volume in W-21, -23, and the MVSTs), which is based on the actual level measurements in the tanks.

Figure 12. Used storage space versus time. (ORNL-DWG. 97-5455R1)

Figure 13. LLLW generation at ORNL. (ORNL-DWG. 97-5456R1)

Figure 14. Building 2026 LLLW generation. (ORNL-DWG. 97-5457R1)

Figure 15. Building 3019 LLLW generation. (ORNL-DWG. 97-5458R1)

Figure 16. Building 3025 LLLW generation. (ORNL-DWG. 97-5459R1)

Figure 17. Building 3026-C LLLW generation. (ORNL-DWG. 97-5460R1)

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Figure 24. 4500 Complex LLLW generation. (ORNL-DWG. 97-5470R1)

Figure 25. Isotopes Area LLLW generation. (ORNL-DWG. 97-5471R1)

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Figure 27. HFIR (Building 7900) LLLW generation. (ORNL-DWG. 97-5475R1)

Figure 28. Building 7920 LLLW generation. (ORNL-DWG. 97-5476R1)

Figure 29. Abandoned tank W-1A LLLW generation. (ORNL-DWG. 97-5477R1)

Figure 30. Diagram of the Gaseous Waste System. (ORNL-DWG. 96-3528)

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