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MARTIN MARIETTA

**Liquid and Gaseous Waste Operations
Department**

**Annual Operating Report
CY 1993**

J. J. Maddox
C. B. Scott

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FOR THE UNITED STATES
DEPARTMENT OF ENERGY

LIQUID AND GASEOUS WASTE OPERATIONS DEPARTMENT
ANNUAL OPERATING REPORT
CY 1993

Date Published: February, 1994

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C. B. Scott

Prepared for
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ACRONYMS

ALARA	- As Low As Reasonably Achievable
CDD	- Combined Data Dictionary
CDROM	- Compact Disk Read Only Memory
CPU	- Central Processing Unit
CWMD	- Central Waste Management Division
CWOI	- Central Waste Operations Initiative
CWTS	- Central Waste Tracking System
CX	- Categorical Exclusion
CY	- Calendar Year
CYRTF	- Coal Yard Runoff Treatment Facility
DAS	- Data Acquisition System
DCS	- Distributed Control System
DEC	- Digital Equipment Corporation
DMC	- Documentation Management Center
DOE	- Department of Energy
EA	- Environmental Assessment
EASC	- Emergency Avoidance Solidification Campaign
ER	- Environmental Restoration
ES&H	- Environmental, Safety, and Health
ESWMO	- Energy Systems Waste Management Organization
FFA	- Federal Facilities Agreement
FSD	- Functional System Design
FSE	- Final Safety Evaluation
FY	- Fiscal Year
HEPA	- High Efficiency Particulate Air
HMIS	- Hazardous Materials Information System
HFIR	- High Flux Isotope Reactor
HP	- Health Physics
I&C	- Instrumentation and Control
ID	- Identification
IE	- Instrumentation Engineering
ITE	- In-Tank Evaporation
LGWOD	- Liquid and Gaseous Waste Operations Department
LLLW	- Liquid Low-Level Waste
LWSP	- Liquid Low-Level Waste Solidification Project
MCC	- Motor Control Center
MJR	- Maintenance Job Request
MMES	- Martin Marietta Energy Systems, Inc.
mR	- millirem
MSDS	- Material Safety Data Sheet
MV	- Melton Valley
NRC	- Nuclear Regulatory Commission
NRWTP	- Nonradiological Wastewater Treatment Plant
OIS	- Operator Interface Station
ORNL	- Oak Ridge National Laboratory
ORO	- Oak Ridge Operations
ORR	- Oak Ridge Research Reactor
ORT	- Operational Readiness Team

ACRONYMS (continued)

OSHA	- Office of Safety and Health Administration
OSR	- Operational Safety Requirements
PC	- Personal Computer
P&E	- Plant and Equipment
PIP	- Performance Improvement Process
PSET	- Plant Safety Evaluation Team
PW	- Process Waste
PWTP	- Process Waste Treatment Plant
QE&I	- Quality Engineering and Inspection
RFD	- Request for Disposal
RRC	- Readiness Review Criteria
RRD	- Readiness Review Board
SARUP	- Safety Analysis Report Update Program
SLLW	- Solid Low Level Waste
SSHHP	- Site Safety and Health Plan
SWOG	- Solid Waste Operations Group
SWSA	- Solid Waste Storage Area
TOA	- Tennessee Oversight Agreement
WAC	- Waste Acceptance Criteria
WAG	- Waste Area Group
WMO	- Waste Management Operations
WMRAD	- Waste Management and Remedial Action Division
WODMAS	- Waste Operations Data Management and Analysis System
WTS	- Waste Tracking System

WASTE MANAGEMENT OPERATIONS SECTION LIQUID AND GASEOUS WASTE OPERATIONS DEPARTMENT

Operating Report — Calendar Year (CY) 1993

1.0 OPERATING SUMMARY

1.1 PROCESS WASTE SYSTEM

A total of 5.99×10^7 gal of liquid waste was decontaminated by the Process Waste Treatment Plant (PWTP) ion exchange system during CY 1993. This averaged to 114 gpm throughout the year. When necessary, a wastewater sidestream of 50-80 gpm was treated through the use of a natural zeolite treatment system. An additional 9.16×10^6 gal (average of 17 gpm throughout the year) were treated by the zeolite system. Therefore, the average total flow treated at the PWTP for CY 1993 was 131 gpm. During the year, the regeneration of the cation exchange resins resulted in the generation of 6.93×10^3 gal of liquid low-level waste (LLLW) concentrate and 1.05×10^4 gal of LLLW evaporator feed. The head-end softening process (precipitation/clarification) generated 610 drums (4.49×10^3 ft³) of solid low-level waste sludge. See Table 1 for a monthly summary of activities at the PWTP. Figures 1, 2, 3, and 4 show a comparison of operations at the PWTP in 1993 with previous years. Figure 5 shows a comparison of annual rainfall at Oak Ridge National Laboratory (ORNL) since 1989.

A total of 1.70×10^8 gal of liquid waste (average of 323 gpm throughout the year) was treated at the Nonradiological Wastewater Treatment Plant (NRWTP). Of this amount, 1.36×10^7 gal were treated by the precipitation/clarification process for removal of heavy metals. Twenty-two boxes (1.50×10^3 ft³) of solid sludge generated by the precipitation/clarification process were removed from the filter press room. The NRWTP receives wastewater from the PWTP, the metals/nonmetals pumping station (collects wastewater from the 1505 and 2000 areas), Building 3518 (steam plant demineralizer regenerant neutralization plant), the 190 pumping station, and the Melton Valley (MV) process waste collection tanks. The NRWTP removes particulates, heavy metals, and organics, as well as adjusts the pH of the wastewater, before discharge to White Oak Creek. See Table 2 for a monthly summary of activities at the NRWTP.

When the NRWTP was put into operation, the demineralizer regenerant from the ORNL Steam Plant was redirected from the neutralization facility (Building 3518) to the Coal Yard Runoff Treatment Facility (CYRTF), with Building 3518 maintained for backup in the event of heavy rainfall, thus resulting in the low amount of wastewater treated by the precipitation/clarification process. In early September, 1990, permitting problems relevant to the disposal of the CYRTF sludges forced this wastewater stream to be diverted back to Building 3518 for neutralization, with subsequent treatment at the NRWTP. Due to the extremely high amount of solids in this metals wastewater feedstream to the NRWTP, sludge generation from the NRWTP clarifiers increased dramatically: from three boxes (1.92×10^2 ft³) in 1989 to thirty-two boxes (2.05×10^3 ft³) in 1991, twenty-five boxes (1.60×10^3 ft³) in 1992), and twenty-two boxes (1.50×10^3 ft³) in 1993. The permit problems for the CYRTF were resolved in early November, and in mid-November this wastestream was diverted to the CYRTF, with Building 3518 again serving in a backup role.

1.2 LIQUID LOW-LEVEL WASTE SYSTEM

Both the A2 and 2A2 evaporator systems operated normally during the year. A total of 4.07×10^5 gal of LLLW were processed through the A2 evaporator system and 0.13×10^5 gal of LLLW were processed through the 2A2 evaporator system. There was 1.41×10^4 gal of concentrate transferred from the A2 system and 3.39×10^3 gal of concentrate transferred from the 2A2 system to the waste storage tanks. See Table 3 for a monthly summary of activities at the evaporator systems and Fig. 6 for a graphical representation of the amount of concentrate presently stored at ORNL awaiting disposal. See Fig. 7 for a graphical comparison of the generation of LLLW at ORNL and Figures 8 through 29 for a comparison of the generation of LLLW by individual sources over the last five years.

The 2A2 evaporator system was removed from service in February and was not used during the remainder of the year. This was done to allow for the replacement of the 2A2 Evaporator vessel, which had three of the seven steam coils fail since it was placed in service in the late 1970's. During the year the existing vessel was decontaminated to allow for worker access, the vessel was disconnected from the system and transported to Solid Waste Storage Area (SWSA) 6 for disposal, and the new vessel was placed in the system and workers were connecting the vessel to the system at the end of the year. See Section 2.9 for detailed discussion of the activities associated with this maintenance project.

1.3 GASEOUS WASTE SYSTEM

The gaseous waste system operated normally during the reporting period. Normal operations during the reporting period means that continuous ventilation service was provided to all customer facilities except during scheduled maintenance periods and was operated within the conditions set in the Limiting Conditions for Operations Document.

1.4 LIQUID LOW-LEVEL WASTE SOLIDIFICATION PROJECT

The Liquid Low-Level Waste Solidification Project (LWSP) - Campaign II had activities throughout the year. Sampling and characterization of the supernate in tanks W-29 and W-30 was conducted at the beginning of the year, and the Operational Readiness Review was started in May. The Readiness Review was completed in October and the project began "hot" operations on October 25. By the end of the year, twenty-four waste forms had been generated (solidifying approximately 19,000 gallons of LLLW supernate), with an expected total of sixty forms to be generated during this campaign. The LWSP is conducted on a periodic basis to free up approximately 50,00 gallons of storage space per campaign for future LLLW operations at ORNL. See Section 2.8 for a detailed discussion of activities associated with this campaign.

2.0 UPGRADE ACTIVITIES

In support of the LWSP - Campaign II a sampling and certification program was established to demonstrate that these waste forms meet the Waste Acceptance Criteria (WAC) for final disposal at the Nevada Test Site. A Nuclear Regulatory Commission (NRC) certified laboratory was contracted to analyze solidified waste form samples against the criteria in the WAC for the Nevada Test Site. The application to the Nevada Test Site for permission to dispose of the waste forms was submitted to the DOE at the end of the year for transmittal to the DOE field office over the Nevada Test Site.

The 2A2 Evaporator Replacement Project continued throughout the year. An Operational Readiness Review was started in May, and permission to begin field work on the evaporator replacement was given on October 13. The existing evaporator vessel was then disconnected from the rest of the evaporator system and transported to Solid Waste Storage Area (SWSA) 6, where it was disposed of in a specially built silo. The replacement vessel was then placed in the cell and personnel worked through the rest of the year welding it to its connections with the rest of the evaporator system. In support of the welding operations, personnel from Quality Engineering and Inspection (QE&I) performed weld inspections on off-shifts so as not to adversely affect the project schedule. Completion of the vessel's installation is scheduled for early CY 94, with a full system checkout scheduled to be conducted afterward. See Section 2.9 for a full description of activities associated with this project.

The Safety Analysis Report Update Program (SARUP) continued to progress throughout the year. The Phase IA efforts were concluded with the approval by the Department of Energy (DOE) - Oak Ridge Operations (ORO) of the Operational Safety Requirements (OSR) for the LLLW System, which went into effect on November 5. Phase II work continued on the development of several chapters of the Facility Safety Evaluation document, which is scheduled for completion at the end of FY 95. See Section 2.10 for a detailed discussion of these activities.

Computer system upgrade activities continued to be a major activity within the Liquid and Gaseous Waste Operations Department (LGWOD). The LGWOD System Administrator was in charge of the development of the ORNL Waste Tracking System (WTS), which replaced the existing Solid Waste Information Management System and the Hazardous Waste Tracking System used by the Solid Waste Operations Department. This included development of common waste information between the three sites at Oak Ridge (the Y-12, K-25, and X-10 sites) so that a common Uniform Request for Disposal (RFD) could be implemented. A personal computer (PC) based version of the new RFD was developed for use at ORNL. The ORNL WTS successfully uploaded information to the Central WTS on October 31, meeting the Tennessee Oversight Agreement date of November 1 for the system to be placed in operation. This activity was performed by LGWOD personnel in support of all Waste Operations at the ORNL site. See Section 2.5 for a detailed discussion.

Other computer activities included the continued upgrade of the Distributed Control System, which is currently utilized to operate the NRWTP, the NRWTP Collection System and the PWTP feed system. This upgrade will give it the capability to be compatible with the new equipment being installed as part of the Bethel Valley LLLW Line Item project. During the year the existing database of all input and output signals and the graphic display screens

were converted for use on the new system. This required the reprogramming of all of the displays since there was no method available to electronically convert the existing database and graphic display screens. In addition online, facility specific help screens were developed as operator aids and alarm messages were developed for approximately 600 signals that give short, detailed instructions to the operator when an alarm occurs. At the end of the year the conversion of the existing consoles was nearing completion. A complete checkout of each signal throughout the collection system and at the NRWTP will be performed early in CY 94 (this is required since the signal database had all of the signal names changed to a longer identifier due to the new system) to verify that all signals and alarms are received as expected.

2.1 NONRADIOLOGICAL WASTEWATER TREATMENT PLANT

June

Plant and Equipment (P&E) personnel completed the insulation of the sulfuric acid transfer line to tank F-1021. This insulation will prevent temperature changes from affecting the adjustment of the wastewater's pH to discharge limits prior to its discharge to White Oak Creek.

August

Two Document Change Directives providing procedures for the use of the new acid/sodium hydroxide tanker truck were approved and issued. This new truck provides a 500 gallon acid tank and a 300 gallon sodium hydroxide tank that will be used to transport chemicals from the chemical storage tanks at Building 3608 to other LGWOD facilities.

Instrumentation and Control (I&C) personnel completed the calibration of the instrumentation of the acid/caustic tanker that was recently delivered to the LGWOD.

LGWOD personnel received the new acid/caustic tanker for use in transporting acid and caustic from Building 3608 to Building 3544 and other LGWOD facilities. A load of acid was then transferred from Building 3608 to Building 3544. The new tanker is equipped with spill containment diking and has instrumentation to prevent acid and caustic from being in the acid and caustic tanks at the same time.

September

The filter press at Building 3608 was decontaminated and modified to allow the use of B-25 boxes for the collection of dried filter cake. This change was made at the request of Solid Waste Operations personnel.

2.2 PROCESS WASTE TREATMENT PLANT AND THE PROCESS WASTE (PW) SYSTEM

January

The instrumentation tray replacement task at the PWTP was initiated. This task consists of identifying numerous instrument and electrical tubes and wires contained in an instrument

tray which runs from the control room to the column room, putting up temporary tubing and wiring, tearing out the old tray, installing a new tray, and installing permanent tubing and wiring in the new tray. All of this work must be accomplished without shutting down the PWTP. The old tray is being replaced due to extensive corrosion damage. P&E personnel, supported by LGWOD personnel, are undertaking this major task.

February

P&E pipefitters completed their work on the instrumentation tray replacement at the PWTP. Electricians are now working on installation of the new conduit and electrical wiring.

A variable speed motor was installed on the agitator for the L-1 clarifier. The variable speed motor will allow better control of the sludge blanket in the clarifier. This modification required LGWOD personnel to clean the sludge buildup from the L-1 clarifier for P&E access to the agitator.

I&C personnel replaced the pH controller for the L-1 clarifier. The old controller would function only in manual position for pH control, while the new controller will control the addition of sodium hydroxide to the clarifier for pH control automatically.

I&C personnel installed an audible High/Low pH alarm on the L-5 clearwell. The previous configuration did not have an audible alarm, only an alarm light on the panelboard. The L-5 clearwell is used for pH adjustment of the wastewater prior to discharge to the NRWTP for further treatment.

April

P&E personnel completed installation of a safety shower/eyewash station in Building 3518 on the second floor. This was installed as the result of a Safety Suggestion from LGWOD personnel.

September

LGWOD personnel participated in the kickoff meeting for the Process Waste Surge Tank project. This project is to construct a million gallon capacity process waste storage tank to be used during periods of high process waste generation.

P&E personnel completed the insulation of the zeolite test system being installed at Building 2600. The test system will be used for development work by Chem Tech personnel in support of Line Item upgrades being planned for the PWTP.

October

P&E and Chem Tech personnel continued work on the installation of the zeolite test system at the Bethel Valley Process Waste Storage Tanks (Building 2600). The system is scheduled to be operational by the end of October or early November. The system will be used to demonstrate proposed designs for the zeolite system upgrades at the PWTP (Building 3544) and to support design efforts on the replacement facility for Building 3544, which is an on-going line item in the conceptual phase of work.

November

LGWOD personnel loaded the test zeolite column and two anthracite prefilters at the request of Chem Tech personnel. This test system will be used to demonstrate the removal of spent zeolite using a sluicing method and to gather additional data in preparation for the FY96 line item to build a new Process Waste Treatment Facility.

December

LGWOD personnel continued to assist in the effort to commence operations at the zeolite demonstration project being performed by Chem Tech and LGWOD personnel at the Bethel Valley Process Wastewater Storage Tanks Facility (Building 2600). The preoperational checklist was completed, operating procedures were approved, and the DOE-ORO on-site representative was given a tour of the facility (no concerns were identified during the tour). In addition, several personnel from Waste Management, Chem Tech, Environmental Safety & Health, and other organization performed a final inspection of the site on December 10. No concerns were identified during this inspection. The zeolite demonstration project is being conducted in support of a FY96 Line Item to build a new Process Wastewater Treatment Facility.

The zeolite demonstration project proceeded with preoperational tests and check-out during the week ending on December 17. The vendor supplying the system was on site during the check-out and assisted in adjusting the system for optimum performance. Several Chem Tech and LGWOD personnel have been trained on how to sample the system and what duties LGWOD will have on off-shifts.

The zeolite demonstration project was started up during the week ending on December 31. This prototype system is being utilized to gather data for the design of the PWTP replacement Line Item.

2.3 LIQUID LOW-LEVEL WASTE SYSTEM

January

Soil samples were pulled in the vicinity of LLLW Tank W-12 so that the soils could be characterized in support of the W-12 transfer system upgrade task. This task consisted of installing a steam jet in W-12 and connecting it to double-contained transfer piping to be run between W-12 and the existing transfer piping. Some contamination was found when the soil was checked by the Health Physicist. This sampling was done to characterize the site as part of the Health and Safety Plan for the work to upgrade this system to meet the Federal Facilities Agreement (FFA).

LGWOD personnel pulled samples from the Building 2533 filter pit to characterize the waste collected in the pit. The waste currently is transferred to the LLLW System. If the characterization shows that the waste can be accepted in the Process Waste System, it could save millions of dollars in system upgrade costs. After the samples were taken, the sump was emptied.

The Operational Readiness Team (ORT) and the Readiness Review Board (RRB) for the WC-10 Pump Pit Maintenance Modification have been selected. Two team meetings were held during the month of January. Preparation of the draft Readiness Review Plan and preliminary Readiness Review Criteria (RRC) for the WC-10 Pump Pit Maintenance Modification Project has been initiated.

February

The Building 2533 filter pit was again sampled to evaluate the possibility of routing the sump contents to the Process Waste System, instead of the LLLW System where it currently goes.

March

The Project Waste Management Plan for the LLLW Tank W-12 Transfer System Maintenance Task received final approval.

April

I&C personnel replaced the level measurement devices at the Melton Valley Storage Tanks (Building 7830). This replacement was being carried out under the LGWOD Configuration Management Program (approved configuration change No. WM-LGWO-1992-200). The new devices were installed for improved accuracy and reduced maintenance.

All RRC were approved by the ORT and the RRB for the WC-10 Pump Pit Maintenance Project. The RRB recommended to the Waste Management and Remedial Action Division (WMRAD) Director that the project should be approved for field work activities. The WMRAD Director prepared an approval memo and it was going through review at the end of the month. A total of 30 RRC were completed for this project.

May

Participated in the 40% review of the Piping and Instrumentation Drawings for the Melton Valley Line Item project.

Reviewed the draft Design Criteria for the Bethel Valley FFA Line Item project.

P&E personnel started work on the WC-10 Pump Pit Maintenance Project. This project will add concrete to the bottom of the pump pit to reduce the radiological background around the pit. Field work activities commenced this project. At the end of the month, repair work on the outer tent had been performed and the access ports in the flooring for the chemical additions had been cut. These ports would be used to place piping, etc. to pump absorbent, grout, and concrete into the pit. It was projected that the chemical additions to the pit will be completed next month and the final pit cover would be fabricated and installed in July.

June

The two-year review of seven procedures for the LWSP was conducted during the month. Four procedures were found to require no revisions. Three procedures were identified requiring revisions, and the revised procedures were approved.

As part of the WC-10 Pump Pit Maintenance Project, absorbent, grout and concrete were pumped into the pit this month. This resulted in a large reduction in the dose rates from the pit. The doses accumulated in performing this activity were significantly less than what was projected in the As Low As Reasonably Achievable (ALARA) Plan. It was projected that 600 mR would be taken at this stage of the job; however, only 248 mR had been taken. Labor negotiations impacted the remaining work, but it was not expected that the schedule impact would be serious. Remaining work included removal of the temporary tent from the pit, decontamination of the pit, and construction of a permanent pit cover.

July

P&E personnel started work on the installation of a new transfer line from LLLW Tank W-12 to Valve Box 2A. The existing transfer system had been taken out of service because it does not meet FAA requirements. This task encompasses the installation of a new steam jet, a new steam supply station, and a double-contained transfer line.

One revised procedure for operations at the LLLW Evaporator Facility was approved.

Field work activities resumed this month for the WC-10 Pump Pit Maintenance Project. The temporary tent was removed and general clean-up of the area was performed. Remaining work included decontamination of the pit, removal of the lead shielding, and construction and placement of the permanent pit cover.

August

LGWOD personnel continued to support P&E personnel in the installation of the new transfer system for LLLW tank W-12. The new transfer line and steam jet were installed and P&E personnel were completing the backfill of the excavation site for the new line.

Field work activities for the WC-10 Pump Pit Maintenance Project resumed this month. The pit had been decontaminated and was awaiting installation of the permanent pit covers. The covers were under construction and would be installed when fabrication was completed.

September

Installation of the new transfer system for LLLW tank W-12 was completed during the month. All RRC have been completed and approved by the ORT. The RRB met September 20 to make their recommendation to place the system in service. The new transfer system was installed to meet FFA requirements for LLLW systems.

Preparations for installation of the new transfer system for the WC-9 tank farm commenced. The site Health and Safety plan was issued for signature and the piping fabrication was started. This project will install a transfer system similar to the one at the WC-10 tank farm.

LGWOD personnel assisted P&E personnel in augering work around LLLW Tank WC-9. This work was done in preparation for the WC-9 Transfer System Upgrade.

Completed the 60% on-board review of the Melton Valley LLLW Line Item and provided comments to Engineering.

A safety screening was performed to determine if an Unreviewed Safety Question Determination (USQD) should be performed for the planned WC-9 Transfer System Upgrade. This screening determined that no USQD was required for this configuration change.

LGWOD personnel attended the first meetings of the Readiness Review Teams for two Line Item projects to proceed to Title I. The two projects were the Bethel Valley FFA Upgrades and the Melton Valley Storage Tanks Capacity Increase projects.

Construction of the pit cover for the WC-10 Pump Pit Maintenance Project was almost completed. It was expected to be installed over the pit in October.

October

LGWOD personnel completed a review of the 90% Construction Package for the Building 3019A FFA Compliance Upgrades and sent comments to Engineering.

P&E and LGWOD personnel completed the cleanup of the area around LLLW tank W-12. Construction debris from the installation of the new transfer system was disposed of per normal operating procedures.

The revised OSR for the Liquid Low-Level Waste System that was submitted as part of the Phase 1A SARUP was received from DOE-ORO with their approval on September 10. Implementation of the OSR requirements into LGWOD procedures was underway during the month, with twelve procedures having been revised and approved for LLLW Evaporator Facility and LLLW Collection and Transfer System operations. Implementation was scheduled for 11/05/93, meeting the commitment to implement the revised OSR within 4 weeks of receipt by the LGWOD.

November

The revised OSR document for the LLLW System was implemented on 11/5. Controlled copies of the OSR and the revised procedures and check sheets were distributed on this date. This implementation required the revision of twelve LGWOD procedures and 30 LGWOD operations check sheets.

LGWOD personnel plugged and locked/tagged out all of the process wastewater drains at Building 2531 at the request of Construction Engineering personnel. The new process wastewater line from the Transported Waste Receiving Facility was scheduled to be tied into the existing process wastewater line from Building 2531, so the drains were isolated for to assure the safety of construction forces.

Provided comments on the Draft Safety Analysis Report for the Transported Waste Receiving Facility (Building 2649) to Safety Engineering. This facility is being constructed as part of the Bethel Valley LLLW Line Item.

One revised procedure for LLLW tank sampling was approved during the month. This was to close a corrective action that resulted from an occurrence report.

Three revised procedures for the LLLW System incorporating new requirements of the LLLW System OSR were approved during the month.

December

Work continued on the WC-9 transfer system upgrade task. This task was undertaken to bypass the WC-5 Tank Farm pump pit with any waste from WC-9. To accomplish this, a submersible pump will be installed into WC-9 and the pump discharge will be tied into the discharge piping from the WC-5 pump pit to the Central Waste Collection Header. The field work is being performed by P&E personnel. To date, a majority of the sections of the new transfer piping have been fabricated and are ready for installation. Excavation to gain access to the old piping (where the new piping will be tied in to the existing discharge piping), has been completed. Remaining work includes completion of fabrication of the new doubly-contained transfer piping, digging a trench for the new piping, installation of the same, and testing the installation prior to placing the new transfer system in service.

The Site Safety and Health Plan (SSHP) for the reconfiguration (upgrade) of the T-1 and T-2 level instrumentation was written and reviewed. Several minor comments are being incorporated into the SSHP prior to its approval. This task will consist of reconfiguring the instrument tubing contained in the level measuring system for LLLW tank T-1 and T-2. These tanks, located at the Central Pumping Station, (Building 7567) serve as collection surge tanks for the HFIR Complex. The reconfiguration task is necessary so that FFA leak testing can be accomplished on the tanks. The SSHP is required because the job has fallen into the HAZWOPER category. In addition to the new instrument tubing, an access flange on the top of each of the tanks will be extended to an above-ground arrangement to provide easier access to the system for future maintenance. During the month, LGWOD personnel tied a nitrogen purge system into the instrumentation in order to purge the lines of water and built-up debris which could be causing inconsistent level readings, thus prohibiting the tanks from passing the FFA leak testing.

2.4 GASEOUS WASTE SYSTEM

June

The draft version of the "Risk Assessment of 3039 Stack Failure" was sent out for review and comment. This study was prepared in response to the Radioactive Operations Committee recommendation RCO/LGWOD/91-2.

August

A draft waste sampling plan for the 3039 Stack Inspection project was prepared.

The specification for the 3039 Stack Inspection was under review by the DOE. The bid for performing this inspection was expected to be awarded in September.

September

The Waste Management Plan for the 3039 Stack Inspection project was written and approved.

October

The 3039 Stack Inspection will be accomplished by an outside vendor. Preparations to send it out for bid continued through the month.

November

The 3039 Stack Inspection proposal was issued for outside vendors to bid on the project.

December

A meeting was held to discuss initiating Phase I of the Cathodic Protection Systems Upgrade Task. The Task Team anticipates having the Certified for Construction Package to MK-Ferguson in February.

2.5 WASTE OPERATIONS DATA MANAGEMENT AND ANALYSIS SYSTEM (WODMAS)

January

Work on a PC based forms entry system for the uniform RFD design proposed by the ORNL Waste Tracking System (WTS) Design Team was started. A prototype was tentatively scheduled to be completed in March. The proposed RFD continued to be reviewed by the Central Waste Operations Initiative Performance Improvement Process (PIP) Team.

The CWISE Functional System Design (FSD) document was signed by the ORNL representative.

Consolidation and preparation of site specific WTS validation tables, such as facility information, continued. The validation tables, which would specify allowable entries, will be distributed for review by the end of March.

Meetings were held with Hazardous Materials Information System (HMIS) managers and technical support to discuss utilization of HMIS as a source for hazardous substance identification information. The information will be used to populate and update the hazardous chemical validation tables of the ORNL WTS automatically. A test file was transferred and tested.

A request for funds to provide magnetic disk storage expansion to support current and future projects was approved.

Two ORNL WTS team members were among approximately 12 Oak Ridge Reservation site personnel to attend a client/server technology conference.

Software to analyze the level of fragmentation of disk files and repair the disk files was installed on the WODMAS VAX. Preliminary testing was completed and a full scale test would begin soon.

February

Two meetings were held with the Central Waste Tracking System (CWTS) team and site data system representatives to discuss a common Waste Pickup Request. A format proposed by the ORNL WMRAD was presented and discussed. Revisions and updates were incorporated into the proposed format. The Y12 team presented a prototype PC based data entry system which utilizes Foxpro.

Extensive work on consolidation and preparation of WTS validation tables continued. The ORNL WTS design team is providing CWTS draft validation tables, which will specify allowable entries, for radionuclides, chemical abstract services and Material Safety Data Sheet (MSDS) data, and container type data in addition to site specific data. A first draft of all tables was completed and distributed for review by all sites and CWTS teams. Outstanding issues remain regarding Container Type, Analytical Laboratory, Waste Type, and Material Type Validation Tables.

Multinet, a communications software package, was installed. The software allows WODMAS users to communicate with users on external UNIX systems. The package was installed to facilitate distribution of WTS information with other sites and CWTS.

Purchase requisitions were issued for a four giga-byte magnetic disk storage expansion and a DECtrace performance tracking software license to support current and future projects.

March

One LGWOD and one Computer Applications Division support personnel completed training in Digital Equipment Corp. (DEC) Pathworks Client/Server System Management. Numerous configuration changes based upon lessons learned were implemented resulting in improved system performance.

A four gigabyte magnetic disk storage array and controllers were received and installed. Modifications to the system configuration were in progress.

Two additional CDROM drives were received and installed to provide on-line access to the entire DEC documentation set.

The software license for DECTRACE, a database performance analysis tool, was received and the software was installed.

Additional device specific print queues to support custom report formats were created.

Extensive meetings were held with site and Central Waste Management Division (CWMD) management and staff regarding the proposed Uniform Request For Disposal (RFD). Modifications were incorporated into the design and reviewed by the Central Waste Operations Initiative (CWOI) PIP Team. A final design was agreed upon. A schedule was established for field testing the RFD prior to full implementation.

Work on consolidation and preparation of WTS validation tables continued. The effort was 95% complete. The ORNL WTS design team provided CWTS draft validation tables, which would specify allowable entries, for radionuclides, chemical abstract services and MSDS data, and container type data in addition to site specific data. Outstanding issues remain regarding Container Type, Analytical Laboratory, Waste Type and Material Type validation tables. The site specific Facility validation tables remained to be completed. The tables would be distributed widely for review and comment after all of the tables were completed.

A meeting with the CWOI PIP Team was held to discuss issues regarding historical waste tracking data conversion. Outstanding issues included the conversion sequence and schedule. An effort was underway to provide more detailed information to support a cost/benefit analysis.

April

Numerous meetings were held with training personnel from all sites to plan the pilot program for the new RFD. Several training sessions were performed for the trainers by the ORNL WTS design technical team. Presentation literature, as well as instructions for the new form, were completed by the technical team and given to the trainers for incorporation into the lesson plans and course material.

Meetings with line management and technical staff were held to finalize the design of the WMRAD internal forms which will interface with the ORNL WTS.

A purchase requisition for a bar-code reader to support on-site label generation was issued.

Several performance adjustments to the system were made based on feedback from the VAX Performance Analysis software tool.

Adjustments to the WTS database design were made to accommodate the final draft of the RFD form.

Work on a PC based forms entry system to support the new RFD was initiated.

May

Extensive development of a PC based package to assist waste generators was initiated. Demonstrations were provided to training personnel from ORNL and K25. Initial response was very positive. A prototype was scheduled to be distributed to RFD pilot generators in June. Twenty copies of the software were purchased for user evaluation.

Pilot RFD examples from generators were beginning to be received. The samples were evaluated for problem areas, training improvements, and to test the PC form filler software.

An initial set of waste barcodes to support the RFD pilot program was printed by Y-12. The barcodes were distributed with the pilot forms. The barcode printer to support local printing was received, with an initial stock of labels. Configuration and setup would be completed in June.

Development of the WTS software component to perform the nightly site upload of new/revised data was initiated.

The beta-test version of a new release of the software being used to develop the WTS software was received and installed. The new release features included several improvements to support client server implementation of the WTS.

The WODMAS system was re-configured to utilize the new disk storage array. Minor problems resulted and were corrected. The configuration was performed during the holidays to minimize prime-time down-time.

The optical storage array (jukebox) underwent routine servicing, during which a malfunction developed and was corrected.

Arrangements were completed to support the WTS development effort with an additional person. A temporary position was opened and successfully filled. The report date was set for June 7.

ORNL was contacted by K25 and asked to barcode an upcoming shipment of waste to K25 using the new standard format. Labels were provided by K25 in addition to instructions for label positioning until an approved barcode standard could be issued.

An estimate for the Building 3001 local area network expansion was completed. The expansion was needed to support WMRAD personnel. The number of 3001 offices which are not used by 3001 personnel was minor so the decision was made to network all offices. WMRAD was contacted by Environmental Restoration (ER) personnel who need local area network support in Building 3001. Arrangements were being made to share the cost of the expansion and the network with ER.

Several configuration changes were made to support optical scanning software being developed by the Computer Applications Division. The software will allow electronic storage and retrieval of original documents.

Two WTS design team members completed off-site training in DEC Rally.

June

Development of a PC based RFD form filler package to assist waste generators continued. Features to allow registration of generators and distribution of barcodes were added to the package. The beta-test version would be available for generator training beginning in late July.

The Pilot RFD program was completed. Examples from generators were used to evaluate problem areas and to test the PC form filler software.

The barcode printer to support local printing was received, with an initial stock of labels. Configuration and setup was completed and tested. Distribution methods were reviewed with WMRAD personnel. The proposed method would be documented and distributed for comment.

The WODMAS database management software was upgraded to the version which will be used for WTS implementation. A final revision to the database structure would be completed in July.

One additional position to support the WTS development effort was filled. The individual began work on June 7.

An estimate for the Building 3001 local area network expansion was completed. The expansion is need to support WMRAD personnel. The number of 3001 offices which are not used by 3001 personnel was minor so the decision was made to network all offices. WMRAD was contacted by ER personnel who need local area network support in 3001. Arrangements were not completed to share the cost of the expansion and the network with ER.

Several meetings were held with ORNL Asbestos Management Program personnel to discuss the implications of the WTS on the Asbestos Management Program.

July

Development of a PC based RFD form filler package to assist waste generators continued. Features to allow automated Container Packing List and Waste Pickup Request form generation were added as well as database integrity functions. A meeting was held with K25 and Y12 site personnel regarding the Y12 and X10 PC packages. Due to development schedules which required intense focus on site specific waste management procedures neither package will be able to support every sites' requirements before January, 1994. This will require Y12 waste destined for X10 (ORNL at Y12 Radioactive and Mixed waste) to be submitted to X10 waste management using the X10 PC package to complete the WTS forms or completing the forms by hand.

The barcode printer software to support local printing was completed. Distribution methods were finalized. A draft barcoding standards document was completed by the barcode standards committee and would be submitted to the Central Waste Operations Initiative for approval.

A final revision to the WTS database structure was completed.

A Maintenance Job Request (MJR) was issued for Building 3001's local area network expansion. The expansion was needed to support WMRAD personnel. The number of 3001 offices which were not used by 3001 personnel was minor so the decision was made to network all offices. Funding for the project was being shared by WMRAD and ER.

A meeting was held between WTS Team personnel and Stoller, Corp. personnel to discuss historical waste data conversion requirements and constraints as well as reporting requirements. Follow-up meetings were scheduled to be held in late August.

A meeting was held with the Solid Waste Operation Group (SWOG) to discuss issues and concerns. Several suggestions were incorporated into the Waste Management Operations (WMO) forms to support operations functions.

The ORNL WTS facility table was completed.

WTS data entry screens organization was finalized.

A new version of Rally for RDB was installed and used for development of the WTS. A VMS 5.5 compatible version of the Laserstar optical jukebox interface was installed and debugged.

Installation of an evaluation version of Diskeeper was installed and tested. Diskeeper is a disk defragmenter used to improve disk performance.

August

Development of a PC based RFD form filler package to assist waste generators continued. The features required for the initial release were finalized. Automated Container Packing List and Waste Pickup Request generation were added as well as utilities to maintain local PC database integrity and context sensitive on-line help. A WINDOWS installation kit was completed. Overall package integration and final testing was started and would be completed the first week of September.

The barcode printer to support local printing was transferred to the Documentation Management Center (DMC) Forms Control office. Training of DMC personnel would be completed in September. A purchase requisition for barcode stock was placed. Selection of the barcode readers to support field operations was made. Three readers would be procured initially. The purchase requisition was scheduled to be issued the first week of September.

A supplier of Tyvek tags was located. An initial stock of 5000 item and 5000 container tags would be ordered with an assortment of fasteners for test purposes. The tags will be used to attach barcode labels to items/containers which cannot otherwise be labeled.

The initial ORNL facility ID validation list was compiled from three sources; the ORNL Facility Listing, the ORNL Building Directory and the WMRAD facility listing. The WMRAD facilities were issued for review. Corrections and additions were made to the listing for incorporation into the WTS. A final listing would be issued for review in September.

Design and development of the applications interface to the WTS continued. Data Entry screens to support DMC operations would be completed in September. Data entry screens to support operations personnel would be completed pending resolution of form/information flow within operations.

Patches to the software were added to correct a problem with the reel to reel tape drive hanging up and to correct a problem with the CPU on board cache memory. The memory patch resulted in an increase in processor speed of approximately 500%.

New drivers were loaded on the system for the optical jukebox. There were some initial problems but they were satisfactorily resolved.

A new version of Combined Data Dictionary (CDD) for VAX/VMS was installed to correct a problem with using CDD 5.0 with RDB 4.2. This corrected a basic incompatibility with the two packages.

September

Development and testing of a PC based RFD form filler package to assist waste generators was completed. A generator training program was developed and initiated. Four classes were held in September. Three classes were scheduled for October. Distribution of the PC package was initiated October 4, 1993.

WTS barcode printing and distribution was initiated September 13 in conjunction with the master forms set. A purchase requisition for additional barcode stock was placed. A purchase requisition for three barcode readers and accessories was issued. A Barcoding Techniques, Do's and Dont's, K25 Lessons Learned' presentation by K25 personnel was made to X10 personnel. A number of issues and questions were raised.

An initial stock of 5000 item and 5000 container tags made of Tyvek were ordered. The wrong tags (paper) were delivered. The correct tags were scheduled for delivery in October. The tags will be used to attach barcode labels to items/containers which cannot otherwise be labeled.

The Building 3001 local area network expansion was initiated. The fiber optic cabling was installed with drops to all Waste Management and ER offices in Building 3001. The project in September was waiting for installation of equipment shelving to be completed. Additional twisted pair ethernet interface cards and adapters as well as connector cables were due to be delivered in October.

Design and development of the applications interface to the WTS continued. Data entry screens to support Documentation Management Center operations were completed in September but deployment was delayed pending completion of secondary data entry screens based upon comments from WMRAD field personnel as well as technical problems. The database was duplicated on the system to allow segregation of the test/production system from the development system.

A purchase requisition for additional disk drive, memory and a high speed/capacity cartridge tape drive hardware was issued. The equipment will be used to support the additional users being added in the 3001 network expansion, improve system performance, as well as provide a fully redundant backup/development system. The high density/capacity tape drive will greatly reduce the time required for system backup and allow a means of backing up the 40 giga-byte optical storage system for off-site storage in the event that disaster recovery is needed.

The software license for RDBexpert, a performance tuning package was received and the package was installed. The package will be used to support periodic system tuning requirements.

October

Four training classes for the WTS Forms Management PC package were held.

WTS barcode printing and distribution continued. The vendor supplied ink ribbons were found to be incompatible with the vendor supplied label media. The correct ribbons were received from the vendor. The incorrect barcode stock is being recalled and replaced. Barcodes which were already in use were being covered with clear, ultraviolet resistant labels to protect them from abrasion.

An initial stock of three barcode readers and associated peripherals were received. Prototype software programs to support inventory, re-labeling, container packing, storage and inspection operations in the field were completed and demonstrated to Radioactive Solid Waste Operations Group and DMC personnel. Enhancements were being incorporated into the software at the end of the month and would be available in November.

An initial stock of 5000 item and 5000 container tags made of Tyvek were received and distributed to Solid Waste Operations Department and DMC personnel. The tags will be used to attach barcode labels to items/containers which cannot otherwise be labeled.

The Building 3001 local area network expansion continued. The installation of equipment shelving was completed. The communications hardware was installed and the twisted pair cabling connected. The PC interface boards were received along with adapters for PCs already equipped with thin wire interface boards. Completion of the expansion was scheduled in November, at which time existing thin wire users could be switched over to the new network and new users could begin to be configured. The new local area network provided users access to the inter-plant high speed FDDI backbone.

Both WODMAS VAX computers were upgraded with additional memory and high capacity disk drives were added to the VAXstation. The equipment will be used to support the additional users being added in the 3001 network expansion, improve system performance, as well as provide a fully redundant backup/development system.

The high density/capacity tape drive was received and installed. Initial benchmarking tests backed up the five magnetic disks to one eight millimeter tape in a little less than 2 hours while the system was on-line. Prior methods and hardware required 6 hours to back up two disks onto eight 9 track, 10 inch reel tapes. Modification to the automated system backup routines was scheduled for completion in November after further testing.

The WTS components supporting data entry of generator supplied forms, waste item review data entry and treatment, storage and disposal record data entry were completed. DMC personnel were personally trained by the WTS technical team members. Corrections and enhancements requested by DMC personnel were incorporated into the system design.

DMC staff successfully entered the first set of waste data from the Energy Systems Waste Management Organization Uniform RFD enabling the data required by the state under the terms of the Tennessee Oversight Agreement (TOA) to be uploaded to the CWTS. The first upload occurred on October 31, 1993, successfully meeting the November 1, 1993 TOA milestone.

November

One training class for the WTS Forms Management PC package was held. Three classes were scheduled for December. Two meetings were held with waste generators to discuss additional features for the next release.

Recall and replacement of the vendor supplied mismatched WTS barcode labels was completed.

Development of barcode software programs to support inventory, re-labeling, container packing, storage and inspection operations in the field continued. A meeting was held with waste operations field personnel to demonstrate the barcode operations. Modifications to barcode software and WTS operations' forms were made to provide additional functionality to support Hazardous Waste Operations Group requirements. A need for additional barcode hardware was identified. A proposed inventory of equipment and a cost estimate was scheduled for completion in December.

The Building 3001 local area network expansion/conversion was completed. The new local area network provided users access to the inter-plant high speed FDDI backbone. A total of 62 network connections were installed in the building. Fifteen existing thinwire users were converted to the twisted-pair network. Network hardware for twenty users was installed in the users' PCs to support immediate needs for operations personnel WTS access and ER personnel Management Control Information System access. PC software and WODMAS user accounts would be configured during December. An informational demonstration for the remaining building occupants was scheduled for January.

The WTS component which executes the nightly data upload to the CWTS was fully automated. The software procedure includes an error analysis report of the CWTS confirmation file and distribution of the report via E-mail.

Two meetings were held with site and CWTS personnel to discuss networking strategies and objectives. Initial focus would be on distributed file and print services between sites to eliminate the need to transfer data and reports manually.

December

Three training classes for the WTS Forms Management PC package were held. A meeting was held with Computing & Telecommunications Services PC support to discuss problems introduced by the un-announced change from the Delrina PerForm Pro product to the FormFlow product.

Development of barcode software programs to support inventory, re-labeling, container packing, storage and inspection operations in the field continued.

Configuration of critical operations personnel's PCs to interface to the Building 3001 local area network expansion/conversion was initiated. Eight users' PCs were completed. Eighteen WODMAS user accounts were configured to provide WTS access. Five users e-mail accounts were re-routed to WODMAS.

Training for operations personnel in the use of the WTS was initiated. A proceduralized training program will be initiated in the next two month.

2.6 WASTE OPERATIONS CONTROL CENTER DATA ACQUISITION SYSTEM (DAS)

January

The installation of the cable for the Vista low level tank leak test program was completed by M. K. Ferguson. Modifications to the WOCC data concentrators were begun in preparation to receive the new channels and the temperature data for the existing channels.

Several data sets were prepared for use in for the preliminary testing of the LLLW tank leak test program. The leak test program was going very well and field testing was anticipated to begin soon.

Programmed maintenance was performed on the WOCC DAS. No errors were noted during this period.

February

Installation of the new cables for the LLLW leak test continued. The project was progressing as planned.

A meeting was held to discuss the use of historical WOCC DAS data to support preparation of the Interim Action Plan for the Waste Area Group (WAG) 1 report. The person preparing the report would investigate the potential uses of the data.

March

Installation of the new cable for the LLLW collection and transfer system leak test was completed. The instrumentation for temperature measurements was being installed and configured into the WOCC DAS database at the end of the month.

Two LLW leak test data reports were generated. Additional reports requested were delayed due to technical problems which were being investigated.

The control room partitioning was re-arranged to provide more space for operating personnel and additional shelf space for documentation.

The existing ink-jet printer, which had become obsolete, was replaced with a higher performance model.

June

Two channels were added to data concentrator two for monitoring criticality instruments in Building 3019.

October

Two new channels were added, and several channel associated messages were edited to reflect the change of ownership of the stack duct monitoring equipment for the 3039 stack area.

Channels were added for the monitoring of the new criticality alarm system in Building 3019. The channels were tested and verified before being placed into service. These channels were also added to the Laboratory Emergency Response Center DAS.

November

Replacement of the WOCC DAS with a newer, faster, more reliable system was being investigated.

2.7 WOCC DISTRIBUTED CONTROL SYSTEM

January

One of two redundant fiber optic cable highways for the DCS was damaged by construction activities associated with the Bethel Valley LLLW Line Item. The system operated normally on the remaining highway while ORNL P&E personnel repaired the damaged cable.

February

Conversion of the existing Operator Interface databases to the new LLLW system upgrade units continued. Conversion of the graphics was approximately 80% complete. Engineering personnel were then focusing on menu and alarm group organization.

March

Conversion of the existing Operator Interface databases to the new system upgrade units continued.

April

Conversion of the existing Operator Interface databases to the new LLLW system upgrade units continued.

May

The WOCC DCS upgrade was on schedule. Loading of the data base began on the Operator Interface Station (OIS) 40. The distribution control system performed as anticipated.

June

Upgrade activities continued with more configuration data being loaded on the OIS40. The development effort was currently focused on alarm management, security and documentation to assist personnel in completing the project when existing engineering staff turn the development effort over to new staff in September.

July

Several new faceplates were added to the new Upgrade OISs as part of the overall system upgrade in support of the Bethel Valley Liquid Low-Level Waste Line Item. Alarm management was configured on the two units in Building 3130.

August

The upgrade work being performed in conjunction with the Bethel Valley LLLW Line Item activities continued. Alarm messages for the existing database (approximately 600 signals) were generated by LGWOD personnel. Development of help screens with system specific information was also initiated by LGWOD personnel.

September

The upgrade work being performed in conjunction with the Bethel Valley LLLW Line Item activities continued. Development of help screens with system specific information continued by LGWOD personnel. To date, facility specific help screens have been developed for all of the facilities in the NRWTP Collection System and for the OIS console. Engineering personnel continued to pursue information on the setup of the OIS consoles with the manufacturer, as well as trying to work around various inadequacies in the manufacturer's programming documentation. These inadequacies were consuming a large amount of system development time and effort.

November

Eighteen system-specific help screens were developed by LGWOD personnel for the new OIS consoles, which were being configured by Instrumentation Engineering (IE) personnel. IE personnel continued to pursue resolution of software and hardware problems, lack of system documentation, etc., with vendor personnel. The vendor committed to sending a field engineer on-site for a three week period to assist in the programming effort and to help correct the problems that have been encountered. The new OIS consoles are being installed as part of an upgrade in support of the Bethel Valley LLLW Line Item.

December

Work on the conversion to the new OISs continued. Due to the loss of the Engineer performing the system conversion, responsibility for the conversion was given to an I&C personnel. Several long-term problems have since been resolved, and the checkout of the signal database should begin in January.

2.8 LIQUID LOW-LEVEL WASTE SOLIDIFICATION PROJECT (LWSP)

February

A revised Project Review Checklist summary was submitted for the proposed New Interim Concrete Cask Storage Facility to be constructed in Melton Valley. This facility will store solidified waste forms, in concrete casks, generated from the EASC and LWSP campaigns. An Environmental Assessment will be prepared for this activity.

March

Preparation of the draft presentation for the LWSP Safety Study was initiated. This presentation was scheduled to be given to the Plant Safety Evaluation Team (PSET) in April/May.

The LWSP Safety Study was revised to comply with DOE/OR - 901, "Guidance for Preparation of Safety Analysis Reports." The second LWSP campaign was tentatively scheduled to occur during late 1993.

The Project Notification and the request for Environmental Assessment Determination for the New Interim Concrete Cask Storage Facility were submitted to the DOE-ORO. The draft Environmental Assessment for the New Interim Concrete Cask Storage Facility was issued for review and comment. This new facility is located in Melton Valley, south of SWSA 7, and will be used to store solidified waste forms resulting from the EASC and LWSP campaigns.

April

LGWOD personnel temporarily shut down the In-Tank Evaporation (ITE) process for tank W-25 in preparation for LGWOD personnel to sample the sludge layer in the tank. The ITE process for the other five tanks remained in operation.

May

The ORT and the RRB were formed during the month. To date, the Readiness Review Plan, the RRC, and the Logic Tree have been approved by both groups. Closure of the RRC will begin in June.

The eight procedures for LWSP operations underwent their mandatory two-year review. Five were found to require no changes. The other three were revised and approved for use during the upcoming LWSP campaign.

June

The LWSP ORT continued to meet during the month. Seventy-four RRC were approved by the ORT during the month. The ORT approved RRC were presented to the RRB members for their review and approval.

July

The LWSP Readiness Review process continued during the month. During the month, fifty-two RRC were presented and approved for closure. This brings the total ORT approved RRC to date to one hundred and twenty-six. A meeting of the RRB was then held. The RRB approved all of the ORT approved RRC and requested one additional RRC be added to the Readiness Review. When this item is approved, all of the RRC required to bring the vendor on-site to begin the system's functional tests will be closed.

Review comments were submitted for the first draft of the "Environmental Assessment for a Gravel Pad to store Solidified Liquid Low-Level Waste (LLLW)."

August

The LWSP - Campaign II activities continued to proceed during the month. Approval was received from the WMRAD Director to mobilize the vendor to come on site and start the surrogate testing program. The vendor arrived on site August 19 and began setup of equipment and training of personnel. Two RRC were approved for closure during the month by the ORT. This brings the total ORT approved RRC to date to one hundred and twenty-eight.

Two revised procedures for operations at the LWSP were approved.

Received the revised Draft Environmental Assessment for the construction of a gravel pad to store solidified LLLW for final review and comment.

Received the approved Project Waste Management Plan and the Project Records Plan for the gravel pad to store solidified LLLW.

Received the preliminary issue of the Risk Assessment/Plan for the gravel pad to store solidified LLLW for review and comment.

September

Submitted Draft Environmental Assessment for the "Construction of a Gravel Pad to Store Solidified LLLW, Oak Ridge National Laboratory," to DOE-ORO for review and transmittal to DOE-HQ for review and approval

A Fall Protection review was conducted for operations at the LWSP. All recommendations (including lanyards and body harnesses) for fall protection safety were being implemented.

Reviewed and submitted comments on the Sampling Analysis Plan for solidification of radioactive liquid waste stored in the Melton Valley Storage Tanks (W-29 and W-30).

October

A briefing was held for DOE-ORO personnel on the status of the LWSP - Campaign II. The briefing was held at the request of DOE-ORO personnel who wanted to review the project prior to its beginning "hot" operations. No concerns were identified during the

briefing. Follow-up conversations between DOE-ORO personnel and Waste Management personnel continued during the week ending October 15, 1993.

The LWSP - Campaign II performed the surrogate testing during the week ending October 8, 1993. The surrogate testing used a simulated waste form that is chemically identical to the composition of the LLLW concentrate that will be solidified but does not contain any radioactive materials. This test allows for training of vendor and MMES personnel and also confirms that the solids formula being used sets up properly. No problems were identified during the test.

The LWSP - Campaign II ORT and RRB met during the week ending October 18, 1993. All open Readiness Criteria were closed and the RRB recommended to the WMRAD Director that the program should be allowed to proceed to "hot" operations. The WMRAD Director gave his approval on October 14 for operations to proceed.

One revised procedure for LWSP operations was approved. Instructions were added for the sampling program to prove that the solidified waste forms meet the Waste Acceptance Criteria for the Nevada Test Site, which is planned to be their final repository.

LGWOD personnel provided comments on the Sampling and Analysis Plan for LWSP - Campaign II to the Waste Certification Official. This plan was internally approved and personnel involved with the solidification campaign underwent training to the certification program. This plan documented the certification sampling done to meet the Waste Acceptance Criteria for the Nevada Test Site.

ORNL personnel performed an additional review of the LWSP facility prior to the startup of "hot" operations. Some electrical connection changes were recommended and additional fall protection issues for the solids trailers and unloading systems were addressed. All recommendations were incorporated.

Two procedure revisions for LWSP activities were approved. These revisions were done to conform to the Sampling and Analysis Plan that has been prepared for this project (the plan will be used to document conformance with the Nevada Test Site Waste Acceptance Criteria).

The LWSP - Campaign II started "hot" operations on 10/25/93. Four solidified waste forms have been completed by the end of the month, with an expected total of sixty forms to be generated during this campaign. LWSP - Campaign II is solidifying the supernate from two LLLW concentrate storage tanks at Building 7830 to provide additional storage space for future operations at ORNL. Approximately 50,000 gallons of waste is expected to be solidified during this campaign.

November

The LLLW Solidification Project (LWSP) - Campaign II continued with "hot" operations during the month, with fourteen solidified waste forms being generated during November. Eighteen solidified waste forms were generated to date, with an expected total of sixty forms to be generated during this campaign to free up approximately 50,000 gallons of storage space for future operations at ORNL.

LGWOD personnel provided comments on the Quality Assurance Plan and the Certification Program for shipping the solidified waste forms from LWSP-Campaign II to the Nevada Test Site, which is planned to be their final repository.

The draft Environmental Assessment for the new Interim Concrete Storage Cask Facility was at DOE-ORO for review and comment.

One revised procedure for the LWSP was approved during the month.

December

The LLLW Solidification Project (LWSP) - Campaign II continued with "hot" operations during the month, with six solidified waste forms being generated during December. Twenty-four solidified waste forms were generated to date, with an expected total of sixty forms to be generated during this campaign to free up approximately 50,000 gallons of storage space for future operations at ORNL.

There were no waste forms generated at the LWSP Facility (Building 7877) during the holiday season. The down time was utilized to accomplish any decontamination needed in the facility. This decontamination was carried out to assure there will be no spread of contamination outside of the facility and to assure the working environment is as safe as possible for the personnel (both MMES and Subcontractor) working at the LWSP Facility. The solidification of waste would continue immediately after the first of the year.

A comment resolution meeting was held with DOE-ORO in the Environmental Assessment for the new proposed storage cask facility to be constructed in Melton Valley. No major unresolved issues remain. The draft EA was being revised based on comments received from the DOE-ORO.

2.9 EVAPORATOR REPLACEMENT AT BUILDING 2531

January

The ORT and the RRB were appointed for the 2A-2 Evaporator project. There were three ORT meetings during the month. A Readiness Review Plan, a set of RRC and a Logic Tree were developed and were out for final review and comment. Also, a Readiness Review Risk Level of 3 was assigned to this project.

There was one informal meeting with the RRB chairman. The main purpose of this meeting was to define responsibilities and interfaces of the RRB and ORT.

It was scheduled to begin field work in the month of March. Sixty-six RRCs were identified to be completed prior to beginning field work. To date, six RRCs had been completed and approved by the ORT.

The foam level probe assembly for the 2A2 evaporator replacement change out was completed, but an error in the prints resulted in modifications to the design. A new probe was being manufactured and would be completed in a very short time.

February

The ORT met four times. The Readiness Review Plan, RRC, and Logic Tree were approved by the ORT and have been given to the RRB for review. Sixty-eight RRC had been identified as being required to be completed prior to beginning field work. As of February 28, twenty-eight were completed and approved by the ORT, and had been presented to the RRB for their review. There was one formal meeting with the RRB.

Decontamination of the old evaporator was underway. A series of boils and flushes using water and nitric acid had been used to perform the decontamination. One of the Cell 4 plugs was pulled and a Health Physics survey was performed. Although progress was made in reducing the dose rates from contamination in the evaporator, additional decontamination work would have to be performed to try to further reduce the dose rates.

March

For the 2A-2 Evaporator project, the ORT met five times and there were two meetings with the RRB. The Readiness Review Plan and the RRC were all approved and signed by the RRB. A total of 71 RRC were identified as being required to complete prior to beginning field work. For the month of March, twenty RRC were approved by the ORT. The total RRC that had been approved by the ORT to date is 48. Twenty-six of these had been approved by the RRB.

Decontamination of the evaporator 2A2 and cell 4 proceeded during the month. Health Physics surveys indicated a significant reduction of the radiation levels.

Additional, significant progress related to this project included:

- High Efficiency Particulate Air (HEPA) units, a plasma arc cutter and personnel protective equipment/clothing were ordered to support work.
- All construction materials required had been fabricated/procured and verified as on site.
- The upper bay crane was load tested and approved.
- A Memorandum of Understanding was written and approved for removing "free-standing liquids" from the evaporator so it would meet the waste acceptance criteria of SWSA 6.
- Resolution of respirator responsibilities was accomplished. MMES would sell respirators to the contractor and they would issue the respirators themselves.

April

The 2A-2 Evaporator Project, ORT met several times and the RRB met once. The total number of RRC that were approved by the ORT to date was 58. Of these the RRB had approved 56. (There was a total of 71 RRC that had to be approved by the ORT and RRB prior to starting field work.)

Funding was approved to begin construction on the temporary enclosure over the evaporator cell. This structure would serve as a containment structure and would support health physics and decontamination activities, as well as the actual field work activities. The work plan for this activity was also approved. Erection of the structure was scheduled for early May.

Equipment that had been ordered to support this effort was received. These included a plasma arc cutter and several HEPA-filtered ventilation blower units.

May

The temporary, containment enclosure over the evaporator cell was completed. Upon completion, the plugs were pulled and a Health Physics (HP) survey was performed. Based on the HP survey, it was decided to perform an additional "boil-out" of the evaporator using a stronger acid solution than previously used. This "boil-out" with acid was an attempt to reduce the radiological readings around the evaporator vessel. The entire "boil-out" cycle, which included rinses and a caustic boil would not be completed until early June. Additional HP surveys would be performed at the conclusion of this cycle. At that time the Work Plan could be completed and field work activities could commence.

June

As part of the 2A2 Evaporator Replacement Project, an additional acid and caustic boil-out was completed on the Evaporator this month. Also, decontamination of the evaporator exterior and the cell, where the evaporator is located, was performed. Two Health Physics (HP) surveys were performed and they show that there had been a significant reduction in dose rate and contamination in the cell. The information from the latest survey would be used to prepare the Work Plan and other related/required documentation to begin field work activities. It had been estimated that it would take ten days to complete the Work Plan. Other activities completed this month which support this project included the completion of Waste Generator training for MK-Ferguson personnel and removal of debris from the upperbay of Building 2531.

July

Drafts of the work plan, ALARA plan, and rigging plan were being prepared. They were expected to be approved and submitted the first week of August. Also, an integrated schedule was prepared which showed MMES and MK-Ferguson activities together. The original containment tent was replaced to reduce contamination.

August

Two Readiness Review Meetings were held during the month. Five RRC were approved, or conditionally approved by the ORT. The total RRC approved by the ORT to date was 64. There were a total of 71 RRC to be completed prior to field work beginning.

September

Four Readiness Review meetings were held during the month. Five RRC were approved by the ORT; however, five criteria that were previously approved had to be reopened. Therefore, there were still a total of seven RRC that had to be completed to begin field work. To date, 64 of 71 "pre-construction" criteria were completed. Included in the criteria that were approved were the Work Plan and ALARA Plan.

Installation of the scaffolding to be utilized during field work and for cutting the evaporator coils began during the month and was expected to be completed during the first part of October. Also, the "containment tent" was replaced.

October

Two ORT meetings were held for the 2A2 Evaporator Replacement Project during the month and one RRB meeting was held. All remaining RRC required prior to beginning field work were approved by both the team and the board - a total of 71. On October 13, the WMRAD Director gave approval to begin field work.

Specific field accomplishments which occurred during the month include:

- Installation of the scaffolding to be used during field work activities was completed.
- The manhole was cut out of the top of the evaporator to allow a video inspection of the evaporator interior. Also, a section of one of the failed coils was cut and removed from the evaporator via the manhole cutout.
- The removed section of coil was submitted for analysis to see if the cause of failure of the coils could be determined.
- As built drawings were completed.
- Forty-one connections from the evaporator were cut and the removed piping was placed inside the evaporator where it will remain. The remaining connections, approximately five, would remain in place on the evaporator until just prior to it's removal. These connections would be used to remove the water from the evaporator.
- Work was initiated to temporarily remove some attachments to Building 2547 to support transport of the evaporator to SWSA 6. These attachments provided obstacles which the transport vehicle would be unable to get around.

November

Field work, which began in late October, progressed well through the month. The old evaporator vessel was removed from Building 2531 on November 13, and transported to SWSA 6 for disposal in a specially built silo. In addition to the field activities of cutting the old evaporator loose from all attachments, other activities which supported this effort

included: Modifications to Building 2547 to allow transport vehicle access to Building 2531; Fabrication and mounting of transportation tie-down fixtures; Pouring absorbent into the evaporator; Coating the evaporator to fix any potential loose contamination; and construction of a special lifting fixture.

Since the removal of the old evaporator field work activities have included: Cleaning the upper bay area of Building 2531; replacing the containment tent; attaching legs to the new evaporator and placing it into Cell 4 of Building 2531; and the initiation of welding activities.

Additionally, two meetings occurred with personnel from the Metals and Ceramics Division to assist in determining the best way to section and analyze the failed section of coil which was removed from the evaporator in October in order to ascertain the failure mode of the failed coils.

December

Field work, in the form of welding connections from the new evaporator vessel to the existing piping in Building 2531, continued through the month. Approximately 75% of the connections to the new evaporator were completed.

Personnel from the Metals and Ceramics Division were still analyzing the sample removed from the old evaporator to determine its cause for failure. A final report has not yet been issued; however, they are finding a general wall thinning, attributable to exterior corrosion, over the entire section of the sample. Additionally, they are performing tests and analysis to possibly select an alternate material with better corrosion resistance characteristics for a replacement evaporator to be ordered in the near future.

2.10 HAZARD SCREENING FOR LGWO DEPARTMENT FACILITIES

January

Preliminary schedules and budgets were developed for preparation of Phase III safety documentation for the LLLW System required under the SARUP. Document preparation for Phase III was tentatively scheduled to begin towards the end of FY 96 and to be completed in FY 99.

Initial preparation of Phase II safety documentation continued.

February

Presented the First Quarterly Review Summary on the status of the SARUP Phase II safety documentation preparation, to the PSET. Phase II safety documentation was being prepared for the LLLW system. This activity is scheduled to last through FY 95.

As part of the Phase II SARUP safety documentation preparation, Top Down Logic Drawings were reviewed for the purpose of generating fault trees for the Final Safety Evaluation (FSE) report. A review of facilities near the LLLW system was initiated in an effort to identify all potential inter-facility interactions that might occur under differing

postulated accident scenarios. Other activities in progress included: initiation of the Probable Risk Analysis by identifying potential accident sequences, identification of natural phenomena initiators which may cause possible accident events, and planning for the development of a model for White Oak Creek and White Oak Lake for use in the consequence analysis when evaluating different potential accident scenarios.

March

Preparation of Chapters 5 and 6 of the FSE was initiated.

April

Reviewed draft "Phase II SARUP Adjacent Facility Interaction Study."

Reviewed draft "Natural Phenomena Initiator Evaluation for the Liquid Low-Level Waste System SARUP Phase II Effort," and the draft of "Chapter 5 - Facility Description" for the FSE. This is the major document that will be prepared as part of Phase II of the SARUP.

The technical scope was finalized for the water transport model for the White Creek/Clinch River that will be used for the LLLW System Phase II FSE. This model will be used to assess the consequences of accident scenarios which result in the release of radionuclides into White Oak Creek.

Reviewed draft of "Chapter 6, Principal Process" for the LLLW System FSE. This is the major document that will be prepared as part of Phase II of the SARUP.

May

Review comments were submitted for Part I "Tank Overfill Accidents" of the Probable Risk Analysis for the LLLW as part of the Phase II SARUP safety documentation preparation. Reviewed draft of "Chapter 6, Principal Process" for the LLLW system FSE. This is the major document that will be prepared as part of Phase II of the SARUP.

June

The Safety Study for the LWSP and the System Safety Analysis for the Building 2099 Monitoring and Control Station Facility (part of the Bethel Valley LLLW Line Item) were presented to the PSET by the LGWOD and were approved after WMRAD management approval was obtained. The LGWOD was awaiting receipt of the signed documents.

The Second Quarterly Update for Phase II of the SARUP for the LLLW System was presented to the PSET. Document preparation was on schedule and costs were on target.

The revised safety study for the "Liquid Low-Level Waste Solidification Facility, Building 7877" received Facility Safety Evaluation Team (FSET) and WMRAD approval. The salient findings of this study were presented to the PSET for review and approval. The LGWOD was awaiting receipt of the signed document.

July

The "Natural Phenomena Initiator and Basic Event Evaluation" for the LLLW System was completed. This document is one of many support documents that will be used in the preparation of the FSE as part of the Phase II SARUP.

August

Received the draft copy of the Bethel Valley LLLW System Fault Trees for review and comment. These fault trees were being developed to support the Probable Risk Assessment for the LLLW System as part of Phase II of the SARUP.

September

Received Draft "The development of an Aquatic Spill Model for the White Oak Creek Watershed" for review and comment.

October

The Phase II SARUP "System/Spatial Interaction Analysis" report was completed and approved by the FSET.

November

No new activity. Development of Accident Scenarios, Fault Trees, and Event Trees was continuing. Preparation of the Probable Risk Assessment was in progress.

December

The quarterly status of the SARUP Phase II safety documentation for the LLLW system was given to PSET.

2.11 CONFIGURATION CONTROL

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

2.12 Update of LGWOD Electrical Drawings

The second phase of the Electrical Drawing Upgrades task for the LGWOD Facilities was completed during January, 1993. This task consisted of going to each facility, physically comparing the as-built configurations of the electrical equipment with the existing drawings, marking up the drawings where changes are warranted, and transferring the markups to the drawings. The one line diagrams were then transferred to the computer assisted design and manufacturing system. The drawings have been distributed by Engineering to LGWOD personnel.

2.13 CATHODIC PROTECTION UPGRADE

May

Submitted the Categorical Exclusion (CX) for the Cathodic Protection Systems Upgrade task for NEPA determination.

June

The CX for the Cathodic Protection Systems Upgrade, Phase 1 was approved.

November

A revised Engineering Service Order for this task was submitted so that work could proceed during FY 94.

December

A meeting was held to discuss initiating Phase I of the Cathodic Protection Systems Upgrade Task. The Task Team anticipated having the Certified for Construction Package to MK-Ferguson in February.

2.14 MISCELLANEOUS

February

LGWOD personnel met with a vendor representative to evaluate the possibility of cleaning the oils used in LGWOD facilities instead of changing it out and having to sample and dispose of it. The cost of the machinery used to clean the oils would be made up in the first year of operation through reduced sampling/disposal costs.

July

Two revised procedures for department-wide operations were approved. As part of this revision, eight other facility specific procedures were canceled and incorporated into an existing department-wide procedure.

The draft Solid Waste Management Plan for the LGWOD was issued for review.

3.0 MAINTENANCE ACTIVITIES

3.1 NONRADIOLOGICAL WASTEWATER TREATMENT

March

P&E personnel repaired a 3" valve at the NRWTP (Building 3608) chemical unloading station. This station is used to unload sulfuric acid and sodium hydroxide to the storage tanks at the NRWTP for use at LGWOD facilities.

Work started on the installation of the new feed pumps at the NRWTP during the week ending on 03/14/93. The existing pumps were being replaced due to multiple pump shaft failures.

The replacement of the transfer pumps at the NRWTP continued at the end of the month. To date both of the filter feed tank pumps (J-1008A & B) and one of the nonmetal tank pumps (J-1002A) had been replaced. The other nonmetals tank pump (J-1002B) was in the process of being replaced. These pumps were being replaced due to excessive maintenance activities (mostly shaft failures) associated with the existing pumps.

April

LGWOD personnel completed the quarterly acid cleaning of the air stripper at the NRWTP (Building 3608). The acid cleaning was performed to remove algae buildup from the packing material in the air stripper. The air stripper is used to remove volatile organics from the wastewater prior to discharge to White Oak Creek.

P&E personnel replaced the leaking sludge rake gear box for clarifier F-1006 at the NRWTP with the gear box from the spare clarifier (F-1007). The leaking gear box would be rebuilt by P&E personnel and returned to service.

May

LGWOD personnel completed the quarterly acid cleaning of the air stripper at the NRWTP (Building 3608). The acid cleaning was performed to remove algae buildup from the packing material in the air stripper. The air stripper is used to remove volatile organics from the wastewater prior to discharge to White Oak Creek.

June

P&E personnel replaced the J-1026C sulfuric acid pump at Building 3608 with the spare pump due to the pump's leaking. At the end of the month, the removed pump was being rebuilt and would be used as the spare pump. This pump is used to transfer sulfuric acid from the storage tank to a tanker truck at the chemical loading/unloading station for use at other LGWOD facilities.

Personnel from MK-Ferguson completed repairs on the J-1002A pump at Building 3608 that had experienced coupling failure after installation by MK-Ferguson. The pump is an inline spare that is used to transfer nonmetals wastewater from the inlet surge tank to the treatment process at Building 3608.

July

P&E personnel replaced the acid valve on the acid addition line for the air stripper at Building 3608 after the valve started leaking. The acid is used to adjust the pH to a normal range for discharge prior to its entering the air stripper.

August

P&E personnel replaced the dessicant on the sulfuric acid tank at Building 3608. The dessicant had changed color, indicating that it had been exhausted. The dessicant is used to allow venting of the sulfuric acid tank while preventing moisture from entering the tank.

September

P&E personnel repaired a leaking seal on jet mixer pump J-1001C at Building 3608. The jet mixer is used to provide adequate mixing in the tank to prevent the settling of solids or particulates in the tank from the wastewater.

October

P&E personnel completed repairs on pump J-1008A at Building 3608, which had a damaged impeller. This pump is used to transfer wastewater to the dual-media filters for removal of particulates prior to treatment in the air stripper.

November

P&E personnel completed a modification of the acid transfer system at Building 3608 that would allow LGWOD personnel to empty the transfer header and relieve the pressure on the hose to the tanker after a transfer had been completed.

LGWOD personnel assisted in testing pumps J-1002B and J-1008B at the NRWTP (Building 3608) for Engineering personnel. This was being done to identify why the pumps have a decreased pumping capacity from what they were designed for.

3.2 PROCESS WASTE TREATMENT AND COLLECTION SYSTEM

January

After the zeolite resin in one of the columns at the PWTP was changed out and the column was put into operation, it was found that the decontamination factor for the removal of the radionuclides in the wastewater was quite low. The column was opened up for inspection and it was found that the internal piping was damaged, allowing the wastewater stream to "short-circuit" through the column without being treated. To repair the damaged distributor, the column had to be emptied. The column was emptied, the piping was repaired, the column was refilled with zeolite resin, and the column was put back on stream. It was then working as designed.

The drywell pump for the WC-9 tank farm was replaced after the pump had failed. This pump is used to transfer drainage from the WC-9 tank farm to the process waste system for treatment.

The 2019 tank jet mixer at the Melton Valley Process Waste Collection Tanks Facility was repaired and returned to service. The jet mixer is utilized to mix the contents of the Cold Metals tank to assure a proper pH in the tank so that it will not corrode.

The 4005 Pumping Station Monitoring Building, Building 3518, and Building 3594 were cleaned up as part of a continuing effort to keep the appearance of LGWOD facilities at their best.

The seal on the 2101 tank jet mixer was found to be leaking and was replaced. The 2101 tank collects the process wastewater to be treated at the PWTP.

LGWOD personnel initiated cleanup action in Building 7952, the Process Waste transfer pump station in Melton Valley. This action was being taken as part of an ongoing effort to keep the LGWOD facilities at their best.

February

The wheels and axle were removed from the caustic storage trailer located at the PWTP. The wheels and axle were removed as part of a corrective action by P&E to a finding against them that the wheels and axle could not be inspected per DOT requirements.

The L-9 pump at the PWTP was replaced after it failed during the week. This pump is used to transfer eluate from the ion-exchange regeneration process to the PWTP evaporator for eluate concentration and nitric acid recovery.

P&E personnel replaced the in-line mixer going to the L-1 clarifier due to plugging in the mixer, which was restricting the flowrate to the PWTP. The in-line mixer is used to ensure proper mixing of sodium hydroxide and ferri-floc to the wastewater prior to it reaching the clarifier.

P&E personnel repaired a broken filter on the F-2017 (Hot Tank #1) jet mixer. The housing of the filter had cracked. This jet mixer is used to agitate the process waste tank's contents to prevent any solids from settling out in the tank.

P&E personnel replaced a cracked valve on the zeolite system at the PWTP. The zeolite system is used to treat the discharge from the ion exchange system for cesium removal or to provide additional treatment capacity at the facility, depending upon the system configuration.

March

P&E personnel replaced valve HV-1614 at the 3518 pump station after it failed. The 3518 pump station is used to transfer neutralized wastewater from Building 3518 operations to the NRWTP for further treatment.

P&E personnel repaired a bad seal on the L-7 pump at the PWTP. This pump is used to transfer nitric acid to the ion-exchange columns during regeneration operations.

P&E personnel replaced the discharge valve on the L-10 evaporator at the PWTP. The PWTP evaporator is used for eluate concentration and nitric acid recovery.

LGWOD personnel unloaded spent zeolite from a zeolite column at the PWTP and then reloaded the column with fresh resin. The zeolite column is used to provide additional throughput capacity at the PWTP or to provide for removal of cesium from the ion-exchange column effluent, depending upon the piping arrangement.

P&E personnel completed repairs on pump J-4003B after the seal failed on it. This pump is an inline spare pump used to transfer neutralized wastewater from Building 3518 to the NRWTP.

P&E personnel repaired a broken discharge pipe located inside one of the zeolite columns at the PWTP. This repair required LGWOD personnel to remove the zeolite from the vessel for P&E personnel prior to performing their work. LGWOD personnel then reloaded the zeolite into the column. A second zeolite column had its exhausted zeolite removed and fresh zeolite loaded. The zeolite columns are used to provide additional throughput capacity at the PWTP or to provide for removal of cesium from the ion-exchange column effluent, depending upon the piping arrangement.

April

A total power outage due to a main transformer failure caused a temporary shutdown of the NRWTP and the PWTP. All backup systems responded per their design, resulting in no loss of service to waste generators. The shutdown of the NRWTP and the PWTP also occurred per their design.

LGWOD personnel sprayed algicide on the Equalization Basin (Building 3524) and the 190 Ponds (Bldgs. 3539 and 3540) to control the growth of algae on the surface of the water. These surface impoundments were used prior to 1989 to collect process wastewater from facilities within the main ORNL site; they are now used only for spare capacity during periods of heavy rainfall.

May

I&C personnel replaced the flow indicator at the Bethel Valley Process Waste Storage Tanks (Building 2600). The flow indicator was replaced due to the unavailability of spare parts. The flow indicator measures the flow rate from the tanks to the PWTP.

P&E personnel repaired the Exit Sign light at Building 3544. The sign was reported to be malfunctioning during a recent fire safety inspection of the facility.

P&E personnel repaired two leaking steam valves at the steam control station at Building 3544.

June

P&E personnel repaired the L-2P-1 pump at Building 3544. The pump's impeller had a buildup of calcium on it. This pump is used to transfer wastewater through the charcoal filters for removal of particulates prior to treatment through the ion-exchange system.

P&E personnel installed a new in-line mixer at Building 3544. The new mixer was installed as part of a work improvement request by LGWOD chemical operators. The in-line mixer is used

to ensure the polymer and sodium hydroxide added to the wastewater is thoroughly mixed with the wastewater prior to it entering the L-1 clarifier.

P&E personnel repaired the L-1 clarifier's agitator coupling after a heavy sludge blanket in the clarifier caused the coupling to fail. The repair required LGWOD personnel to remove all of the sludge from the clarifier prior to P&E personnel entering it to make the repair.

P&E personnel installed relief valves on both of the zeolite vessels at Building 3544. The ASME code requires that pressure vessels have relief valves installed. The zeolite columns are used to remove cesium from the ion-exchange columns' effluent or to provide additional treatment capacity at the treatment facility, depending upon their configuration.

LGWOD personnel unloaded spent zeolite from two columns at Building 3544 and then reloaded them with fresh zeolite resin. The zeolite columns are used to provide additional throughput capacity at Building 3544 or to treat the ion exchange system's discharge for cesium removal, depending upon the piping configuration.

P&E personnel completed the replacement of the wood grating at Building 3518 with a fiberglass grating. During this activity, the pipe chase under the grating was decontaminated.

P&E personnel replaced the L-9 transfer pump at Building 3544 after the pump failed. This pump supplies feed to the L-10 evaporator for nitric acid recovery.

July

LGWOD personnel cleaned out the L-1 clarifier at the PWTP so that P&E personnel could replace a leaking gear box on the clarifier's agitator. The clarifier is used to soften the wastewater prior to entering the ion exchange columns; thus extending the life of the columns and reducing the amount of LLLW generated during column regeneration operations.

September

P&E personnel replaced all of the pump and valve control switches in Building 3544 on the control panels. The switches were replaced to correct indication problems that had developed with the existing switches.

P&E personnel repaired a leak on caustic (sodium hydroxide) pump M-1-P at Building 3544. This pump is used to transfer caustic to the inlet wastewater stream, which raises the pH of the wastewater and aids in the water softening process in the clarifier.

The annual Department of Transportation testing of the LGWOD process waste tanker fleet was completed. This required both visual and hydro testing of the tankers.

P&E personnel completed the replacement of the regulators on the steam control station at Building 3544. The regulators were replaced due to deterioration caused by normal use and had developed leaks that could not be repaired.

P&E personnel replaced the sample line on L-12 at Building 3544. This replacement was done to allow better sampling of L-12 (acid off-gas scrubber) which would prevent the spread of contamination. A leaking seal on the L-12 scrubber pump was also repaired.

P&E personnel completed repairs on the jet mixer for process wastewater collection tank F-2017 at Building 7961. The jet mixer had developed a leaking seal. The jet mixer is used to keep any solids in the wastewater suspended in the wastewater until they are transferred out, thus preventing the buildup of solids in the bottom of the tank.

October

The evaporator feed pump (L-9) at Building 3544 was replaced with the spare pump by P&E personnel after the pump developed a leaking seal.

November

P&E personnel repaired a leaking seal on pump L-8 at the PWTP (Building 3544). L-8 is used during the regeneration cycle for the ion-exchange columns at the facility.

LGWOD personnel assisted Instrument and Control (I&C) personnel in the calibration of the pH probes located at the Melton Valley Process Waste Collection Tanks (Building 7961).

P&E personnel repaired the L-2 control valve at Building 3544. The valve's operation had become hindered by a buildup of calcium in it.

December

One of the zeolite treatment columns at the PWTP was backwashed and put back into service. These columns must periodically be backwashed in order to remove debris (particles) from the resins which may cause excessive differential pressure across the columns due to plugging. These zeolite columns are used at the PWTP for Strontium and Cesium removal from the wastewaters.

3.3 LIQUID LOW-LEVEL WASTE SYSTEM

January

The 100 psig air compressor at Building 7830 was returned to service after the diaphragm on the air dryer blowdown valve was replaced.

The air and oil filters on the compressors supplying air to the ITE Process were changed out as part of programmed maintenance.

The upgrades at Valve Box 1A were completed. These upgrades consisted of making configuration changes so that the sump could be emptied more easily, adding an alarm system to alert LGWOD personnel when there is liquid present in the valve box sump, and sealing the pipe penetrations through the pit wall in an attempt to keep inleakage out of the valve box.

February

The 35-pound steam header at the LLLW Evaporator Facility was found to be leaking and was repaired.

P&E personnel replaced the block valve on the prime water supply to the HFIR transfer pumps. These pumps are used to transfer the HFIR LLLW tank to the Central Pumping Station.

P&E personnel repaired four Robertshaw valves located in LLLW Evaporator 2A2's pipe tunnel.

LGWOD personnel continued work on decontamination of the 2A2 LLLW evaporator vessel. Acid was added to the vessel to aid in the decontamination process. The decontamination is being done to prepare the vessel for removal and installation of the spare evaporator vessel.

P&E personnel worked on the leak from the LLLW Evaporator A2 Cooling Tower's return line. The leak was repaired and the evaporator was returned to service.

P&E personnel removed the motor from pump B at the HFIR LLLW pump pit after it was found to be locked up. This pump is used to transfer the HFIR LLLW tank to the Central Pumping Station.

Prepared draft Project Waste Management Plan for the W-12 Transfer System Maintenance Task.

March

P&E personnel replaced the bonnets on both of the suction valves and the recycle valve at the HFIR LLLW Tank Pump Pit. This was done in an attempt to repair the transfer system so that the HFIR LLLW Tank could be transferred to the Central Pumping Station.

LGWOD personnel attempted to transfer the HFIR LLLW Tank after the repairs to the valves were completed. The attempt was unsuccessful and a temporary truck unloading connection was installed in the tank. LGWOD personnel on March 3 transferred approximately 2,800 gallons from the tank to the Process Waste Tanker, transported it to Bethel Valley, and emptied it into the Process Waste System for treatment. This transfer to the Process Waste System was done under an approved waiver to the Waste Acceptance Criteria, based on sampling results of the HFIR LLLW Tank.

LGWOD personnel pressurized the transfer line from the HFIR LLLW Tank Pump Pit to the Central Pumping Station in an attempt to clear a plug of material from the line that was preventing the tank from being transferred. The attempt to clear the line was successful and the HFIR LLLW Tank was transferred to the Central Pumping Station.

P&E personnel replaced a failed sump pump at the LLLW Tank WC-2 Pump Pit.

April

P&E personnel replaced the motor on the A pump at the HFIR LLLW Tank Pump Pit. The motor failed during a transfer. This pump is one of two pumps used to transfer the HFIR LLLW Tank to the Central Pumping Station.

May

P&E personnel replaced the B pump at the HFIR LLLW Tank Pump Pit. The pump had failed during previous transfer attempts from this tank. The new pump was then successfully used to transfer the HFIR LLLW Tank contents to the Central Pumping Station.

P&E personnel completed the replacement of the cooling water recirculation line between the A-2 Evaporator and its cooling tower (Building 2535) and back-filled the excavation site.

P&E personnel repaired a leaking fire sprinkler line in the control room at the New Hydrofracture Facility (Building 7860).

A chain was erected around LLLW Tank WC-2's pump pit to eliminate a possible safety (tripping) hazard.

P&E personnel excavated the transfer line from LLLW tank WC-10 to the Central Waste Collection Header near Valve Box 1 in order to determine if a leak had developed in the line. The possible leak was identified during a helium test of the line during FFA leak testing of the LLLW system.

June

P&E personnel completed repairs on the transfer line from the WC-10 tank farm to Central Waste Collection Header Valve Box #1. The line was excavated after a helium test of the line indicated a possible leak. The helium test was done as part of the line integrity certification testing for the FFA for the Liquid Low-Level Waste System.

P&E personnel replaced a broken regulator on the air sparge system at Building 2537. This system is used to air sparge the evaporator service tanks.

Replaced the automatic blowdown valve on the 30 psig air compressor receiver tank at Building 7860. This blowdown removes water that is collected in the receiver tank and is part of the ITE System.

P&E personnel completed repairs on the transfer line from the WC-10 tank farm to Central Waste Collection Header Valve Box #1. The line was excavated after a helium test of the line indicated a possible leak. The helium test was done as part of the line integrity certification testing for the FFA for the Liquid Low-Level Waste System.

P&E personnel replaced a broken regulator on the air sparge system at Building 2537. This system is used to air sparge the evaporator service tanks.

Replaced the automatic blowdown valve on the 30 psig air compressor receiver tank at Building 7860. This blowdown removes water that is collected in the receiver tank and is part of the ITE System.

July

The annual programmed maintenance was performed on the 30 psig air compressor located at Building 7860. This compressor is used in support of the ITE operations at Building 7830.

P&E personnel installed a new stack at Building 2531 for the ventilation discharge from the sample room for evaporator 2A2. The old stack had rusted through at its base.

August

The transfer system from the WC-10 Tank Farm was returned to service during the month. The system was then used to transfer the contents of specifically approved tanks to the LLLW Evaporator Service Tanks for future treatment.

The 30 psig compressor had the automatic blow down of the air receiver tank repaired by the maintenance vendor's personnel. This compressor is used at the Building 7830 facility to supply instrument air.

P&E personnel cleared a clogged discharge line for the WC-2 pump pit sump pump. The sump pump is used to transfer the sump's contents to the process wastewater system.

The 100 psig air compressors at Bldgs. 7830 and 7860 had their annual maintenance completed. This maintenance was performed under the supervision of the manufacturer's representative.

September

LGWOD personnel assisted P&E personnel in the removal and cleaning of the HFIR LLLW Tank Pump Pit roof plug. This was done in preparation for the replacement of HFIR LLLW Tank Transfer Pump A. After the plug was cleaned, it was reinstalled until the pump is ready for installation.

P&E personnel repaired a steam leak on the 35 psig steam header that supplies steam to LLLW Evaporator 2A2. The inlet valve to the regulator had developed a leak at the flexible gasket.

Instrument and Controls (I&C) personnel replaced the instrument air lines on the 30 psig air compressor at Building 7860. These lines were changed from plastic to stainless steel due to deterioration of the existing plastic lines. This compressor is used in support of ITE.

P&E personnel continued to work on repairing a leak in the water supply line to Bldgs. 7830, 7860, and adjacent facilities.

The annual ultrasonic inspection of the 1,000 gallon LLLW tanker was completed. The inspection indicated normal wall thickness, showing no deterioration of the tanker's walls.

October

P&E personnel repaired the air compressor at Building 7569. The valves were leaking through and it was not loading and unloading properly.

P&E personnel completed repairs on the water supply line for Building 7860 and adjacent facilities.

P&E personnel completed the replacement of Pump A at the HFIR LLLW Tank Transfer Station. This completed the replacement of both pumps at this station, which is used to transfer the HFIR LLLW Tank to the Central Pumping Station, where the waste is stored temporarily until it is transferred to the LLLW Evaporator Facility for future treatment.

The WC-10 Pump Pit Modification Project is now completed. The pit cover has been installed. Readiness Review documentation is being finalized prior to submitting it to the WMRAD Documentation Management Center.

November

The compressor supplying instrument air to the Central Pumping Station (Building 7567) was replaced.

December

P&E personnel replaced the sump pump at the cell ventilation filter pit (Building 2533) for the LLLW Evaporator Facility after it had failed. The sump contents were then transferred to the LLLW System for future treatment.

P&E personnel installed the first rebuilt breaker in the Motor Control Center (MCC) at Building 2531. The entire MCC is being rebuilt; the remaining breakers will be removed and rebuilt, then reinstalled in the MCC as part of a preventive maintenance activity.

The six month scheduled maintenance on the 30 psig air compressor at Building 7860 was performed. This compressor supplies instrument air to the equipment at Building 7860.

3.4 GASEOUS WASTE SYSTEM

January

QE&I personnel successfully DOP tested the HEPA filters on the Building 3092 off-gas system. These filters are used to remove particulates from the off-gas prior to discharge to the 3039 Stack.

The off-gas filters at Building 7830 were replaced twice during the month due to plugging that had occurred during operation of ITE. The new filters were successfully DOP tested by personnel from QE&I.

The governor on the Building 3025/3026 turbine was found to be faulty during routine programmed maintenance and was repaired. The purpose of this automatic attachment to the steam turbine is to control the turbine speed.

LGWOD personnel assisted in the changeout of the HEPA filters at the Old Hydrofracture Facility (Building 7952) in support of the Remedial Actions Section. The filters were then taken to a LGWOD facility where they were sampled in support of air permitting compliance.

The demister media was changed out on the Building 3092 (Central Off-gas) Scrubber System. This plugging is thought to be the result of a plugged drain on the scrubber housing, which was unplugged during the maintenance task.

The monthly operational check was performed on the vacuum relief valve located at the Central Off-gas System. The system operated as designed.

February

The filters on the off-gas system at the Melton Valley Waste Storage Facility were replaced as a result of plugging. The new filters were successfully DOP tested by QE&I personnel. This plugging results from the continuous ITE operations, which are being carried out to reduce the tank volumes.

P&E personnel repaired the governor on the Isotope Area Cell Ventilation turbine (T-4). The governor was allowing too much steam to go to the turbine, thus tripping the turbine's controls. This turbine provides on-line backup cell ventilation to the Isotope Area.

P&E personnel repaired several steam leaks in the 3039 Stack Area and at the Equipment Cleaning Facility (Building 7935).

P&E personnel repaired several steam leaks at the 3025/3026 cell ventilation steam station. This station regulates the steam flow to the steam turbine which supplies backup cell ventilation to the 3025/3026 area in case the primary electric blower fails.

March

P&E personnel replaced the sump pump for the 4500 Cell Ventilation duct. This sump pump is used to transfer condensate and inleakage from the 4500 Cell Ventilation duct to the Process Waste system. After the pump was replaced, LGWOD personnel transferred approximately 3,000 gallons to the Process Waste tanker and transferred it into the Process Waste system for treatment.

The filters on the off-gas system at the Melton Valley Waste Storage Facility (Building 7830) were replaced as a result of plugging twice during the month. The new filters were successfully DOP tested by QE&I personnel. The plugging results from the continuous ITE operations, which are being carried out to reduce the tank volumes.

P&E and LGWOD personnel completed the quarterly load test of the 3125 diesel generator. This test is a Limiting Condition of Operation requirement. The 3125 diesel generator provides backup power to the 3039 Stack Ventilation System.

P&E personnel repaired a leak on the steam tracing at the Building 3092 Off-Gas System. The off-gas system provides off-gas ventilation services to the main ORNL complex in Bethel Valley.

P&E personnel replaced a malfunctioning oil pressure gauge on the 4500 Cell Ventilation steam turbine. This turbine provides an inline backup for the 4500 area cell ventilation system in case the primary electric blower fails.

Replaced the North and South Banks of HEPA filters at Building 3092. The new filters were then successfully DOP tested by personnel from QE&I. The filters are used to filter the off-gas from radiochemically contaminated glove boxes, process vessels, etc., throughout the main ORNL complex before it is discharged to the 3039 Stack.

April

P&E personnel completed repairs on the housing for the Building 3092 south bank of HEPA filters. The repairs consisted of welding the adjustment rods inside the filter housing which had become worn from use (resulting in increased work time in a radiation area). This activity was done as part of the continuing emphasis by the LGWOD on ALARA.

Instrument and Control (I&C) personnel repaired a plugged instrument sensor line on the 4500 Cell Ventilation Steam Turbine. The plug was causing the turbine to start due to a false signal. This turbine is an in-line backup that provides cell ventilation to the 4500 area in case of failure of the primary electric blower.

The filters on the off-gas system at the Melton Valley Waste Storage Facility (Building 7830) were replaced as a result of plugging. The new filters were successfully DOP tested by QE&I personnel. The plugging results from the continuous ITE operations, which are being carried out to reduce the tank volumes.

P&E personnel repaired a steam leak at the steam control station for the ORR cell ventilation turbine. This station regulates the steam flow to the steam turbine which supplies backup cell ventilation to the ORR in case the primary electric blower fails.

P&E personnel repaired a steam leak at the steam control station for the Isotope Area Cell Ventilation turbine. This turbine is an in-line backup that provides cell ventilation to the Isotope Area in case of failure of the primary electric blower.

LGWOD personnel performed the monthly operational and six month calibration check on the Central Off-gas system (Building 3092) relief valve. The valve was found to be operating normally.

May

P&E personnel repaired a steam leak at the steam control station for the 3025/3026 cell ventilation turbine. This turbine provides backup cell ventilation for the 3025/3026 area in case the primary electric blower fails

The off-gas HEPA filters at Building 7830 were replaced due to plugging caused by the ITE operations. The filters were then successfully DOP tested by personnel from QE&I. The ITE operations were then resumed.

P&E personnel replaced a defective pressure relief valve at the steam control station for the 3500 cell ventilation steam turbine. This turbine is used to provide cell ventilation to the 3500 area in case the primary electric blower fails.

P&E personnel replaced the electric sump pump at Building 3092. The packing had developed a leak during normal operations. This sump pump is used to circulate a caustic (sodium hydroxide) solution through the off-gas scrubber to remove any acids from the airstream prior to discharge to the 3039 Stack.

The HEPA Filters at Building 3608 were replaced after a high pressure drop across the filters showed that they were plugging. The new filters were then successfully DOP tested by personnel from QE&I.

June

P&E personnel replaced the demister media in the Building 3092 off-gas system due to plugging. The demister is used to remove entrained liquids from the gas stream prior to its entering the HEPA filters, thus prolonging the filter's life.

The HEPA Filters in the Building 7830 off-gas system were replaced due to a high pressure drop across the filters. The new filters were successfully DOP tested by personnel from QE&I and then placed in service. The filter replacement is a reoccurring activity due to the ITE operations being conducted at the facility.

P&E personnel repaired a broken counter-weight on the Oak Ridge Research Reactor (ORR) cell ventilation damper. This system provides cell ventilation to the ORR facility.

The quarterly load test of the 3039 Stack Area Diesel Generator (Building 3106) was successfully performed during the month. The test included a test of the new connection supplying backup electrical power to the electric motor-driven fan for the off-gas system and the electric sump pump that transfers a caustic solution to the off-gas scrubber. This load test is a requirement of the Limiting Conditions Document for the 3039 Stack Area.

P&E personnel repaired the cell ventilation fan at Building 7569 (LLLW Tank WC-20) after the fan's motor had burned out.

July

The north bank of HEPA filters at Building 3092 were replaced and the new filters were successfully DOP tested by personnel from QE&I. During the change-out, modifications were made to the filter housings to assist in future filter change outs and assure a better filter seal. The off-gas system passes through these filters for treatment prior to its discharge to the 3039 Stack.

August

LGWOD personnel completed the monthly operational check of the Building 3092 off-gas system vacuum relief valve.

P&E personnel repaired an oil leak on the 3025/3026 cell ventilation steam turbine. The leak occurred on the sight glass from the oil sump. This turbine is used to provide backup cell ventilation to the 3025/3026 area in case the primary electric blower shuts down.

The HEPA filters at Building 7830 were replaced due to plugging caused by the ITE process. The new filters were then successfully DOP tested by personnel from QE&I.

September

P&E personnel and LGWOD personnel completed the quarterly load test of the 3039 Stack Area diesel generator (Building 3125). This test is a requirement of the Limiting Conditions of Operations for the 3039 Stack Area. No problems were identified during the test.

Personnel from QE&I replaced the HEPA filters at Building 7830 due to plugging caused by the ITE process. The new filters were then successfully DOP tested by personnel from QE&I.

P&E personnel repaired a steam leak on the 3025/3026 cell ventilation system turbine's steam control station. The steam turbine provides an in-line backup to provide cell ventilation services to the 3025/3026 area in case the electric blower malfunctions or loses power.

October

Personnel from QE&I completed the quarterly DOP testing of the Building 3092 off-gas HEPA filters. The primary and in-line spare filters, which filter the off-gas discharge from the main ORNL complex in Bethel Valley prior to discharge to the 3039 Stack, passed their quarterly inspection.

Personnel from QE&I replaced the off-gas HEPA filters at Building 7830 that were plugging due to the ITE process. The new filters were then successfully DOP tested by QE&I.

P&E personnel replaced worn belts on the Isotope blower. This blower provides cell ventilation services for the Isotope Area.

P&E personnel rebuilt the steam control station for the central off-gas system's turbine, which had developed several steam leaks. This turbine provides an on-line backup to the electric blower, which provides off-gas services to the main ORNL complex in Bethel Valley and is exhausted through the 3039 Stack.

November

P&E personnel repaired a leak on the shaft packing for the Building 3092 Central Off-gas Scrubber sump pump. This pump transfers caustic solution to the central off-gas scrubber, which treats all off-gas prior to discharge to the 3039 Stack.

Personnel from QE&I replaced the plugged HEPA filters at Building 3092 and then successfully DOP tested the replacement filters. These filters are used to filter the central off-gas system prior to discharge to the 3039 Stack.

Replaced the demister media at Building 3092 due to plugging of the demisters. The demisters are used to remove moisture from the off-gas system prior to passing through the HEPA filters.

Personnel from QE&I successfully DOP tested the HEPA filters at Bldgs. 2537 and 7860. This was the scheduled inspection of these filters.

Personnel from QE&I replaced the off-gas filters at Building 7830 that were plugging due to the ITE process. The new filters were then successfully DOP tested by QE&I personnel.

LGWOD personnel completed the monthly check of the Building 3092 relief valve. This check is a requirement of the Limiting Conditions Document for the 3039 Stack Area.

P&E personnel found a ground in Junction Box TB-1 located in the 3039 Stack Area during the annual programmed maintenance test of all of the breakers in the 3039 Stack Area.

P&E personnel replaced the pulleys and belts on the 3025/3026 area cell ventilation system blower in the 3039 Stack System. This blower provides cell ventilation to the 3025 and 3026 facilities.

3.5 WASTE OPERATIONS CONTROL CENTER DATA ACQUISITION SYSTEM AND DISTRIBUTED CONTROL SYSTEM

May

The WOCC DAS has experienced 5 failures in the past month. There was one failure due to a disk malfunction. The other failures were due to overheating in the control room. The problem with the air conditioning is being addressed. No data was lost due to the failure.

June

A problem with the air conditioning in Building 3130 resulted in two shutdowns of the WOCC DAS. The system was re-started each time without incident, and the air conditioning has been repaired.

Programmed Maintenance was completed without any problems arising.

July

The Cathode Ray Tube for one of the Data Acquisition System display units at Building 3130 was replaced after a high voltage power supply had failed.

August

Programmed maintenance was performed at which time a problem with one of the reel to reel tape drives was identified and repaired. No loss of data or functionality occurred due to the problem with the tape drive. No additional channels were added during the month.

September

A failure occurred in the hard disk at the Building 3608 Operator Interface Unit. The disk was replaced and reloaded with system software and configuration software. The system is operating normally with the exception of on screen trend displays. This problem is being addressed. Some loss of data did occur, but was minimized.

November

The power supply for the WOCC DAS failed and was replaced with another unit by the computer maintenance group. This resulted in a minimum amount of down time.

The processor card also failed which had to be replaced with a spare unit. The down time was very minimal and no loss of data occurred.

Programmed maintenance was performed on the system.

December

P&E and LGWOD personnel completed the quarterly load test on the 3039 Stack Area diesel generator (Building 3125). No problems were encountered during the test.

The High Efficiency Particulate Air filters at the Melton Valley Storage Tanks Facility were changed out due to a high differential pressure reading across the filters. The new filters were successfully DOP tested. These filters are utilized to remove contaminated particulates from the ITE discharge stream. ITE is an ongoing process designed to remove excess water from the storage tanks, thus decreasing the tank volumes.

A faulty relay was replaced on the Isotopes Turbine. This relay is designed to start the turbine in the event of a loss of power to the Isotopes Electric Fan. The steam turbine is a backup for the fan, which provides Cell Ventilation to the Isotopes Circle on a continuous basis. The relay was found to be faulty during routine weekly testing.

4.0 MISCELLANEOUS ACTIVITIES

4.1 TRAINING ACTIVITIES

January

Twenty-five LGWOD personnel attended Total Quality Management training.

Five LGWOD personnel completed their mask fittings.

Four new chemical operators were qualified as chemical operators to work in the LGWOD.

Two LGWOD personnel attended Satellite Generator Training.

Eleven LGWOD personnel attended Solid Low-Level Waste (SLLW) Generator Training.

Four LGWOD personnel attended ORNL SLLW Generator Certification Officer Training.

Three LGWOD personnel received their annual whole body count.

One LGWOD personnel attended 16 hour SARA/OSHA Training. This sixteen hours, in addition to the initial 24 hour training, is necessary so that LGWOD personnel can work on HAZWOPPER tasks.

Five LGWOD personnel attended Lockout/Tagout Training.

Two LGWOD personnel attended EM-30 Cost and Schedule Estimating training.

February

Eight LGWOD personnel attended Solid Low Level Waste training.

Two LGWOD personnel attended SARUP training.

Two LGWOD personnel attended Accident Investigation training.

Three LGWOD personnel were Whole-Body counted.

Eleven LGWOD personnel attended Lockout/Tagout training.

Two LGWOD personnel attended Criticality training.

Two LGWOD personnel attended Resource Conservation and Recovery Act training.

One LGWOD personnel attended an off-site supervisor training course.

SAR Update Program Phase II training was completed by two LGWOD staff members.

March

Three LGWOD personnel attended the annual 8-hour SARA/OSHA refresher course.

Seven LGWOD personnel attended Lockout/Tagout training.

11 LGWOD personnel attended Solid Low-Level Waste training.

Four LGWOD personnel completed the annual respirator fitting.

Three LGWOD personnel were whole-body counted.

One LGWOD personnel completed General Employee Training.

Four LGWOD personnel completed confined space training.

One LGWOD staff member completed a 3-day off-site Environmental Regulations Course.

14 LGWOD personnel attended Total Quality Management training.

April

One LGWOD personnel was respirator fit tested.

One LGWOD personnel attended Hazardous Material Information System (HMIS) training.

One LGWOD personnel attended Instructor's Training for On-The-Job Training.

Two LGWOD personnel attended Stack Recertifying school. This is to perform visual emissions monitoring of the discharge from LGWOD facility stacks as required by the facility air permits.

Seventeen LGWOD personnel attended the Radiation Worker Requalification Training Course.

Three one-day sessions of Conduct of Operations training was held for LGWOD Chemical Operators and Foremen. During April, approximately 60% of the affected LGWOD personnel were trained. The rest will be trained during the next few weeks as their shift rotations permit training.

May

Four LGWOD personnel completed the two-year Radiation Worker Requalification training.

Four LGWOD personnel completed the annual respirator fit test.

One LGWOD personnel completed an off-site managerial skills training course.

The final three one-day sessions of Conduct of Operations training were held for LGWOD Chemical Operators and Foremen. All but two affected personnel have now completed this training. A makeup session for these individuals will be held in the near future.

Two LGWOD personnel attended Confined Space training.

One LGWOD personnel attended General Employee Retraining.

One LGWOD personnel attended Criticality training.

June

Thirty-one LGWOD personnel attended forklift vehicle retraining.

One LGWOD personnel attended Solid Low-Level Waste training.

One LGWOD personnel was whole-body counted.

Three LGWOD personnel completed the annual respirator fit testing.

Two LGWOD technical staff personnel completed a one day course on ALARA for Design and Operations Engineers.

One LGWOD staff member attended the Myers Briggs Type Indicator Qualifying and Experiencing the Sixteen Types Programs. These programs integrate Keirseyan Temperament Theory with the Jung/Myers Type Theory. Concepts learned in these programs will be used to improve communication, management development, and team building skills in LGWOD.

July

Three LGWOD personnel completed Satellite Generator Training

Three LGWOD personnel were whole-body counted.

Three LGWOD personnel completed Crane Operator Training. These personnel will be assisting in the processing of 3,900 gallons of zinc bromide by Chem Tech personnel.

Four LGWOD personnel completed the annual HAZWOPER refresher training.

One LGWOD personnel completed Lockout/Tagout training.

August

Five LGWOD personnel completed the annual HAZWOPER update training.

Three LGWOD personnel completed the 2 year Radiation Worker refresher course.

Two LGWOD personnel completed Satellite Area training.

Four LGWOD personnel attended training on the new RFD form that will be going into use throughout MMES in September.

One emergency response table top exercise was held. This exercise involved the scenario of an acid spill while making an acid transfer. Two LGWOD foremen, five operators, the LGWOD Operations Supervisor, one WMRAD Training Officer, and one WMRAD Environmental, Safety, and Health (ES&H) personnel were involved with the exercise.

Two LGWOD personnel completed training as Generator Certification Officials for Solid Low-Level Waste.

Five back-to-work safety meetings were conducted each week by LGWOD shift foremen.

September

Ten LGWOD personnel completed the annual HAZWOPER refresher training.

Six LGWOD personnel were whole body counted.

One LGWOD personnel attended training on the new Uniform RFD forms that went into effect in mid-September for the disposal of solid and hazardous waste.

Five LGWOD personnel completed Unreviewed Safety Question Determination Training

One LGWOD personnel completed satellite generator training.

Three LGWOD personnel completed the annual respirator fit-test retraining.

Three LGWOD personnel attended the first WMRAD Financial Training session.

One LGWOD personnel attended a three day off-site training course on evaporator technologies.

October

Three LGWOD personnel attended the annual HAZWOPER refresher training.

Four LGWOD personnel were whole body counted.

Five LGWOD personnel attended the WMRAD Financial Training session on the Cost Accounting System Reports.

One LGWOD personnel attended training on the PC-based version of the new RFD form.

Two LGWOD day-shift personnel attended a training course at Y-12 on an oil cleaning system that LGWOD has ordered. The new system will be used to clean the oil in place, thus allowing the oil from motors, etc. to be reused instead of being disposed of as a hazardous waste.

A tabletop training exercise for the LWSP facility was conducted by WMRAD Training personnel for LGWOD and the solidification vendor's personnel. The exercise reviewed what

would be done in the event a loss of annulus pressure was discovered during a transfer of LLLW waste to the solidification facility.

Six LGWOD personnel attended Lockout/Tagout training.

Ten LGWOD personnel attended training on the LGWOD Conduct of Operations Implementation Guidelines. This completed the training for all LGWOD personnel.

Five LGWOD personnel completed the annual emergency squad training.

Three LGWOD personnel attended the third Financial Training class for WMRAD personnel.

November

Seven LGWOD personnel completed the annual Emergency Squad refresher training.

Ten LGWOD personnel completed the annual HAZWOPER refresher training.

Three LGWOD personnel were respirator fit tested.

One LGWOD personnel was whole-body counted.

Two LGWOD personnel attended the fourth WMRAD Financial Training session.

Five LGWOD personnel completed the Lockout/Tagout retraining

Twenty-six LGWOD personnel attended the Defensive Driving and Non-paved Surfaces Training.

Six LGWOD personnel attended the annual security briefing.

One LGWOD personnel attended Satellite Area Training.

Two LGWOD personnel attended the 5th WMRAD Financial Training Session.

December

One LGWOD personnel attended Satellite Generator training.

Two LGWOD personnel attended Family Medical Leave for Supervisors training.

Five LGWOD people completed the annual respirator fit training.

Two LGWOD people were whole body counted.

All LGWOD day shift chemical operators completed training for the zinc bromide solidification project that is being directed by Chem Tech personnel. This training is in support of activities to resume solidification operations for zinc bromide.

Fourteen LGWOD personnel attended the Defensive Driving and Non-paved Surfaces Driving training.

Five LGWOD personnel completed the annual HAZWOPER refresher training.

One LGWOD personnel attended the annual security briefing.

Three LGWOD personnel attended the seventh session of the WMRAD Financial Training program.

4.2 AUDITS AND TOURS

February

LGWOD personnel conducted a tour of the HFIR Area Waste Management facilities for the WMRA Safety Group. There were no significant findings or deficiencies resulting from this inspection.

April

A DOE-OR assessment of the Process Waste System was conducted during the month. No significant findings or concerns were identified during the assessment.

May

A DOE-OR assessment of the Process Waste System was conducted during the month. No significant findings or concerns were identified during the assessment.

A week-long audit by DOE-OR personnel was conducted. The audit examined the Conduct of Operations, Radiation Protection, Industrial Hygiene, Water Pollution Control, and Occupational Safety and Health items. No major findings were identified during the daily close-out sessions.

A DOE-OR assessment of Bldgs. 3130 and 3608 was conducted during the month. No findings were identified at the closeout session.

June

Two members of an on-site oversight team from Martin Marietta Energy Systems Corporate observed Conduct of Operations (including shift turnovers and maintenance activities) in the LGWOD.

LGWOD personnel conducted WMRA Environmental, Safety, and Health personnel through Bldgs. 3039 and 3544 during an internal audit. No new findings were identified.

July

An Energy Systems Waste Management Operations (ESWMO) representative conducted an oversight inspection of the LGWOD for Lockout/Tagout and Operator Aid Postings (part of the Conduct of Operations program). This inspection was performed at Buildings 3544, 3130, and the process wastewater system. No findings were identified.

Environmental Compliance conducted an audit on the air permits for Buildings 3039, 3544, and 3608. No findings were identified.

August

An oversight by Energy Systems Waste Management Organization on Conduct of Operations at Bldgs. 3608, 7860, 7877, and 7935 was conducted. No findings or concerns were identified.

A lockout-tagout surveillance was performed on the LGWOD by the ORNL Quality Department. No findings on the LGWOD were identified.

There was an ORNL Radiation Protection Survey of a number of LGWOD areas looking for consistency in postings.

A review of the LGWOD transported waste operations was conducted by the Transportation Committee during the month. No major findings or concerns were identified during the review.

The WMRAD ES&H Department reviewed all of the tankers in the LGWOD for compliance to fall protection requirements.

A walk-through of the 3039 Stack Area reviewing access controls was conducted during the week ending August 6.

September

A walkthrough of Bldgs. 2531, 3130, and 3544 was conducted by the WMRAD Environmental, Safety, and Health department. No significant findings or concerns were identified.

A review of LGWOD operations in the LLLW System was conducted by a representative of Energy Systems Waste Management Organization, with emphasis on Conduct of Operations. No findings or concerns were identified.

The DOE-ORO on-site representative and two associates toured Bldgs. 3130 and 3544 and reviewed the LGWOD tanker fleet. The tankers were reviewed to assess their compliance with Office of Safety and Health Administration (OSHA) fall protection requirements. Recommendations from their review will be received in the near future.

A fire engineer performed an inspection tour of Building 3608. This inspection was to develop an up-to-date pre-fire plan for the facility.

Five back-to-work safety meetings were conducted by LGWOD shift foremen each week.

A Hearing Conservation Program review was conducted of the Tank Farm Operator and the Sample Run Operator in the LGWOD to determine if there were any duty areas where they are exposed to excessive noise requiring hearing protection. The review showed that the noise levels fell well below the requirements for actions by this program.

October

The DOE on-site representative conducted a review of Conduct of Operations and Occupational Safety and Health Administration compliance at Building 3608. No findings or concerns were identified during the review.

Energy Systems Waste Management Organization oversight personnel conducted an oversight tour of Bldgs. 3039, 3092, 3106, and 3125. This tour reviewed Conduct of Operations at these facilities, with emphasis on Chapter 4, 8, 9, 10, 17, and 18 of the DOE order on Conduct of Operations.

A week-long audit of the LLLW operations was conducted by DOE-ORO personnel. No major findings or concerns were identified during the closeout sessions.

LGWOD personnel conducted a tour of the LLLW System for the members of the Facility Safety Evaluation Team that is preparing the SARUP - Phase II Report to give them more familiarity with the System.

LGWOD personnel gave personnel from Engineering a tour of the Bethel Valley Process Waste Storage Tanks and the Nonradiological Wastewater Treatment . This tour was to support the design of Instrumentation for the new Process Waste Surge Tank Project that is presently underway.

November

LGWOD personnel participated in the MMES Corporate Audit during the week ending 11/05/93. No findings or concerns were identified against LGWOD operations.

An assessment visit by personnel from the Quality Technical Assessment Group was performed at the request of the Office of Operational Readiness and Facility Safety. The visit was to look at the effectiveness of the OSR program conducted by the LGWOD. The five person team looked at the implementation of the OSR for the LLLW System which was just recently approved by the DOE-ORO. The team could not identify any areas of weakness in the LGWOD program and had no recommendations for improvement.

December

A review of the process waste system was conducted by personnel from Energy Systems Waste Management Organization (ESWMO) during the first week of December. The review focused on the implementation of certain portions of Conduct of Operations at these facilities. No findings or concerns were identified during the visit.

A review of the Acid Neutralization Facility (Building 3518) and Building 3130 was conducted by personnel from ESWMO. The review focused on the implementation of certain portions of

Conduct of Operations at these facilities. No findings or concerns were identified during the visit.

4.3 MISCELLANEOUS

January

LGWOD personnel picked up one bottle of LLLW at Building 3592, transported it to the bottle receiving facility at the LLLW Evaporator Facility (Building 2531), and transferred the waste into the LLLW System.

Two loads of LLLW were received from Building 3525 and emptied into the LLLW System.

Inleakage from Inactive LLLW Tank WC-17 was pumped out and the tank interior was videotaped to provide documentation that the tank was cleaned out and emptied.

LGWOD personnel sampled the 7562 LLLW Tank for the Remedial Actions group for eventual transfer to the LLLW Collection System through the use of the LLLW Tanker Truck. It was hoped that the waste characterization would show that the waste was acceptable for the Process Waste System, but sampling results showed that this is not the case. LGWOD personnel performed calculations on the sampling data which shows the waste to be Low Specific Activity (LSA) waste; and, therefore, capable of transport using the existing LLLW Tank Truck.

LGWOD personnel picked up twelve containers of process waste from Building 1505 and transferred them to the process wastewater system.

LGWOD personnel emptied 15 drums of wastewater at the NRWTP. The wastewater was generated during the removal of an underground storage tank at Rogers Quarry.

LGWOD personnel transferred the 3002A vault and tank to the process waste system at the request of Remedial Action personnel. The tank had been found to be collecting inleakage.

LGWOD personnel transported approximately ten thousand gallons of Process Wastewater from tanks in SWSA 6 for Bechtel at the request of the ORNL ER Program.

LGWOD personnel pumped liquid wastewater from silos in SWSA 6, transported the waste to the Process Waste Collection System, and transferred it into the system for treatment.

LGWOD personnel assisted P&E personnel with the decontamination of the ventilation duct at Building 2001.

LGWOD personnel pulled samples from the casks housing the solidified waste forms from the EASC and LWSP campaigns at the request of the SWOD personnel.

One new technical staff member joined the LGWOD.

LGWOD personnel received and unloaded three thousand gallons of sodium hydroxide at the PWTP. This chemical is used at the PWTP to increase the pH of the wastewater so that the hardness in the wastewater feed will precipitate in the clarifier.

Received 1500 gallons of sulfuric acid at the NRWTP. This acid delivery was unscheduled and resulted from an overage being delivered to the ORNL Steam . Sulfuric acid is used at the NRWTP to lower the pH of the effluent wastestream before releasing it to the environment.

Four drums of sodium hydroxide were loaded at the NRWTP, transported to the Melton Valley Process Waste Collection Tank Facility (Building 7961), and transferred into the sodium hydroxide storage tank. This tank feeds the chemical addition system, which adjusts the pH in the collection tanks to assure the pH is kept basic.

The sulfuric acid transport tank was loaded at the NRWTP, transported to the PWTP, and unloaded.

February

Three loads (approximately 2400 gallons) of LLLW were pumped from LLLW tank 7562 into the LLLW tank truck, transported to the LLLW Central Collection Header, and emptied into the LLLW Collection System for eventual treatment at the LLLW Evaporator. This task was carried out at the request of Remedial Action Section personnel.

One bottle of LLLW was picked up at Building 4501, transported to the LLLW Evaporator Facility, and transferred into the LLLW System at the LLLW Bottling Station.

Two bottles of LLLW was picked up at Building 3592, transported to the LLLW Evaporator Facility, and transferred into the LLLW System at the LLLW Bottling Station.

Three bottles of Process Waste were picked up at Building 1505 and transported to the Process Waste System.

Six bottles of Process Waste were picked up at Building 1504 and transported to the Process Waste System.

LGWOD personnel transported 2,000 gallons of liquid wastewater from Building 7601 to the NRWTP, and transferred it into the process waste system for treatment.

LGWOD personnel received and unloaded 3,000 gallons of nitric acid at the PWTP. Nitric acid is used at the PWTP in the regeneration of the strong acid ion-exchange columns. These columns are utilized for the removal of radioactive strontium from the process wastewater.

A load of sodium hydroxide (caustic) was received at the PWTP. Caustic is used to adjust the pH of the wastewater to assist in the water softening process.

Two LGWOD personnel participated in an Impoundments Workshop to identify available technologies for interim and final closure of inactive impoundments at ORNL.

I&C personnel checked the levels on the six Melton Valley Storage Tanks participating in the ITE operations. The level data will be used to determine the amount of volume reduction during the previous month.

LGWOD personnel checked the liquid level of inactive LLLW tank WC-1 at the request of Remedial Action personnel.

LGWOD personnel participated in the conductance of the leak tests for LLLW tanks WC-3 and WC-9. These tests are part of the requirements of the FFA.

One LGWOD personnel attended WATTec '93.

One LGWOD personnel participated in an independent assessment of four waste facilities at Y-12. This assessment was conducted by Central Waste Management Division, with assistance of personnel from the X-10 and K-25 sites, as part of the self-assessment activities at all five MMES sites. The LGWOD personnel did not identify any noncompliance issues, however, four Best Management Practice recommenda- tions were made.

Draft review comments have been submitted for the working draft "Office of Waste Management (EM-30) Cost and Schedule Estimating Guide," December 8, 1992. This guide will eventually become the standard by which cost estimates for EM-30 waste management activities will be prepared.

March

LGWOD operations were not adversely affected by the Blizzard of 1993, even though LGWOD was utilizing a skeleton crew.

LGWOD personnel transported four tanker loads of LLLW from Building 7562 to the LLLW Central Collection Header, and emptied it into the LLLW Collection System for eventual treatment at the LLLW Evaporator Facility. This task was carried out at the request of Remedial Action Section Personnel.

One bottle of LLLW was picked up at Building 3592, transported to the LLLW Evaporator Facility, and transferred into the LLLW System at the LLLW Bottling Station.

One load of LLLW was transferred into the LLLW dumpster tank, transported to the LLLW Central Collection Header, and emptied into the LLLW Collection System for eventual treatment at the LLLW Evaporator Facility.

One load of LLLW was transferred into the 1,000 gallon LLLW Tanker, transported to the LLLW Central Collection Header, and emptied into the LLLW Collection System for eventual treatment at the LLLW Evaporator Facility.

LGWOD personnel picked up seven bottles of Process wastewater from Building 1505 and transferred them into the Process Waste system for treatment.

LGWOD personnel transported 2,000 gallons of liquid wastewater from Building 7601 to the NRWTP, and transferred it into the Process Waste system for treatment.

LGWOD personnel picked up 80 gallons of process wastewater from Building 1505 and transferred it to the Process Waste system for treatment.

LGWOD personnel transferred 2,000 gallons of wastewater from the EGCR facility into the process waste tanker, transported it to the NRWTP, and emptied it into the NRWTP Collection System for treatment at the NRWTP.

LGWOD personnel sampled LLLW tank WC-13 for sludges as part of the characterization program for the Group 6 tanks under the FFA.

LGWOD personnel sampled tank H-209 for Remedial Action personnel.

LGWOD personnel sampled the HFIR LLLW Collection Tank to determine if the wastewater could be transported by the LLLW tanker truck.

LGWOD personnel sampled the sumps at SWSA 5 at the request of the Solid Waste Operations Group.

LGWOD personnel sampled LLLW Tank WC-14 as part of the effort to characterize the Group 6 Tanks for the FFA.

LGWOD personnel assisted in the video camera inspection of tanks 3002A and LLLW Tank WC-12. These inspections are being carried out as part of the work for the FFA.

A load of sodium hydroxide was received at the NRWTP. The sodium hydroxide is used to adjust the pH of the wastewater prior to its discharge to White Oak Creek.

LGWOD personnel transferred four 55 gallon drums of sodium hydroxide from the NRWTP to the Melton Valley Process Waste Collection Tank Facility. The sodium hydroxide is used to maintain the wastewater in the tanks at a basic pH.

LGWOD personnel transported two loads of sulfuric acid from the NRWTP to the PWTP. The sulfuric acid is used to adjust the pH of the wastewater to a neutral range prior to its discharge to the NRWTP.

One load of sodium hydroxide (approximately 3,000 gallons) was received at the PWTP and unloaded. The sodium hydroxide is used to adjust the pH of the wastewater to a basic level to aid in the water softening process.

I&C personnel took the monthly level readings on the tanks participating in the ITE Project at Building 7830. These numbers were given to personnel from Chem Tech Division to determine the rate of evaporation from the tanks.

LGWOD personnel assisted in the pressure testing of the LLLW header from Building 3544 to Valve Box 1, and from the WC-7/2533 sump lines to Valve Box 1. These test were carried out as part of the testing requirements in the FFA.

The new office administrator/manager for LGWOD reported to work during the month.

Review comments for the "Office of Waste Management (EM-30) Cost and Schedule Estimating Guide" have been finalized and submitted to Energy Systems Waste Management Organization (formally CWMD) via the ORNL Waste Management Programs Office. This guide will

eventually become the standard for which cost estimates for EM-30 waste management activities will be prepared.

April

Submitted the Categorical Exclusion for the Cathodic Protection Systems Upgrade task for NEPA determination.

Two loads (approximately 960 gallons) of LLLW were transferred into the 1,000 gallon LLLW Tanker, transported to the LLLW Central Collection Header, and emptied into the LLLW Collection System for eventual treatment at the LLLW Evaporator Facility.

LGWOD personnel transferred the vault and pump room sumps at Building 7830 into the 1,000 gallon LLLW Tanker, transported it to the LLLW Central Collection Header, and emptied into the LLLW Collection System for eventual treatment at the LLLW Evaporator Facility.

LGWOD personnel picked up 5 gallons of process wastewater from Building 1504 and transferred it to the process waste system for treatment.

LGWOD personnel loaded and transported approximately 5,000 gallons of wastewater from SWSA 6 to the main ORNL complex, where it was transferred to the process waste system for treatment.

One load of sulfuric acid (approximately 2,700 gallons) was received at the NRWTP during the week. Sulfuric acid is used to adjust the pH of the wastewater to a normal range prior to discharge to White Oak Creek.

LGWOD personnel responsible for tank sampling activities met with a subcontractor who is developing sampling procedures for the inactive tanks controlled by the Remedial Action Section. LGWOD personnel provided comments on the draft procedure being developed to sample these tanks.

LGWOD personnel sampled the EASC and LWSP casks and checked the archived samples at the request of the Solid Waste Operations Group.

LGWOD personnel sampled the 7562 tank at the request of Remedial Action Section personnel.

LGWOD personnel sampled the Equalization Basin (Building 3524) for Chem Tech personnel. This sample will be used in jar tests to identify a polymer to help clarify the wastewater in this surface impoundment. Water clarity is essential in carrying out a series of dye tests in an attempt to see where the basin is leaking. This surface impoundment was used prior to 1989 to collect process wastewater from facilities within the main ORNL site for treatment at the PWTP; it is now used only for spare capacity during periods of heavy rainfall.

LGWOD personnel collected a one liter sample from the sludge layer in LLLW Storage Tank W-25 and submitted the sample to laboratory personnel for analysis.

LGWOD personnel decontaminated a Hustler mower at the request of P&E personnel. The decontamination was carried out at the Equipment Cleaning Facility (Building 7935).

The revised LGWO Quality Assurance Plan, QAP-X-91-WMRA/WM-027 Rev. 2, was approved during the week.

LGWOD personnel assisted Remedial Action Section personnel with decontamination work in the South Tank Farm.

May

LGWOD personnel twice transported the LLLW Dumpster Tank from Building 3074 to the Central Waste Collection Header, and emptied it into the LLLW Collection System for eventual treatment at the LLLW Evaporator Facility.

LGWOD personnel collected one bottle of LLLW from Building 3592, transported it to the LLLW Evaporator Facility, and transferred it into the LLLW System at the LLLW Bottling Station.

One load of LLLW (160 gallons) was collected at Building 3525 into the LLLW Tanker, transported to the Central Waste Collection Header, and emptied into the LLLW Collection System for eventual treatment at the LLLW Evaporator Facility.

LGWOD personnel collected 25 gallons of process wastewater from Building 1505 and transferred it to the Process Waste Collection System for future treatment.

Five bottles of process waste were collected at Building 1505 and transferred into the process waste collection system for eventual treatment.

LGWOD personnel, using equipment previously used to sample sludges in tanks, obtained eight liters of sludge from LLLW Storage Tank W-25. This sludge was then delivered to Chemical Technology personnel to be used in various development projects related to treatment of underground storage tanks contents throughout the DOE complex. In addition, a sample of sludge was turned in to Analytical Chemistry personnel in order to ascertain the fissile material ratios and concentrations in the sludges. This task was accomplished as the result of a Criticality Review Committee appraisal finding.

LGWOD personnel loaded and transported one tanker load of sulfuric acid from Building 3608 to Building 3544. The sulfuric acid is used to adjust the pH of the wastewater at Building 3544 prior to discharge to Building 3608.

One load (3,000 gallons) of sodium hydroxide (caustic) was received at the PWTP during the week. The caustic is used to adjust the pH of the wastewater to a high pH to aid in the clarification process at this facility.

One load of nitric acid (approximately 3,000 gallons) was received at the PWTP (Building 3544). The nitric is used to regenerate the cation exchange columns at the PWTP.

One load (400 gallons) of sulfuric acid was transported from Building 3608 and delivered to Building 3544. The sulfuric acid is used to adjust the pH of the wastewater to an acceptable range prior to its discharge to Building 3608 for further treatment.

LGWOD personnel transferred rain water that had collected in the 190 ponds (Bldgs. 3539 and 3540) to the process waste system for future treatment. These surface impoundments have been removed from active service and are used only during periods of peak rainfall.

June

LGWOD personnel collected one LLLW bottle package from Building 4500S, transported it to the LLLW Evaporator Facility, and emptied it in the LLLW Bottle Unloading Station to the LLLW System.

LGWOD personnel collected one LLLW bottle package from Building 3592, transported it to the LLLW Evaporator Facility, and emptied it in the LLLW Bottle Unloading Station to the LLLW System.

LGWOD personnel collected one LLLW bottle package from Building 4500N, transported it to the LLLW Evaporator Facility, and emptied it in the LLLW Bottle Unloading Station to the LLLW System.

LGWOD personnel collected one tanker of LLLW from Building 3525 (approximately 220 gallons), transported it to the Central Waste Collection Header, and transferred it into the LLLW System for future treatment.

LGWOD personnel collected on carboy of process waste from Building 1504 and transferred the waste to the process waste system for future treatment.

LGWOD personnel collected three containers of process waste from Building 1505 and transferred the waste to the process waste system for future treatment.

LGWOD personnel collected three containers of process wastewater from Building 7920 and from Building 4500N and transferred them to the process waste collection system for future treatment.

LGWOD personnel, at the request of Remedial Action personnel, opened the tank at Building 7503 in preparation to collect samples from the tank. Upon inspection by the sampling personnel, the tank was determined to be empty.

LGWOD personnel completed the quarterly sampling of the casks generated during the Emergency Avoidance Solidification Campaign and the LWSP - Campaign I at the request of the Solid Waste Operations Department. No unusual readings were encountered during the sampling.

LGWOD personnel unloaded approximately 3,000 gallons of sodium hydroxide (caustic) at Building 3544 during the month. The caustic is used to adjust the pH of the wastewater prior to its entering the L-1 Clarifier to improve the clarification process.

LGWOD personnel assisted in the television camera inspection of the interior of LLLW Tank W-12. This inspection was done in support of the FFA for the LLLW System.

LGWOD personnel sprayed a polymer on the Equalization Basin (Building 3524) in an attempt to clear the waste sufficiently to perform a dye test on the basin. The Equalization Basin was

used prior to 1990 as the surge basin for Building 3544; it is now used only for extra storage capacity during periods of heavy wastewater generation.

LGWOD personnel assisted a survey crew in surveying the storm drain located near the Equalization Basin (Building 3524).

July

LGWOD personnel sampled the six Isotope Area cell ventilation traps during the week. These samples will be used to determine the characterization of wastewater contained within these traps.

LGWOD personnel transported two loads of LLLW (approximately 200 gallons each) from Building 3525 in the LLLW tanker to the Central Waste Collection Header and transferred it into the LLLW System for treatment.

LGWOD personnel transferred one dumpster tank of LLLW from Building 3074 (approximately 300 gallons) to the Central Waste Collection Header and transferred it into the LLLW System for future treatment.

LGWOD personnel sampled LLLW tank WC-10 as part of the on-going effort to characterize the LLLW tanks for ER and FFA activities.

LGWOD personnel pumped approximately 3,000 gallons of water from the basement of Building 2011 after a leak had flooded the basement. The water was transferred to the process waste system for treatment.

LGWOD personnel collected 4,500 gallons of process wastewater from ER operations in SWSA 6 and transferred it to the process waste collection system for treatment.

LGWOD personnel transferred 4,500 gallons of process wastewater from well drilling operations by Bechtel into the process waste system for treatment.

One container of bottled waste was collected at Building 2024 and transferred to the process waste system for treatment.

LGWOD personnel transferred two tanker loads of sulfuric acid from Building 3608 to Building 3544. The sulfuric acid is used to adjust the pH of the wastewater prior to discharge to Building 3608.

One load of sodium hydroxide (approximately 3,000 gallons) was received at Building 3544. The sodium hydroxide is used to raise the pH of the wastewater prior to entering the clarifier: the raised pH aids the water softening process in the clarifier.

LGWOD personnel transferred a load of sodium hydroxide to the storage tank at the Melton Valley Process Wastewater Collection Tank Facility. The sodium hydroxide is used to adjust the pH of the collected wastewater to basic.

LGWOD personnel received a load of sulfuric acid (3,000 gallons) at Building 3608. The sulfuric acid is used to adjust the pH of the wastewater at Building 3608 prior to discharge to

White Oak Creek in order to meet National Pollution Discharge Elimination System (NPDES) discharge requirements.

LGWOD personnel provided overtime support to personnel in Building. 3525 for decontamination work on the cells and other equipment in the facility.

LGWOD personnel completed the scheduled inspection of the Emergency Avoidance Solidification Campaign (EASC) archived samples. All samples were found to be in satisfactory condition.

LGWOD personnel performed a pressure test on the transfer line from the Old Hydrofracture Facility (OHF) (Building 7852) to the Evaporator Facility at the request of Remedial Action personnel. The transfer pipeline passed the pressure test. An inspection of the valve/pipe manifold at OHF was also accomplished.

LGWOD personnel cleaned the pad located on the east side of Building 3544 in preparation for painters to apply a new covering surface.

LGWOD personnel supported personnel from QE&I who were performing a X-ray inspection of the new transfer line from the Building 2099 Monitoring and Control Station to Valve Box 1A. This new line is being installed as part of the Bethel Valley LLLW Collection and Transfer System Line Item.

LGWOD personnel cleaned up the diked area around the clarifier (L-1) at Building 3544 in preparation for painters from P&E to reseal and repaint the surface.

August

Painters from P&E were assigned to work in the 3039 Stack Area in preparation for the Nuclear Safety Audit. The painters touched up existing painting, added additional equipment labelling, and color-coded the ductwork and pipes in this area.

There were several ES&H walkthroughs of the 3039 Stack area in preparation for the Nuclear Safety Audit.

LGWOD personnel conducted an extensive cleanup and review of all LGWOD facilities in preparation for the Office of Nuclear Safety's audit of the 3039 Stack Area the week of August 23.

WMRAD ES&H Department conducted a safety inspection walkthrough of the 3039 Stack Area in preparation for the Office of Nuclear Safety audit.

Painters marked all tripping hazards in the 3039 Stack Area with yellow paint.

LGWOD personnel participated in an audit by the Office of Nuclear Safety of the 3039 Stack Area August 23 through 27. No major findings or concerns were identified against the LGWOD during the close-out sessions.

One load of LLLW was collected at Building 7562 in the LLLW tanker, transported to the Central Waste Collection Header, and transferred into the LLLW Collection System for future treatment. This load was collected at the request of Remedial Action personnel.

LGWOD personnel collected 200 gallons of LLLW at Building 3525 using the LLLW tanker and transported it to the Central Waste Collection Header, where it was transferred to the LLLW Collection System for future treatment.

LGWOD personnel collected one LLLW bottle package at Building 3592, transported it to the LLLW Evaporator Facility, and transferred it to the LLLW Collection System for future treatment.

LGWOD personnel resampled LLLW Tank WC-14 as part of the continuing effort to characterize the LLLW Tanks at ORNL for ER and FFA activities.

LGWOD personnel transferred the contents of inactive tank WC-15 into LLLW tank WC-10 at the request of Remedial Action personnel. LGWOD personnel then assisted in the video inspection of the interior of the tank. This tank was removed from active service in 1956 after it was identified to have a leak. It presently collects groundwater.

The draft Design Criteria for the Melton Valley Storage Tanks Capacity Increase was reviewed and comments were submitted to Engineering.

LGWOD personnel started operation of the zinc bromide solidification process developed by Chem Tech personnel at the beginning of the month. The operation was stopped after overheating of the mixture occurred. Chem Tech personnel reevaluated their solidification process and resumed operations.

LGWOD personnel completed the decontamination of the P&E crane that is used in SWSA 6. This was done to assist P&E personnel in the newly required inspection/certification of all mobile cranes.

September

LGWOD personnel transferred tanks H209 and 3013 at the request of ER personnel as part of their project to remove liquids from inactive tanks. The liquid in these tanks was transferred to the LLLW Collection System for future treatment.

LGWOD personnel transferred the heel in LLLW Tank W-17 to LLLW Tank W-16 in support of FFA activities.

LGWOD personnel transferred wastewater from tanks 3004 and T-30 at the request of ER personnel as part of the Inactive Tank Liquid Removal Project. The wastewater was transferred to the LLLW tanker and transported to the Central Waste Collection Header, where it was transferred to the LLLW Collection System for future treatment.

LGWOD personnel collected one tanker of LLLW at Building 3525 and transported it to the Central Waste Collection Header, where it was transferred to the LLLW Collection System for future treatment.

LGWOD personnel transferred the contents of LLLW Tanks WC-4, WC-5, WC-6, WC-11, WC-12, WC-13, and W-18 to the LLLW Collection System for future treatment. These tanks were emptied in support of FFA activities. Tank WC-4 was also video inspected after it had been emptied.

LGWOD personnel collected 15 containers (approximately 5 gallons each) of process wastewater at Bldgs. 1504 and 1505, and transferred them to the process waste collection system for future treatment.

LGWOD personnel transferred 11 drums of process wastewater into the process wastewater collection system for future treatment. These drums had been generated from ongoing activities in SWSA 6.

LGWOD personnel transferred wastewater from tank 3003 at the request of ER personnel as part of the Inactive Tank Liquid Removal Project. The wastewater was transferred to the process waste system where it will be stored for future treatment.

LGWOD personnel sampled the 7500 sump at the request of Remedial Action personnel in preparation for the emptying of the sump.

LGWOD personnel assisted in the video inspection of a storm sewer outfall located near Building 3518. The camera was unable to pass an obstruction in the line; it was found that both ends of the line are blocked.

LGWOD personnel completed the sampling of the monitored casks from the two previous solidification campaigns. A total of 27 water samples were collected; however, no radiation readings were found on any of the samples. This sampling was done at the request of the Solid Waste Operations Group.

LGWOD personnel completed the inspection of the archived samples from the previous two solidification campaigns. No problems were identified.

LGWOD personnel sampled the 7562 tank at the request of Remedial Action personnel to determine if a zeolite system can be used to treat this wastewater.

LGWOD personnel sampled LLLW tank WC-4 to determine which liquid waste system the tank's contents should be transferred to.

LGWOD personnel completed the first transfer of sodium hydroxide (caustic) from Building 3608 to Building 7961 using the new acid/caustic tanker.

One load of acid was transferred from Building 3608 to Building 3544. The acid is used to adjust the pH of the wastewater prior to its transfer to Building 3608.

One load of caustic was received at Building 3544. Caustic is used to adjust the pH of the wastewater to aid in the water softening process.

One load of caustic was transferred from Building 3608 to Building 7961. Caustic is used to maintain the pH of the process wastewater in the collection tanks at a high pH to prevent corrosion.

LGWOD personnel decontaminated two weed eaters used by P&E personnel.

LGWOD personnel performed decontamination work on a back hoe at the request of P&E.

October

LGWOD personnel transferred rain water that had collected in the Building 7830 sump into the LLLW Tanker and transported it to the Central Waste Collection Header, where it was transferred into the LLW Collection System and Storage for future treatment. Emptying of the sump is a FFA requirement.

LGWOD personnel collected one load of LLLW in the LLLW Tanker at Building 3525 and transported it to the Central Waste Collection Header, where it was transferred into the LLLW Collection and Storage System for future treatment.

LGWOD personnel collected 5 containers of process wastewater at Building 1505 and transferred them into the Process Waste Collection and Transfer System for future treatment.

LGWOD personnel transferred 3,000 gallons from Building 7500 at the request of Remedial Action personnel. This wastewater was transferred to the Process Waste Collection and Transfer System, where it will be stored for future treatment.

LGWOD personnel collected 5 bottles of process waste at Building 1505 and transferred them to the Process Waste Collection and Transfer System, where it will be stored for future treatment.

LGWOD personnel transferred one tanker of nonradiological process wastewater from Building 7601 to Building 3608, where it was transferred into the collection system for future treatment.

LGWOD personnel transferred a load of sodium hydroxide to Building 7961. The sodium hydroxide is used to maintain the pH of the wastewater at this tank farm at a basic pH to prevent corrosion.

A load of sulfuric acid was transported from Building 3608 to Building 3544 for use in adjusting the pH of the treated wastewater at Building 3544 prior to its transfer to Building 3608 for future treatment.

LGWOD personnel sampled Evaporator Service Tank W-23 as part of the waste characterization efforts presently underway to develop a Solids Waste Management Plan for LGWOD operations.

LGWOD personnel assisted in the video inspection of the storm sewer drain line running from the area of Building 3518 to White Oak Creek. This was done in support of a Capital Improvements project for the storm sewer system in this area of the plant.

LGWOD personnel assisted in the video inspection of LLLW Tanks WC-5, -6, and -8.

LGWOD personnel submitted comments on the Closure Plan for the New Hydrofracture Facility (Building 7860) to Environmental Compliance personnel.

November

LGWOD personnel collected one LLLW Bottle Package at Building 3592 and transported it to the LLLW Evaporator Facility, where it was transferred to the LLLW Collection and Transfer System for later treatment.

LGWOD personnel transferred water that had collected in the sumps at Building 7830 to the LLLW Tanker and transported it to the Central Waste Collection Header, where it was transferred to the LLLW System for future treatment.

LGWOD personnel collected eleven bottles of process waste at Bldgs. 1504 and 1505 and transferred them to the process waste collection and transfer system for later treatment.

LGWOD personnel transferred eleven 55 gallon containers of process wastewater to the process waste collection system for future treatment at the request of the Solid Waste Operations Group.

LGWOD personnel transferred the contents of the sump at Building 3506 to the process waste system for future treatment.

LGWOD personnel sampled the LLLW Evaporator Facility Cell Ventilation Pit's sump (Building 2533) and the Equalization Basin (Building 3524) at the request of personnel from Bechtel.

LGWOD personnel sampled LLLW Tank WC-19 for characterization of this wastestream.

LGWOD personnel assisted in the video inspection of a storm drain located outside the West gate of the main ORNL complex in Bethel Valley.

LGWOD personnel checked the levels in tanks TH-1, -2, and -3 at the request of Remedial Action personnel. Tanks TH-1 and -3 were found to be empty; TH-2 had 1 gallon of liquid present.

LGWOD personnel transferred two loads of sulfuric acid from Building 3608 to Building 3544. Sulfuric acid is used to adjust the pH of the wastewater prior to transferring it to Building 3608 for further treatment.

LGWOD personnel received 3,000 gallons of sulfuric acid at Building 3608. The sulfuric acid is used to adjust the pH of the wastewater prior to discharge to White Oak Creek.

LGWOD personnel transferred two loads of sodium hydroxide to Building 7961. The sodium hydroxide (caustic) is used to maintain the pH of the process wastewater collected at this tank farm for the HFIR area at a basic pH.

LGWOD personnel installed signs at Bldgs. 2532 and 2651 that were identified during a recent safety inspection.

LGWOD personnel conducted a cleanup campaign of all LGWOD facilities and transferred the waste to Solid Waste Operations personnel.

LGWOD personnel cleaned up Building 7935 as part of a continuing effort by LGWOD to improve housekeeping at its facilities.

LGWOD personnel assisted Remedial Action personnel in the decontamination of a carrier.

LGWOD personnel completed data sheets on fifty facilities for the Surplus Facility Inventory and Assessment Project for DOE.

December

LGWOD personnel collected one LLLW bottle package at Building 4501 and transported it to the LLLW Evaporator Facility, where it was transferred to the LLLW system for future treatment.

LGWOD personnel transferred 800 gallons of LLLW from tank 7562 into the LLLW Tanker, transported it to the Central Waste Collection Header, and transferred it into the LLLW system for future treatment at the LLLW Evaporator. This task was carried out at the request of the Remedial Action Section.

The contents of the portable collection tank at the Manipulator Decontamination Facility (Building 3074) were sampled by LGWOD personnel, transported to the Central Waste Collection Header, and transferred into the LLLW system for future treatment at the LLLW Evaporator.

LGWOD personnel collected thirty-one 5 gallon containers of process wastewater at Building 1505 and transferred them to the process waste collection system for future treatment.

LGWOD personnel transferred two tankers of wastewater (approximately 9,000 gallons total) from operations by Bechtel in SWSA 5 to the NRWTP for future treatment.

LGWOD personnel sampled and performed a visual inspection of LLLW Tank WC-9.

LGWOD personnel checked the level and sampled the tank at Building 7562 at the request of Remedial Action personnel.

LGWOD personnel assisted in the video inspection of the storm drain located west of Building 3518 that goes to White Oak Creek. There is a planned General Plant Project (GPP) to upgrade the storm sewer in this section of the laboratory.

LGWOD personnel assisted in the video inspection of LLLW Tank WC-10 during the heavy rainfall event on December 4. This inspection is part of the FFA activities for the LLLW System.

LGWOD personnel assisted with the video inspection of the interior of LLLW Tanks WC-10, -11, and -13. This inspection is being done as part of the FFA activities for the LLLW System.

One load of sodium hydroxide (3,000 gallons) was received at Building 3544. This material will be used to raise the pH of the wastewater to aid in the water softening process at this facility.

LGWOD personnel completed the decontamination of numerous air conditioner parts at the request of the P&E Division.

LGWOD personnel assisted the Hazardous Waste Department in the required leak testing of the secondary containment for RCRA Tank 7830A. After the test was completed, the water was pumped from the containment area and transported to the NRWTP for treatment.

4.4 OCCURRENCE REPORTING

<u>Number</u>	<u>Facility</u>	<u>Categorization</u>
MMES-93-000399 X-10-93-00052	2531	Non-Routine
MMES-93-000421 X-10-93-00059	7900 Pump Pit	Off-Normal
MMES-93-000482 X-10-93-00073	3039	Non-Routine
MMES-93-000775 X-10-93-00115	Building 3518 Pipe Chase	Off-Normal
MMES-93-000701 X-10-93-00102	WC10 Transfer Pipe	Off-Normal
MMES-93-000871 X-10-93-00131	Personnel Contamination	Off-Normal
MMES-93-000908 X-10-93-00140	Failed Transfer Switch	Non-Routine
MMES-93-001121 X-10-93-00207	Melton Valley Storage Tanks	Non-Routine
MMES-93-001125 X-10-93-00208	Building 7800	Non-Routine
MMES-93-001178 X-10-93-00221	3500 LLLW System	Unusual

4.5 PROCEDURES AND SYSTEM DESCRIPTIONS

The LGWOD Conduct of Operations Manual was approved during April. This manual gives information on how Conduct of Operations is implemented in LGWOD operations.

Seventy-two new and revised procedures were prepared for operations throughout the LGWOD department during the previous year. These documents are listed in Table 4. Eight LGWOD procedures were cancelled and incorporated into one procedure. In addition, six other LGWOD procedures were found to have no changes during their mandatory two-year review.

5.0 APPENDIX

5.1 TABLES

1. Process waste operations.
2. NRWTP operations.
3. LLLW operations.
4. LGWO procedures.
5. LLLW generation.

5.2 FIGURES

1. Process waste treated at ORNL. (ORNL-DWG. 94-5704)
2. Sludge generation at the PWTP. (ORNL-DWG. 94-5705)
3. Dilute LLLW from the PWTP. (ORNL-DWG. 94-5706)
4. LLLW concentrate from the PWTP. (ORNL-DWG. 94-5707)
5. Rainfall at ORNL. (ORNL-DWG. 94-5708)
6. Used storage space versus time. (ORNL-DWG. 94-5709)
7. LLLW generation at ORNL. (ORNL-DWG. 94-5710)
8. Building 2026 LLLW generation. (ORNL-DWG. 94-5711)
9. Building 3019 LLLW generation. (ORNL-DWG. 94-5712)
10. Building 3025 LLLW generation. (ORNL-DWG. 94-5713)
11. Building 3026-C LLLW generation. (ORNL-DWG. 94-5714)
12. Building 3026-D LLLW generation. (ORNL-DWG. 94-5715)
13. Building 3028 LLLW generation. (ORNL-DWG. 94-5716)
14. 3039 Stack Area LLLW generation. (ORNL-DWG. 94-5717)
15. Building 3074 LLLW generation. (ORNL-DWG. 94-5718)
16. Building 3504 LLLW generation. (ORNL-DWG. 94-5719)
17. Building 3508 LLLW generation. (ORNL-DWG. 94-5720)
18. Building 3517 LLLW generation. (ORNL-DWG. 94-5721)
19. Building 3525 LLLW generation. (ORNL-DWG. 94-5722)
20. Building 3544 LLLW concentrate generation. (ORNL-DWG. 94-5723)
21. Building 3544 LLLW feed generation. (ORNL-DWG. 94-5724)
22. 4500 Complex LLLW generation. (ORNL-DWG. 94-5725)
23. Isotopes Area LLLW generation. (ORNL-DWG. 94-5726)
24. Reactors in Bethel Valley LLLW generation. (ORNL-DWG. 94-5727)
25. WC-5 Pump Pit (tank WC-8) LLLW generation. (ORNL-DWG. 94-5728)
26. WC-5 Pump Pit (tank WC-9) LLLW generation. (ORNL-DWG. 94-5729)
27. HFIR (Building 7900) LLLW generation. (ORNL-DWG. 94-5730)
28. Building 7920 LLLW generation. (ORNL-DWG. 94-5731)
29. Abandoned tank W-1A LLLW generation. (ORNL-DWG. 94-5732)

TABLE 1 PROCESS WASTE OPERATIONS

	Process waste treated by ion exchange (gal)	Process waste treated by zeolite (gal)	Total process waste treated (gal)	Sludge generated		PWTP generated LLLW concentrate to storage (gal)	PWTP generated LLLW feed (gal)
				Drums	Ft ³		
January	6.09 x 10 ⁶	1.01 x 10 ⁶	7.10 x 10 ⁶	66	485.23	440	400
February	4.83 x 10 ⁶	1.07 x 10 ⁶	5.90 x 10 ⁶	51	374.95	0	760
March	6.53 x 10 ⁶	1.00 x 10 ⁶	7.53 x 10 ⁶	68	499.93	554	967
April	3.08 x 10 ⁶	2.94 x 10 ⁶	6.02 x 10 ⁶	39	286.73	635	1340
May	4.07 x 10 ⁶	0.99 x 10 ⁶	5.06 x 10 ⁶	39	286.73	635	980
June	4.05 x 10 ⁶	0.54 x 10 ⁶	4.59 x 10 ⁶	49	360.25	830	608
July	4.77 x 10 ⁶	0.01 x 10 ⁶	4.78 x 10 ⁶	42	308.78	770	635
August	4.95 x 10 ⁶	0.12 x 10 ⁶	5.07 x 10 ⁶	49	360.25	0	0
September	5.15 x 10 ⁶	0	5.15 x 10 ⁶	42	308.78	725	930
October	5.02 x 10 ⁶	0	5.02 x 10 ⁶	47	345.54	682	1020
November	5.71 x 10 ⁶	0	5.71 x 10 ⁶	62	455.82	840	1040
December	5.64 x 10 ⁶	1.48 x 10 ⁶	7.12 x 10 ⁶	56	411.71	818	1790
1993 Totals	59.89 x 10 ⁶	9.16 x 10 ⁶	69.05 x 10 ⁶	610	4484.70	6929	10470

TABLE 2 NRWTP OPERATIONS

	Metals wastewater treated (gal)	Nonmetals wastewater treated (gal)	Total wastewater treated (gal)	Sludge generated	
				Boxes	Ft ³
January	1.19 x 10 ⁶	1.37 x 10 ⁷	1.49 x 10 ⁷	2	128
February	1.32 x 10 ⁶	1.13 x 10 ⁷	1.26 x 10 ⁷	2	128
March	1.38 x 10 ⁶	1.40 x 10 ⁷	1.54 x 10 ⁷	2	128
April	1.35 x 10 ⁶	1.22 x 10 ⁷	1.35 x 10 ⁷	3	192
May	1.09 x 10 ⁶	1.16 x 10 ⁷	1.27 x 10 ⁷	3	192
June	1.17 x 10 ⁶	1.18 x 10 ⁷	1.30 x 10 ⁷	0	0
July	1.22 x 10 ⁶	1.29 x 10 ⁷	1.41 x 10 ⁷	4	256
August	1.25 x 10 ⁶	1.37 x 10 ⁷	1.49 x 10 ⁷	1	64
September	1.07 x 10 ⁶	1.23 x 10 ⁷	1.34 x 10 ⁷	2	128
October	1.18 x 10 ⁶	1.30 x 10 ⁷	1.42 x 10 ⁷	1	96
November	0.92 x 10 ⁶	1.43 x 10 ⁷	1.52 x 10 ⁷	1	96
December	0.49 x 10 ⁶	1.50 x 10 ⁷	1.59 x 10 ⁷	1	96
1993 Totals	13.63 x 10 ⁶	15.58 x 10 ⁷	16.98 x 10 ⁷	22	1504

*At the request of Solid Waste Operations, the sludge boxes were changed from 64 ft³ to 96 ft³ capacity beginning in October (this was a permanent change).

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	3.57×10^4	1.33×10^4	--	3390
February	3.19×10^4	--	1620	--
March	3.91×10^4	--	--	--
April	5.69×10^4	--	2960	--
May	5.54×10^4	--	1840	--
June	2.44×10^4	--	2550	--
July	--	--	--	--
August	2.44×10^4	--	--	--
September	2.96×10^4	--	2700	--
October	3.83×10^4	--	--	--
November	3.13×10^4	--	2380	--
December	3.98×10^4	--	--	--
1993 Totals	40.68×10^4	1.33×10^4	14050	3390

The 2A2 Evaporator was removed from service in February and was not used throughout the remainder of the year due to a maintenance project to replace the 2A2 Evaporator with the spare vessel. The existing vessel had developed three failed steam coils out of seven since it went in service in the late 1970's.

Table 4 LGWO Procedures

WM-LGWO-601 OPERATING MANUAL FOR THE LIQUID WASTE SOLIDIFICATION PROJECT

WM-LGWO-601.2.1, Rev. 1
WM-LGWO-601.2.4, Rev. 3, 4, 5, 6
WM-LGWO-601.2.6, Rev. 1
WM-LGWO-601.2.7, Rev. 4

WM-LGWO-602 OPERATING MANUAL FOR THE PROCESS WASTE TREATMENT PLANT

WM-LGWO-602.2.1, Rev. 1
WM-LGWO-602.2.2, Rev. 4, 5
WM-LGWO-602.2.5, Rev. 3
WM-LGWO-602.2.8, Rev. 2
WM-LGWO-602.2.10, Rev. 4
WM-LGWO-602.2.11, Rev. 4
WM-LGWO-602.2.12, Rev. 3

WM-LGWO-603 OPERATING MANUAL FOR THE NONRADIOLOGICAL WASTEWATER TREATMENT FACILITY COLLECTION SYSTEM

WM-LGWO-603.2.1.1, Rev. 2
WM-LGWO-603.2.1.2, Rev. 2
WM-LGWO-603.2.2.4, Rev. 1
WM-LGWO-603.2.2.5, Rev. 1
WM-LGWO-603.3.4, Rev. 1
WM-LGWO-603.4.3, Rev. 1

WM-LGWO-604 OPERATING MANUAL FOR THE NONRADIOLOGICAL WASTEWATER TREATMENT PLANT

WM-LGWO-604.2.3, Rev. 7
WM-LGWO-604.2.4, Rev. 5
WM-LGWO-604.2.8, Rev. 5
WM-LGWO-604.2.9, Rev. 4, 5
WM-LGWO-604.2.11, Rev. 4, 5
WM-LGWO-604.3.1, Rev. 1
WM-LGWO-604.3.2, Rev. 1
WM-LGWO-604.3.3, Rev. 2
WM-LGWO-604.4.2, Rev. 2
WM-LGWO-604.4.3, Rev. 3

WM-LGWO-605 OPERATING MANUAL FOR THE EQUIPMENT CLEANING FACILITY

WM-LGWO-605.2, Rev. 0

WM-LGWO-606 LGWO DEPARTMENT-WIDE PROCEDURE MANUAL

WM-LGWO-606.1, Rev. 1, 2
WM-LGWO-606.2, Rev. 2
WM-LGWO-606.3, Rev. 2
WM-LGWO-606.4, Rev. 3
WM-LGWO-606.6, Rev. 1

WM-LGWO-607 OPERATING MANUAL FOR THE PROCESS WASTE COLLECTION SYSTEM - MISCELLANEOUS PROCEDURES

WM-LGWO-607.1, Rev. 1

WM-LGWO-608 LIQUID LOW-LEVEL WASTE MANUAL - MISCELLANEOUS PROCEDURES

WM-LGWO-608.1, Rev. 2
WM-LGWO-608.2, Rev. 4
WM-LGWO-608.6, Rev. 4
WM-LGWO-608.7.1, Rev. 2

WM-LGWO-609 OPERATING MANUAL FOR THE WOCC

WM-LGWO-609.2.1, Rev. 8, 9, 10, 11
WM-LGWO-609.2.3, Rev. 0
WM-LGWO-609.6, Rev. 1

WM-LGWO-610 OPERATING MANUAL FOR THE LLLW AND PW COLLECTION AND TRANSFER SYSTEMS

WM-LGWO-610.2.1, Rev. 7, 8
WM-LGWO-610.2.2, Rev. 6
WM-LGWO-610.2.3, Rev. 4
WM-LGWO-610.2.4, Rev. 3
WM-LGWO-610.6, Rev. 1

WM-LGWO-611 OPERATING MANUAL FOR THE LLLW EVAPORATOR FACILITY

WM-LGWO-611.2.1, Rev. 1, 2, 3
WM-LGWO-611.2.2, Rev. 2
WM-LGWO-611.2.3, Rev. 1, 2
WM-LGWO-611.2.4, Rev. 5
WM-LGWO-611.2.5, Rev. 5, 6
WM-LGWO-611.2.6, Rev. 2
WM-LGWO-611.3.1, Rev. 4
WM-LGWO-611.6, Rev. 1

WM-LGWO-612 OPERATING MANUAL FOR THE 3039 STACK VENTILATION SYSTEM

WM-LGWO-612.2.3, Rev. 3
WM-LGWO-612.2.7, Rev. 4
WM-LGWO-612.3.1, Rev. 3

Table 5. LLLW generation.

Building/Area Served	Tank	1989 Avg. (Gal/week)	1990 Avg. (Gal/week)	1991 Avg. (Gal/week)	1992 Avg. (Gal/week)	1993 Avg. (Gal/week)
Isotopes Area	WC-10	244	134	434	208	373
3039 Stack	W-22	852	813	808	728	797
Reactors	WC-19	548	560	384	209	58
Abandoned	W-1A	935	897	744	411	427
2026	2026	21	23	67	43	45
4500 Complex	WC-11	203	68	399	103	96
4500 Complex	WC-12	26	25	18	17	12
4500 Complex	WC-13	51	45	24	21	4
4500 Complex	WC-14	17	16	24	4	13
3517	W-12,W-22	306	226	456	215	626
Pump Pit	WC-8	315	271	82	25	45
WC-5 Pump Pit	WC-9	88	200	361	145	274
3508	WC-5,WC-6	63	78	68	50	46
3525	W-12	439	395	299	81	71
3544 Concentrate	W-21	69	64	104	148	163
3544 Feed	W-22	112	72	167	209	229
7920	WC-20	236	246	329	260	314
HFIR	HFIR	711	1419	2411	2750	2388
3028	WC-2	13	8	8	9	10
3504	WC-7	26	11	43	13	15
3026-D	W-16	31	10	28	20	18
3026-C	W-17,W-18	685	605	592	203	282
3019	W-22	23	23	20	24	8
3025	WC-3	13	0	10	9	11
3074	TRUCK	26	24	28	30	43

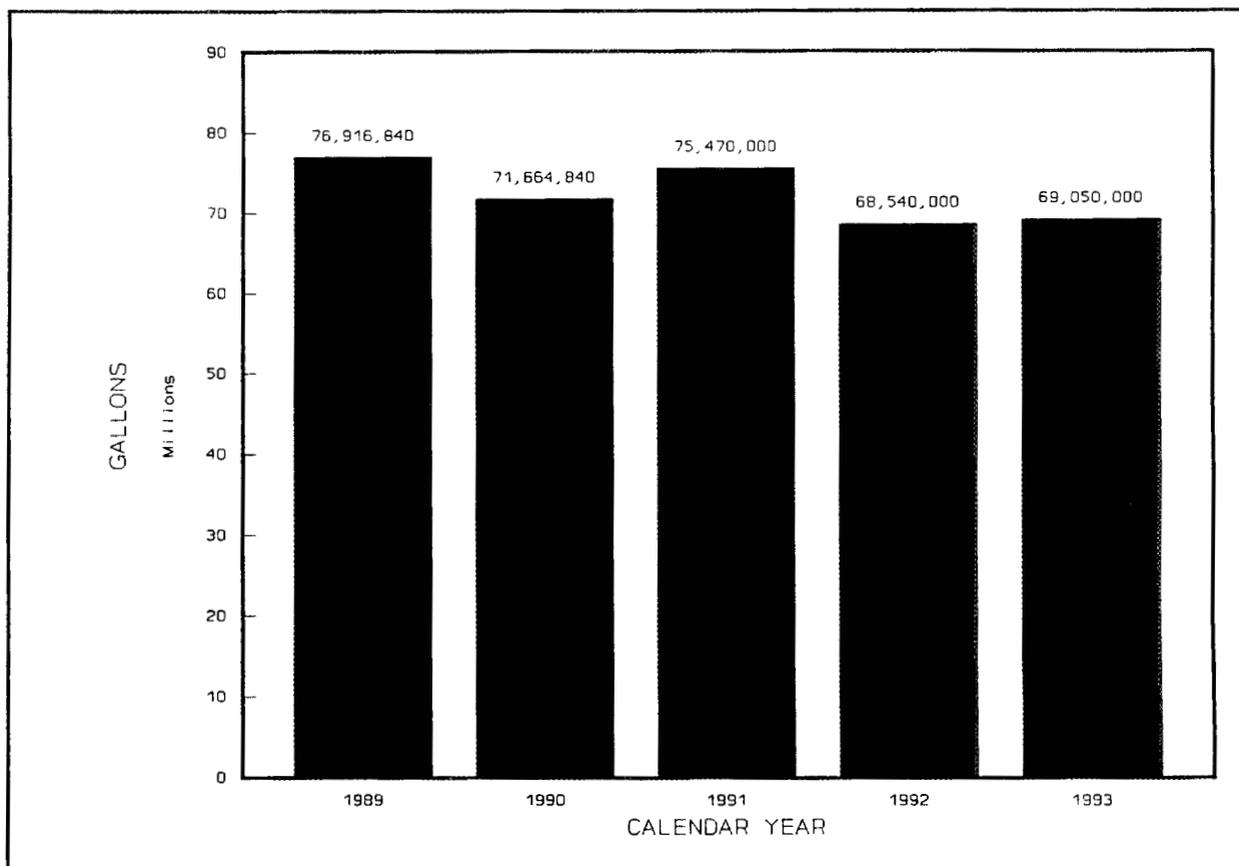


Figure 1. Process waste treated at ORNL. (ORNL-DWG. 94-5704)

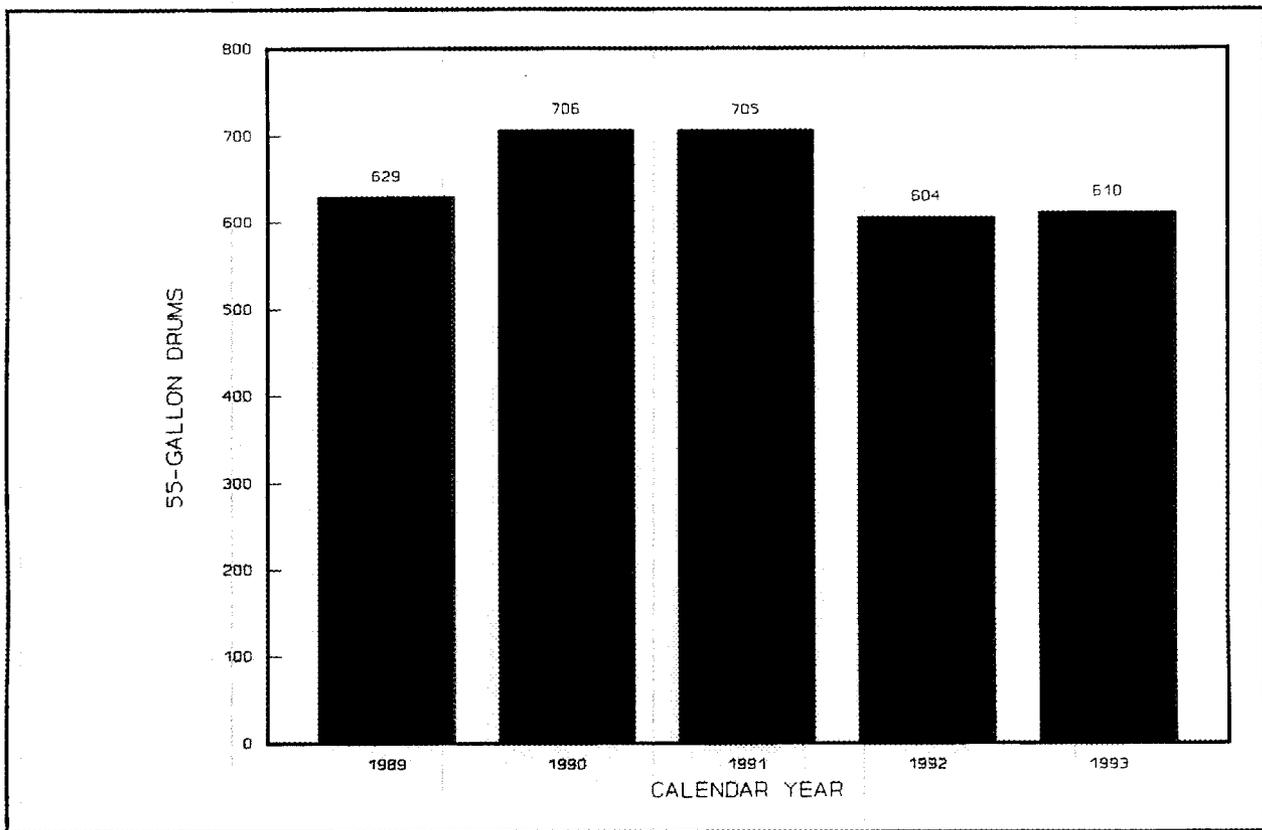


Figure 2. Sludge generation at the PWTP. (ORNL-DWG. 94-5705)

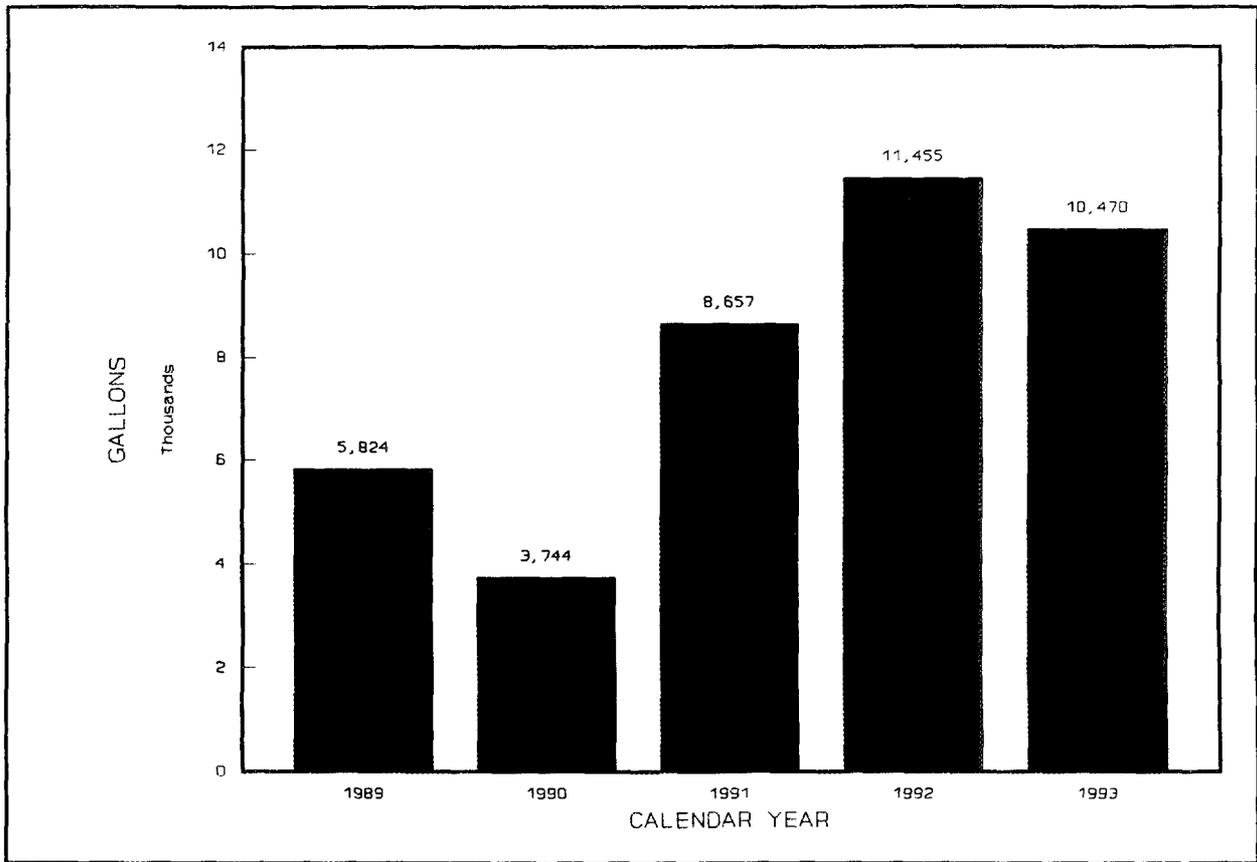


Figure 3. Dilute LLLW from the PWTP. (ORNL-DWG. 94-5706)

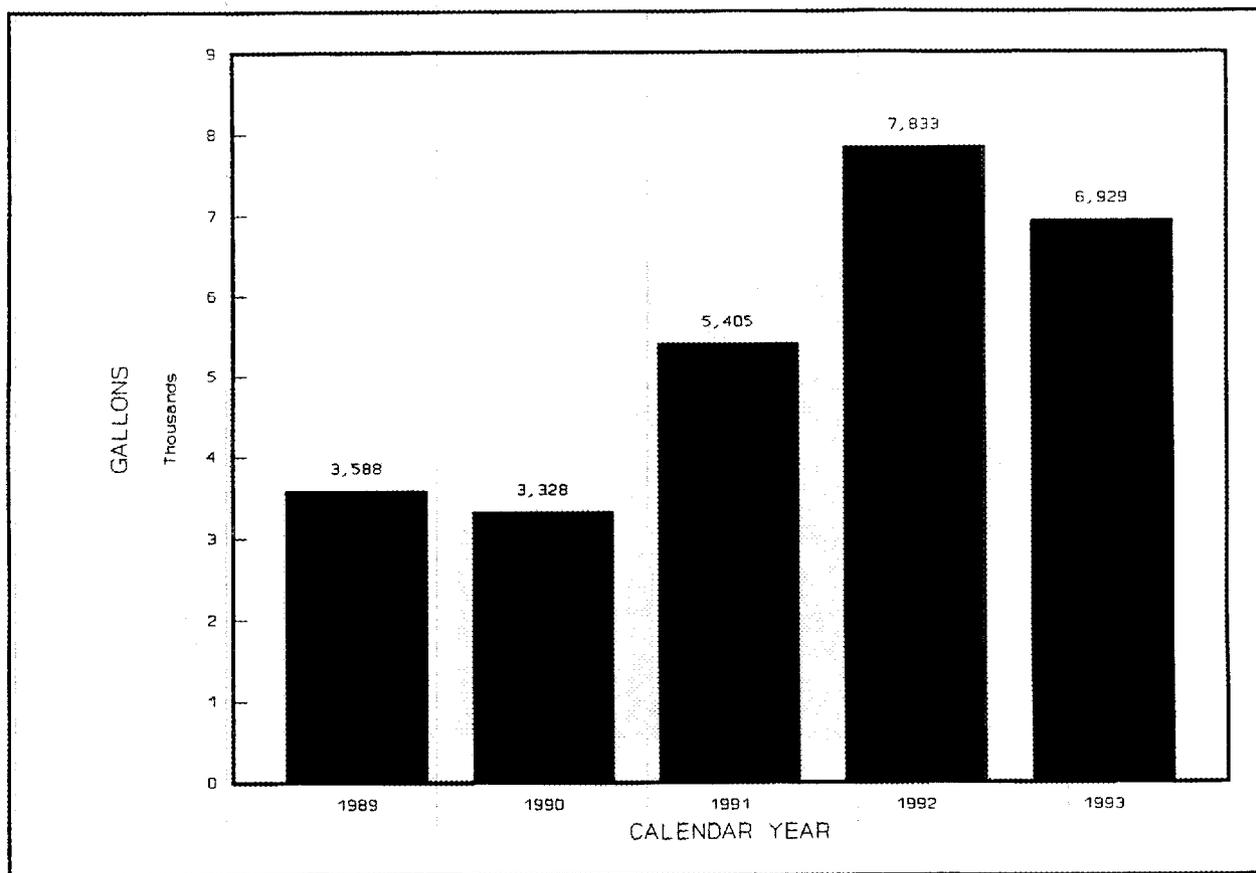


Figure 4. LLLW concentrate from the PWTP. (ORNL-DWG. 94-5707)

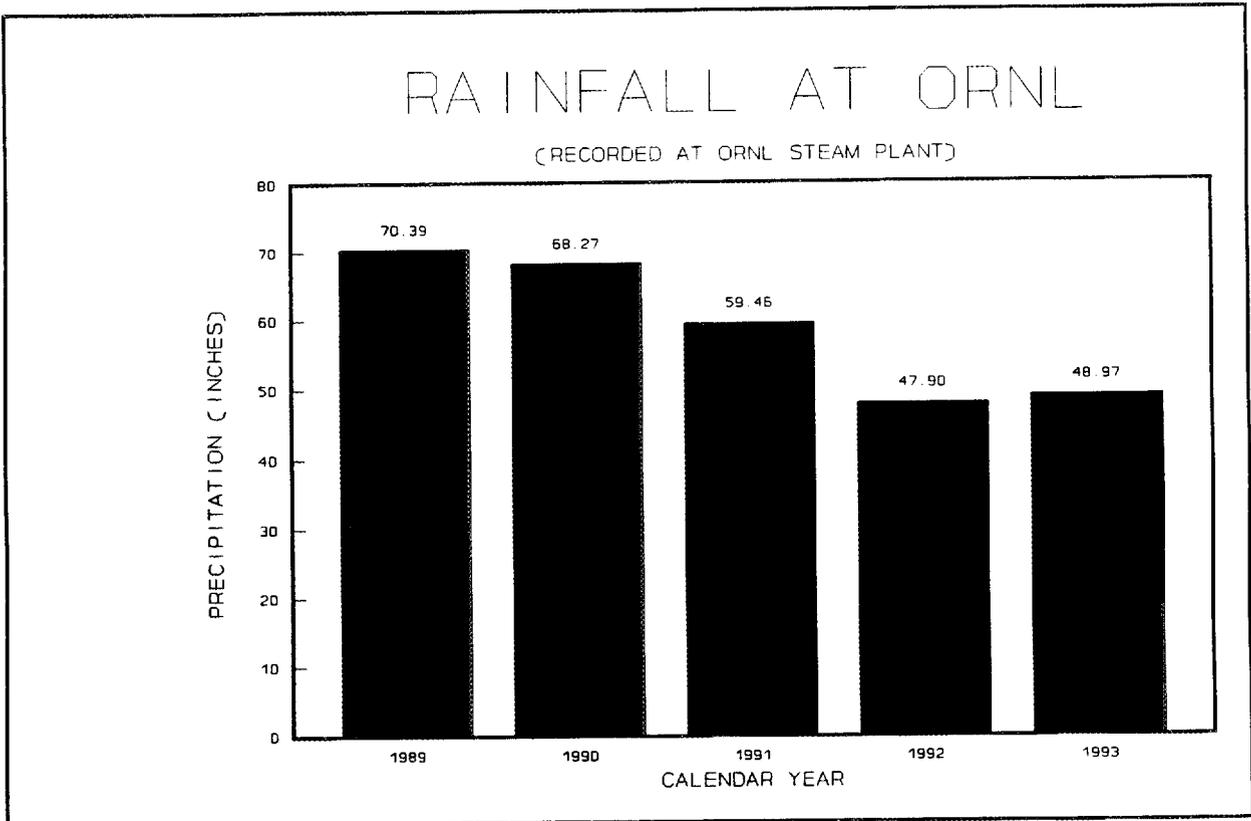


Figure 5. Rainfall at ORNL. (ORNL-DWG. 94-5708)

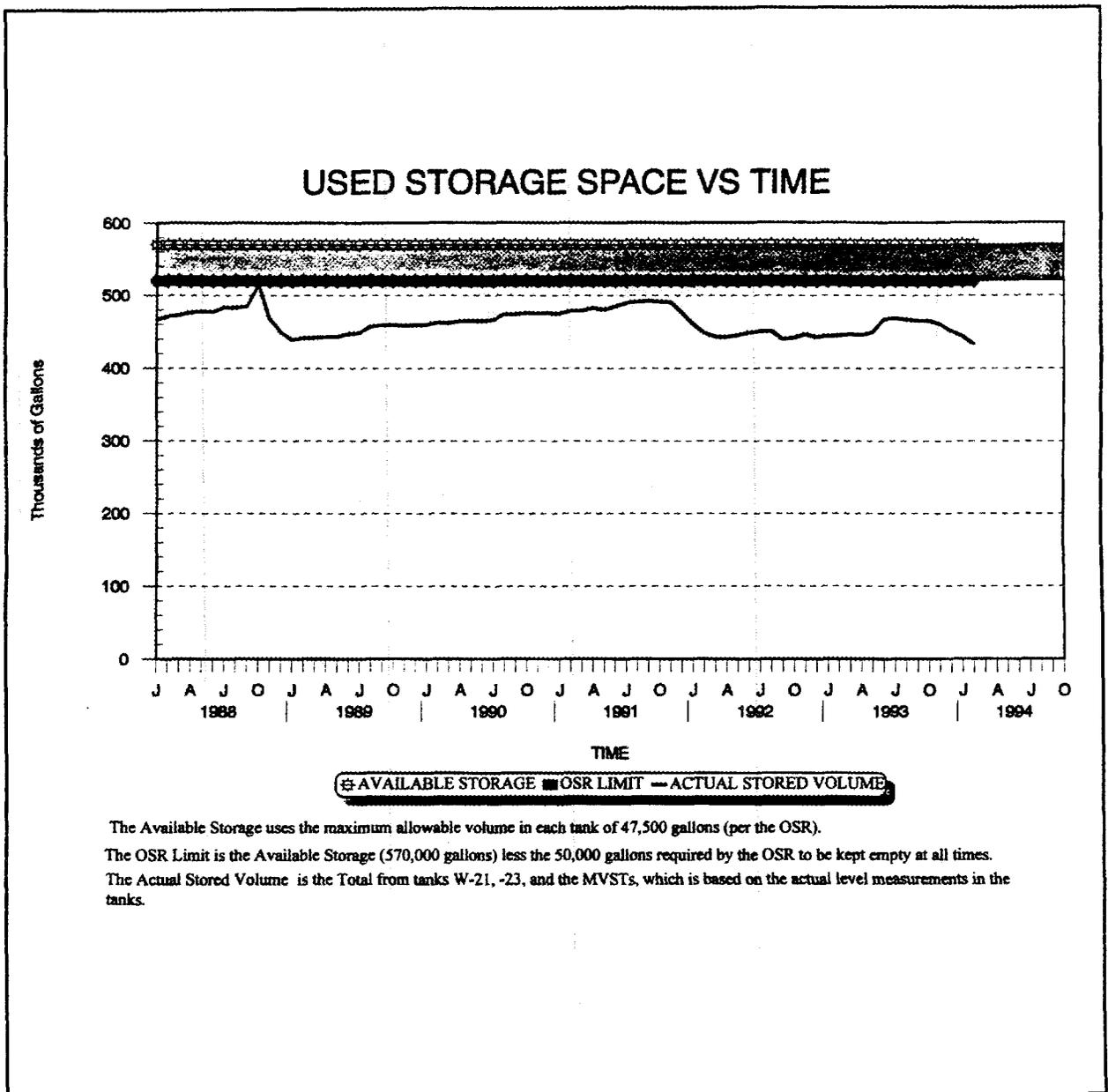


Figure 6. Used storage space versus time. (ORNL-DWG. 94-5709)

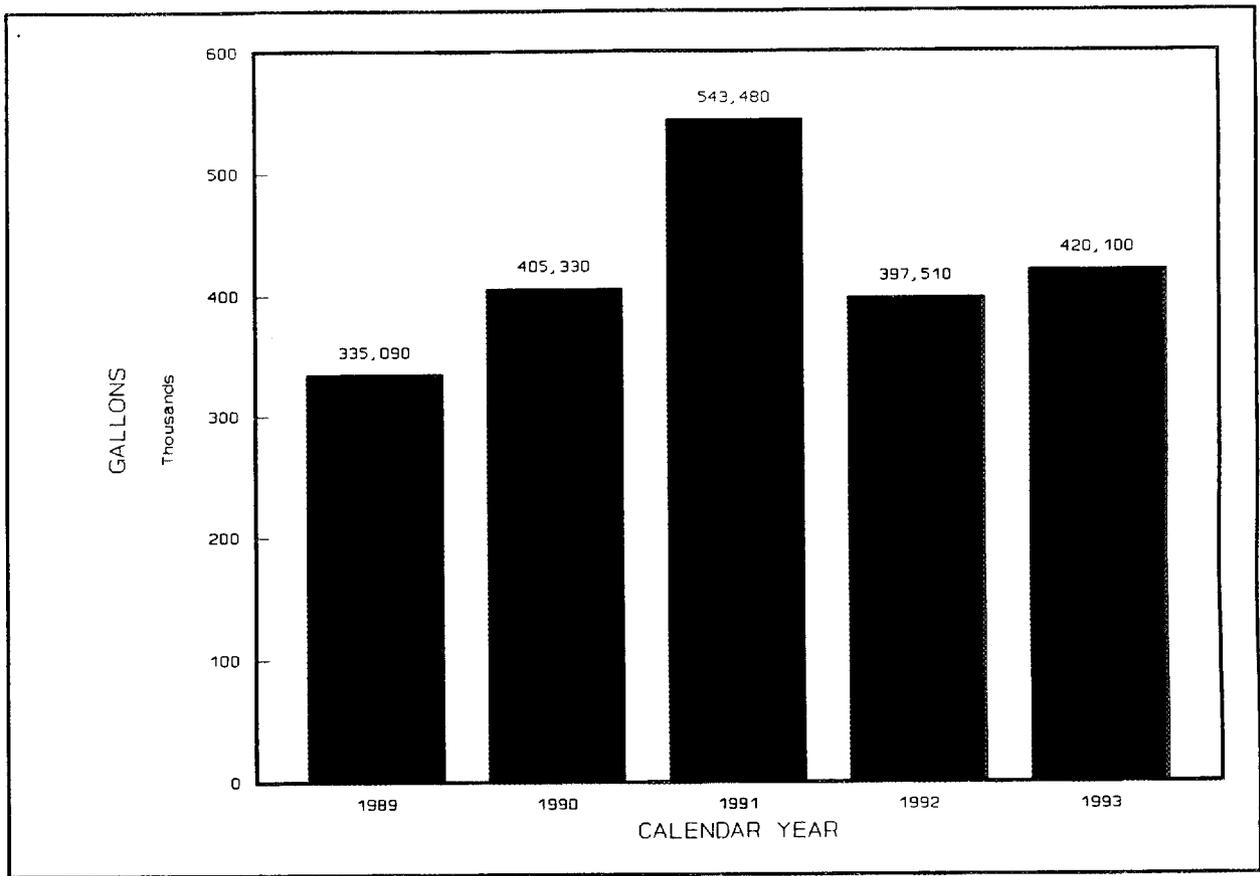


Figure 7. LLLW generation at ORNL. (ORNL-DWG. 94-5710)

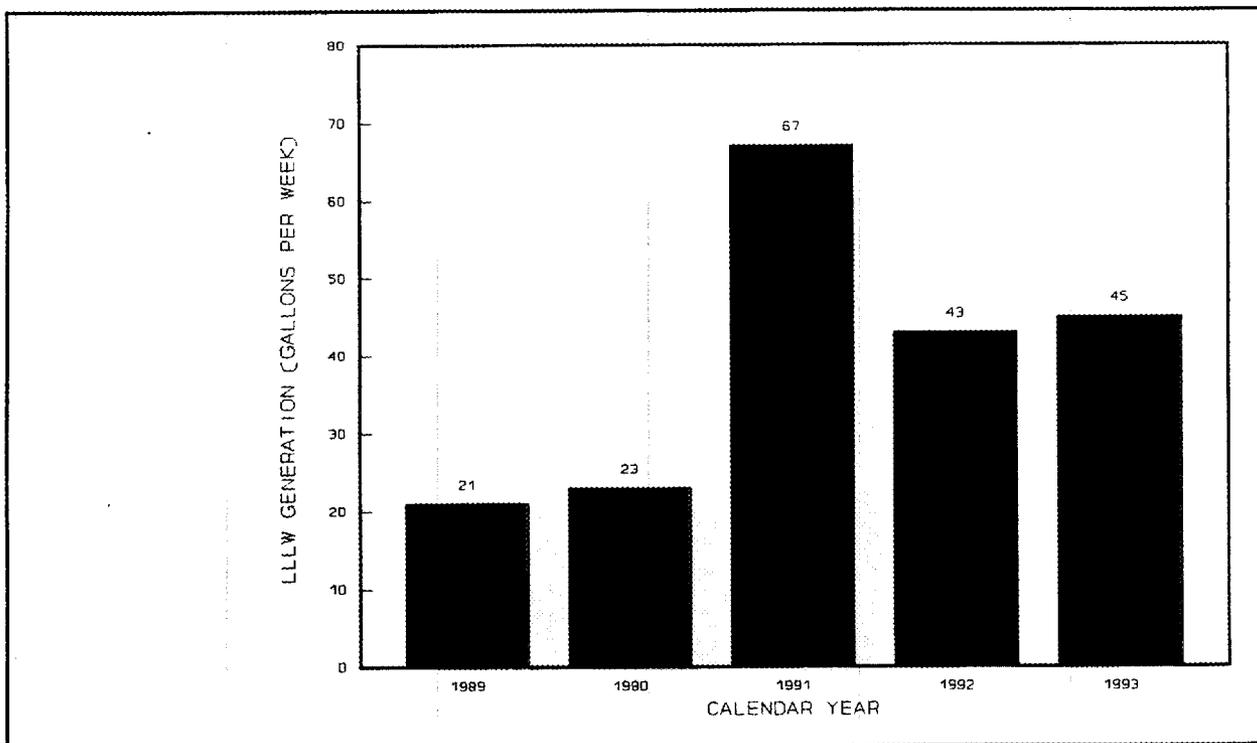


Figure 8. Building 2026 LLLW generation. (ORNL-DWG. 94-5711)

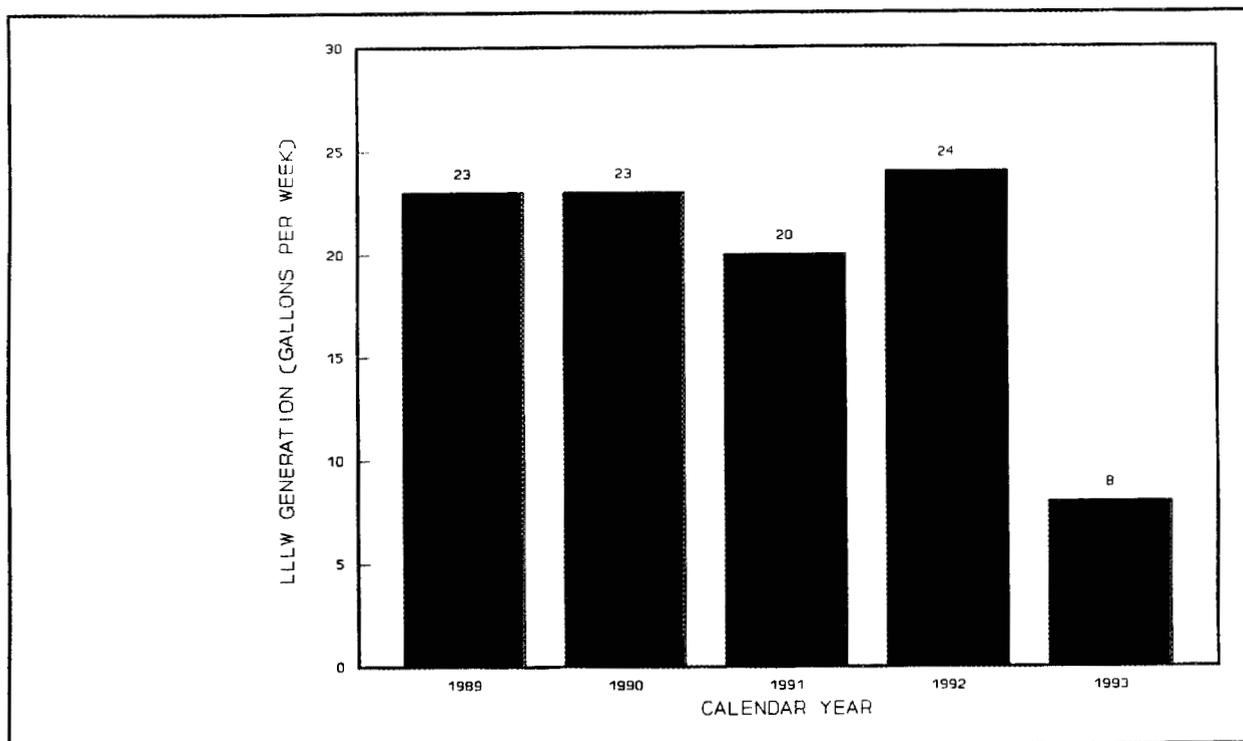


Figure 9. Building 3019 LLLW generation. (ORNL-DWG. 94-5712)

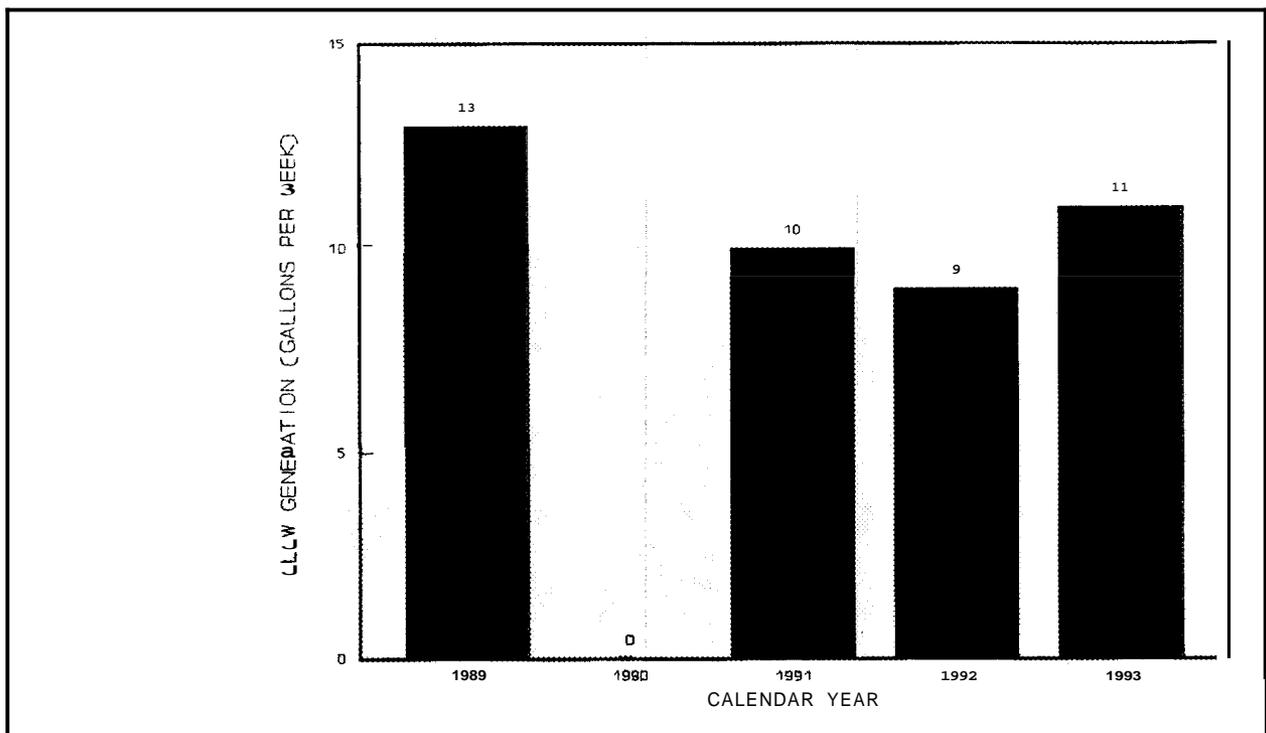


Figure 10. Building 3025 LLLW generation. (ORNL-DWG. 94-5713)

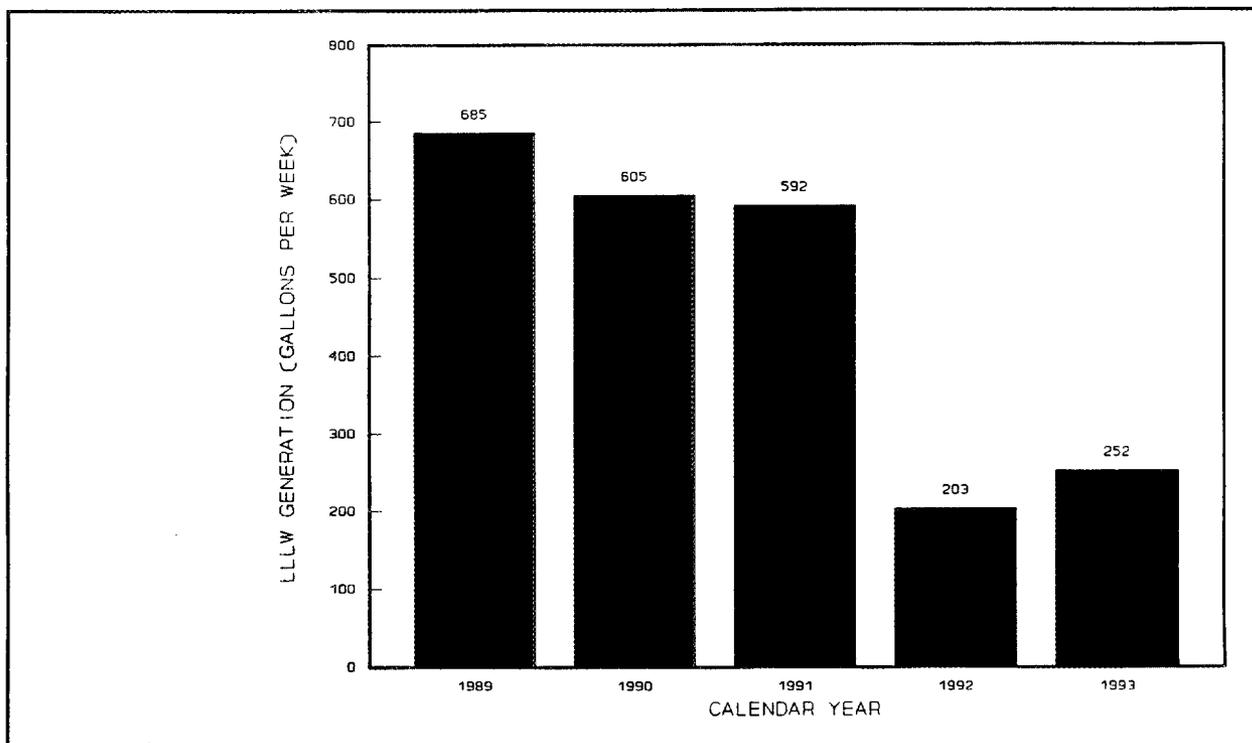


Figure 11. Building 3026-C LLLW generation. (ORNL-DWG. 94-5714)

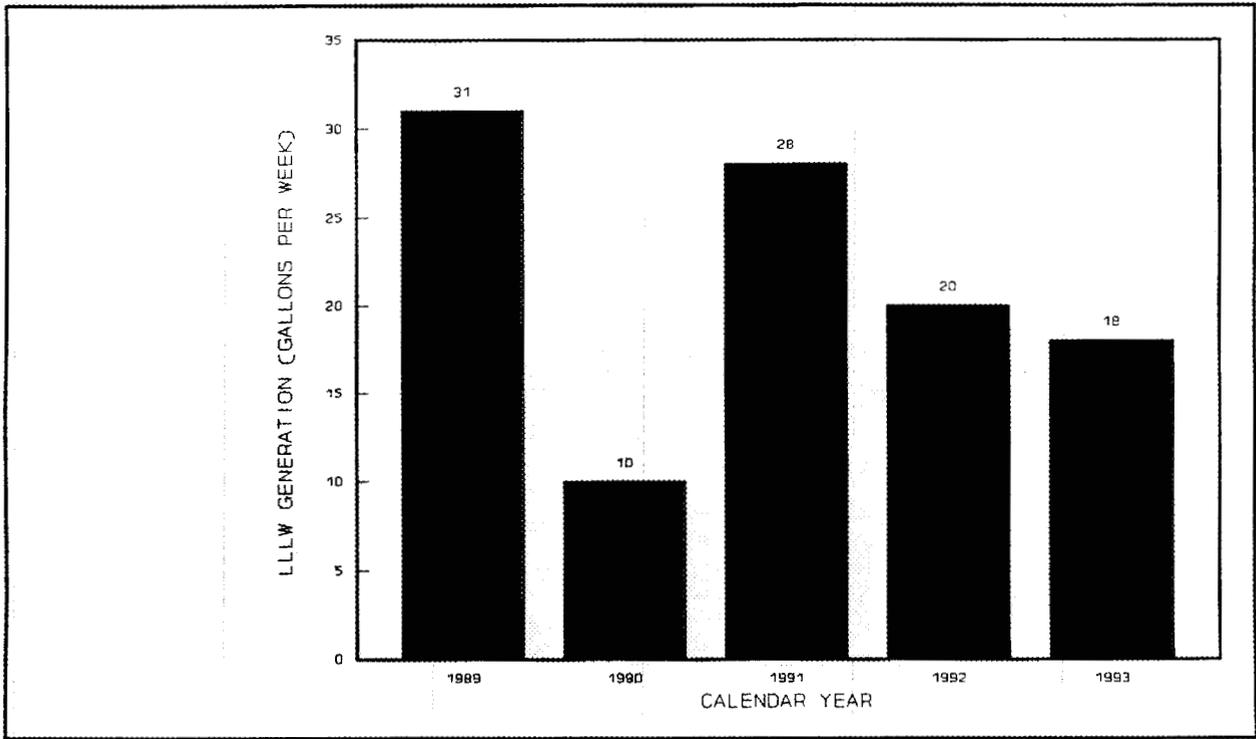


Figure 12. Building 3026-D LLLW generation. (ORNL-DWG. 94-5715)

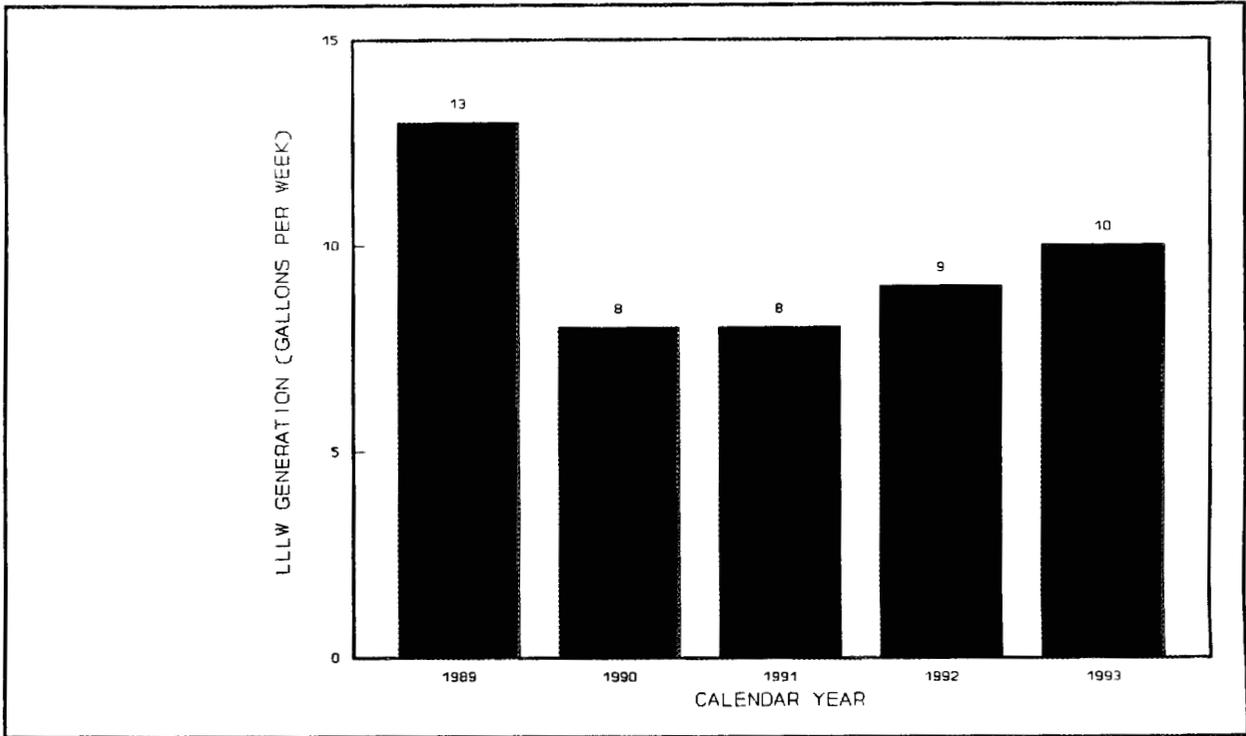


Figure 13. Building 3028 LLLW generation. (ORNL-DWG. 94-5716)

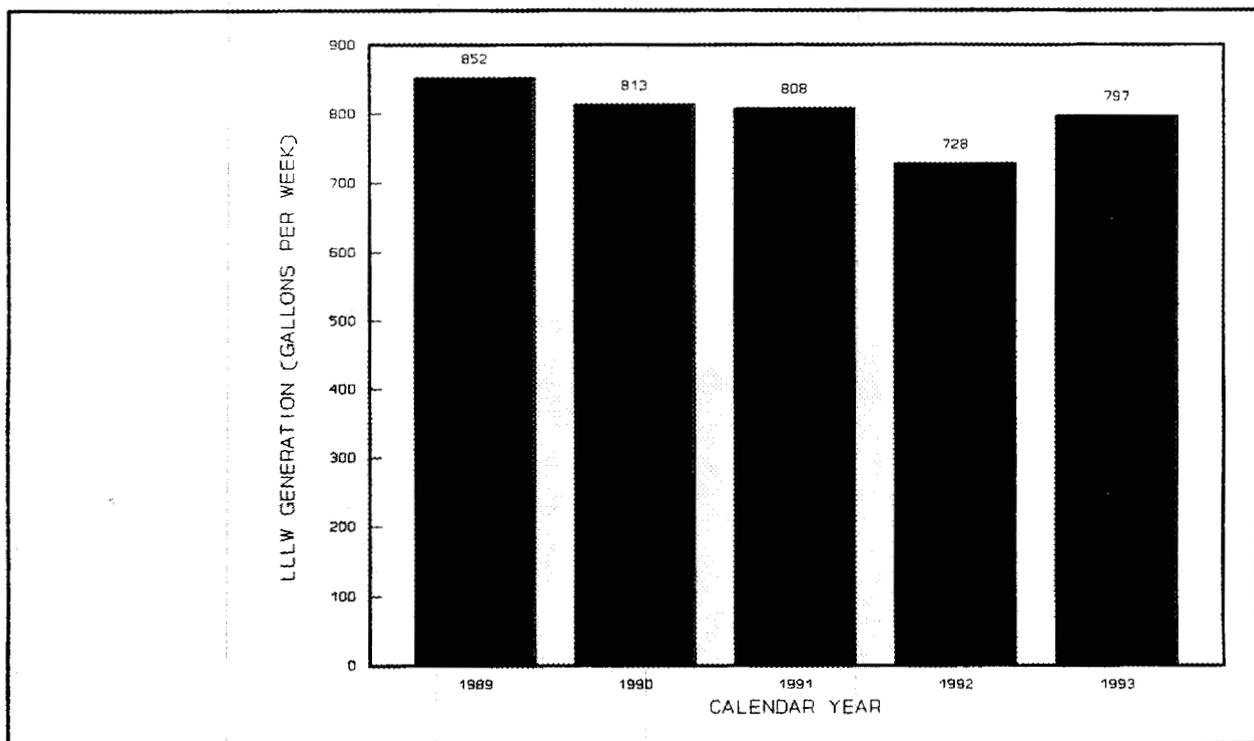


Figure 14. 3039 Stack Area LLLW generation. (ORNL-DWG. 94-5717)

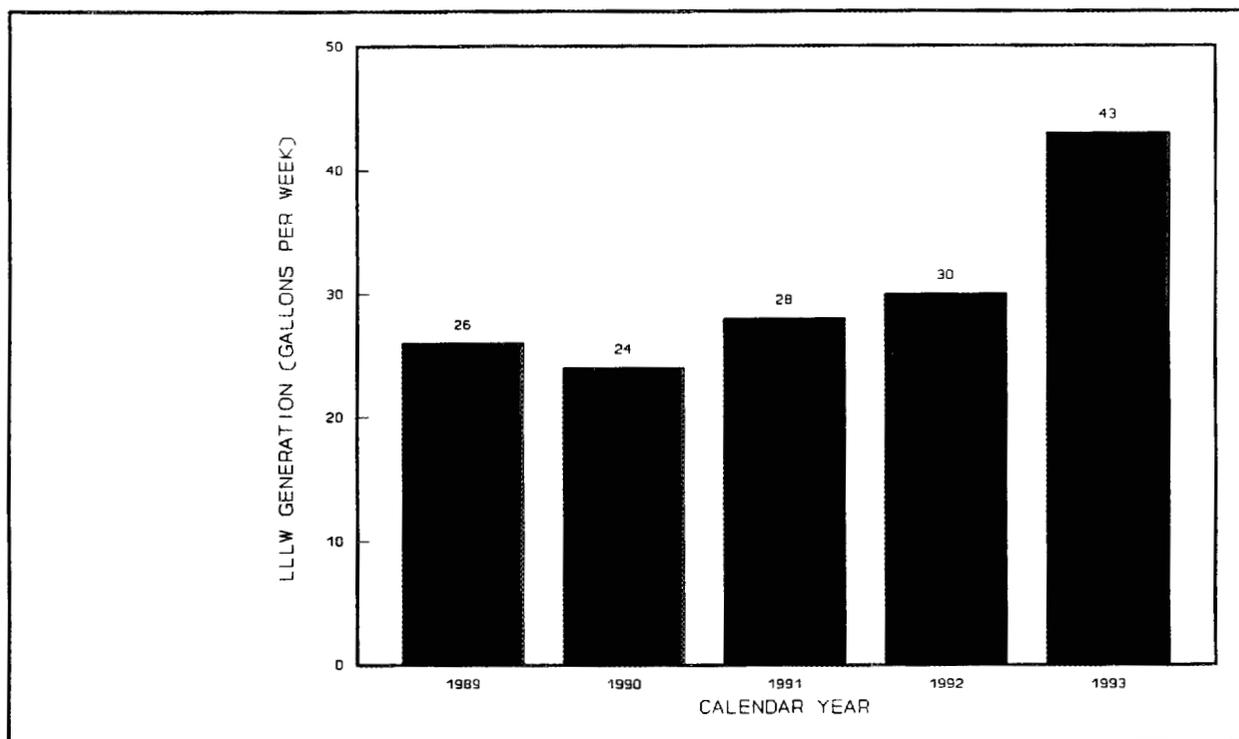


Figure 15. Building 3074 LLLW generation. (ORNL-DWG. 94-5718)

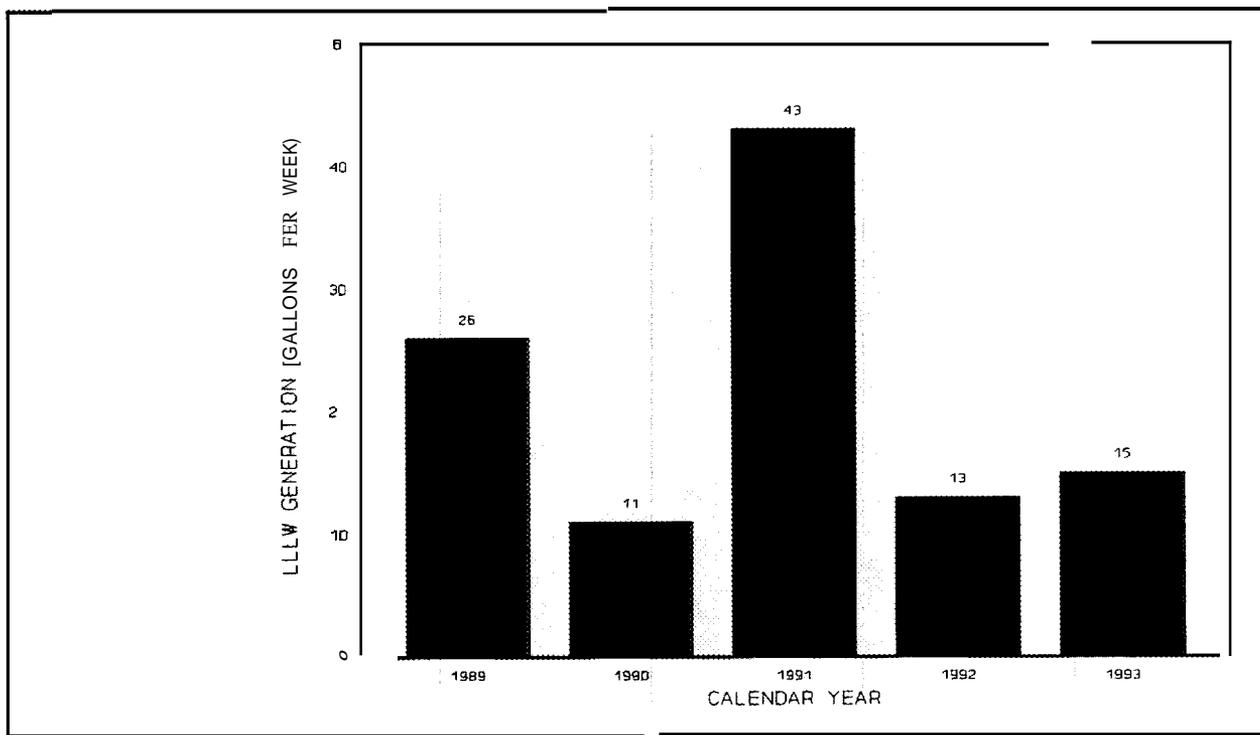


Figure 16. Building 3504 LLLW generation. (ORNL-DWG. 94-5719)

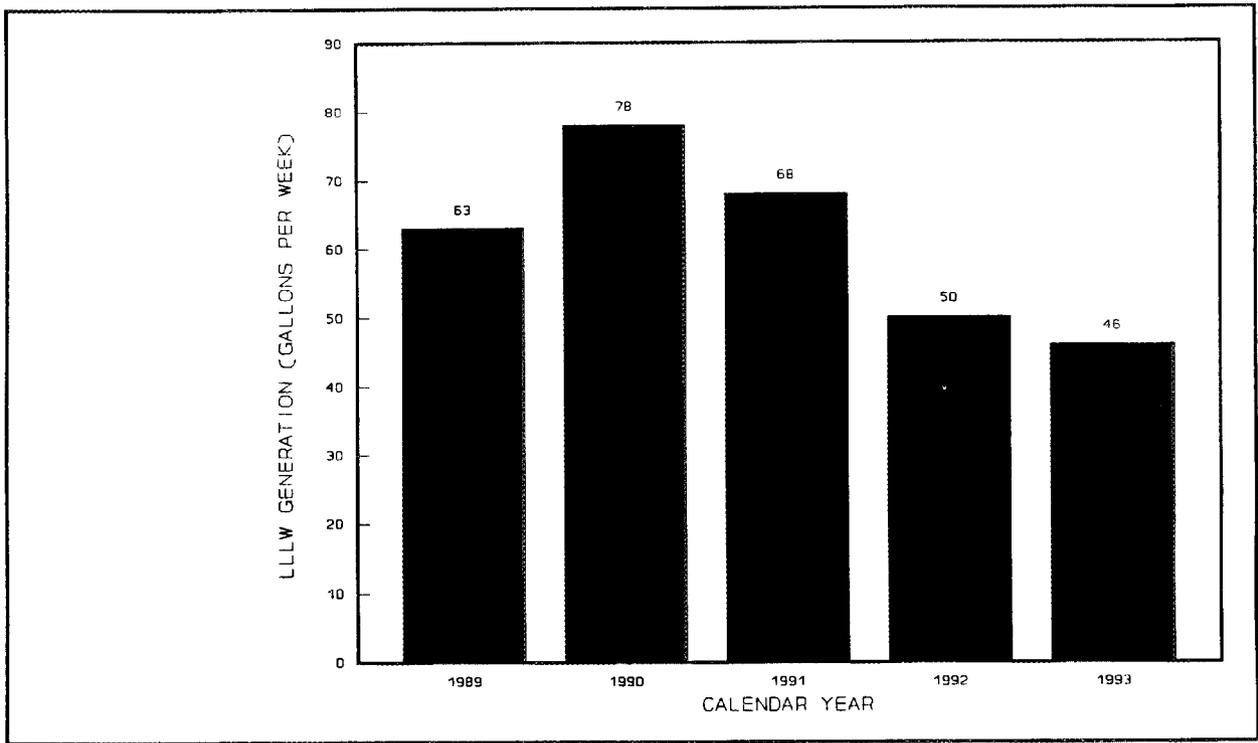


Figure 17. Building 3508 LLLW generation. (ORNL-DWG. 94-5720)

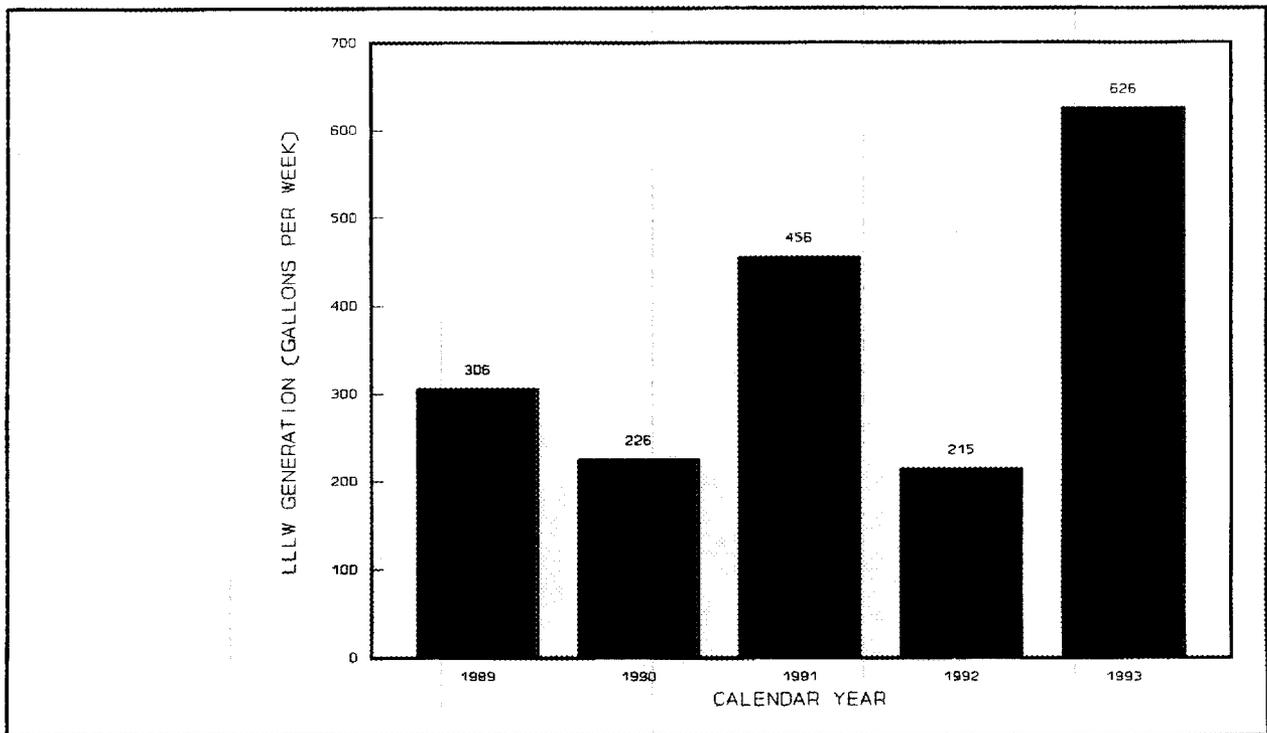


Figure 18. Building 3517 LLLW generation. (ORNL-DWG. 94-5721)

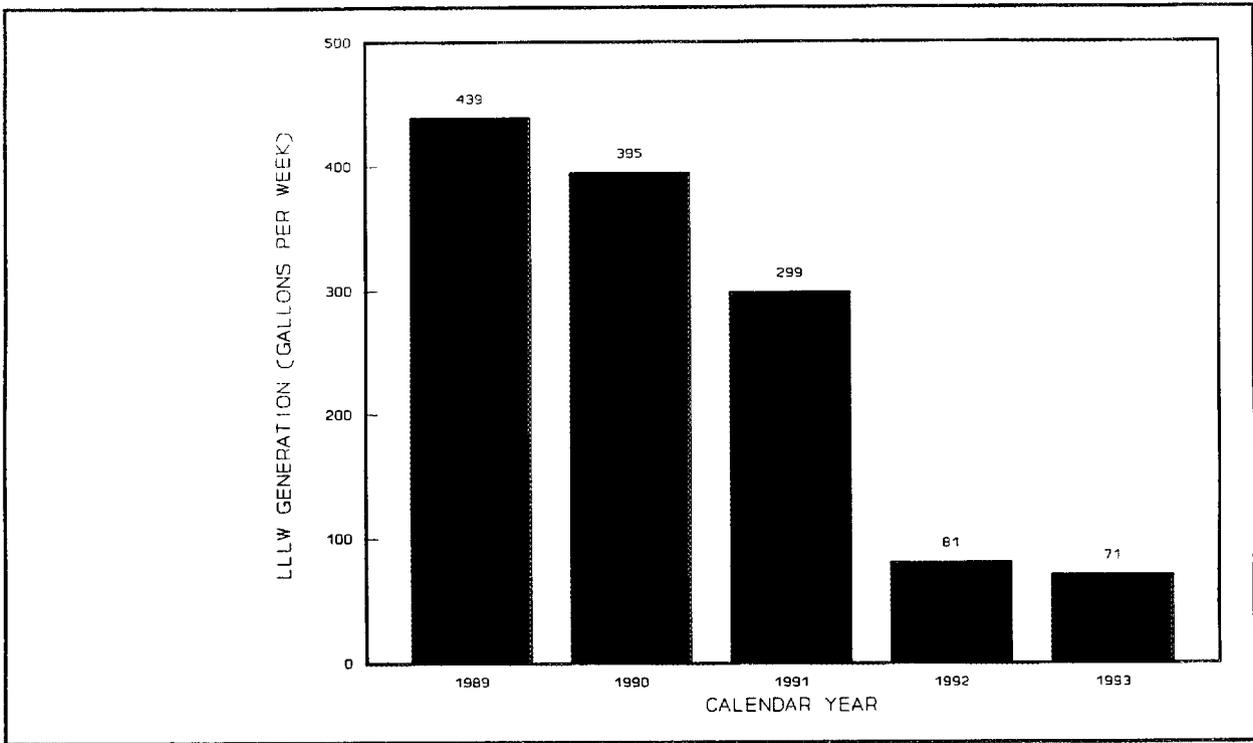


Figure 19. Building 3525 LLLW generation. (ORNL-DWG. 94-5722)

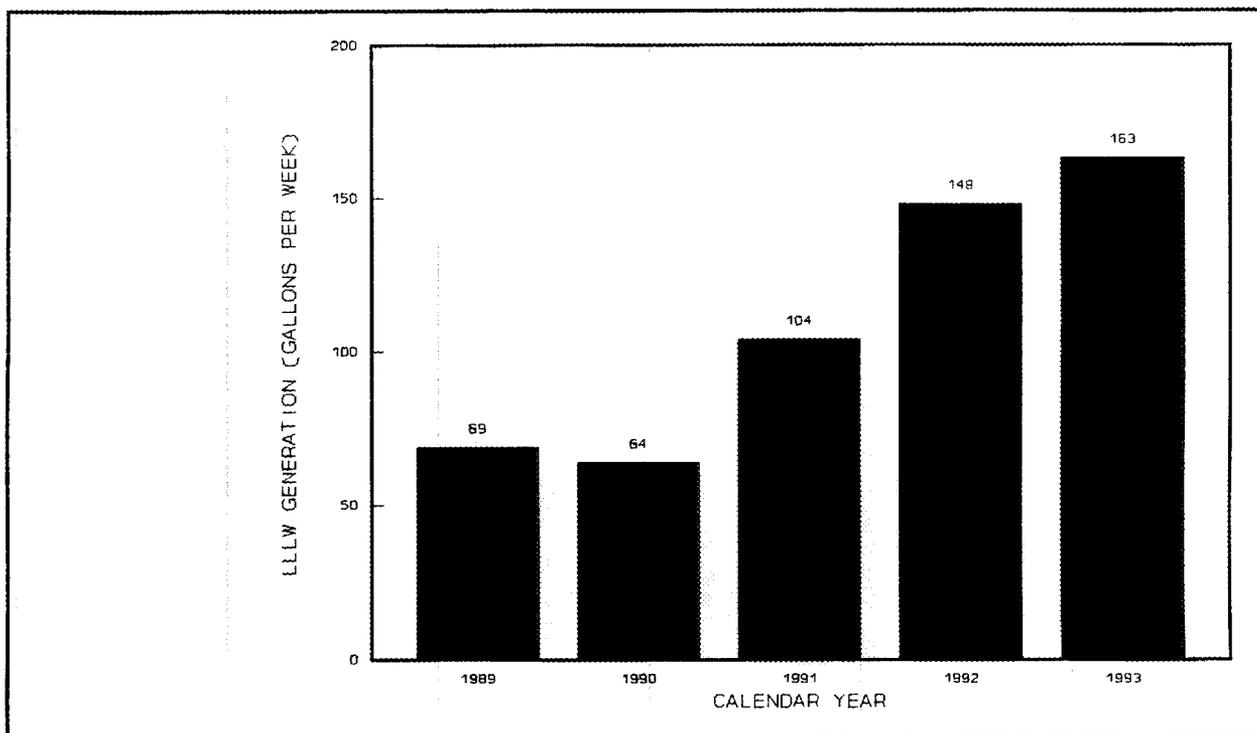


Figure 20. Building 3544 LLLW concentrate generation. (ORNL-DWG. 94-5723)

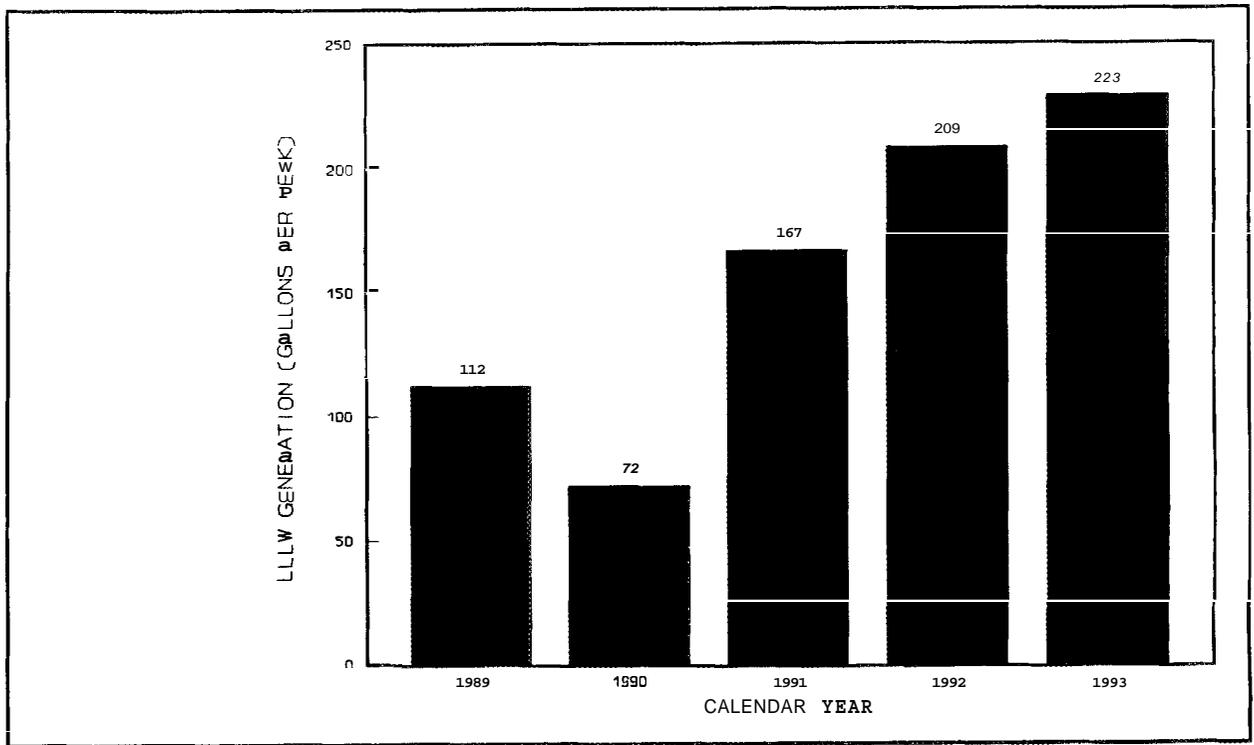


Figure 24. Building 3544 LLLW feed generation. (ORNL-DWG. 94-5724)

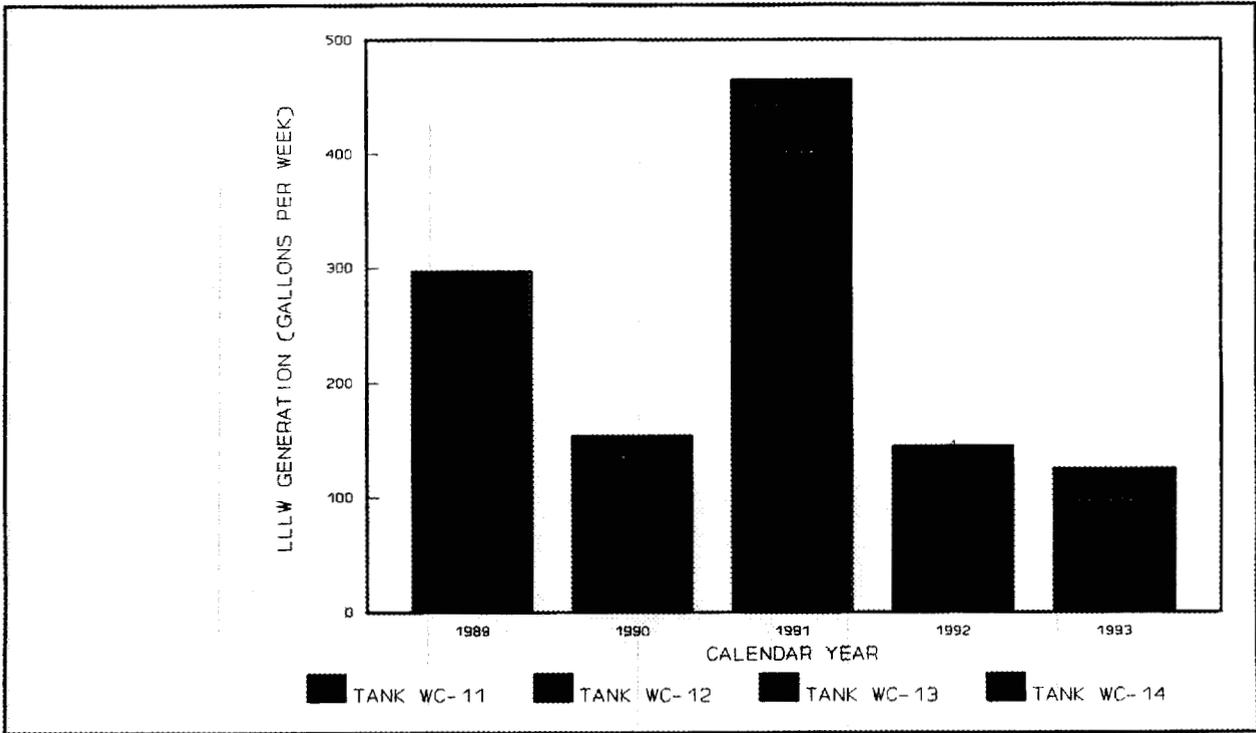


Figure 22. 4500 Complex LLLW generation. (ORNL-DWG. 94-5725)

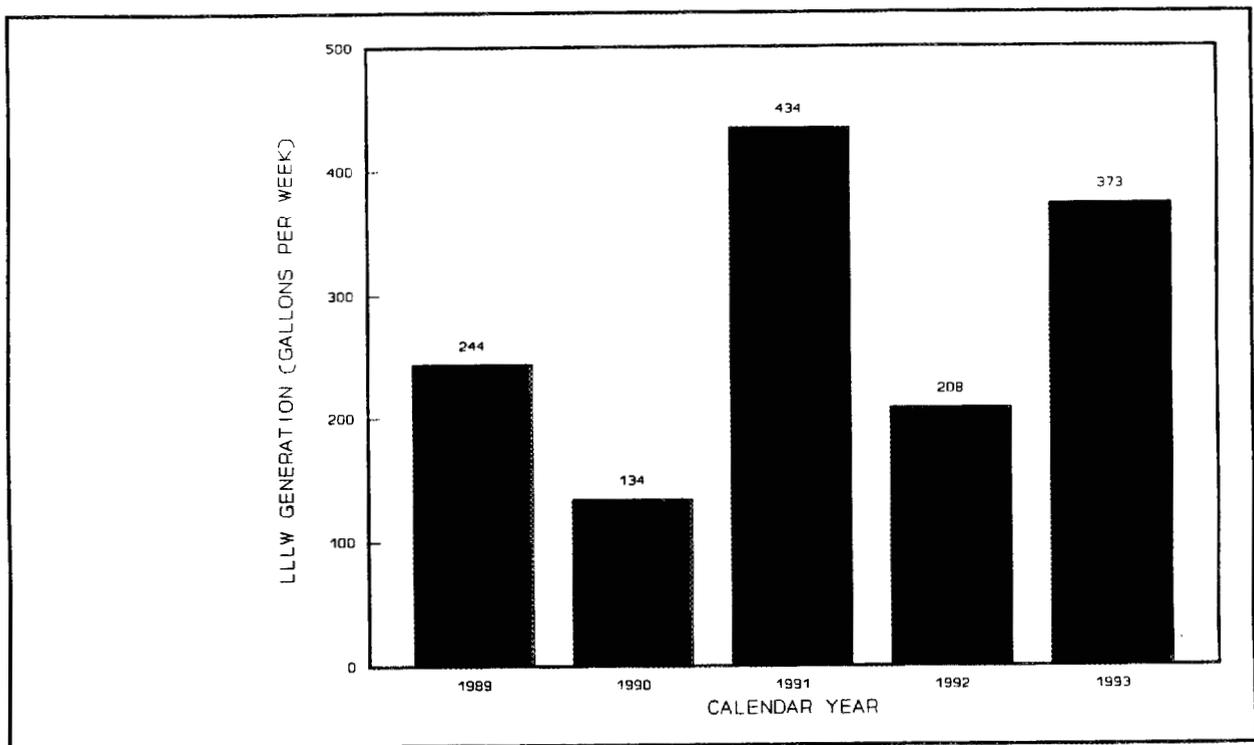


Figure 23. Isotopes Area LLLW generation. (ORNL-DWG. 94-5726)

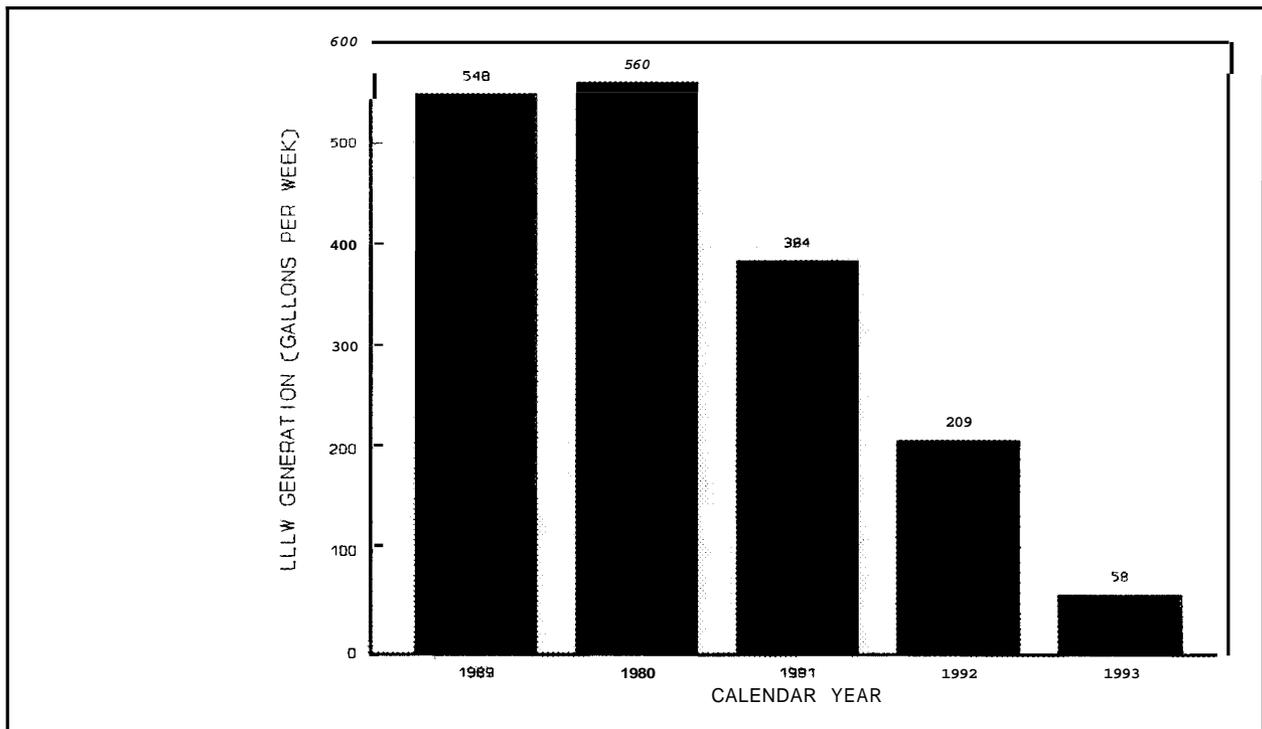


Figure 24. Reactors in Bethel Valley LLLW generation. (ORNL-DWG. 94-5727)

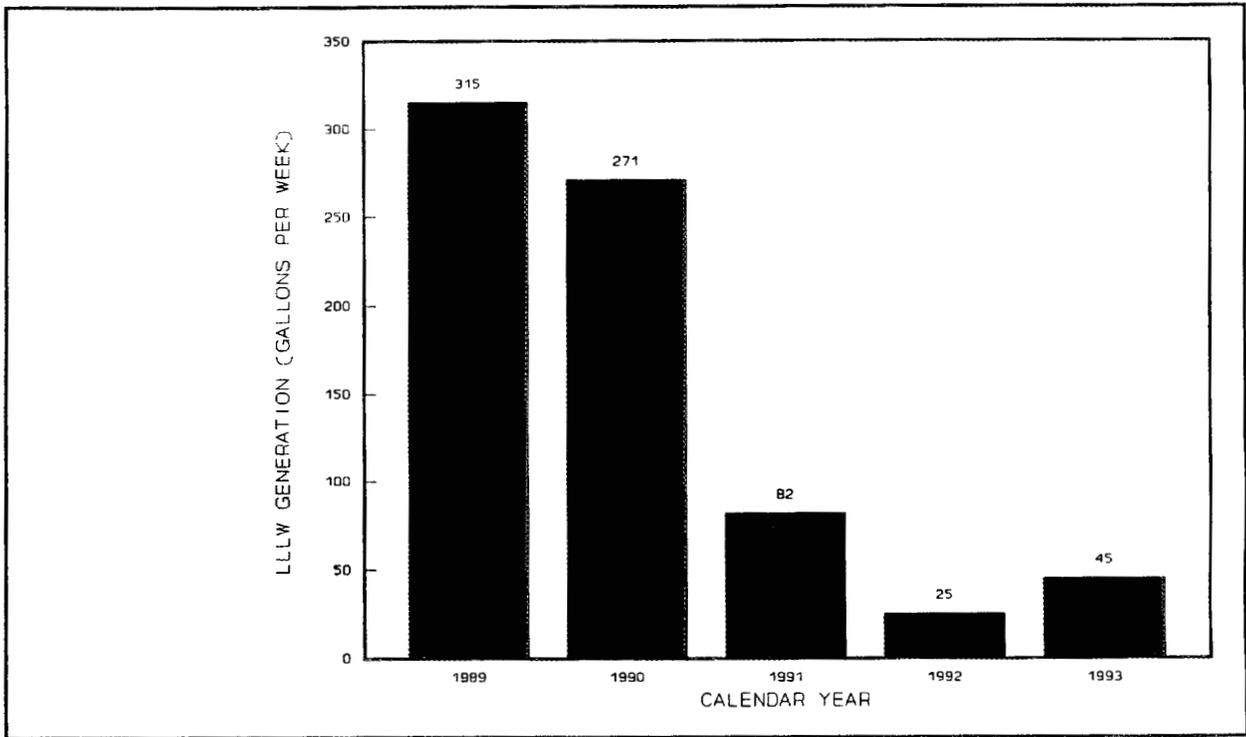


Figure 25. WC-5 Pump Pit (tank WC-8) LLLW generation. (ORNL-DWG. 94-5728)

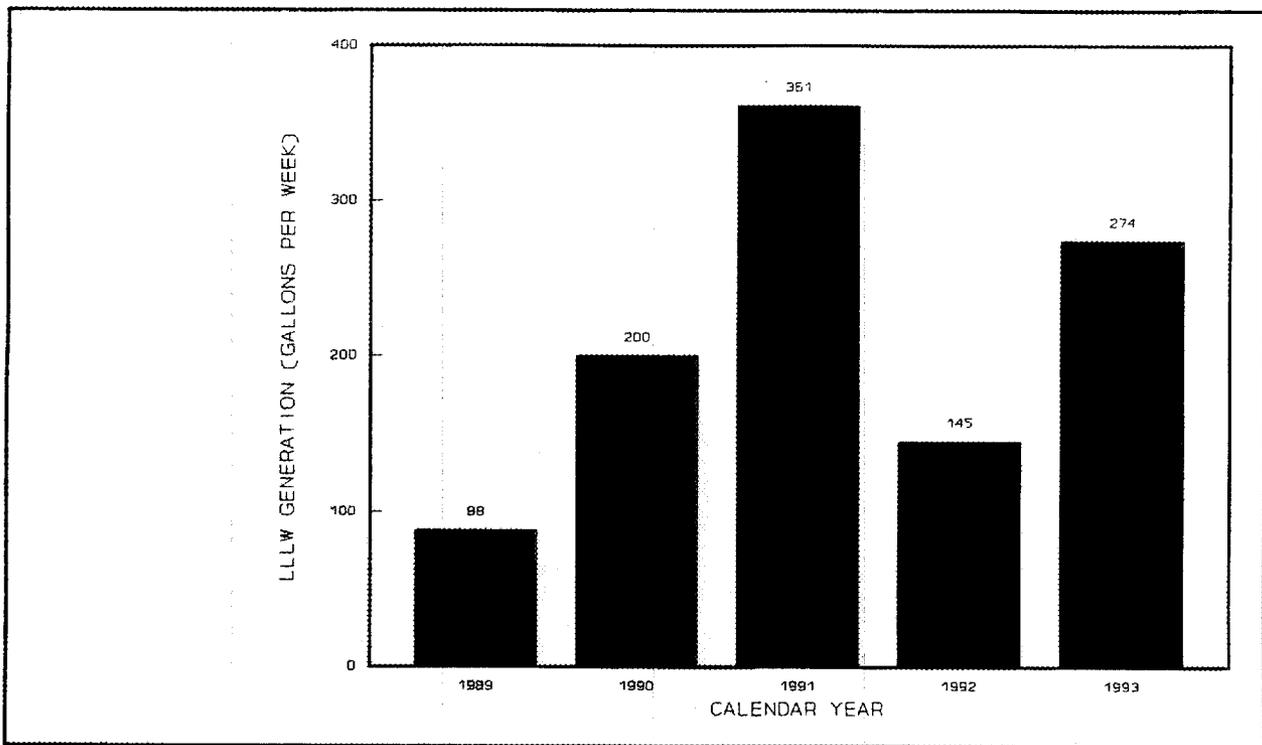


Figure 26

Figure 26. WC-5 Pump Pit (tank WC-9) LLLW generation. (ORNL-DWG. 94-5729)

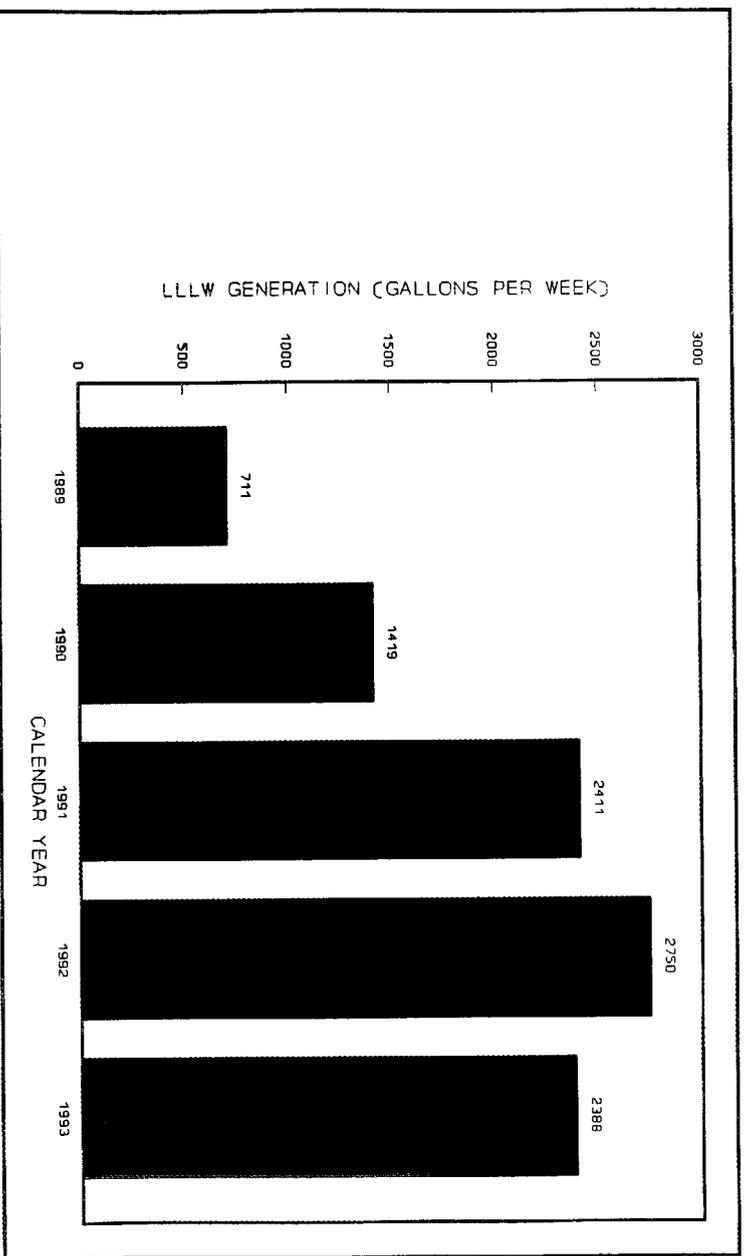


Figure 27. HFIR (Building 7900) LLLW generation. (ORNL-DWG. 94-5730)

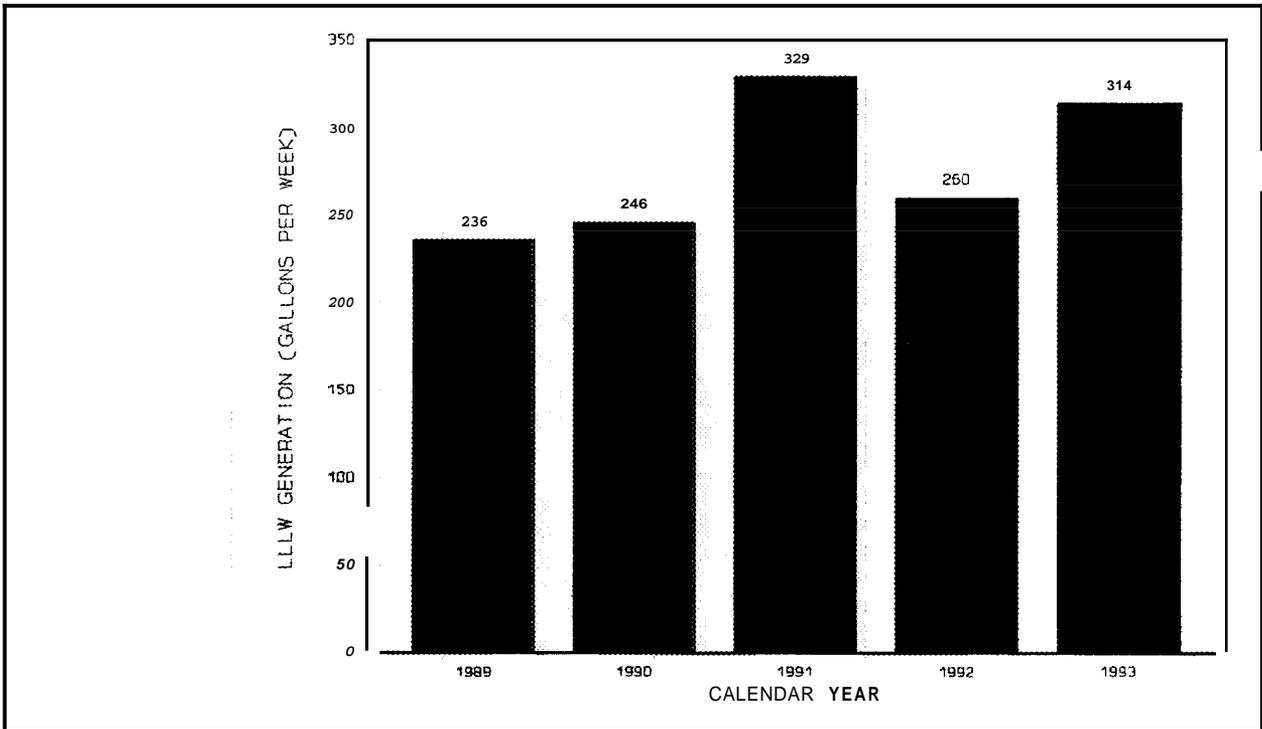


Figure 28. Building 7920 LLLW generation. (ORNL-DWG. 94-5731)

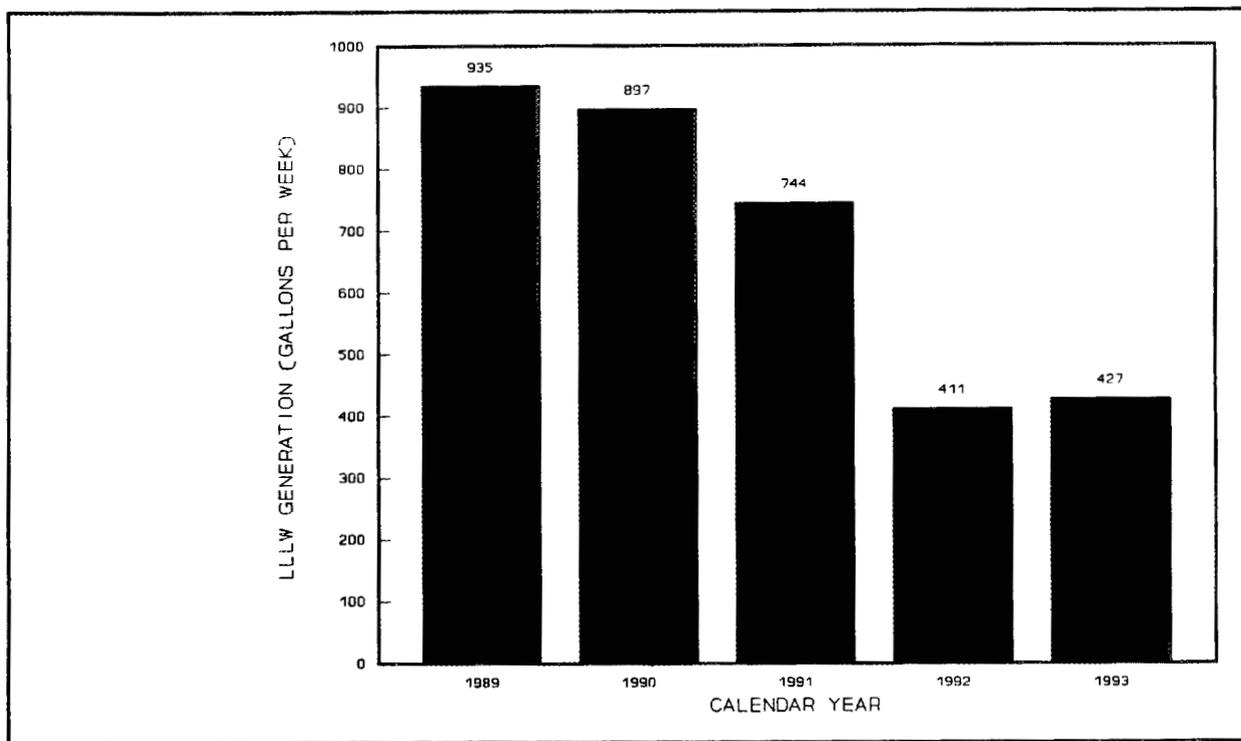


Figure 29. Abandoned tank W-1A LLLW generation. (ORNL-DWG. 94-5732)

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