TA-50

Department of Energy
Field Office, Albuquerque
Los Alamos Area Office
Los Alamos, New Mexico 87544

MAR 1 1995

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

RECEIVED
MAR _ 3 1995

Barbara Hoditschek, Program Manager
Hazardous Waste Permitting
Hazardous and Radioactive Materials Bureau
New Mexico Environment Department
525 Camino de los Marquez
Santa Fe, New Mexico 87502

Dear Ms. Hoditschek:

As per our earlier conversations, enclosed is a copy of the Los Alamos National Laboratory's (LANL) upgrades made to or proposed for the Controlled Air Incinerator. Included are justifications of why each does not trigger a modification to the permit. I have enclosed the supporting documentation that was requested when this issue was discussed with you and your staff. Also included is a listing of proposed changes to the permit for clarification or correction.

We are in the process of getting the appropriate engineer's certifications for these modifications. They will be submitted along with the formal request for modification once you and your staff have completed your classification determination.

Once a consensus is reached between the New Mexico Environment Department and LANL on the classification of each of the upgrades and permit modifications, we will prepare the formal request for permit modification. The formal request will contain a red-line/strike-out version of the affected parts of the permit, a clean insertable copy of the affected portions of the permit, and the appropriate engineer's certifications. We will prepare and issue a public notice (with the announcement of a 60-day public comment period), set up a public meeting, and make arrangements for the modifications to be available for public review as per the requirements of 270.42(c).

If you should have any questions or concerns about this submittal/request, please feel free to call me at (505) 665-5026.

Sincerely,

Jon Mack
Waste Management Program Manager
Office of Environment and Projects

LAAMEP:2JM-025

Enclosures

cc:
See page 2

8737

MAR 1 1995

cc w/o enclosures:
Jack Ellvinger, ESH-19, LANL,
MS-K490
Kathy Elsberry, CST-16, LANL,
MS-E517
Garth Reader, CST-16, LANL,
MS-E517
Alice Barr, ESH-19, LANL,
MS-K498
Paul Schumann, ESH-19, LANL,
MS-K498
ESH-19 File (95078.JEE), LANL,
MS-K490

Los Alamos
NATIONAL LABORATORY

Hazardous & Solid Waste Group
Environmental Protection
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

Date: February 21, 1995
In Reply Refer To: ESH-19:95-078
Mail Stop: K490
Telephone: (505) 667-0633

Jon Mack
ES&H Branch
US Department of Energy
Los Alamos Area Office
Los Alamos, New Mexico 87544

Dear Mr. Mack:

SUBJECT: LIST OF UPGRADES AND PERMIT MODIFICATIONS

Attached is a draft letter for your consideration. That letter is intended to transmit the list of upgrades and permit modifications for the Controlled Air Incinerator to the New Mexico Environment Department (NMED). This letter as we discussed earlier this week is requesting a classification determination by NMED.

Once NMED makes the classification determination and we are notified of that determination we will develop a formal request for modification. That formal request will contain the engineer's certification as required by the permit. That request will also trigger the transmittal of public notices and the announcement of a public meeting to discuss the proposed modifications.

I have coordinated this transmission with Kathy Elsberry and Garth Reader. If you should have any questions concerning this letter please call me at 667-0633.

Sincerely,

Jack Ellvinger
Hazardous & Solid Waste

JEE:es

Attachments (4)

Cy: Kathy Elsberry, CST-16, MS E517
Garth Reader, CST-16, MS E517
Alice Barr, ESH-19, MS K498
Paul Schumann, ESH-19, MS K498
CIC-10, MS A150
ESH-19 Circ. File

DRAFT
CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Barbara Hoditschek
Program Manager
Hazardous Waste Permitting
Hazardous and Radioactive Materials Bureau
New Mexico Environment Department
525 Camino de los Marquez
Santa Fe, New Mexico, 87504

Dear Ms. Hoditschek:

As per our earlier conversations attached is a copy of the Los Alamos National Laboratory's (LANL) upgrades made to or proposed for the Controlled Air Incinerator. Included are justifications of why each does not trigger a modification to the permit. I have attached the supporting documentation that was requested when this issue was discussed with you and your staff. Also included is a listing of proposed changes to the permit for clarification or correction.

We are in the process of getting the appropriate engineer's certifications for these modifications. They will be submitted along with the formal request for modification once you and your staff have completed your classification determination.

Once a consensus is reached between the New Mexico Environment Department and LANL on the classification of each of the upgrades and permit modifications, we will prepare the formal request for permit modification. The formal request will contain a red-line / strike-out version of the affected parts of the permit, a clean insertable copy of the affected portions of the permit, and the appropriate engineer's certifications. We will prepare and issue a public notice (with the announcement of a 60 day public comment period), set up a public meeting and make arrangements for the modifications to be available for public review as per the requirements of 270.42(c).

If you should have any questions or concerns about this submittal/request please feel free to contact either Jack Ellvinger at 667-0633 or myself at 665-5026.

Sincerely,

Jon Mack

Attachments (3)

Cy: Jack Ellvinger, ESH-19, MS K490
Kathy Elsberry, CST-16, MS E517
Garth Reader, CST-16, MS E517
Alice Barr, ESH-19, MS K490
Paul Schumann, ESH-19, MS K490
ESH-19 File (95078.JEE), MS K490

Proposed Modifications to the LANL RCRA Hazardous Waste Operating Permit for Mixed Waste Operations at the Controlled-Air Incinerator

16-Feb-95

ATTACHMENT	PAGE	SECTION	SUMMARY	MODIFICATION CLASS	CLASS CITATION
Attachment B	B-3	B.2	Change 1st sentence "The waste incinerator system building and Room 117 storage area are routinely" to "The controlled-air incinerator system building and Rooms 117 and 118 storage areas are routinely".	1	A.1
Attachment B	B-3	B.2	Change section title "TA-50 Waste Incinerator and Room 117 Storage Area Potential Problems" to "TA-50 Controlled-Air Incinerator and Rooms 115, 117, and 118 Storage Area Potential Problems"	1	A.1
Attachment B	B-4	B.2.3	Change "A copy is sent for records to HSE-8 and kept for" to "A copy is sent for records to ESH-19 and kept for"	1	A.1
Attachment B	B-6	B.5.1	Change "The TA-50 waste incinerator" to "The TA-50 controlled-air incinerator"	1	A.1

ATTACHMENT	PAGE	SECTION	SUMMARY	MODIFICATION CLASS	CLASS CITATION
Attachment B	B-7	B.5.1	Update the list of emergency communication equipment.	1	A.1
Attachment D	D-12	D.6.1	Add "(unless an electronic badge reader is in use)" after the phrase, "...the secretary will remove the personnel attendance roster that is located near the secretary's desk..."	1	A.1
Attachment D	Table		Under the first column, change "TA-50-37 Room 117 Storage Area" to "TA-50-37 Rooms 117 and 118 Storage Areas".	1	A.1
Attachment J	J-5	J.2.6.1	5th Para. Add "Rooms 117 and 118 are drained to the sump in Room 112 manually, if necessary".	1	A.1
Attachment J	J-5	J.2.6.2	1st Para. Delete "Selected controls and instrument readouts are also located at the incinerator main control panel and the liquid burner station at the incinerator".	1	A.1

ATTACHMENT	PAGE	SECTION	SUMMARY	MODIFICATION CLASS	CLASS CITATION
Attachment J	J-6	J.2.6.3.2	Add after the word "timer", " or a programmable logic controller".	1	A.1
Attachment J	J-6	J.2.6.3.4	Delete "the loading cycle timer is disabled and"	1	A.1
Attachment J	J-7	J.3.4	Change "HSE-7 maintains a safety" to "CST-27 maintains a safety ". Change "inspections of all HSE-7 facilities" to inspections of all CST waste management facilities". Change "A representative of HSE-3, Industrial Safety, is an ad hoc member" to "A	1	A.1
Attachment J	J-7	J.3.5.1	Change "Each person assigned to TDF operations receives a copy of" to "Each person assigned to TDF operations has access to a copy of"	1	A.1
Attachment J	J-7	J.3.5.1	Change "Standard Operating Procedures" to "Safe Operating Procedures". Change "Facility Operating Instructions (OIs)" to Facility Operating Procedures". Change "Process Operating Instructions (OIs)" to "Process Operating Procedures" Change "Utility O	1	A.1

ATTACHMENT	PAGE	SECTION	SUMMARY	MODIFICATION CLASS	CLASS CITATION
Attachment J	J-7	J.3.5.2	Change section title "Standard Operating Procedures" to "Safe Operating Procedures".	1	A.1
Attachment J	J-7	J.3.5.2	Change "Standard Operating Procedures" to "Safe Operating Procedures". Change "revisions to the HSE Division SOP Committee" to "revisions to the ESH Division SOP Committee".	1	A.1
Attachment J	J-8	J.3.5.3	Change paragraph ... "The building manager ...SWPs" to "The appropriate disciplines in Facilities Engineering (ENG-5), Health Physics Operations (ESH-1), Facility Risk Management (ESH-3), and Industrial Hygiene and Safety (ESH-5) review the SWPs.	1	A.1
Attachment J	J-8	J.3.5.4	Change section title "Operating Instructions" to "Detailed Operating Procedures".	1	A.1
Attachment J	J-8	J.3.5.4	Change paragraph "Operating Instructions (OIs)" to "Detailed Operating Procedures (DOPs)". Add "and/or review " after "Member's of the engineering staff". Change "OIs" to "DOPs". Change "section" to "Group"	1	A.1

ATTACHMENT	PAGE	SECTION	SUMMARY	MODIFICATION CLASS	CLASS CITATION
Module III	III-1	2	Change "c. Containers may be stored within storage Room 117 of the Controlled Air incinerator" to "c. Containers may be stored within storage Rooms 117 and 118 of TA-50-37".	1	A.1
Module III	III-3	3	Change section e. "...stored in Building 50-37, Room 117" to "...stored in Building 50-37, Rooms 117 and 118 combined".	1	A.1
Module V		FIGURE 8	Update Figure 8, CAI Process Diagram, to reflect changes to the pollution control equipment train.	1	A.3
Module V	40	F.9	Modification of the radioactivity monitoring requirement to allow for treatment of mixed waste.	3	L.5.b
Module V	43	I.5.b	Change "EID" to "NMED".	1	A.1

ATTACHMENT	PAGE	SECTION	SUMMARY	MODIFICATION CLASS	CLASS CITATION
Module V	43	J.3	To clarify the intent of the permit condition, insert "either" after "may be".	1	A.2
Module V	V-3	V.E	1. Delete text {, "Process Sump pH Out";} 2. Delete {, "Lower Chamber Temperature";} 3. Delete {, "Upper Chamber Temperature";} 6. Delete {, "Upper Chamber Oxygen";} 7. Delete {, "Final Flow Totalizer";}	1 (or 2)	A.1 (or L.5.c)
Module V	V-3	V.F.1	Change title - "Total Chloride Content" to "Total Chlorine Content"	1	A.2
Module V	V-4	V.F.5.b.	Change text from "...1400 degrees Fahrenheit, measured at the hot duct between the primary and secondary chambers" to "...1400 degrees Fahrenheit, measured at the entrance to the duct connecting the primary and secondary combustion chambers".	1	A.1
Module V	V-4	V.F.6.b.	Change text from "...controlled with either sodium hydroxide or potassium hydroxide to a pH range above 1.0 ± 3%" to "...controlled with either sodium hydroxide, potassium hydroxide, or magnesium chloride to pH range above 1.0."	1	A.1

ATTACHMENT	PAGE	SECTION	SUMMARY	MODIFICATION CLASS	CLASS CITATION
Module V	V-5	10	Change section title "Automatic Shutdown" to "Automatic Waste Feed Cutoff".	1	A.1
Module V	V-5	11.b.(4)	Change "The applicable Operating Instruction (OIs), Safe Operating Procedures, and/or Special Work Permit(s) required for the particular..." to "The applicable procedures, Safe Operating Procedures, and/or Special Work Permit(s) (SWPs) required for the	1	A.1
Module V	V-5	V.F.10.a.	Change "shutdown" to "discontinued".	1	A.1
Module V	V-5	V.F.10.b.	Change "automatic shutdown" to "automatic waste feed cutoff".	1	A.1
Module V	V-6	V.G.1.	Change "Ash resulting from a listed waste burn shall be cemented and disposed of off site as a hazardous waste." to "Ash resulting from a listed waste burn shall be stabilized or vitrified as defined by 40 CFR 268.42, Table 1, and disposed of off site a	1 (or 2)	A.1 (or 40 CFR 27

ATTACHMENT	PAGE	SECTION	SUMMARY	MODIFICATION CLASS	CLASS CITATION
Module V	V-6	V.H.4.	Change section title "Automatic Cutoff" to "Automatic Waste Feed Cutoff".	1	A.1

Changes, Upgrades, -Maintenance to the LANL Controlled-Air Incinerator

16-Feb-95

ID	TITLE	SYSTEM AFFECTED	DESCRIPTION	CATEGORY	Permit modification required???	JUSTIFICATION
7	**Absorption Column Maintenance**	Absorption Column	Replacement of packing with structured Hastelloy C-276 packing. Replacement packing has a higher specific surface area. References: Revised Part B Application; Kaiser Report	Maintenance	No	Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit.
6	**Absorption Column Size Increase**	Absorption Column	Column diameter increased from 24 inches to 30 inches. References: Revised Part B Application; Kaiser Report	Upgrade	No	Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit.
42	**Material Change**	Absorption Column	Material changed from FRP to Hastelloy. References: Revised Part B Application; Kaiser Report	Upgrade	No	Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit.

ID	TITLE	SYSTEM AFFECTED	DESCRIPTION	CATEGORY	Permit modification required???	JUSTIFICATION
8	**Scrub Solution Flow Increase**	Absorption Column	Increase in liquid flow rate 7 gpm to 20-25 gpm. References: Revised Part B Application; Kaiser Report	Process change	No	Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit.
18	**Ash Handling System Redesign**	Ash Handling System	Ash handling system modified from a vacuum removal and conveyance system to a gravity dropout and removal system. References: Revised Part B Application	Upgrade	No	Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit.
30	**Air Locks**	CAI Building	Personnel and material air locks are being added and roll up doors replaced to comply with DOE Order 6430.1A (Containment Criteria). References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	None	No	The change described does not pertain to the authorized unit as described in Permit Module V.

ID	TITLE	SYSTEM AFFECTED	DESCRIPTION	CATEGORY	Permit modification required???	JUSTIFICATION
43	**Ash Pit**	CAI Building	A pit to accomodate the gravity ash drop out and removal system has been constructed under the primary combustion chamber. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	None	No	The change described does not pertain to the authorized unit as described in Permit Module V.
39	**Building Exhaust**	CAI Building	New building exhaust fan expansion joints constructed to replace deteriorated joints. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	None	No	The change described does not pertain to the authorized unit as described in Permit Module V.
46	**Building HVAC**	CAI Building	Replacement of the existing building evaporative cooler with a mechanical chiller system. Ventilation control upgrades including new PLC based data aquisition and connection to main CAI control room for process area, high bay, and storage bay exhaust sy References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	None	No	The change described does not pertain to the authorized unit as described in Permit Module V.

ID	TITLE	SYSTEM AFFECTED	DESCRIPTION	CATEGORY	Permit modification required???	JUSTIFICATION
44	**Siesmic Upgrades**	CAI Building	TA-50-37 may be structurqally upgraded to withstand a more intense design earthquake. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	None	No	The change described does not pertain to the authorized unit as described in Permit Module V.
54	**Combustion Air Blower Replacement**	Combustion Chamber	Replacement of combustion air blowers with flanged units of same type (performed to allow for addition of HEPA filters to flange). Combustion air glovebox face removed. (Necessary due to control valve size changes occuring in this glovebox.) References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Upgrade	No	Replacement units are identical except for the flange. The change from indirect HEPA filtration of the glovebox to direct HEPA filtration on the blower provides filtration of combustion air equivalent to the previous condition (ie., functionally equivalent component change. 53 FR 37930, September 28, 1988)
47	**Hearth Sweep-out System Addition**	Combustion Chamber	IGOR (Integrated Glovebox-Operated Robotics) system for hearth sweep-out and inspection of PCC, SCC and main duct added. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Upgrade	No	The system upgrade is not used during incinerator operation (it is used mainly to clean ash off the incinerator hearth). Therefore it has no effect on DRE or any other relevant incinerator parameters.

ID	TITLE	SYSTEM AFFECTED	DESCRIPTION	CATEGORY	Permit modification required???	JUSTIFICATION
86	**Liquid Injection Burner Modification**	Combustion Chamber	The high-intensity vortex liquid burner will be enclosed in a glovebox to provide containment when servicing the component. Due to space limitations, the burner must be altered from the original design. The new burner has been specfied to function exactly as the former burner design, and testing and third-party verification of equivalent performance will be perfromed and provided. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Upgrade	No	This component is specified to perform exactly as the unit which it replaces. Replacement of components with functionally equivalent components does not require a modification unless a permit condition is affected (53 FR 37930, September 28, 1988).
59	**Flow Meter Replacement**	Combustion Chambers	Replacement of combustion air and natural gas flow indicators (hot wire anemometers) with venturi flow tubes and Foxboro flow totalizers. References: Revised Part B Application	Maintenance	No	Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit.
14	**Lower Burner Removal**	Combustion Chambers	Removal of primary combustion chamber gas-fired lower burner, because of the addition of the liquid injection vortex burner. References: Revised Part B Application	Process change	No	Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit.

ID	TITLE	SYSTEM AFFECTED	DESCRIPTION	CATEGORY	Permit modification required???	JUSTIFICATION
33	**Demister Relocation**	Demister	Move demister closer to absorber column and replace with Hastelloy unit. References: Revised Part B Application; Kaiser Report	Upgrade	No	Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit.
34	**Heat Exchanger Addition**	Heat Exchanger	Addition of heat exchanger to scrub solution recycle. References: Revised Part B Application; Kaiser Report	Upgrade	No	Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit.
38	**Material Change**	Heat Exchanger	Material and size change on existing process liquid heat exchanger. References: Revised Part B Application	Upgrade	No	Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit.

ID	TITLE	SYSTEM AFFECTED	DESCRIPTION	CATEGORY	Permit modification required???	JUSTIFICATION
52	**HEPA Bank Addition**	HEPA Filters	Second stage HEPA filter bank duplicated with the addition of a parallel filter plenum. References: Revised Part B Application; Kaiser Report	Upgrade	No	Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit.
53	**HEPA Filter Housing Redesign**	HEPA Filters	Redesign and replacement of HEPA filter housing by placing filters in separate, individually accessible enclosures. References: Revised Part B Application	Upgrade	No	Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit.
49	**Material Change**	HEPA Filters	Third-stage HEPA to be moved and housing replaced with 316L stainless steel. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Maintenance	No	Material substitution as part of normal maintenance. Unit moved physically, but not relative to other unit processes; therefore the process and process diagram does not change.
51	**Backup Power**	Instrumentation and Controls	A new uninterruptible power supply and new transfer switching equipment have been installed to replace aging battery packs. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Maintenance	No	Maintenance items are not modifications (53 FR 37924, September 28, 1988).

ID	TITLE	SYSTEM AFFECTED	DESCRIPTION	CATEGORY	Permit modification required???	JUSTIFICATION
15	**Burner Control Logic Enhancement**	Instrumentation and Controls	Addition of control loop to compensate for changes in the liquid waste supply which will adjust for differing liquid waste combustion air requirements. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Upgrade	No	Replacement of equipment with functionally equivalent components is a modification only if the permit is affected by such change. Addition of automatic process control to formerly manually or mechanically operated system is a functionally equivalent component replacement. (53 FR 37930, September 28, 1988)
2	**Burner Control Logic Enhancement**	Instrumentation and Controls	Addition of lead-lag logic control for fuel-to-air ratio control to compensate for sluggish air supply response versus rapid fuel supply response. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Upgrade	No	Replacement of equipment with functionally equivalent components is a modification only if the permit is affected by such change. Addition of automatic process control to formerly manually or mechanically operated systems is a functionally equivalent component replacement. (53 FR 37930, September 28, 1988)
16	**Burner Control Logic Enhancement**	Instrumentation and Controls	Removal of mechanical linkage control of fuel and combustion air so these may be controlled independently and automatically. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Upgrade	No	Replacement of equipment with functionally equivalent components is a modification only if the permit is affected by such change. Addition of automatic process control to formerly manually or mechanically operated system is a functionally equivalent component replacement. (53 FR 37930, September 28, 1988)

ID	TITLE	SYSTEM AFFECTED	DESCRIPTION	CATEGORY	Permit modification required???	JUSTIFICATION
56	**Burner Control Logic Enhancement**	Instrumentation and Controls	Addition of control loop relating liquid waste feed to equivalent natural gas feed rate. Will ensure that neither heat capacity nor combustion air capacity of burner is exceeded. (Previously performed manually.) References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Upgrade	No	Replacement of equipment with functionally equivalent components is a modification only if the permit is affected by such change. Addition of automatic process control to formerly manually or mechanically operated systems is a functionally equivalent component replacement. (53 FR 37930, September 28, 1988)
21	**Combustion Chamber O2 Monitor**	Instrumentation and Controls	Replacement of O2 monitors in the primary and secondary combustion chambers. The RCRA operating permit requires monitoring of upper (secondary) chamber oxygen monitoring. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Maintenance	No	Maintenance items are not modifications (53 FR 37924, September 28, 1988).
66	**Combustion Gas Monitor Removal**	Instrumentation and Controls	Removal of combustion gas monitor in the combustion gas glovebox, due to removal of the glovebox front. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Upgrade	No	This monitor was removed because the combustion blower glove box face has been remmoved. Therefore, combustion gases cannot accumulate and cause an explosion hazard. (The combustion gas monitor was an alarm type indicator.) There is no permit condition or monitoring requirement

ID	TITLE	SYSTEM AFFECTED	DESCRIPTION	CATEGORY	Permit modification required???	JUSTIFICATION
68	**Control System Upgrade**	Instrumentation and Controls	Replacement of mechanical process recorders and controllers with multipoint digital controllers. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Upgrade	No	Replacement of equipment with functionally equivalent components is a modification only if the permit is affected by such change. Replacement of mechanical-based control system with software-based control systems is a functionally equivalent component replacement.
69	**Control System Upgrade**	Instrumentation and Controls	Change in offgas pressure control valve control logic from feedback to feed forward-based control. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Upgrade	No	This change in the control logic changes the response time of the pressure control valve, making response quicker, and causes less flucuation in valve response. Valve function is not otherwise affected. (Functionally equivalent component change. 53 FR 37930, September 28,
67	**Control System Upgrade**	Instrumentation and Controls	Replacement of mechanical relay-based control logic with a Programmable Logic Controller (PLC). The PLC will control some of the critical system interlocks and provide data aquisition. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Upgrade	No	Replacement of equipment with functionally equivalent components is a modification only if the permit is affected by such change. Replacement of mechanical-based control systems with software-based control systems is a functionally equivalent equipment replacement. (53 FR 37930, September 28, 1988)
48	**Control Systems Upgrade**	Instrumentation and Controls	pH meters on the scrub solution recycle line are being moved to new locations to provide better data aquisition and parameter control. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Maintenance	No	Maintenance items are not modifications (53 FR 37924, September 28, 1988).

ID	TITLE	SYSTEM AFFECTED	DESCRIPTION	CATEGORY	Permit modification required???	JUSTIFICATION
29	**Control Valve Replacement**	Instrumentation and Controls	Replacement of control valves on the combustion air and natural gas supply lines with new control valves. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Maintenance	No	Maintenance items are not modifications (53 FR 37924, September 28, 1988).
11	**Cooling Loop Breakthrough Detection**	Instrumentation and Controls	A conductivity meter has been installed on the secondary cooling water loop to detect breakthrough or leaking from the process scrub system. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Maintenance	No	Maintenance items are not modifications (53 FR 37924, September 28, 1988).
45	**Electrical Rewiring**	Instrumentation and Controls	Entire electrical system rewired to separate high voltage and low voltage instrument wiring in order to eliminate induced signals. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Maintenance	No	Maintenance items are not modifications (53 FR 37924, September 28, 1988).
55	**Flow Meter Replacement**	Instrumentation and Controls	A new gyroscopic/coriolis mass flow meter installed on the liquid feed line to provide instantaneous readings of liquid waste flow to the high intensity vortex burner. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Maintenance	No	Maintenance items are not modifications (53 FR 37924, September 28, 1988).

ID	TITLE	SYSTEM AFFECTED	DESCRIPTION	CATEGORY	Permit modification required???	JUSTIFICATION
87	**Flowmeter Addition**	Instrumentation and Controls	A venturi flowmeter with mass calculator was added to the main ram glovebox to measure air in-leakage into the incinerator during box feed operations and during liquid feed operations. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Upgrade	No	Addition of this monitor is for additional data gathering capability outside of the permit monitoring requirements. This change has no effect on the permit or any permit monitoring conditions.
10	**Flowmeter Replacement**	Instrumentation and Controls	Flow meters on the scrub solution recycle system have all been replaced with gyroscopic/coriolis mass flowmeters. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Maintenance	No	Maintenance items are not modifications (53 FR 37924, September 28, 1988).
23	**HEPA Filter Pressure Drop Meassurement**	Instrumentation and Controls	Individual differential pressure gauges added to each HEPA filter to detect blinding and breakthrough. Formerly, pressure drop was measured across the filter plenum, not individual filters. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Maintenance	No	Maintenance items are not modifications (53 FR 37924, September 28, 1988).

ID	TITLE	SYSTEM AFFECTED	DESCRIPTION	CATEGORY	Permit modification required???	JUSTIFICATION
22	**Instrument Air Supply**	Instrumentation and Controls	Instrument air compressor replaced by Ingersoll Rand duplex compressor specifically designed for instrument air systems. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Maintenance	No	Maintenance items are not modifications (53 FR 37924, September 28, 1988).
17	**Neutron Monitors**	Instrumentation and Controls	Addition of neutron monitors in the CAI process area, external to the CAI process volume. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	None	No	The change described does not pertain to the authorized unit as described in Permit Module V.
60	**Offgas Alpha-Beta Monitor**	Instrumentation and Controls	Addition of offgas continuous alpha-beta monitor, for compliance with the RCRA permit monitoring requirement. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Upgrade	No	Monitor added to comply with permit monitoring condition. Equipment added is a requirement and does not affect the permit or the monitoring condition.
72	**Offgas CO/CO2/H2O Monitor**	Instrumentation and Controls	Addition of an offgas CO/CO2/H2O. This is to comply with the RCRA permit monitoring requirement for CO monitoring. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Upgrade	No	Monitor added to comply with permit monitoring condition. Equipment added is a requirement and does not affect the permit or the monitoring condition.

ID	TITLE	SYSTEM AFFECTED	DESCRIPTION	CATEGORY	Permit modification required???	JUSTIFICATION
64	**Offgas NO/NOx/SO2 Monitor**	Instrumentation and Controls	Addition of an offgas NO/NOx/SO2. There is no RCRA permit monitoring requirement. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Upgrade	No	Addition of this monitor is for additional data gathering capability outside of the permit monitoring requirements. This change has no effect on the permit or any permit monitoring conditions.
63	**Offgas Total Hydrocarbon Monitor**	Instrumentation and Controls	Addition of an offgas total hydrocarbon monitor to comply with the RCRA permit monitoring requirement. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Upgrade	No	Monitor added to comply with permit monitoring condition. Equipment added is a requirement and does not affect the permit or the monitoring condition.
74	**Carbon Adsorber Redesign**	Misc. APC Systems	Replacement of the carbon adsorber unit with a redesigned, dual-pass annular design unit constructed of Hastelloy C-22 and AL-6XN. Performance of the replacement unit has been modeled and determined to be functionally superior to the old unit. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Upgrade	No	Replacement of equipment with functionally equivalent components is a modification only if the permit is affected by such change. The new unit is functionally equivalent to the one it replaces and does not affect any aspect of the permit.

ID	TITLE	SYSTEM AFFECTED	DESCRIPTION	CATEGORY	Permit modification required???	JUSTIFICATION
73	**Flow Straightener Addition**	Misc. APC Systems	Addition of flow straighteners downstream of the HEPA bank and between the I.D. blowers and offgas flow meter. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Upgrade	No	Addition of flow straighteners is required by the monitoring instruments which have also been added in order to meet permit monitoring requirements. The addition does not affect the permit or any monitoring conditions.
26	**Material Change**	Misc. APC Systems	Replacement of sampling trombone with identical unit constructed of AL-6XN. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Maintenance	No	Maintenance items are not modifications (53 FR 37924, September 28, 1988).
25	**Material Change**	Misc. APC Systems	Change in offgas ducting not otherwise mentioned with ducts constructed of AL-6XN, in addition to minor rerouting. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Maintenance	No	Maintenance items are not modifications (53 FR 37924, September 28, 1988).
77	**NESHAPS Sampling Train Upgrade**	Misc. APC Systems	Possible changes to stack-gas sampling train to comply with NESHAPS sampling requirements. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	None	No	The NESHAPS stack-gas sampling train is not addressed by the RCRA operating permit, nor are the analytical results used to comply with any RCRA permit monitoring conditions.

ID	TITLE	SYSTEM AFFECTED	DESCRIPTION	CATEGORY	Permit modification required???	JUSTIFICATION
71	**Piping Change**	Misc. APC Systems	Possible addition of offgas superheater drain valve, in order to drain off accumulated condensation for the prevention of internal corrosion of the unit. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Maintenance	No	Maintenance items are not modifications (53 FR 37924, September 28, 1988). There is no change in function or capacity associated with this change.
76	**Sampling Duct Expansion**	Misc. APC Systems	Added expanded sampling duct section on the sampling trombone and stack. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Upgrade	No	This addition is required by the monitoring instruments which have also been added in order to meet permit monitoring requirements. The addition does not affect the permit or any monitoring conditions.
31	**Material Change**	Piping	Replacement of all process pumps. New pumps contain Hastelloy wetted parts. All units are sealess technology. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Maintenance	No	Maintenance items are not modifications (53 FR 37924, September 28, 1988).
28	**Material Change**	Piping	Existing instrument air supply lines replaced with Duraplus plastic pipe, straightened, and consolidated. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Maintenance	No	Maintenance items are not modifications (53 FR 37924, September 28, 1988).

ID	TITLE	SYSTEM AFFECTED	DESCRIPTION	CATEGORY	Permit modification required???	JUSTIFICATION
19	**Material Change**	Piping	Replacement of most pipes not otherwise mentioned with Hastelloy C-276 References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Maintenance	No	Maintenance items are not modifications (53 FR 37924, September 28, 1988).
70	**Piping Change**	Piping	Liquid feed line (1/2" pipe with threaded fittings) replaced with 1/2" tubing with "Swagelok" fittings. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Maintenance	No	Maintenance items, including minor design changes, are not modifications (53 FR 37924, September 28, 1988). There is no change in function or capacity associated with this change.
57	**Piping Change**	Piping	Main Ram Glovebox air supply HEPA replaced by direct piping of combustion air to the underfire air blower. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Process Change	No	Minor design changes, like maintenance items, are not modifications (53 FR 37924, September 28, 1988). There is no change in function or capacity associated with this change.

ID	TITLE	SYSTEM AFFECTED	DESCRIPTION	CATEGORY	Permit modification required???	JUSTIFICATION
58	**Piping Change**	Piping	Movement of caustic addition line from process sump tank entry point to upstream of the scrubber liquid return pump. This change is to ensure proper mixing of the added caustic and better pH control. The plastic line will also be changed to st. steel. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Process change	No	Minor design changes, like maintenance items, are not modifications (53 FR 37924, September 28, 1988). There is no change in function or capacity associated with this change.
61	**Piping Change**	Piping	Added block valve on quench tower booster pump inlet. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Upgrade	No	Minor design changes, like maintenance items, are not modifications (53 FR 37924, September 28, 1988). There is no change in function or capacity associated with this change.
62	**Piping Change**	Piping	Added check valve on absorber column makeup water line to prevent backflow. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Upgrade	No	Minor design changes, like maintenance, are not permit modifications (53 FR 37924, September 28, 1988). There is no change in function or capacity associated with this change.

ID	TITLE	SYSTEM AFFECTED	DESCRIPTION	CATEGORY	Permit modification required???	JUSTIFICATION
65	**Piping Change**	Piping	Check valves added to combustion air lines, for prevention of combustion air and or combustion gas backflow out of the PCC and SCC. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Upgrade	No	Minor design changes, like maintenance items, are not permit modifications (53 FR 37924, September 28, 1988). There is no change in function or capacity associated with this change.
27	**Routine Maintenance**	Piping	Replaced original steam lance nozzles with identical parts. Addition of strainers to steam line and slight rerouting. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Maintenance	No	Maintenance items are not modifications (53 FR 37924, September 28, 1988).
75	**Blower Replacement**	Prime Mover	1900 ICFM induced draft blowers replaced with 2200 ICFM I.D. blowers equipped with blower drains. The replaced blowers had corroded significantly and lacked drains. References: Revised Part B Application	Maintenance	No	Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit.

ID	TITLE	SYSTEM AFFECTED	DESCRIPTION	CATEGORY	Permit modification required???	JUSTIFICATION
78	**IDB Drive Upgrade**	Prime Mover	Addition of variable frequency drives to the induced draft blowers to allow for precise control of draft. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Upgrade	No	Minor design changes, like maintenance items, are not modifications (53 FR 37924, September 28, 1988). There is no change in function or capacity associated with this change.
80	**Process Liquid Filtration Upgrade**	Process Liquid Handling	Replacement of tube filters ("dual filters") with a hydrocyclone and polypropylene bag filter system. References: Revised Part B Application	Upgrade	No	Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit.
79	**Process Liquid Filtration Upgrade**	Process Liquid Handling	Addition of 1/16" perforated screen strainers to hydrocyclone overflow line for the protection of scrub solution recycle pumps downstream of the hydrocyclone. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Maintenance	No	Maintenance items, including minor design changes, are not modifications (53 FR 37924, September 28, 1988). The addition is to protect fluid handling equipment downstream. There is no change in function or capacity associated with this change.
36	**Material Change**	Quench Tower	Material changed from FRP to Hastelloy References: Part B Application; Kaiser Report	Upgrade	No	Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit.

ID	TITLE	SYSTEM AFFECTED	DESCRIPTION	CATEGORY	Permit modification required???	JUSTIFICATION
5	**Quench Liquid Flow Increase**	Quench Tower	Liquid flow rate increased from 24 gpm to 28 gpm. References: Revised Part B Application; Kaiser Report	Process Change	No	Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit.
4	**Quench Tower Nozzle Replacement**	Quench Tower	Lower nozzles replaced with Hastelloy C-22 alloy nozzles and are reoriented. References: Kaiser Report	Upgrade	No	Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit.
37	**Quench Tower Spray Nozzles**	Quench Tower	Overflow weir replaced with spray nozzles References: Kaiser Report	Upgrade	No	Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit.

ID	TITLE	SYSTEM AFFECTED	DESCRIPTION	CATEGORY	Permit modification required???	JUSTIFICATION
82	**Routine Maintenance**	Quench Tower	All gaskets replaced with Viton gaskets; all plug valve liners replaced with Teflon liners. References: Kaiser Report	Maintenance	No	Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit.
32	**Superheater Relocation**	Superheater	Relocation of stack gas superheater closer to absorber column. References: Kaiser Report	Process change	No	Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit.
12	**Caustic Supply Tank**	Support Systems	Caustic tank replaced with new tank equipped with pre-mixed caustic supply hookups. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Maintenance	No	Maintenance items are not modifications (53 FR 37924, September 28, 1988).
9	**Cooling Tower Replacement**	Support Systems	Old cooling towers replaced with new identical units. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Maintenance	No	Maintenance items are not modifications (53 FR 37924, September 28, 1988).

ID	TITLE	SYSTEM AFFECTED	DESCRIPTION	CATEGORY	Permit modification required???	JUSTIFICATION
24	**Natural Gas Supply Upgrade**	Support Systems	The natural gas supply line has been upgraded to 1.5 inches. A new meter was installed. (An earthquake shutoff valve may be added.) References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Maintenance	No	Maintenance items are not modifications (53 FR 37924, September 28, 1988).
88	**Replacement of Air Dryers for Instrument Air**	Support Systems	Molecular sieve dryers added to replace less reliable refrigeration-type dryers on instrument air supply compressor. This change is part of the compressor replacement. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Maintenance	No	Maintenance items are not modifications (53 FR 37924, September 28, 1988).
40	**Material Change**	Venturi Scrubber	Material changed from FRP to Hastelloy. References: Revised Part B Application; Kaiser Report	Upgrade	No	Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit.

ID	TITLE	SYSTEM AFFECTED	DESCRIPTION	CATEGORY	Permit modification required???	JUSTIFICATION
83	**Routine Maintenance**	Venturi Scrubber	Flow restriction orifice liner changed from Hypalon to Viton. References: Revised Part B Application; Kaiser Report	Maintenance	No	Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit.
50	**Scrub Solution Flow Increase**	Venturi Scrubber	Increase in liquid flow rate from 5 gpm to 10 gpm. References: Kaiser Report	Process change	No	Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit.
81	**Venturi Pressure Drop Increase**	Venturi Scrubber	Increase offgas pressure drop through the venturi from 40 inH2O to 60 inH2O by restricting the variable venturi throat opening. References: Kaiser Report	Process change	No	Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit.

ID	TITLE	SYSTEM AFFECTED	DESCRIPTION	CATEGORY	Permit modification required???	JUSTIFICATION
13	**Venturi Realignment**	Venturi Scrubber	Movement of venturi exit cone from axial to tangential alignment with the absorber column. References: Kaiser Report	Upgrade	No	Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit.
41	**Venturi Scrub Liquid Flow Increase**	Venturi Scrubber	Venturi liquid injection orifice increased in sized from 1/4" to 3/8". References: Revised Part B Application; Kaiser Report	Upgrade	No	Items in the Kaiser Report and/or the Revised Part B Application were submitted to NMED prior to permit issuance and are, therefore, already known to NMED and are reflected in the 1989 RCRA Hazardous Waste Operations Permit.
84	**Fire Suppression System Change**	Waste Feed	Replacement of water-based feed glovebox fire suppression system with a foam-based system. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Upgrade	No	Minor design changes, like maintenance items, are not modifications (53 FR 37924, September 28, 1988). In addition, this system is not addressed by the permit.
3	**Fire Suppression System Change**	Waste Feed	Main ram feeder glovebox carbon dioxide fire suppression system added. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Upgrade	No	Minor design changes, like maintenance items, are not modifications (53 FR 37924, September 28, 1988). In addition, this system is not addressed by the permit.

ID	TITLE	SYSTEM AFFECTED	DESCRIPTION	CATEGORY	Permit modification required???	JUSTIFICATION
1	**HEPA Filter Addition**	Waste Feed	Main ram feeder glovebox HEPA filter added. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Upgrade	No	Minor design changes, like maintenance items, are not modifications (53 FR 37924, September 28, 1988). In addition, this system is not addressed by the permit.
20	**MEGAS Replacement**	Waste Feed	Multiple Energy Gamma Assay System (MEGAS) for SNM assay replaced with Multiple Axis Dual Analysis Measurement (MADAM) system. Also, the MADAM and waste package X-ray systems have been moved from the waste feed glovebox. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Maintenance	No	Minor design changes, like maintenance items, are not modifications (53 FR 37924, September 28, 1988). In addition, this system is not addressed by the permit.
85	**Ram Feeder Redesign**	Waste Feed	Ram feeder chain-drive mechanism replaced with hydraulic system. References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)	Upgrade	No	Minor design changes, like maintnenance items, are not modifications (53 FR 37924, September 28, 1988). In addition, this system is not addressed by the permit.

ID	TITLE	SYSTEM AFFECTED	DESCRIPTION	CATEGORY	Permit modification required???	JUSTIFICATION
35	**Routine Maintenance**	Waste Feed	Replacement of the old feed glovebox with a stainless steel glovebox.	Maintenance	No	Maintenance items are not modifications (52 FR 37924, September 28, 1988).

References: Summary of Modifications to the LANL CAI (LA-UR-95-496, 2-1-95)

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ENCLOSURE I

7.0 CONTINGENCY PLAN

This section presents contingency measures for hazardous and mixed waste treatment and storage units at Los Alamos National Laboratory (LANL). The contingency plan is intended to meet the requirements specified in the New Mexico Hazardous Waste Management Regulations, Revision 7 (HWMR-7), Pt. V, Subpart D, Contingency Plan and Emergency Procedures, and Part B permit application requirements in HWMR-7, Pt. IX, 270.14(b)(7), for Resource Conservation and Recovery Act (RCRA) treatment, storage, or disposal (TSD) facilities. In addition, this document is consistent with the LANL Emergency Management Plan (EMP) (LANL, 1993) prepared by the LANL Emergency Management and Response (EM&R) Office (formerly the Emergency Management Office). The provisions of this plan will be carried out immediately whenever there is a fire, explosion, or release of hazardous or mixed waste or hazardous or mixed waste constituents that could threaten human health or the environment [HWMR-7, Pt. V, 264.51(b)].

7.1 HAZARDOUS AND MIXED WASTE EMERGENCY RESPONSE RESOURCES [HWMR-7, Pt. V, 264.53]

The primary resources for management of emergency incidents at LANL reside within the EM&R Office. During an emergency situation, line management (i.e., the Group Leader of the affected area) works with the duty Emergency Manager from the EM&R Office, who assumes the primary responsibility for managing emergency response operations. The Emergency Manager is the functional equivalent of the RCRA Emergency Coordinator (HWMR-7, Pt. V, 264.55). Additional resources include personnel from the Health and Safety (HS) and Environmental Management (EM) Groups at LANL.

Outside of LANL, contracted services and other agencies are also available for assistance during emergencies. These include the contracted services of Protection Technology Los Alamos (PTLA) for security, Johnson Controls World Services Inc. (JCI) for facility maintenance, and the Los Alamos County Fire Department (LACFD). The Los Alamos County Police Department (LACPD) provides assistance under a Memorandum of Understanding (MOU). The Los Alamos Medical Center (LAMC) provides assistance under a Planning Agreement.

All response groups and agencies called upon during emergencies are coordinated by the duty Emergency Manager. The emergency notification procedure is illustrated in Figure 7-1. The responsibilities and/or assistance available from the response groups/agencies are listed in Table 7-1 and discussed briefly in Sections 7.1.2 through 7.1.7. Each of the emergency response groups/agencies and the facility operators will retain a current copy of this contingency plan. The Environmental Protection Group (EM-8) is responsible for the controlled distribution of the contingency plan.

7.1.1 Emergency Management and Response (EM&R) Office [HWMR-7, Pt. V, 264.55 and 264.52(d)]

The Director of LANL has delegated the authority and responsibility for administering and implementing LANL's emergency management program to the EM&R Office. The EM&R Office coordinates and issues LANL's EMP and provides response coordination for emergencies. The EM&R Office also provides a 24-hour Emergency Manager to respond to emergencies, including hazardous and mixed waste releases. Additionally, the EM&R Office maintains the Emergency Operations Center (EOC) in a ready condition should the center be required. The primary EOC is located at Technical Area 59, Building 1 (TA-59-1). An alternate EOC is located at TA-49-113.

EM&R Office personnel designated as Emergency Managers are listed in Table 7-2. Assignments as the duty (i.e., primary) Emergency Manager are rotated. The Emergency Manager can be reached by contacting the EM&R Office (667-6211 during working hours, 667-7080 after working hours) or the Central Alarm Station (CAS) operator (9-911 or 911).

An Emergency Manager will respond to emergency incidents involving the release of hazardous or mixed waste to the environment, including spills, fires, or explosions. The Emergency Manager will initially assess, with HS and EM guidance, the possible hazards to human health or the environment, and will use whatever response group(s) and/or emergency equipment needed to control and contain the waste. In the event of an emergency, the Emergency Manager becomes the Incident Commander (IC) with full responsibility for all response actions. At the scene of the emergency, an Incident Control Group (ICG) will form which consists of responding emergency personnel and advisors who report to the IC. The ICG works together to take command and control of emergency situations.

The duty Emergency Manager responding to an emergency will take to the scene a copy of the appropriate Building Emergency Plan(s), relating to the area in which the incident is occurring. These plans are located at the EM&R Office at TA-59 and are kept on-line on LANL's e-mail system. The Emergency Manager then supplies the various response groups with specific information relating to the facilities involved including the layout of all affected buildings, the location of evacuation routes, equipment, and personnel, properties of the materials/wastes managed at the facility, and the hazards associated with these materials/wastes.

7.1.2 Hazardous Materials (HAZMAT) Response Group (HS-10)

The Hazardous Materials (HAZMAT) Team is comprised of personnel from the Hazardous Materials Response Group (HS-10). The HAZMAT Team is responsible for the aggressive mitigation of chemical, radiological, hazardous waste, and mixed waste emergencies, including field decontamination of victims and responders. The HAZMAT Team is capable of providing a contamination-control station at the scene of a hazardous material incident to process people working in a contaminated area and can perform decontamination of personnel. The HAZMAT Team is part of the ICG reporting through the HAZMAT Group Supervisor (HMGS). The LANL HMGS coordinates or arranges for the necessary HS personnel, response, and resources for LANL or LANL-related emergencies and coordinates the activities of the HAZMAT and radiological field monitoring team for areas outside of the affected building boundaries.

HS-10 also provides site field monitoring to determine the nature and extent of contamination, provides information on correct handling of chemicals, makes recommendations on protective clothing and equipment, and provides exposure and treatment information. HS-10 may obtain resources from other HS groups, such as the Health Physics Operations Group (HS-1) and the Industrial Hygiene and Safety Group (HS-5), to perform its function.

7.1.3 EM Response Groups

At the scene, the EM groups are coordinated in the ICG by the Environmental Management Advisor (EMA). In addition to technical support, the EMA will ensure LANL compliance with federal, state, and local regulations.

7.1.3.1 Waste Management Group (EM-7)

EM-7 is responsible for initial response actions at RCRA TSD facilities, including hazardous and mixed waste treatment and storage units. This group also provides guidance on proper treatment, storage, and transportation of hazardous and mixed waste.

7.1.3.2 Environmental Protection Group (EM-8)

EM-8 is responsible for regulatory compliance and provides guidance on regulatory requirements to other groups. After an emergency, EM-8 provides field surveys of soil, water, air, and biota to determine environmental effects of exposure. The group provides expertise in hydrogeology and meteorology to establish short- and long-term environmental effects of emergency conditions.

7.1.4 Other LANL Response Resources

Several personnel from the Nuclear Materials Processing - Nitrate Systems Group (NMT-2) have been trained in emergency procedures. In the case of an emergency interrupting operations at TA-55, these personnel are responsible for monitoring for leaks, pressure buildup, gas generation, or equipment ruptures.

7.1.5 Contracted Response Groups

In the event of an emergency, contracted response groups report directly to the IC in the ICG. If the IC deems it necessary, the IC may designate an Operations Officer to aid in the coordination and direction of these groups in responding to an emergency.

7.1.5.1 Protection Technology Los Alamos (PTLA)

PTLA is responsible for LANL security, which is provided by PTLA under contract to LANL. During an emergency, PTLA activities include maintenance of security, direction of traffic within LANL, and control of access to the emergency scene. PTLA maintains the necessary equipment to perform these functions, such as crowd-control equipment and patrol vehicles. In addition, the CAS at TA-64-1 is manned by PTLA personnel 24 hours a day.

7.1.5.2 Johnson Controls World Services Inc. (JCI)

JCI provides a maintenance support force under contract to LANL. This support force is under LANL's direction in an emergency. JCI conducts inspections of LANL equipment, maintains equipment, and participates in post-emergency cleanup under the direction of a recovery

manager. The Utilities Control Center (UCC) at TA-3-223 is maintained by JCI personnel 24 hours a day.

7.1.5.3 Los Alamos County Fire Department (LACFD)

The LACFD provides fire protection and ambulance coverage for the residential communities of Los Alamos and White Rock and for LANL. In the case of an emergency at LANL, the LACFD coordinates fire suppression efforts under the overall direction of the LANL IC. The U.S. Department of Energy (DOE) requires that LACFD personnel meet the training criteria for emergency response personnel specified in 29 CFR 1910.120(q)(6)(i) and (ii). A copy of the contract between the DOE and the Incorporated County of Los Alamos is provided as Appendix J.

7.1.6 LANL Support Groups

7.1.6.1 Health Physics Operations Group (HS-1)

Mixed waste incidents that occur at any of the TAs are evaluated by HS-1. HS-1 will provide field personnel to perform radiological monitoring and decontamination under the supervision of certified health physicists. This group augments the assessment and monitoring functions of the HAZMAT Team.

7.1.6.2 Occupational Medicine Group (HS-2)

HS-2 provides appropriate medical treatment for occupationally related illnesses and injuries and monitors employees to assess the effectiveness of health protection programs. In addition to promoting early identification and prevention of illnesses or injuries that may arise from low-level exposures to hazardous or radioactive materials, HS-2 maintains documented records of the health status of employees and related occupational medicine activities.

Although HS-2 is not routinely involved with on-scene emergency response, it maintains and operates LANL's medical facility with a fully equipped emergency room and decontamination facilities at TA-3, Building 409 (SM-409). Additionally, this group staffs three satellite first-aid stations at TA-53, TA-16 (S-Site), and TA-55. The locations of these emergency facilities are shown on Figure 7-2. Medical staff includes physicians, physician's assistants, registered nurses, x-ray technicians, and clinical laboratory technicians. All full-time physicians and nurses receive radiation accident training.

HS-2 also maintains access to a software program called the TOMES system at the central medical facility (SM-409). This extensive database supplies the clinical staff with timely exposure and treatment information.

7.1.6.3 Industrial Hygiene and Safety Group (HS-5)

HS-5 provides support to HS-2 with its ability to obtain additional exposure and treatment information via telephone access to the National Library of Medicine's TOXLINE and CHEMLINE, the Toxicity Databank files POISONDEX and TOMESPLUS (Micromedics), and the CC/INFO database files on Material Safety Data Sheets. In addition, HS-5 maintains access to the National Institute of Occupational Safety and Health Technical Information Center and the Registry of Toxic Effects of Chemical Substances.

7.1.6.4 Occurrence Investigations Group (HS-7)

HS-7 has the lead in reporting the occurrence of an on-site emergency and is in part responsible for tracking follow-up corrective actions. HS-7 personnel assist the facility manager in investigating the occurrence, determining the causal factors, identifying the appropriate corrective actions, and assisting in the preparation and submittal of reports documenting the occurrence to DOE. HS-7 is responsible for the Occurrences Reporting and Processing System at LANL. This group tracks the target and actual completion dates for all corrective actions associated with an emergency. This information is maintained by HS-7 in an on-site database.

7.1.7 Outside Response Agencies

During an emergency, outside response agencies report directly to the IC in the ICG. If the IC deems it necessary, the IC may designate an Operations Officer to aid in the coordination and direction of these groups in responding to an emergency.

7.1.7.1 Los Alamos County Police Department (LACPD)

The LACPD has only minimal interaction with LANL in an on-site emergency. The interaction is limited to traffic control on DOE roads with public access and to criminal investigations. The MOU between the DOE and the Incorporated County of Los Alamos for mutual aid assistance is included as Appendix K.

7.1.7.2 Los Alamos Medical Center (LAMC)

Medical cases that cannot be handled at the HS-2 medical facility will be transferred to LAMC, where LANL maintains a fully equipped decontamination room adjacent to the emergency room. In the event that a case is sent to LAMC, support for the emergency room staff is provided by HS-2 medical personnel. HS-1, HS-5, and HS-10 personnel also provide assistance to the emergency room staff. This assistance is coordinated through HS-10. The Planning Agreement between the DOE Los Alamos Area Office (DOE/LAAO) and LAMC is included as Appendix L.

7.2 EMERGENCY EQUIPMENT AND COMMUNICATIONS [HWMR-7, Pt. V, 264.52(e)]

7.2.1 Emergency Equipment

HWMR-7, Pt. V, Subpart D requires a listing of all emergency response equipment available that can be used in the event of an emergency. Emergency equipment available at the hazardous and mixed waste units and subunits addressed in this permit application and in the HAZMAT vehicles and trailers is provided in Attachment 7-1. In addition, emergency equipment available at TA-54, Area L, is included in Attachment 7-1 because the area is located adjacent to TA-54, Area G, and the equipment is available in the event of an emergency. Attachment 7-1 also includes supplemental emergency equipment maintained by JCI, the LACFD, and HS-2. The locations of emergency facilities are shown on Figure 7-2.

7.2.2 Emergency Communications [HWMR-7, Pt. V, 264.56(a)]

Effective emergency response at LANL requires an efficient communication system that will integrate required personnel into the emergency response. The initial phase of an emergency will involve a small number of individuals at the affected area and notification of the duty Emergency Manager. When responding to hazardous or mixed waste emergencies, the EM&R Office provides communications between response units and emergency organizations.

7.2.2.1 Central Alarm Station (CAS)

The CAS is located at TA-64-1. This station is manned by PTLA personnel 24 hours a day and is equipped with telephones, medium- and short-range radios, direct-line telephones, a National Warning System (NAWAS) station, and an emergency power system. The fire alarm board at the control room gives the location of automatic and pull fire alarms.

The CAS receives alarms from several sources, and in turn notifies the duty Emergency Manager of a hazardous or mixed waste emergency. Sources include:

- Telephone communication (9-911 or 911)
- Automatic fire alarms
- Manual pull alarms
- Computer interface (to warn of critical events at selected facilities)
- Security alarms
- Radio communications.

Upon receipt of an alarm, the CAS operator then notifies the LACFD and the duty Emergency Manager. Emergency response groups may be requested to respond by the Emergency Manager, HMGS, the EOC communicator, and/or the CAS operator. Should the LANL 911 system fail, the Los Alamos County System, located at the LACPD Station, will be used to activate emergency response groups.

7.2.2.2 Utilities Control Center (UCC)

JCI personnel maintain the UCC at TA-3-223. This facility is maintained 24 hours a day. Alarms at this facility are connected to LANL experiments, equipment, and/or buildings to record outages and hazardous conditions. Any conditions that activate these alarms will be reported immediately to building management or to the CAS operator for notification and response.

7.2.2.3 Additional Communication Systems

Internal communication systems at LANL include:

- Centrex telephone system
- Telephone paging system
- Variety of FM VHF simplex and repeater radio systems including:
  - multiple base stations
  - mobile and hand-held units
  - links to northern New Mexico public safety agencies
- UHF radio system including:
  - multiple antenna sites
  - mobile and hand-held units
  - links with the LACPD and the State Medical System

- 400 megahertz trunked radio system including:
  - link with the LACFD
- LANL's EOC has transmission and reception capacity for:
  - secure telephone
  - secure fax
  - secure still video
- LANL's EOC has access to all radio systems outlined above.

Off-site communications with federal, state, tribal, county, and other agencies are available through the following:

- Centrex telephone system
- Private telephone lines (if Centrex fails)
- Two NAWAS
- KRSN radio link (local radio station)
- Local cable television
- Community Alert Network.

The LANL EOC, maintained by the EM&R Office, operates radio systems on key LANL and off-site channels. Emergency personnel responding to on-site incidents have the benefit of wide-area radio coverage. After hours, the duty Emergency Manager is responsible for activating whatever support personnel, services, or equipment is needed.

7.3 CONTINGENCY PLAN IMPLEMENTATION [HWMR-7, Pt. V, 264.56]

The following section defines the guidelines used to initiate this contingency plan and the resulting actions taken.

7.3.1 Guidelines For Implementation [HWMR-7, Pt. V, 264.51(b) and 264.56]

The decision to implement this contingency plan depends upon whether or not an imminent or actual incident involving a release of hazardous or mixed waste to the environment could threaten human health or the environment. The following guidelines will be used by the Emergency Manager in making the decision whether or not to implement this plan.

This contingency plan will be implemented immediately in the following situations involving hazardous or mixed waste:

Spills

- A hazardous or mixed waste spill cannot be contained with secondary containment or application of sorbents
- Precipitation threatens to move spilled material off site
- A hazardous or mixed waste spill causes the release of flammable material, creating a fire or explosion hazard
- A hazardous or mixed waste spill results in toxic fumes which threaten human health
- An earthquake or other natural disaster threatens containment integrity.

Explosions

- An unplanned explosion involving hazardous or mixed waste occurs
- An imminent danger exists that an explosion involving hazardous or mixed waste could occur.

Fires

- Any fire involving hazardous or mixed waste occurs
- Any building, grass, forest, or nonhazardous waste fire exists that threatens to volatilize or ignite hazardous or mixed waste.

7.3.2 Emergency Notification [HWMR-7, Pt. V, 264.56(a) and (b)]

During working hours, immediately upon discovery of an imminent or actual incident involving hazardous or mixed waste, line management and the EM&R Office will be notified by on-site personnel. During nonworking hours, all incidents involving hazardous or mixed waste shall be reported to the duty Emergency Manager or the CAS operator. In the case of fire involving hazardous or mixed waste, notification of these individuals is superseded by the LANL fire alarm system. A fire is reported by dialing 9-911 or 911 (from telephone exchanges 667 and 665) or 667-7080 (from all exchanges), activation of automatic alarms, or activation of a fire pull box. All fire alarms alert the CAS operator, the LACFD, and PTLA. For fire involving hazardous or mixed waste or a hazardous or mixed waste unit, the CAS operator will contact the duty Emergency Manager.

Upon recognition of a hazardous or mixed waste emergency, the first arriving emergency-trained person becomes the temporary IC. Once the EM&R Office is notified of the emergency, the duty Emergency Manager will proceed to the scene and be briefed by the temporary IC, building/area personnel, and/or other emergency units/teams. The Emergency Manager will then assume the position of IC. The IC may recommend activation of the EOC. If necessary, the EOC will be activated and the necessary members of the emergency management team will be determined. The IC will form an ICG and contact the HMGS. The HMGS will notify the appropriate emergency response groups. Table 7-1 describes the assistance available from each response group. The IC may use this list to determine which groups to contact in an emergency. Each response group maintains an on-call person and/or a call-down procedure to respond to emergencies.

The EM&R Office will be notified of any potential hazardous or mixed waste emergency (e.g., spills, fires, explosions). The IC and the HMGS will use whatever means are available, including the assistance of other response groups, computer data searches, and sampling, to determine if a hazardous or mixed waste is being or has been generated and/or released. HS-10, EM-7, and EM-8 have the expertise to determine the nature and extent of contamination and the characteristics of the hazardous or mixed waste involved.

7.3.3 Emergency Manager Actions [HWMR-7, Pt. V, 264.56 (b-h)]

Upon notification of an incident, the duty Emergency Manager will:

1. Proceed directly to the scene.
2. Call the HMGS.
3. Assess the nature of the incident (e.g., through communication with the temporary IC).
4. Assume incident command.
5. Make an initial assessment of the incident and, in conjunction with the HMGS, obtain resources to determine the source, quantities, and types of hazardous or mixed waste involved, and the areal extent of any released materials.
6. Based on the guidelines in Section 7.3.1 of this plan, determine if implementation of this contingency plan is warranted.
7. Recommend activation of the EOC, if necessary.

Upon deciding to implement this contingency plan, the IC will perform the following additional response actions using the HMGS and EMA, when appropriate:

1. Assess the hazards to human health and the environment, including both direct and indirect effects, such as generation of toxic, irritating, or asphyxiating gases and/or hazards of runoff of water or chemicals used for fire suppression. An individual designated by the IC will use the guidelines in Section 7.3.1 to assess the hazards to human health and the environment. If any of the criteria under Section 7.3.1 are met, evacuation of the immediate area will be initiated if the responsible Group Leader has not already accomplished evacuation of the area.

2. Determine if evacuation of the local area is advisable and, if so, immediately notify appropriate response groups and the LACPD, if appropriate. Consider activating one or more of the following community alert mechanisms: the Community Alert (telephone) Network, the KRSN radio remote input system, or the cable TV capture system.

3. Notify required response personnel and the DOE/LAAO by phone, radio, or through the CAS operator. In the case of fire, the IC shall confirm that the LACFD Senior Officer at the scene is aware of the special hazards associated with hazardous or mixed waste.

4. Warn the remaining on-scene and response personnel of imminent or actual hazards using internal radio communication systems or the public address (PA) system. A site-wide radio/PA system may be used after installation in late 1993.

5. In emergency situations, the activated EOC Crisis Manager (Laboratory Director or designee), through the EM representative, will notify the New Mexico Environment Department (NMED) at (505) 827-9329 and the National Response Center at (800) 424-8802, reporting:

   - Name and telephone number of the EM representative
   - Name and address of the facility
   - Time and type of incident
   - Name and quantity of material involved, to the extent known
   - The extent of injuries, if any
   - The possible hazards to human health or the environment outside the facility.

   If the EOC is not activated, the EMA assures that proper notifications are made.

6. Advise the response groups of hazards to minimize personnel exposure and expedite mitigation.

7. For hazardous or mixed waste treatment units when the emergency interrupts operations, EM-7 personnel or, in the case of TA-55, the NMT-2 emergency response personnel, must monitor for leaks, pressure buildup, gas generation, or equipment ruptures.

Once control of the emergency is established, the IC will take all reasonable measures to minimize the occurrence, recurrence, or spread of fires, explosions, or releases. In addition, the IC will delegate cleanup and decontamination responsibilities to the affected area's line management. The responsible Group Leader or Group Leader designee will:

1. Arrange for site cleanup.
2. Provide for proper handling of recovered waste, contaminated soil, or contaminated surface/groundwater.
3. Provide for decontamination of equipment, as needed.
4. Arrange for replacement and/or repair of equipment, as needed.
5. Ensure that testing is conducted to verify successful cleanup.

Within 15 days of the incident, DOE/LAAO will submit a report to the U.S. Environmental Protection Agency (EPA) Regional Administrator and the NMED. The contents of this report are generated by several LANL groups responding to the emergency, as detailed in Section 7.12.

7.4 SPILLS [HWMR-7, Pt. V, 264.56(e) and 264.196(a-e)]

Sudden releases include spills of hazardous or mixed waste that pose a significant threat to human health or the environment. Spill incidents resulting in a sudden release of hazardous or mixed waste that presents a potential threat to human health or the environment, as listed in Section 7.3.1, require implementation of this contingency plan.

Hazardous and mixed waste is stored on site in a variety of containers including, but not limited to, 55-gallon drums, lab packs, tanks, and small laboratory bottles. At the TA-63 Hazardous Waste Treatment Facility (HWTF), mixed plating waste will be treated in a skid-mounted tank. Volumes of hazardous or mixed waste stored or treated will vary from unit to unit. The general steps in handling hazardous and mixed waste spills are:

- Isolate the immediate area and deny entry to all unauthorized personnel.
- Contain the spill by spreading sorbents or forming temporary dikes to prevent further migration (performed by properly trained personnel, if safe).
- Monitor and sample.

- Package the waste and contaminated soil and/or water in sound containers.
- Decontaminate the area and all involved equipment and personnel (followed by testing to assure adequate cleanup).
- Remove the waste (performed by EM-7).

The steps to be taken for spill mitigation will be determined by the IC with input from the HMGS and EMA. If initial mitigation of the spill is necessary and can be accomplished safely before the Emergency Manager arrives, a qualified member of the affected area's operating group may serve as the temporary IC.

The emergency preparedness procedures related to flammable organic solvent spills call for stabilization of the spilled material with an organic solvent spill kit. Other chemical spills are to be stabilized using acid and caustic spill kits or by the addition of universal sorbents. Personal protective equipment (PPE) will be worn during spill control and cleanup. Health physics monitoring will be conducted whenever mixed waste is involved to ensure that radiation exposure is minimized. The stabilized material will be treated as hazardous or mixed waste, depending on the constituents present. Runoff that might occur from spills of listed hazardous or mixed waste that have migrated outside waste storage and/or treatment areas must be contained and managed as hazardous or mixed waste, as appropriate. If the spill was from a characteristic hazardous or mixed waste and analysis shows that the runoff does not exhibit the characteristic (i.e., ignitability, corrosivity, reactivity, and/or toxicity), then the runoff need not be managed as characteristic waste. Temporary dikes may be constructed to contain runoff.

7.4.1 Spill Control Procedures

When a flammable organic solvent, highly acidic, or highly caustic spill has been stabilized with the contents of an organic solvent, acid, or caustic spill kit, respectively, the resulting material may be sorbed using a nonbiodegradable universal sorbent. Universal sorbent can be used to control spills if it is known to be compatible with the spilled material. Approved drums or packaging will be used to collect all spilled material and contaminated sorbent. For corrosives, the drums will be lined with polyethylene drum liners. Emergency equipment available for spill control at each area covered in this permit application where waste is treated and/or stored is listed in Attachment 7-1. The ultimate disposition of any contaminated sorbent or waste material will be determined by EM-7 according to RCRA regulatory requirements.

7.4.1.1 Tank System Spill Control and Reporting

A tank system will be removed from service immediately using approved shutdown procedures if a leak or spill occurs from the tank system or its secondary containment system or if either system is determined to be unfit for use. Further addition of waste to the tank or containment system will cease and the system will be inspected to determine the cause of the leak or spill. If a leak occurs from a tank system, as much of the waste as is necessary to prevent further release of waste will be removed within 24 hours after detection or as early as practicable, and the system will be inspected and repaired. All released waste will be removed within 24 hours or as soon as possible if a leak occurs to a tank's containment system.

If a spill from a tank is not immediately contained and cleaned up and exceeds a quantity of 1 pound, the release will be reported to the NMED within 24 hours of its detection per the requirements of HWMR-7, Pt. V, 264.196(d)(1). In addition, a written report will be submitted to the NMED within 30 days describing the likely migration route of the release; soil characteristics at the site; monitoring and sampling data relevant to the release; proximity to downgradient drinking water, surface water, and populated areas; and response actions taken or planned.

7.4.1.2 Tank System Secondary Containment, Repair, and Closure

If the integrity of a tank system, including its secondary containment, has not been damaged by a spill, the system may be returned to service. Service may not resume until after all released waste is removed and repairs, if necessary, are made. Any tank system that cannot satisfy the criteria described above will undergo closure in accordance with the requirements of HWMR-7, Pt. V, 264.197.

7.4.1.3 Certification of Major Repairs

If a tank system has been repaired and the repair has been extensive (e.g., installation of an internal liner, repair of a ruptured primary containment or secondary containment vessel), the tank system will not be returned to service until a certification by an independent, qualified registered professional engineer is obtained, verifying that the repaired system is capable of handling wastes without release for the intended life of the system. This certification will be submitted to NMED within seven days after returning the tank system to use.

7.4.2 Decontamination Verification

Decontamination will be accomplished at the spill site. After the spilled material has been sorbed, the material will be containerized. If the spill occurs on a cemented area, water or an appropriate solvent will be used to clean the area. Spilled liquid will be sorbed with a compatible, nonbiodegradable sorbent and containerized. PPE will be worn during decontamination verification. Health physics monitoring will be conducted whenever mixed waste is involved to ensure that radiation exposure is minimized.

A sample of decontamination water or solvent and nonbiodegradable sorbent material will be taken prior to the start of the decontamination effort to establish baseline data. A sample will then be taken of the material used to sorb the final waste water. No hazardous waste constituents should be present in this sample at levels above those found in the baseline data. If the sample exhibits any of the characteristics of a hazardous waste as defined in HWMR-7, Pt. II, Subpart C, or if a hazardous constituent listed in HWMR-7, Pt. II, Appendix VIII (and not detected in the baseline data), is present above established health-based levels, the decontamination procedure will be repeated. An alternative demonstration of decontamination may be proposed and justified to NMED, who will evaluate the proposed alternative in accordance with the standards and guidance then in effect. If the proposed alternative is accepted, decontamination levels will meet the levels approved by NMED. Each sample will be collected with an appropriate sampling device (e.g., thief or trier) as specified in EPA's SW-846, "Test Methods for Evaluating Solid Waste," Physical/Chemical Methods, latest edition (EPA, 1992).

If the spill occurs on soil, any free liquid present will be sorbed with a compatible nonbiodegradable sorbent and the resulting material will be containerized. For such a spill, all contaminated soil will be excavated and containerized. Health physics and industrial hygiene monitoring will be conducted to minimize exposure during soil removal operations. The spill site will then be characterized to ensure that all contaminated material has been removed.

If a spill occurs in an area with sealed floors, verification sampling will be performed after decontamination. Swipe samples or other types of sampling appropriate for the contaminant will be collected at random in the area and analyzed. For a spill that occurs in an area that does not have sealed floors, random samples of the floor material, such as concrete chips, will be collected and analyzed for decontamination verification. Removal of contaminated floor material

will occur if the level of contamination remains above those detected in the background data after repeated decontamination attempts.

If a spill is from a known source, then the spilled material will be analyzed for the hazardous waste constituents known to be components of the waste managed at that unit. The appropriate analytical method(s) given in Table 7-3 will be utilized. If the spill is from an unknown source, then the spilled material will be analyzed for all of the parameters listed in Table 7-3.

7.5 EXPLOSION

Explosions and resultant releases may result in a significant threat to human health or the environment. The potential exists for hazardous or mixed waste to be released during an explosion. Implementation of this contingency plan is required whenever a sudden release that cannot be contained or that presents a threat to human health or the environment occurs as a result of an explosion.

In the case of explosions, all personnel will immediately evacuate the area. Any injured personnel will be decontaminated at the site, if required and time allows, and transported by LACFD ambulance to an HS-2 facility or LAMC for treatment. If an injury is severe and requires immediate medical evacuation, the injured person will be wrapped to contain contamination, if necessary. The EM&R Office must be contacted immediately in the case of an actual or potential explosion so that the Emergency Manager can ensure that the LACFD and all other necessary emergency response personnel are alerted. The Emergency Manager assumes incident command and will remain near the site, but at a safe distance, to inform the personnel responding to the explosion of the known hazards.

Upon arrival at the scene, the LACFD Senior Officer will evaluate information provided by the Group Leader, other site personnel, other members of the ICG, and IC to select the appropriate firefighting methods and tactics. The LACFD Senior Officer will direct firefighting operations under the general direction of the IC.

7.6 FIRE

Fires and resultant releases of hazardous or mixed waste may result in a significant threat to human health or the environment. Implementation of this contingency plan is required whenever

a fire incident results in a sudden release of hazardous or mixed waste that cannot be contained or that presents a threat to human health or the environment.

Depending on the size of the fire and the fuel source, portable fire extinguishers may be used. However, LANL policy does not encourage the use of portable fire extinguishers by employees and encourages immediate evacuation of the area and notification of the LACFD. For any fire involving hazardous or mixed waste, the responsible Group Leader and the EM&R Office must be contacted immediately. The Emergency Manager will alert the LACFD and all other necessary emergency response personnel. If the fire spreads or increases in intensity, all personnel must evacuate to an area designated by the responsible Group Leader or Emergency Manager. The Emergency Manager assumes incident command and will remain near the scene to advise personnel responding to the fire of the known hazards. The IC is familiar with spill response and emergency actions and, therefore, is qualified to advise firefighting personnel of the potential hazards involved.

Upon arrival at the scene, the LACFD Senior Officer will evaluate information provided by the Group Leader, other site personnel, other members of the ICG, and IC to select the appropriate firefighting methods and tactics. The LACFD Senior Officer will
under the general direction of the IC.

7.7 UNPLANNED NONSUDDEN RELEASES

Nonsudden releases include those incidents that, if uncontrolled, impact the environment over a long period of time. Such incidents include minor leaks from containers, loss of secondary containment integrity, and incomplete treatment.

7.7.1 Responsibility

Correction of a nonsudden release from a hazardous or mixed waste unit will be the responsibility of the operating group if correction can be performed safely with normal maintenance and management procedures. Otherwise, the operating group will call the EM&R Office. Correction methods for nonsudden releases that have resulted in an impact to the environment will be coordinated with the NMED.

7.7.2 Nonsudden Releases

Not all failures can be predicted. In general, the response to a nonsudden release will be to (1) contain the release, (2) correct the cause of the release, and (3) clean up any release to a level that protects human health and the environment.

Failure of containment at the hazardous and mixed waste storage and treatment units addressed in this application will be detected during inspections. Regularly scheduled inspections of containers and tanks will be conducted to ensure that they are not leaking. In addition, secondary containment systems will be inspected regularly to ensure that the integrity of the containment systems has not deteriorated. If an inspection reveals that containers or tanks are leaking or that secondary containment has deteriorated, maintenance or replacement of containment will be performed, as appropriate.

7.7.3 Nonsudden Release Surveillance

In addition to routine inspection and site-specific sampling and testing, LANL has established an areawide environmental monitoring network maintained by EM-8. Monitoring and sampling locations for various types of measurements are organized into three main groups. Regional monitoring stations are located within the five counties surrounding Los Alamos County. They are placed up to 80 kilometers (50 miles) from LANL and serve to determine background conditions. Perimeter stations are located within approximately 4 kilometers (2.5 miles) of the LANL boundary and document conditions in residential areas surrounding LANL. On-site stations are within the LANL boundary and most are accessible only to employees during normal working hours.

The types of routine surveillance conducted at these stations include radiation measurements and collection of air particulates, surface waters, groundwaters, soil, sediment, and foodstuffs for subsequent analysis. Additional samples are collected to gain information about particular events, such as major runoff events and nonroutine releases. Data are used for comparison with standards, background levels, and for radiation dose calculations.

7.8 EXPOSURE TO HAZARDOUS OR MIXED WASTE

If a person is exposed to hazardous or mixed waste, the affected person, a coworker, or line management will notify the EM&R Office. The duty Emergency Manager will contact HS-10, and the HMGS will notify HS-1 and/or HS-5 directly, as appropriate, as soon as possible so that

exposure levels and decontamination requirements can be established. Chemical material in the eye or on the skin will be washed either with the entire contents of a portable eyewash station or for at least 15 minutes. The eyelids will be held open during washing, if possible. The injured person will then be quickly transported to the HS-2 medical facility or to the LAMC for evaluation. If possible, the material involved in the injury will be ascertained and the information given to the medical staff.

Other potential exposures will necessitate evacuation of the area if anyone notices any of the following conditions:

- Irritation of the eyes, breathing passages, or skin
- Difficulty in breathing
- Nausea, light-headedness, vertigo, or blurred vision.

The affected person will be transferred to the HS-2 medical facility or LAMC and an HS-1, HS-5, or HS-10 representative will attempt to ascertain what, if any, exposure occurred and what corrective measure is appropriate.

7.9 EVACUATION [HWMR-7, Pt. V, 264.52(f)]

A facility will be evacuated upon the voice command to evacuate the area or upon the sounding of the evacuation or fire alarm.

7.9.1 Emergency Process Shutdown Prior To Evacuation

Personnel are instructed to shut down equipment prior to evacuating a building unless an immediate building evacuation is announced or signaled. To ensure efficient shutdown, training and exercises in process shutdown are performed. In the case of an immediate evacuation, a selected team may shut down designated equipment in an evacuated area. The team will be equipped with the proper equipment, clothing, and breathing apparatus. If present, HS-1, HS-5, and HS-10 will provide advice and assistance. Process shutdown procedures will apply to the skid-mounted treatment process. Process shutdown procedures are described below.

TA-63 Skid-Mounted Chemical Plating Waste Treatment Process

The skid-mounted chemical plating waste treatment system at the HWTF will be operated in accordance with standard operating procedures developed for that process. If a fire or

evacuation alarm sounds during the operation of the waste treatment system, the operating crew will initiate a process shutdown. Cessation of treatment is generally adequate to bring the process to a safe condition.

7.9.2 Evacuation Plan

Emergency situations may warrant the shutdown and evacuation of an area(s) or building(s) in order to protect personnel and property, to anticipate the emergency condition, or to enhance the appropriate response. Table 7-4 shows the criteria for evacuation, persons responsible for initiating evacuations, and reentry conditions. Evacuation routes, alternate evacuation routes, and assembly/muster areas for the units and subunits addressed in this permit application are shown on Figures 7-3 and 7-4.

To initiate building evacuation, the evacuation or fire alarm is sounded and/or the PA system is used. The evacuation alarm cannot be silenced and reset by site personnel. The Fire Alarm Maintenance Section at 667-4027 and the LACFD Platoon Chief at 667-7026 can silence and reset the alarm.

To evacuate a portion of a building, use of the PA system is more appropriate. The PA system will notify the occupants of the area to be evacuated and will advise personnel in the rest of the building of the existence of a problem in a specific area.

Once evacuation has been initiated, personnel are to turn off all equipment, if conditions allow, that could contribute to the hazard if left unattended. Personnel should then leave the affected area and go to the assembly/muster area.

In the event of an evacuation of only a portion of the building, one of the outbuildings, or an outlying work area, the responsible Group Leader will designate a control point at the closest safe location (e.g., considering wind direction). This area will be outside the affected area and will serve as an assembly/muster area where the Group Leader or designee can oversee evacuation operations and work to prevent further spread of the hazard.

As personnel exit an affected building/area, a primary sweep of the building/area will be performed to ensure that all personnel have evacuated. If the building/area is evacuated, a

Group Leader designee will take the attendance roster to the assembly/muster area, call roll, and report personnel accountability to the IC. The evacuation procedure follows:

1. Person discovering the accident or emergency will call 911 or 9-911 and ensure that line management and the EM&R Office are notified.

2. Building Emergency Plan(s) will be followed concerning evacuation, sweep, personnel accountability, and equipment shutdown procedures.

The EM&R Office will be notified and until the duty Emergency Manager arrives at the scene to assume responsibility for the evacuation, a responsible on-site person may begin the evacuation process.

7.10 SALVAGE AND CLEANUP [HWMR-7, Pt. V, 264.56(g) and (h)]

The affected area will be surveyed by appropriate representatives from the HS and EM Groups before salvage, cleanup, and return to normal operations begins. Visual inspections of the affected area will be supplemented by sampling to determine whether cleanup is complete. After determination of any existing hazards from toxic or hazardous gases or fumes, electrical hazards, radiological hazards, or other unsafe conditions, personnel or selected teams equipped with proper breathing apparatus and protective clothing will reenter the area to perform designated decontamination tasks, repairs, and salvage to allow the return to normal operations. After an emergency, the IC will turn the operation over to line management, who will:

- Provide for proper handling of recovered waste, contaminated soil or surface water, or any other material that results from a spill, fire, or explosion. Contaminated material will be managed appropriately and temporarily stored at one of the interim status mixed waste storage areas or less-than-90-day storage areas at LANL. EM-7 will be responsible for determining the final disposition of the waste. This determination will be made in compliance with RCRA TSD standards.

- Monitor for damage or improper operation of the unit and associated equipment as a result of the emergency or of plant shutdown in response to the emergency.

- Arrange for site cleanup procedures to be completed and ensure that no waste that may be incompatible with the released material is treated or stored in the same area.

- Ensure that emergency equipment is cleaned, decontaminated, and fit for its intended use before operations are resumed. Equipment will be inspected visually and then sampled, if necessary, to determine the type and degree of contamination and appropriate cleanup measures that will be used.

Prior to resuming operations, facility management will verify that the previously-mentioned tasks have been performed and the owner/operator (DOE/LAAO) will notify appropriate State as well as local authorities that cleanup procedures are completed and emergency equipment is clean and fit for its intended use.

The IC assumes the coordination of post-emergency actions until he can appoint a Recovery Manager (Group Leader or designee). The Recovery Manager then assumes this coordination role. Such actions include cleanup operations, repair of vital equipment, or interim hazard-removal operations (such as demolition of unstable walls). The services of the affected operational organizations, HS and EM Groups, JCI, and other on-site resources will also be utilized to estimate cleanup costs and operational impact.

7.11 POST-EMERGENCY ASSESSMENT

When the emergency is over, the cause of the emergency and the effectiveness of the response are investigated so that future emergencies may be prevented and so the response to them may be more effective. Following each event requiring the implementation of this contingency plan, HS-7 will evaluate and perform an assessment of the cause(s) and facility management will schedule and conduct a critique with representatives of all response groups, building/area representatives, and LANL management to determine the adequacy of the response.

7.12 EMERGENCY RESPONSE RECORDS AND REPORTS [HWMR-7, Pt. V, 264.56(j)]

Any emergency that requires implementation of the contingency plan will be reported in writing within 15 days to the NMED. The incident report, submitted by DOE/LAAO, shall include the following data:

- Name, address, and phone number of owner or operator
- Name, address, and phone number of the facility
- Date, time, and type of incident (e.g. fire, explosion, spill)
- Name of material(s) involved
- Quantity of material(s) involved
- Extent of injuries (if any)
- Assessment of actual or potential hazards to human health or the environment

- Estimated quantity and disposition of material recovered from the incident.

The details of any incident that requires implementation of this plan will be recorded by various LANL personnel responding to the emergency. The CAS operator, the EOC communicator, the Emergency Manager and/or the responsible Group or Section Leader for that hazardous or mixed waste unit will record the date, time, location of the incident, wastes/materials involved, injuries (if any), property damage (if any), and a detailed description of the incident. This information will be maintained in the facility operating record. In addition, HS-7 will supply information relating to any follow-up actions and EM-8 will provide details relating to the removal and disposal of hazardous and mixed wastes relating to the emergency.

7.13 CONTINGENCY PLAN AMENDMENT [HWMR-7, Pt. V, 264.54]

This contingency plan will be reviewed by the EM&R Office, EM-7, EM-8, and by HS-10 periodically, if necessary, and will be amended immediately if determined to be inadequate to handle spills, explosions, fires, and whenever:

- The facility permit is reviewed and revised.
- There is change in the design or operation of the facility (e.g., waste quantities handled and handling techniques) that increases the likelihood of an emergency and requires changes in emergency response.
- The list of Emergency Managers changes.
- The list of emergency equipment changes significantly.

This plan is a controlled document distributed by EM-8. Any amendments to this contingency plan will be distinguished by the revision number and date of revision noted in the upper right-hand corner of each page. Amendments shall be issued to all contingency plan holders and will include a cover letter that describes the plan changes and the rationale for those changes.

Table 7-1

Response Groups and Agencies Available to the Emergency Management and Response Office for Guidance and/or Emergency Assistance

Laboratory-Controlled Response Group	Telephone	Responsibilities
HS-1, Health Physics Operations	667-5296	Radiological monitoring and decontamination.
HS-2, Occupational Medicine	667-7251	Emergency medical treatment.
HS-5, Industrial Hygiene and Safety	667-4644	Provide guidance on operational safety.
	665-4427	Site evaluation/support field testing to determine the nature and extent of contamination (nonradiological).
HS-7, Occurrence Investigation	667-0598	Report occurrences and track follow-up actions.
HS-10, Hazardous Materials Response	665-5237	Specify protective clothing and equipment. Provide Hazardous Materials Response Team. Provide support for chemical, radiological, hazardous, and mixed waste incidents and personnel decontamination.
EM-7, Waste Management	667-5839	Provide guidance on proper treatment, storage, and off-site shipment of hazardous and mixed waste.
EM-8, Environmental Protection	667-5021	Provide guidance on regulatory requirements. Field surveys to determine spread of contamination and adequacy of cleanup.
NMT-2, Nuclear Materials Processing-Nitrate Systems Group	667-2338	Monitor for leaks, pressure buildup, gas generation, or equipment ruptures in the event of interruption of operations at TA-55 due to an emergency.
PTLA, Protection Technology Los Alamos	667-4437	Traffic control, security.

Table 7-1 (Continued)

Response Groups and Agencies Available to the Emergency Management and Response Office for Guidance and/or Emergency Assistance

Laboratory-Controlled Response Group	Telephone	Responsibilities
Johnson Controls World Services Inc.	667-6191	Maintenance personnel and equipment, assist in waste cleanup with guidance from HS-5.

Non-Laboratory-Controlled Response Group	Telephone	Responsibilities
Los Alamos County Fire Department	667-7080	Firefighting personnel and equipment.
Los Alamos County Police Department	662-8222	Traffic control on public access roads.
Los Alamos Medical Center[a]	662-4201 662-2455	Medical services. Emergency Room.

[a] Medical services related to hazardous and mixed wastes injuries provided under the direction of HS-2.

Table 7-2

Emergency Management and Response Office
Emergency Managers[a]

Emergency Managers[b]	Laboratory Telephone	Home Telephone	Home Address

This information has been provided confidentially under separate cover.

[a] To ensure immediate response, the Emergency Manager may be reached at the Emergency Management and Response Office, 667-6211 or, after hours, 667-7080.

[b] Assignments as the designated (i.e., primary) Emergency Manager are rotated. A current schedule is maintained at the Emergency Management and Response Office (667-6211, working hours; 667-7080, after working hours) and at the Central Alarm Station (9-911 or 911).

Table 7-3

Waste Analysis Parameters and Test Methods[a]

Parameter	Test Method	Reference[b]
Ignitability	Pensky-Martens	(L) SW1010
	Closed-cup method	(L) ASTM D93-80
Reactivity	Test method to determine hydrogen cyanide released from waste	(L,S) SW
	Test method to determine hydrogen sulfide released from waste	
Corrosivity	Electrometric (pH of aqueous solution)	(L) SW9040
Toxicity characteristic	Toxicity characteristic leaching procedure (TCLP)	(L,S) Method SW1311
	Extraction and graphite furnace atomic absorption (AA) spectroscopy	
Arsenic		(L) SW7060, SW7061
Barium		(L) SW7081, SW7080
Cadmium		(L) SW7131, SW7130
Chromium		(L) SW7191, SW7190
Lead		(L) SW7421, SW7420
Selenium		(L) SW7740
Silver		(L) SW7761, SW7760
Mercury	TCLP extraction and manual cold vapor technique	(L) SW7470
Volatile organics	TCLP extraction and gas chromatography/ mass spectrometry (GC/MS)	(L) SW8240
	GC/MS capillary column technique	(L) SW8260
Semivolatile organics	TCLP and GC/MS	
	Packed column technique	(L) SW8250
	GC/MS capillary column technique	(L) SW8270
Organochlorine pesticides	TCLP extraction and GC	(L) SW8080
Chlorinated herbicides		(L) SW8150

Refer to footnotes at end of table.

Table 7-3

Waste Analysis Parameters and Test Methods[a] (Continued)

Parameter	Test Method	Reference[b]
Chemical composition	95% organic composition by GC/flame ionization detector (FID)	(L) SW8100
Trace organic analysis	Any of the following:	
	Volatile organic compounds-GC/MS	(L) SW8240
	Semivolatile organic compounds-GC/MS	
	-Packed column	(L) SW8250
	-Capillary column	(L) SW8270
Heat value	Bomb calorimeter	(L) A006, ASTM D240
Organic chloride	Halide titration of combustion residue	(L,S) A004, ASTM D2361
Ash content	Residue after combustion in muffle furnace	(L) A001, ASTM D482 (S) A001, ASTM D3174
Cyanide, free and total	Distillation and colorimetric ultraviolet	(L) SW9012, SW9010
Total chromium	Colorimetric method for hexavalent chromium	(L) SW7196
Sulfide	Colorimetric titration	(L) SW9030
Total metals[c]	Acid digestion	(L,S) SW3020
	Inductively coupled plasma-atomic emission spectroscopy	(L) SW6010
Arsenic		(L) SW6010
Barium		(L) SW6010
Beryllium		(L) SW6010
Cadmium		(L) SW6010
Chromium		(L) SW6010
Lead		(L) SW6010
Nickel		(L) SW6010

Refer to footnotes at end of table.

Table 7-3

Waste Analysis Parameters and Test Methods[a]
(Continued)

Parameter	Test Method	Reference[b]
Selenium		(L) SW6010
Silver		(L) SW6010
Thallium		(L) SW6010
Zinc		(L) SW6010
Mercury	Manual cold vapor technique	(S) SW7471 (L) SW7470
Free liquids	Paint Filter Liquids Test	(S) SW9095

[a] At Los Alamos National Laboratory, current analytical capabilities include the analysis of mixed waste samples. This analysis includes gross alpha, beta and gamma screening.
[b] "A" refers to "Sampling and Analysis Methods for Hazardous Waste Combustion", *EPA-600/8-84-002* (EPA, 1984).
"ASTM" refers to American Society for Testing Material Standards.
"SW" refers to U.S. Environmental Protection Agency, 1986, "Test Methods for Evaluating Solid Waste", *SW-846*, Physical/Chemical Methods, 3rd Edition.
(L) refers to liquid waste.
(S) refers to solid waste.
See 55 FR 11863.
[c] See also Atomic Absorption Methods listed under TCLP.

Table 7-4

Evacuation Determination and Reentry Conditions [a]

Reason for Evacuation	Evacuation Determination Made By	Reentry Conditions
Fire	Fire or evacuation alarm, Group Leader or Alternate, Lead Engineer, Senior Staff Member present, Senior Technician, or Emergency Manager	Following survey by the Chief Fire Officer, HS-1[b], HS-5[c], and/or HS-10[d], and R&D[e] Supervision
Explosion	Same as above	Same as above
Loss of ventilation	Group Leader or Alternate, Senior Staff Member, Lead Engineer, or Senior Technician	Following survey by HS-1 and/or HS-5, and R&D Supervision
Loss of electric power	Same as above	Same as above
Extensive contamination	Same as above or HS-1 Representative	Same as above or HS-10
Airborne contamination	Same as above or Radiation Monitor	Same as above or HS-10
Escape or release of toxic or hazardous gas or fumes	Group Leader or Alternate, Senior Staff Member, Lead Engineer, Senior Technician, or Emergency Manager	Same as above plus HS-5 or HS-10
Bomb threat	EM&R[f] or PTLA[g] Representative, R&D Section Leader or Alternative, Senior Staff Member, or Lead Engineer	Following determination by the Emergency Manager or HDT Team Leader

[a] All reentries are authorized by the Incident Commander.
[b] "HS-1" refers to the Health Physics Operations Group.
[c] "HS-5" refers to the Industrial Hygiene and Safety Group.
[d] "HS-10" refers to the Hazardous Materials Response Group.
[e] "R&D" refers to the Research and Development Section.
[f] "EM&R" refers to the Emergency Management and Response Office.
[g] "PTLA" refers to Protection Technology Los Alamos.

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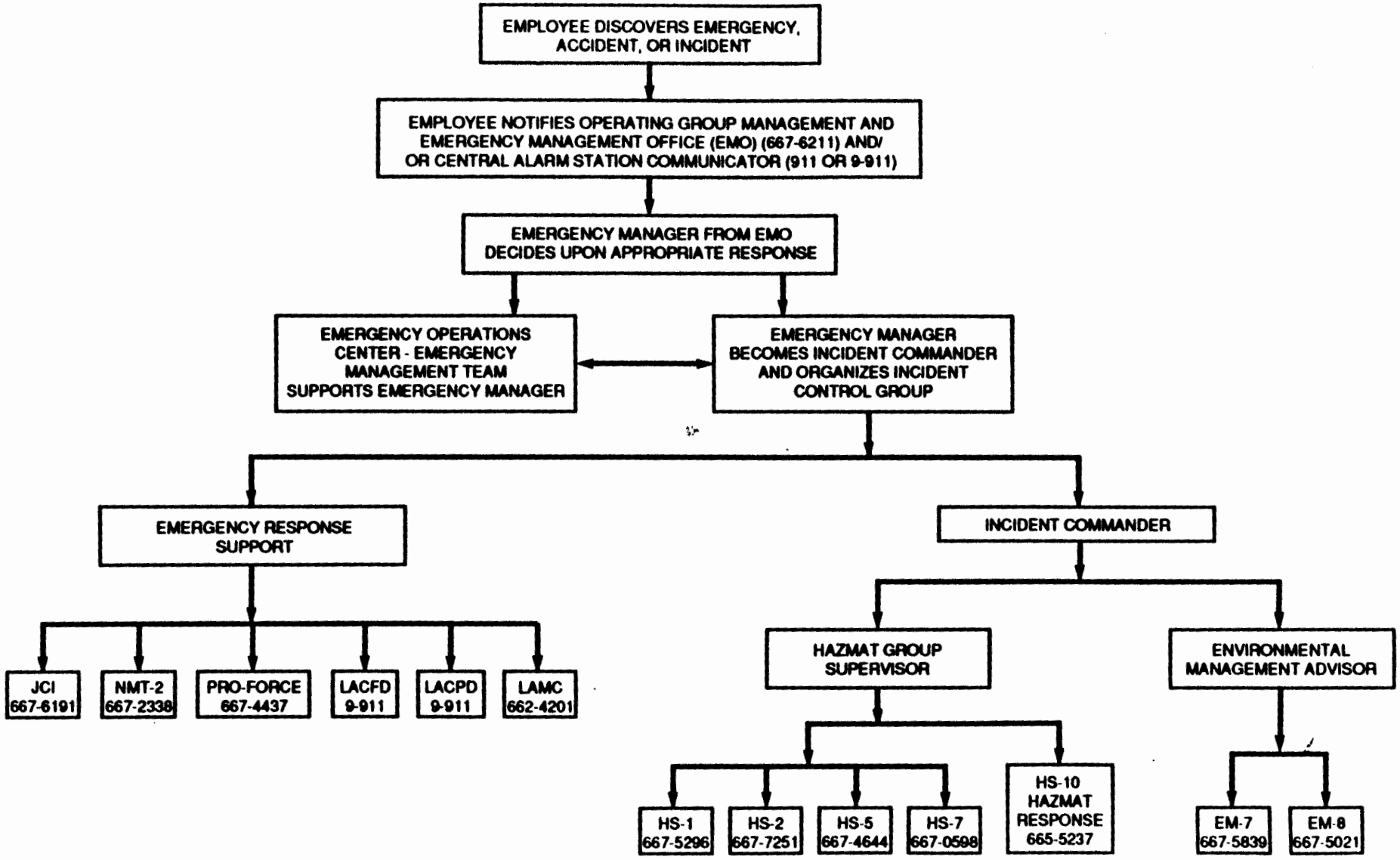

Figure 7-1
Mixed Waste Emergency Notification Structure

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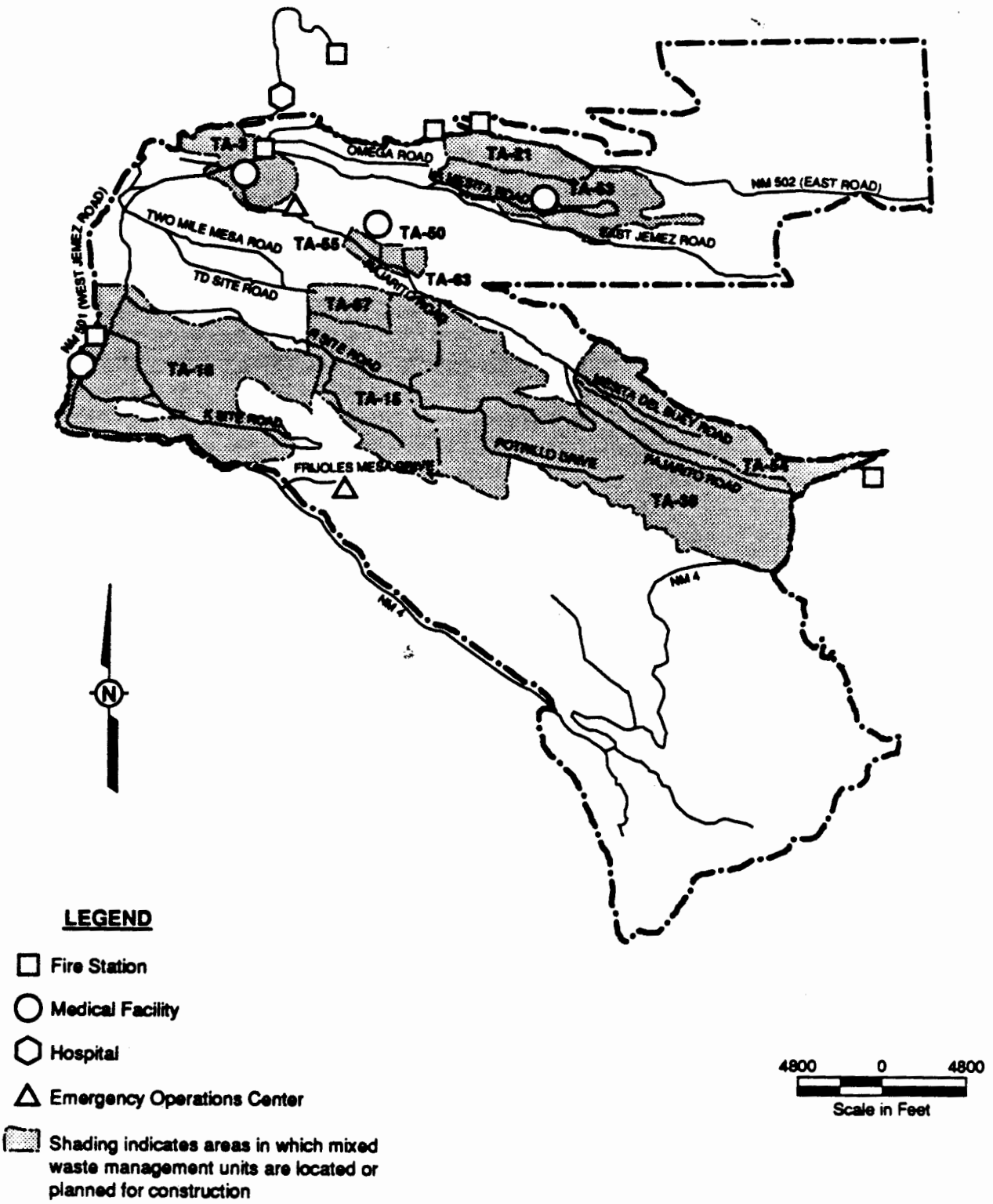

LEGEND

- Fire Station
- Medical Facility
- Hospital
- Emergency Operations Center
- Shading indicates areas in which mixed waste management units are located or planned for construction

Figure 7-2
Emergency Facilities

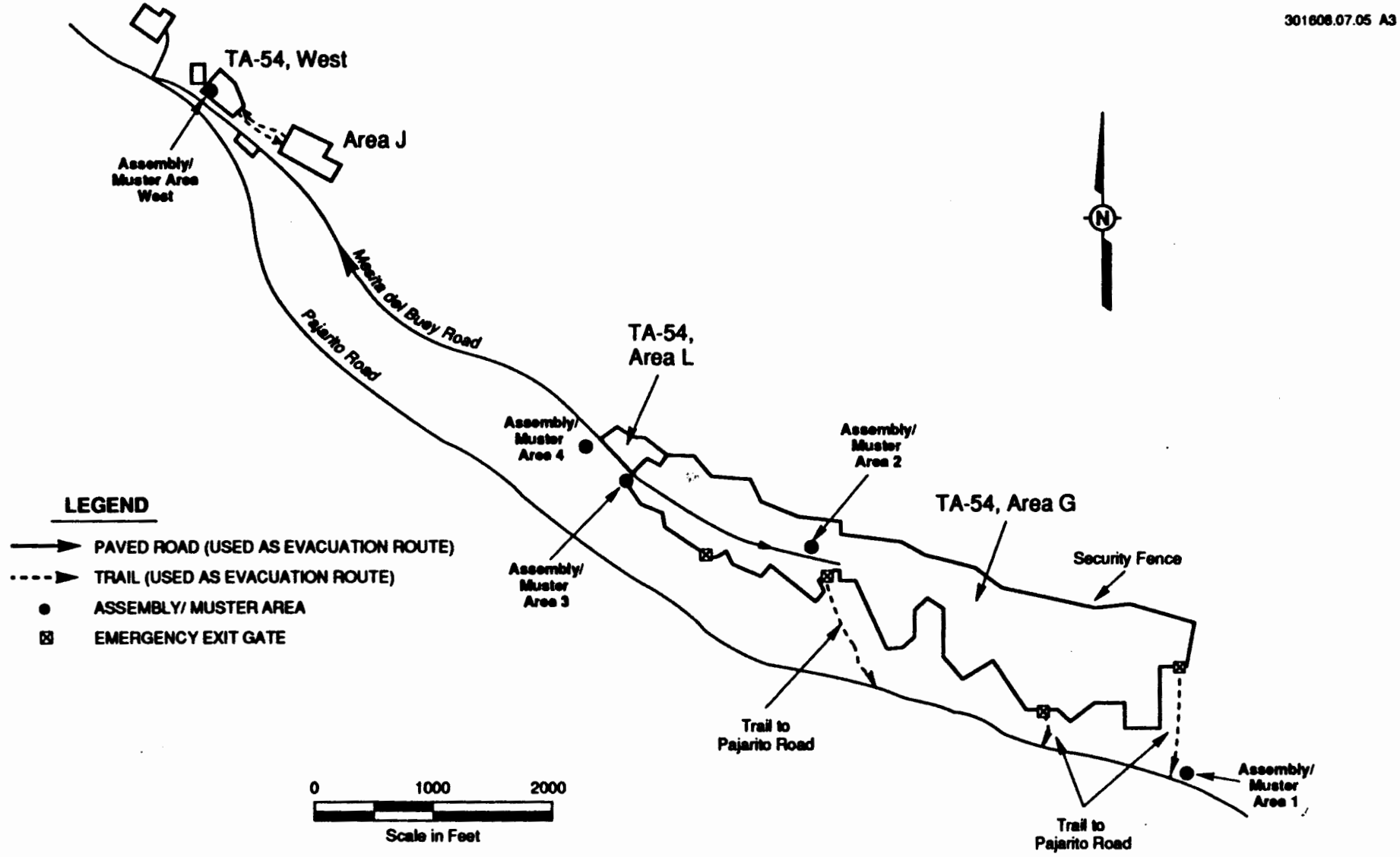

Figure 7-3

Evacuation Roads, Evacuation Trails, Assembly/Muster Areas, and Emergency Exit Gates at Technical Area-54

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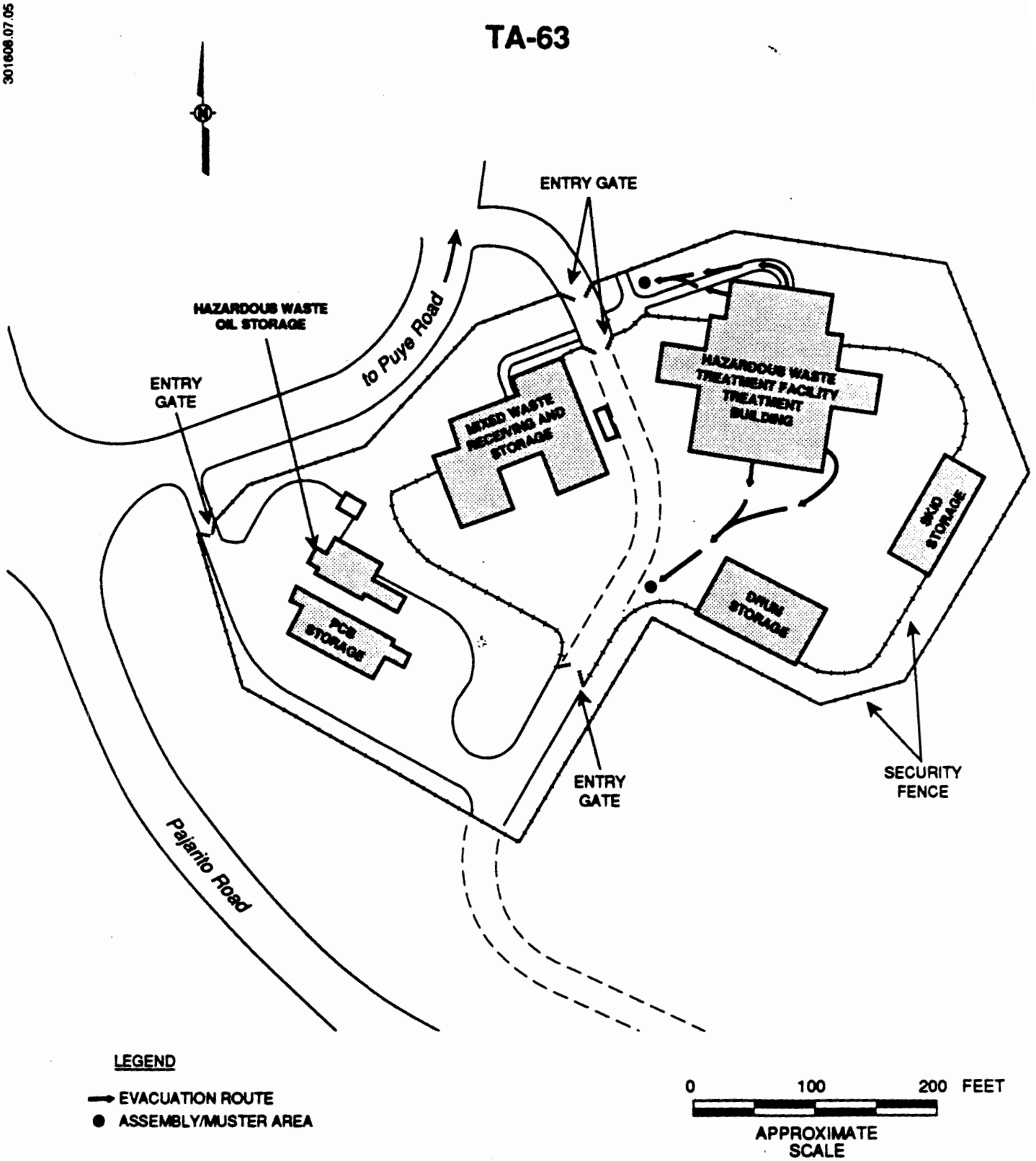


Figure 7-4
Evacuation Routes and Assembly/Muster Areas at the Proposed Hazardous Waste Treatment Facility at TA-63

ATTACHMENT 7-1

Emergency Equipment

Attachment 7-1

Emergency Equipment

Hazardous Materials (HAZMAT) Vehicles and Associated Emergency Equipment:

Hazardous Materials (HAZMAT) vehicles and trailers are located at Technical Area 52 (TA-52). They are available to HS-10 for emergency response to all of the TAs at LANL. HS-10 is responsible for maintaining the supplies of appropriate emergency equipment in each vehicle and trailer.

The HAZMAT vehicles and trailers are equipped with safety and emergency equipment, personal protective clothing, and other supplies, which may include, but are not limited to: assorted coveralls, T-shirts, and gloves; safety goggles and glasses; boots and booties; face shields; totally encapsulating suits and boots; Level A and B suits; flash suits; self-contained breathing apparatus (SCBA) and SCBA bottles; hazardous chemical reference books and other reference materials; shovels; siphon pumps; assorted spill kits and sorbents; chemical burn and neutralizing solutions; communication radios; bottles of leak detector; leak repair kits; emergency repair packs; HAZMAT bags; gas detectors; respirators and cartridges; sponges and cleaners; warning signs; traffic control barriers; flashlights; timers; cameras and film; knives; warning and signal horns; harnesses and belts; portable emergency oxygen; and assorted tools, tape, and other supplies.

Attachment 7-1

Emergency Equipment

TA-54

Emergency equipment at TA-54, Area G:

FIRE CONTROL EQUIPMENT:

Seven fire extinguishers (five 10-pound Halon, two 5-pound chemical BC) are located in TA-54-49.
An automatic smoke alarm system is located in TA-54-49.

Storage Domes A, B, C, and D and Pad 1's and Pad 4's New Storage Domes will be equipped with fire alarm pull stations and fire and heat detection alarm systems. All alarm signals will be transmitted to the Central Alarm Station (CAS). These six domes will also have access to fire extinguishers.
Description of General Capabilities:
Fire extinguishers may be used by any employee in the event of a small fire. If the ceiling mounted smoke, fire, or heat alarm system sensors are activated, Protection Technology Los Alamos (PTLA) and the Los Alamos County Fire Department (LACFD) are alerted.

Three existing fire hydrants are located in Area G, and additional fire hydrants will be added to serve Storage Domes A, B, C, and D; Pad 1's and Pad 4's New Storage Domes; and Storage Pad 2.

SPILL CONTROL EQUIPMENT:

A 6-inch asphalt curb surrounds the interior of TA-54-49 and has sufficient capacity for any spill. Sorbent spill pillows and pads are stored at the emergency spill station inside Storage Domes 48 and 49. Vermiculite and corn cob fractions are available at the emergency spill station in Storage Domes 48 and 49.

One portable spill station contains:
- 2 plastic suits
- 2 pair goggles
- 2 pair rubber gloves
- sorbent pads and pillows
- plastic bags

Attachment 7-1

Emergency Equipment (Continued)

Emergency equipment at TA-54, Area G, continued:

SPILL CONTROL EQUIPMENT (Continued):

A 6-inch asphalt curb will be installed around the interior floor perimeter of Storage Domes A, B, C, and D and Pad 1's and Pad 4's New Storage Domes to contain any liquids accumulated in the event of a waste spill or leak. A spill control kit will also be stationed near the main door inside each dome. An area within Storage Domes A and C and within Pad 1's New Storage Dome will be lined with high density polyethylene. These areas will be used to store drums that may potentially contain free liquids.

COMMUNICATION EQUIPMENT:

A private telephone is located near the middle of TA-54-49.

Storage Domes A and B will share a pole-mounted telephone, as will Storage Domes C and D. Pad 1's and Pad 4's New Storage Domes will each be equipped with a pole-mounted telephone. All telephones will be equipped with public address (PA) capabilities. Warning horns will also be mounted on the telephone poles.

Telephones with speakers are located in TA-54-2, -11, -22, and -33.

Eight portable two-way radios are issued to technicians and to the secretary at TA-54-22.

One base unit radio is located in TA-54-22.

Pagers are carried by all technicians. Pagers are accessed by telephone.

Description of General Capabilities:

Telephones and alarms are located in Area G. The evacuation alarm is a high-pitched wailing sound that can be heard throughout Area G. Strobe lights mounted on poles may be used to visually alert personnel to evacuate the area. A video explaining alarms and evacuation procedures must be viewed prior to entering the site.

DECONTAMINATION EQUIPMENT:

A portable eyewash and emergency shower will be located inside Storage Domes A, B, C, and D and Pad 1's and Pad 4's New Storage Domes.

Portable eyewash stations are available at TA-54-49.

One safety shower is located at TA-54-33.

Material Safety Data Sheets (MSDSs) are available at TA-54-2, -11, -22, and -49.

A personnel decontamination trailer will be located south of Dome 48 during the container retrieval project. Emergency showers and change rooms will be provided in the trailer.

Attachment 7-1

Emergency Equipment
(Continued)

Emergency equipment at TA-54, Area G, continued:

DECONTAMINATION EQUIPMENT (Continued):

Description of General Capabilities:
The safety and emergency showers and eyewashes are used by personnel who receive a chemical splash to the skin or eyes. Specific MSDSs for the chemical(s) should be obtained prior to working with hazardous or mixed waste to determine if the application of water is indicated for decontamination.

PERSONAL PROTECTIVE EQUIPMENT:

A change room is located at TA-54-11; protective clothing is available in TA-54-2 and -11.

Six air-purifying respirators are available at TA-54-156.

Additional respirators are available in the Area G emergency equipment trailer.

OTHER:

Heavy equipment kept on site includes:
- 2 scrapers
- 1 bulldozer
- 1 front-end loader
- 1 flat-bed truck
- 1 vacuum truck equipped with a HEPA filtration system

Four portable emergency generators are available on site: three are located by TA-54-33; the other is in the Area G emergency equipment trailer.

Fourteen vehicles are available in Area G to evacuate personnel include:
- 2 Honda all terrain vehicles (ATVs)
- 2 Polaris ATVs
- 2 pickup trucks
- 1 flatbed truck
- 7 golf carts

The Area G emergency equipment trailer may be pulled by several different vehicles and is equipped to respond as a first response vehicle.

See page 1 of this attachment for equipment available in the HAZMAT vehicles and trailers.

Attachment 7-1

Emergency Equipment
(Continued)

TA-54

Emergency equipment at TA-54, Area L:

FIRE CONTROL EQUIPMENT:

Nine fire extinguishers (Halon, water, carbon dioxide [CO_2])

Locations:

1 Halon (ABC) is located inside TA-54-37
1 Halon (ABC) is located inside TA-54-60
1 water (A) is located inside TA-54-51
1 Halon (ABC) is located inside northeast end of TA-54-32
1 extinguisher (BC) is located inside TA-54-39
1 extinguisher (CO_2) is located at southeast end of Area L next to spill kit
1 CO_2 (BC) is located outside of TA-54-31
1 extinguisher is located 30 feet from southeast side of TA-54-32
1 water (A) is located outside of TA-54-117

Description of General Capabilities:

These fire extinguishers may be used by any employee in case of a small fire.

Fire alarm pull boxes are located inside TA-54-37, -39, -51, -60, and -117.

Description of General Capabilities:

Fire alarms may be activated by any employee in the event of a fire to notify the CAS.

One fire hydrant is located 30 feet south of the entrance to Area L.

One freeze-proof faucet is located approximately 25 feet east of TA-54-31.

SPILL CONTROL EQUIPMENT:

Shovels (located in TA-54-46)
Oversized drums
Sawdust absorbent (located on site)

Spill kits are located throughout Area L. Each kit includes two 25-pound bags of Zorball, 50 pounds of caustic neutralizer, 100 pounds of acid neutralizer, and an inventory of tools and supplies. A complete spill kit inventory list can be obtained at TA-54, Area L.

Attachment 7-1

Emergency Equipment (Continued)

Emergency equipment at TA-54, Area L, continued:

COMMUNICATION EQUIPMENT:

Two-way radios are available to personnel while in Area L. Three two-way radios are issued to vehicles used in Area L activities. Three outdoor telephones are located in Area L. Area L also has fire alarms, evacuation alarms, and a PA system.

Locations:

Telephones are located inside TA-54-37, TA-39, TA-51, TA-55 and TA-61. Two evacuation telephones and alarm buttons are located at the northeast end of TA-54-32 and inside Building 37 by the secretary's desk. A portable phone is available for emergency communications during evacuation. This portable phone is located in Building 37 in the secretary's office. The fire alarm is a double slow whoop sound. An emergency evacuation paging system is located in TA-54-37 and at the north end of TA-54-32. The evacuation alarm is a pulsating sound. The PA system can be operated from any phone in Area L.

Description of General Capabilities:

Telephones for internal, external, and PA capabilities are available for use by any employee. Fire and evacuation alarms are activated in the event of a fire or in case an evacuation is required.

DECONTAMINATION EQUIPMENT:

One emergency shower and eyewash are located immediately east of TA-54-31.
One emergency shower and eyewash are located between TA-54-35 and -36.
One emergency shower and eyewash are located in TA-54-39.
One portable eyewash is located in TA-54-52.
MSDSs are available in TA-54-46.

Description of General Capabilities:

Safety showers and eyewashes are used by personnel who receive a chemical splash to the skin or eyes. Specific MSDSs for the chemical(s) should be obtained prior to working with mixed waste or mixed material to determine if the application of water is indicated for decontamination.

PERSONAL PROTECTIVE EQUIPMENT:

Two SCBAs are located in TA-54-55.

Attachment 7-1

Emergency Equipment
(Continued)

Emergency equipment at TA-54, Area L, continued:

OTHER:

A portable emergency generator is located in TA-54-46. A forklift and Bobcat are available in Area L. Heavy equipment from Area G is available for emergencies at Area L. Six emergency evacuation crash gates are located throughout Area L. One pedestrian/crash gate is located adjacent to Building 37. See page 1 of this attachment for equipment available in the HAZMAT vehicles and trailers.

Attachment 7-1

Emergency Equipment
(Continued)

TA-63

Emergency equipment at TA-63, Hazardous Waste Treatment Facility (HWTF):

FIRE CONTROL EQUIPMENT:

Each treatment room in the treatment building will be equipped with detector-actuated, high-expansion-foam fire suppression systems. A separate control panel for this system will be interfaced with the fire alarm control panel in the office building.

Each sampling area associated with the treatment rooms will have an independent special agent fire suppression system with detection and discharge controls. The system will be interfaced as a zone on the fire alarm control panel located in the office building.

The treated liquid storage areas will be provided with dry-pipe sprinkler systems.

A wet-pipe fire protection system will serve the remaining areas of the treatment building. The building fire alarm will be interfaced with the CAS.

Double-action type manual pull stations will be located at designated areas throughout the building.

Description of General Capabilities:

The automated fire suppression systems will be activated to extinguish potential fires in their respective areas. Manual pull stations may be activated by any employee in the event of a fire to notify the CAS.

SPILL CONTROL EQUIPMENT:

Each treatment room and associated sampling area in the treatment building will be provided with underfloor or perimeter trenches and sump pits that will serve as secondary containment for accidental spills and leaks. All sumps in the treatment building will be equipped with liquid level detectors.

Each tank in the treated liquid storage areas will be provided with its own containment basin to collect spills or leaks. The containment basins will be equipped with spill detection systems.

COMMUNICATION EQUIPMENT:

Telephones with paging/PA capabilities will be located throughout the treatment building. Emergency alarm and paging will override all routine paging.

Audio-visual fire alarms will consist of slow whooping horns and red flashing lights.

An evacuation alarm system with horns and strobes will be used to notify personnel both inside and outside the building to evacuate an area. The evacuation alarm system will have a separate control panel in the office building.

Attachment 7-1

Emergency Equipment (Continued)

Emergency equipment at TA-63, HWTF, continued:

COMMUNICATION EQUIPMENT (Continued):

Gas detectors in each treatment room will activate a special alarm. A local alarm will sound and the control room will be signaled remotely if toxic or explosive gas is generated during the treatment process.

Liquid level detectors in the treatment building sumps will trigger a local alarm and a remote audio-visual alarm panel in the control room if liquids in the sump pits reach unacceptable levels.

Continuous air monitors will be installed in the treatment rooms to detect airborne radioactive material from mixed waste.

DECONTAMINATION EQUIPMENT:

Emergency showers and eyewash stations will be located in each treatment room as well as the laboratory, maintenance area, and warehouse area of the treatment building.

Equipment for detection of personnel contamination will be provided in the decontamination area of the treatment building.

A change room with protective clothing available will be located in the decontamination area.

Air purifying respirators and canisters and SCBAs will be available in the decontamination rooms.

Hand and foot monitors will be installed in the treatment rooms for radioactive characteristic and radioactive listed waste. The monitors will be located near the doors of the decontamination area.

OTHER:

See page 1 of this attachment for equipment available in the HAZMAT vehicles and trailers.

Attachment 7-1

Emergency Equipment (Continued)

Supplemental emergency equipment available from the Los Alamos County Fire Department:

	Number
Engine Companies - 1,250 gallons per minute	
Engines 1, 3, 4, 5, 6, 10, and 40	7
Engine 50 (Reserve) - 1,000 gallons per minute	1
Mini-pumpers	
MT-1, -3, -4, and -5	4
Modular ambulances	4
3 First line - M1, M3, M4	
1 Reserve Unit - M10	
Rescue vehicles	3
1 First Line	
1 Stored at Station #5, Out of Service	
1 Newly Purchased	
Crash-Fire-Rescue (CFR) units	2
CFR 6	
SCBA units	44
SCBA air tanks	130
105-foot Tower ladder with pump - 1,500 gallons per minute	1
Personnel with 120 hours Emergency Medical Technician training	90
Personnel with Advance Life Support Training	14
Water Tankers	5
T-1 = 1,500 gallons	
T-3 = 2,500 gallons	
T-4 = 3,000 gallons	
T-5 = 2,500 gallons	
T-50 = 1,500 gallons	

Attachment 7-1

Emergency Equipment
(Continued)

Supplementary emergency equipment and personnel available from Johnson Controls World Services Inc.:

	Number
TRANSPORTATION:	
Pickups, 1/2 through 3/4 ton	183
Trucks, 1 through 3 ton	25
Buses (11-passenger)	2
Vans, panels, and carryalls	24
SPECIAL EQUIPMENT:	
Road grader, Cat, self-propelled blade, with radio	1
Grader, John Deere, self-propelled, with radio	2
Loaders, bucket, Melroe, Bobcat, 1/3 cubic yards	3
Loader, bucket, Cat, 2-3/4 cubic yards, with radio	1
Loader, Fiat-Allis, 3 cubic yards	1
Loader, bucket, Cat, 2-1/2 cubic yards	1
Loader, bucket, Cat, 3-1/4 cubic yards	1
Loader, bucket, Yale, 3 cubic yards, with radio	1
Loader, bucket, backhoe, Case, 1-1/2 cubic yards	1
Loaders, bucket, backhoe, Case, 7/8 cubic yards	2
Loader, backhoe, Ford, 1 cubic yard	1
Snowplows, Bombardier, with blade	2
Bulldozer, D-8, Crawler	1
Bulldozers, TD-25, International	2
Scraper, Terex, self-propelled	1
Scraper, Fiat-Allis, self-propelled	1
Bulldozer, 280, rubber-tired, with radio	1
Semitrailers	7
Chain saws	(approx) 6
Flusher, street, 3,000-gallon truck, tanker, 500-gallon, FMC	1
Mobile transceivers (2-way, KOB-753)	144
Generators	6
Handsets (2-way)	113
Pageboys (1-way)	398
Welders, mounted on trailers and trucks	32

Attachment 7-1

Emergency Equipment
(Continued)

Supplementary emergency equipment and personnel available from Johnson Controls World Services Inc., (continued):

PERSONNEL:	Number
Heavy equipment operators	14
Clerks	10
Dispatchers	1
Mechanics	17
Power saw operators	8
Radio and telephone operators	1
Truck drivers	13

Attachment 7-1

Emergency Equipment
(Continued)

Emergency equipment and personnel at the Central Medical Facility and Satellite First-Aid Stations, HS-2:

At TA-3 (SM-409) Central Clinic:

PERSONNEL:	Number
Physicians (2 casual)	7
Physician's Assistants (2 casual)	4
Nurses (3 casual and 1 at 75%)	10
X-ray Technicians	1
Clinical Laboratory Technicians (4 part-time)	5

SPECIAL EQUIPMENT-PORTABLE:	
Multichannel Emergency Receiver	1
Two-way radios on the State Med Net, the LANL Emergency Management channel, and the LANL Health-Safety Net	5
Cardiac monitors and defibrillators (1 backup)	2
Crash cart-emergency equipment with E-tank oxygen (O_2)	1
Portable physicians bag-drugs	1
Portable suction unit	1
Portable, 1 ambulance, 2 gurney stretchers, 1 folding stretcher	4
Wheel chairs	3
O_2 tanks	3
Manual resuscitators	2
IV stands	2
IV solutions	q.s.*
Otoscope/ophthalmoscopes	4
Portable sphygmomanometers	6
Stethoscopes	20
Anticontamination apparel	q.s.
Eye irritation solution	q.s.
Full set air splints	1
Industrial first-aid kits	3
Extrication and cervical collars, crutches, canes	q.s.
Suture sets	4
Protective apparel	4

*q.s. - inventory varies as needed.

Attachment 7-1

Emergency Equipment
(Continued)

Emergency equipment and personnel at the Central Medical Facility and Satellite First-Aid Stations, HS-2 (continued):

At TA-3 (SM-409) Central Clinic (continued):

SUPPLIES-GENERAL:

Bedding/Pillows
Rescue blankets
Burn blankets
Thermal/icing pouches
Multitrauma dressings, surgical and first aid supplies
Disposable ice bags

SPECIAL FACILITIES - NONPORTABLE:

Completely equipped emergency room with ambulance entrance
Emergency lighting system
Complete X-ray suite
Protective clothing, and wound counters
12-lead electrocardiograph (2)
Fully equipped crash cart with Life Pak, intubation equipment, emergency drugs, etc.
Fully equipped decontamination room at Los Alamos Medical Center adjacent to the LAMC emergency room

TRANSPORTATION:

Full ambulance service is available within minutes to the central facility and all satellite clinics.
1983 Dodge Van

COMMUNICATION:

Base station on State Medical Net

At TA-53 Satellite First-Aid Station:

PERSONNEL:

Physician's Assistant (part-time)	1
Nurse (half-time)	10

*q.s. - inventory varies as needed.

Attachment 7-1

Emergency Equipment
(Continued)

Emergency equipment and personnel at the Central Medical Facility and Satellite First-Aid Stations, HS-2 (continued):

At TA-53 Satellite First-Aid Station (continued):

SPECIAL EQUIPMENT - PORTABLE:

Beeper	1
Stretcher	1
Wheel chair	1
Oxygen tank	1
Intravenous solutions	q.s.
Otoscope/ophthalmoscopes	2
Sphygmomanometer	1
Stethoscope	2
Anticontamination apparel	q.s.
Eye irrigation solution	q.s.
Industrial first-aid kit	1
Extrication and cervical collars	1
Crutches	1
Suture set	1

SUPPLIES:

Ample first aid supplies

At TA-16 (S-Site) Satellite First-Aid Station:

PERSONNEL:

Nurse (half-time)

*q.s. - inventory varies as needed.

Attachment 7-1

Emergency Equipment
(Continued)

Emergency equipment and personnel at the Central Medical Facility and Satellite First-Aid Stations, HS-2 (continued):

At TA-15 (S-Site) Satellite First-Aid Station (continued):

SPECIAL EQUIPMENT - PORTABLE:

Ambu bag	1
Stretcher	1
Wheel chair	1
Oxygen Tank	1
Intravenous solutions	q.s.
Otoscope/ophthalmoscopes	1
Sphygmomanometer	2
Industrial first-aid kit	1
Crutches	1
Cane	1
Disposable suture set - no suture	1
Full face shields, vinyl apron	1
ET tube laryngoscope	1
Diakok digital thermometer	1

SUPPLIES:

Ample first aid supplies

At TA-55 Satellite First-Aid Station:

PERSONNEL:

Nurse (half-time)	1

*q.s. - inventory varies as needed.

Attachment 7-1

Emergency Equipment
(Continued)

Emergency equipment and personnel at the Central Medical Facility and Satellite First-Aid Stations, HS-2 (continued):

At TA-55 Satellite First-Aid Station (continued):

SPECIAL EQUIPMENT - PORTABLE:

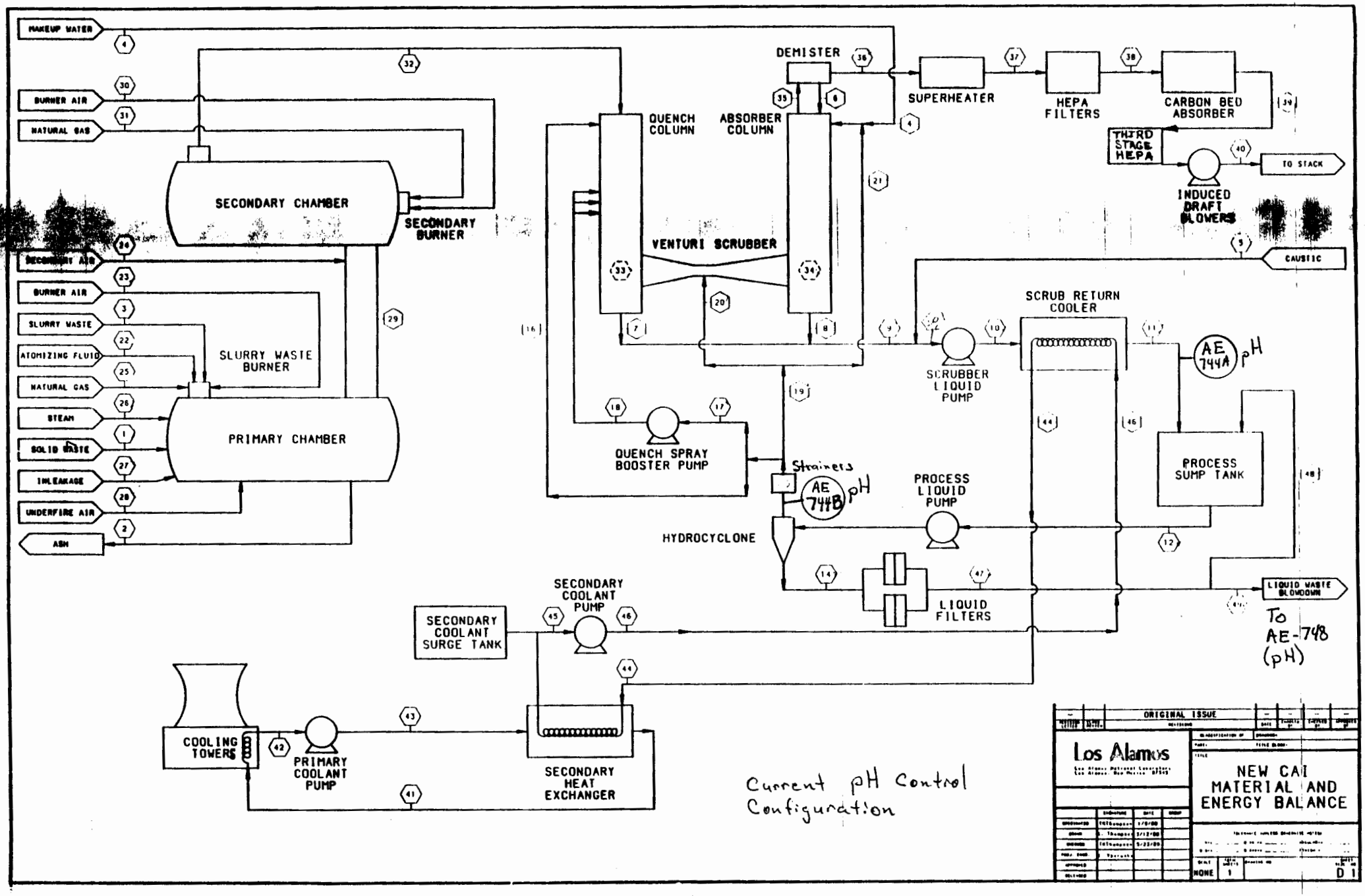
Beeper	1
Stretcher	1
Wheel chair	1
Oxygen tank	1
Otoscope/ophthalmoscopes	1
Sphygmomanometer	1
Stethoscope	1
Contamination apparel	q.s.
Eye irrigation system	1
Inflatable limb traction splints (set)	1
Industrial first-aid kit	1
Cervical collar	1
Crutches (pair)	1
Ambu bag	2

SUPPLIES:

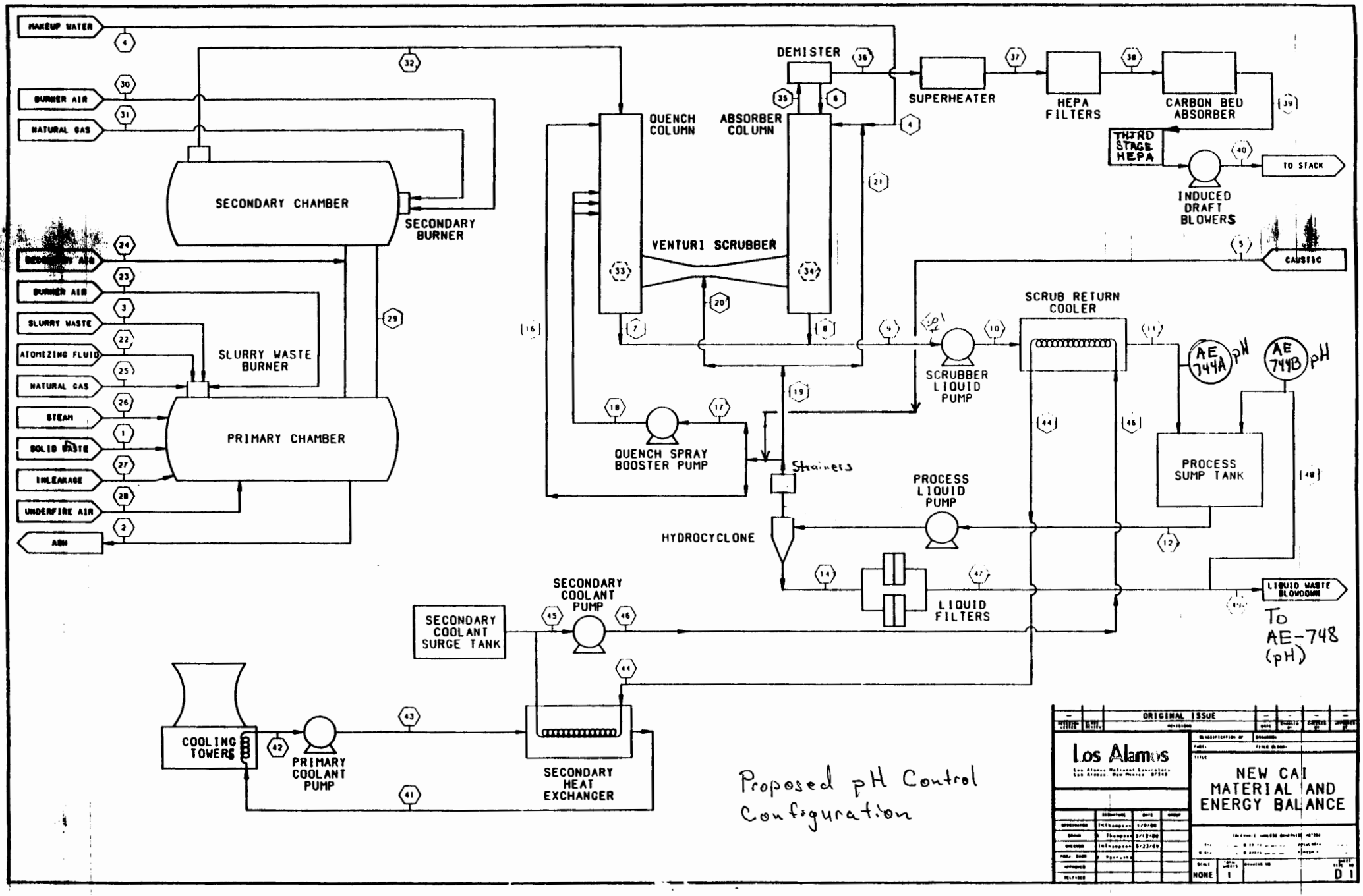
Ample first aid supplies

*q.s. - inventory varies as needed.

ENCLOSURE II


MAKEUP WATER
BURNER AIR
NATURAL GAS
SECONDARY CHAMBER
SECONDARY BURNER
SECONDARY AIR
BURNER AIR
SLURRY WASTE
ATOMIZING FLUID
NATURAL GAS
STEAM
SOLID WASTE
INLEAKAGE
UNDERFIRE AIR
ASH
SLURRY WASTE BURNER
PRIMARY CHAMBER
QUENCH COLUMN
ABSORBER COLUMN
DEMISTER
VENTURI SCRUBBER
SUPERHEATER
HEPA FILTERS
CARBON BED ABSORBER
THIRD STAGE HEPA
INDUCED DRAFT BLOWERS
TO STACK
CAUSTIC
SCRUB RETURN COOLER
SCRUBBER LIQUID PUMP
AE 744A pH
QUENCH SPRAY BOOSTER PUMP
Strainers
AE 744B pH
HYDROCYCLONE
PROCESS LIQUID PUMP
PROCESS SUMP TANK
LIQUID FILTERS
LIQUID WASTE BLOWDOWN
To AE-748 (pH)
SECONDARY COOLANT SURGE TANK
SECONDARY COOLANT PUMP
COOLING TOWERS
PRIMARY COOLANT PUMP
SECONDARY HEAT EXCHANGER
Current pH Control Configuration
ORIGINAL ISSUE
Los Alamos
NEW CAI MATERIAL AND ENERGY BALANCE
NONE
D 1

ENCLOSURE III


MAKEUP WATER
BURNER AIR
NATURAL GAS
SECONDARY CHAMBER
SECONDARY BURNER
SECONDARY AIR
BURNER AIR
SLURRY WASTE
ATOMIZING FLUID
NATURAL GAS
STEAM
SOLID WASTE
INLEAKAGE
UNDERFIRE AIR
ASH
SLURRY WASTE BURNER
PRIMARY CHAMBER
QUENCH COLUMN
ABSORBER COLUMN
DEMISTER
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AE 744A pH
AE 744B pH
PROCESS SUMP TANK
PROCESS LIQUID PUMP
LIQUID FILTERS
LIQUID WASTE BLOWDOWN
To AE-748 (pH)
SECONDARY COOLANT SURGE TANK
SECONDARY COOLANT PUMP
COOLING TOWERS
PRIMARY COOLANT PUMP
SECONDARY HEAT EXCHANGER
Proposed pH Control Configuration
ORIGINAL ISSUE
Los Alamos
NEW CAI MATERIAL AND ENERGY BALANCE
NONE
D 1

LA-UR-95-496

Title: **Summary of Modifications to the Los Alamos National Laboratory Controlled-Air Incinerator**

Author(s): G. E. Reader, CST-16

Submitted to: New Mexico Environment Department for regulatory review and for general distribution

Los Alamos
NATIONAL LABORATORY

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1.0 BACKGROUND

The Los Alamos National Laboratory (LANL) Controlled-air Incinerator (CAI) and associated systems were originally a research and development tool used to prove the viability of incineration as a treatment method for various transuranic (TRU) wastes, radioactively contaminated polychlorinated biphenals (PCBs), and low-level mixed (hazardous and radioactive) wastes (LLMW). The original CAI was installed in 1977 and first operated in 1979. Operations ceased in 1987 so that upgrades to the system, identified during the initial phase of operation, could be performed. These upgrades and modifications are nearing completion. Information regarding the original design, operations, and subsequent recommendations were published in Los Alamos National Laboratory reports.[1]

Every effort has been made to cover all changes to the CAI system. However, due to the number of modifications and the time span over which they were made, some modifications may have been omitted. Minor changes may have also never been documented.

2.0 SUMMARY

All modifications done to the CAI system were performed for one of two reasons. The first is replacing equipment due to normal wear. The second is upgrading existing equipment for routine operations. This latter type of modification centers on items such as increased component life, increased corrosion resistance, and improved electronics.

Given these types of changes, CAI system performance will not be degraded compared with the original CAI design. In many instances, enhanced performance is expected.

3.0 BASELINE

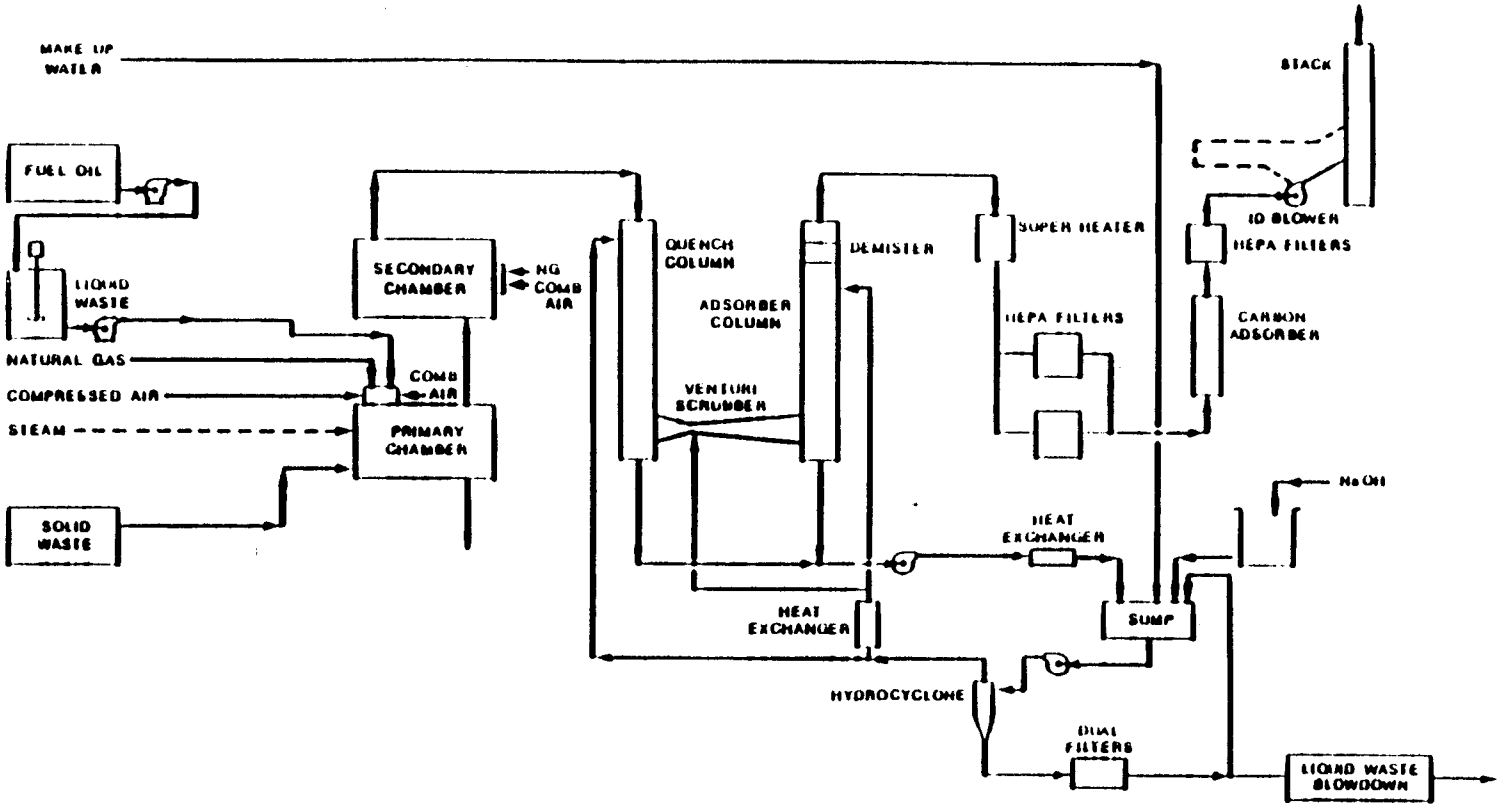
Because many changes have been made to or planed for the incinerator and associated support systems, a baseline is needed to fix the design so that new changes can be documented. This baseline will also prove useful in the event of future modifications.

The baseline selected for this report is the design outlined the current RCRA Operating Permit (Part B). The system layout associated with this baseline is shown in Fig. 1.

4.0 INITIAL MODIFICATIONS

Initial changes to the CAI system have been previously documented[2,3]. These changes were done prior to the issuance of the current RCRA Operating Permit and are therefore inconsequential. Other modifications done to the system prior to the RCRA trial burn[4] are outlined in other documentation[5].

The remainder of this report will address changes planned for or performed on the CAI system baseline described above. The present configuration is outlined in Fig. 2.



INCINERATOR PROCESS DIAGRAM

PREPARED FOR

LOS ALAMOS NATIONAL LABORATORY
LOS ALAMOS, NEW MEXICO

FIGURE 1
RCRA Part B Permit

IT Creating a Safer Tomorrow

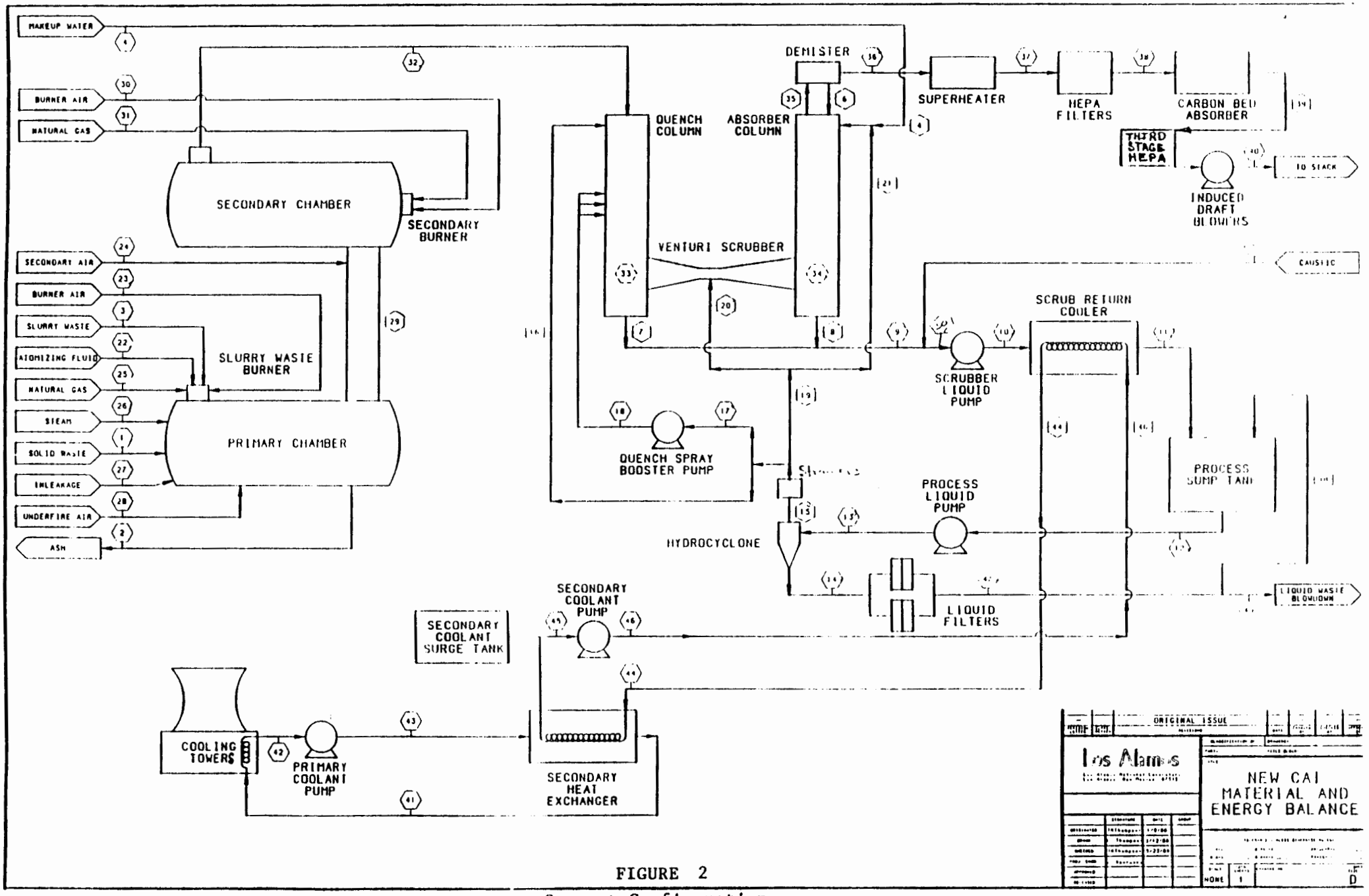


FIGURE 2

Current Configuration

5.0 FEED PREPARATION AND FEED SYSTEMS

The whole feed system has been modified and upgraded. The following summarizes these modifications.

5.1 Multiple Energy Gamma Assay System / Multiple Axis Dual Analysis Measurement System

To keep track of special nuclear materials (SNM) such as plutonium, a multiple energy gamma assay system (MEGAS) was originally employed. The system determined the amount of SNM in waste by analyzing the associated radiation emanating from the waste. The original MEGAS system was inside a glovebox at the beginning of the solid waste feed line. Any waste failing the acceptance criteria would be bagged out, thus generating additional waste. To minimize waste generation, the MEGAS was moved outside of the solid waste feed glovebox.

In addition to this physical move, the MEGAS was upgraded to a multiple axis dual analysis measurement (MADAM) system. The principle of operation of this equipment is similar to that of the MEGAS. The MADAM has modernized analyzer software, computer equipment, and mechanical scanning table. The original Keronix computer was also replaced with an IBM-type PC. The detector hardware and associated electronics design did not change; however, new hardware was obtained. The scanning table was updated with optical encoders and stepping motors. A segmented gamma scanner (SGS) was added to assay low to medium levels of TRU materials. These change will not affect incinerator operations and emissions.

5.2 Waste Package X-ray System

Incoming waste packages are examined by x-ray to prevent introducing unwanted materials into the CAI system and to identify shielding that may prevent detecting radionuclides. This examination will identify wastes containing large noncombustible items, aerosol cans, large containers of potentially flammable materials, and other materials that are not acceptable for incineration in the CAI. As with the MEGAS, the waste package x-ray system was originally in the solid waste feed glovebox. The original system was moved outside of the solid waste feed glovebox. This change will not affect incinerator operations and emissions.

5.3 Feed Staging Glovebox

The original solid waste feed glovebox housed the MEGAS and x-ray systems and also had waste sorting capabilities. The new feed staging glovebox will not contain the MEGAS and x-ray systems and will not be used for waste sorting. The new feed staging glovebox will be used only for staging acceptable, preassayed solid waste boxes before they are introduced into the solid waste feed system.

The original solid waste feed glovebox was constructed of steel and was painted. The new feed staging glovebox is constructed of stainless steel, which is the current Los Alamos standard, and is not painted. Stainless steels are easier to decontaminate because of their smoother finish. The new feed staging glovebox also has a larger capacity than the original solid waste feed glovebox.

These changes will not affect the incinerator performance.

5.4 Feed Storage Glovebox Fire Suppression System

The original fire suppression system for the feed storage glovebox was a limited-flow water type. This system has been replaced with a foam type to minimize contamination and cleanup if used. This change will not affect incinerator performance.

5.5 Ram Feeder Mechanism

The original ram feeder mechanism used to push boxes into the primary (lower) combustion chamber was chain driven. This mechanism has been replaced with a hydraulic cylinder system for simplicity and to minimize parts. This change will not affect incinerator performance and does not increase feed capacity.

The elevator that lifted the boxes from the feed storage glovebox to the level of the primary combustion chamber hearth and the side ram that pushed the boxes in front of the main ram feeder have not been changed.

5.6 Main Ram Glovebox High-Efficiency Particulate Air Filter

An additional high-efficiency particulate air (HEPA) filter has been added to the main ram glovebox to supplement the existing one. The air in-leakage flow rate into the primary combustion chamber can now be measured during solid waste box feeding/incineration and during incineration of liquids.

5.7 Main Ram Glovebox Fire Suppression System

A carbon dioxide fire suppression system was installed on the main ram glovebox to replace the original argon-injection fire suppression system.

5.8 Main Ram Feeder Safety Features

Methods of locking out the main ram feeder are being investigated as an added personnel protection measure because this equipment is automatically controlled.

5.9 Liquid Feed System

Modifications to the liquid feed system include correcting deficiencies with the liquid feed tanks to allow for safe handling of volatile organic materials, the addition of nitrogen pad/de-pad capabilities, and the addition of a second (spare) tubular diaphragm pump. These changes will not affect incinerator performance.

Upgrades to the drum pump-out station hood and other piping changes between the two feed tanks will be pursued.

Additional changes were made to the piping and instrumentation of the liquid feed system. These are discussed in Sections 8.0 and 9.0 below.

6.0 INCINERATOR

No modifications have been made to the incinerator proper. Most of these modifications deal with ash handling and removal and will have no effect on the performance of the incinerator. Some modifications to the combustion air and fuel gas systems are discussed in Sections 8.0 and 9.0 below.

6.1 Gravity Ash Drop Out System / Gravity Ash Removal System

The original CAI system employed a vacuum/pneumatic conveyance system to remove ash from the end of the primary combustion chamber hearth. The system consisted of a blower, a cyclone, and a sintered metal filter. This system worked acceptably in the research environment. Occasionally the system became clogged by large clinkers or other noncombustibles and had to be disassembled and cleaned. This problem could lead to unnecessary worker exposure to radionuclides.

To improve system reliability and to limit possible worker exposure, a new gravity ash removal system (GARS) was designed and will be installed. The system connects to the original gravity ash drop-out system (GADOS), a refractory door on the bottom of the primary chamber. The GARS consists of a hopper with a circulating air shroud and a spool piece with two knife-gate valves to stage ash prior to dumping it into drums through a bag-out ring.

Modifications to the ash removal system are external to the incinerator and will not affect incinerator operation.

6.2 Hearth Sweeper

Previously, the primary (lower) combustion chamber was cleaned and inspected either by manned entry or by observation and manipulation through a glovebox on the end of the chamber. This system was acceptable for the research purposes at the time, but is presently unacceptable because of unnecessary exposure of personnel to radiation. A remotely operated robotics system, the integrated glovebox-operated robotics (IGOR) system, is being installed. This system will have the capability to reach all the hearth in the primary combustion chamber for cleaning; the flue leading to the secondary combustion chamber for inspection; some of the secondary chamber for inspection; and the ash drop-out system for inspection and cleaning. Inspection will be done with a closed-circuit television (CCTV). The operating mechanism on the incinerator door through which the IGOR will enter will be modified. The glovebox on the end of the incinerator will also be modified to house the IGOR system. The IGOR will only be used when the CAI is not operating.

6.3 Liquid Burner Modifications

The high-intensity vortex liquid burner will now be enclosed in a glovebox to provide containment during maintenance, equipment change-out, and cleaning operations associated with the liquid burner. The glovebox will also provide storage space for spare parts. Due to space limitations, a new burner with minor changes will be procured and installed. Besides re-routing the fuel gas pipe and changing a packing gland, the atomizing section of the burner will be shortened 6-10 inches and flame observation ports are being rotated/eliminated/split. The impact of this modification has been discussed with the burner manufacturer. The exact performance of the modified burner will be demonstrated during upcoming trials at the manufacturer.

6.4 Combustion Air Glovebox

Due to the dimensions of the new control valves being installed on the combustion air system, the glovebox face has been removed. This impacts the underfire and secondary combustion air blowers since HEPA-filtered air was supplied through this glovebox. The underfire air blower supplies underfire air, ventilation air to the main ram feeder glovebox, and air to the secondary combustion chamber burner. The secondary combustion air blower supplies secondary combustion air to the plenum between the primary and secondary combustion chambers. Changes associated with this modification are discussed below in Subsection 6.6.

6.5 Combustion Air Blowers

The original CAI system had three combustion air blowers. The underfire and secondary air blowers were in the combustion air glovebox with air supplied through HEPA filters. The liquid burner combustion air blower is on top of the main ram feeder glovebox with a dedicated HEPA filter on the discharge side.

Since the face of the combustion air glovebox is being removed, the underfire and secondary air blowers will be fitted with separate HEPA filters on their suction sides. These two blowers will be replaced with models that have flanged inlets to accommodate HEPAs.

6.6 Combustion Air Check Valve Addition

Check valves are being installed on all combustion air lines to the incinerator. This installation includes the combustion air line to the primary combustion chamber burner, the air line to the secondary combustion chamber burner, and the underfire air line. These valves were added to prevent blowback of radioactively contaminated gases into the combustion air distribution equipment in the event of an overpressurization. The check valves are located at the inlet of the combustion air lines to the incinerator, downstream of the blowers. In addition, all incoming combustion air passes through HEPA filters.

7.0 AIR POLLUTION CONTROL SYSTEM

Most significant changes made to the incinerator system involved the air pollution control system and were completed during the initial round of changes made to the equipment. These changes are detailed in the Kaiser Report[3]. Modifications completed after this engineering analysis include the following.

7.1 Hydrocyclone Overflow Strainers

Strainers were added to the hydrocyclone overflow line. These strainers are constructed of Hastelloy C-276 and have 1/16-inch perforated screens. The strainers were added to exclude large particulates from the recycled scrub solution. They will not affect CAI system performance.

7.2 Super Heater Drain Valve

A drain valve may be added to the off-gas super heater to remove water that may accumulate. Water would be removed during shutdown or maintenance operations.

7.3 Carbon Bed Adsorber

The original carbon bed adsorber is constructed mainly of carbon steel. Water vapor corrosion of carbon steel components in the off-gas system contributed to particulate emissions during trial burns (although this was insignificant when compared to RCRA requirements). Studies have been completed regarding the replacement of the existing adsorber with a unit constructed of a corrosion resistant alloy.

The replacement unit will be a two-pass annular design. The shell will be fabricated of AL-6XN. Internal components will be constructed of Hastelloy C-22. The performance of the replacement unit is functionally equivalent to the original and thus will not impact CAI system performance[6].

7.4 Third Stage HEPA Filter

As with the carbon bed adsorber, the third-stage HEPA filter housing is constructed of carbon steel. It is proposed to replace the existing carbon steel housing with two new housings which will be operated in parallel. These new housings will be constructed of 316L stainless steel. They will also be relocated so that change-out is easier. These changes will reduce particulate emissions due to the elimination of possible water vapor corrosion of carbon steel components.

7.5 Off-gas Ducting

An expanded sampling section spool piece has been added between the sampling trombone and the stack. The spool piece increases the diameter of the off-gas ducting at this point from 12-inches to 20-inches, is approximately 40-inches long, and is constructed of AL-6XN alloy. The increased diameter is required for the addition of the various off-gas monitoring probes discussed under Section 9.0 below.

The off-gas ducting between the carbon bed adsorber and the induced draft fans will be changed when the carbon bed adsorber is upgraded. Changes to this ducting will include upgrading from carbon steel to AL-6XN for corrosion protection (to reduce particulate emissions); rerouting to accommodate the new carbon bed adsorber; relocating the third-stage HEPA filter; and installation of minor additional piping to accommodate the continuous radiation monitor required by the RCRA Operating Permit for hazardous waste operations.

7.6 Off-gas Sampling Trombone

The existing sampling trombone on the air pollution control system is constructed of carbon steel. Because of water vapor corrosion, this piece was replaced with an identical unit made of AL-6XN. This change will reduce particulate emissions by eliminating water vapor corrosion of carbon steel components.

7.7 Flow Straighteners

Three flow straighteners have been added to the off-gas piping to condition the gas stream for analytical sampling equipment. The first of these is downstream of the HEPA filter bank before the alpha/beta monitor. This straightener will have a 10-inch diameter and is constructed of AL-6XN. The second straightener is located between the induced draft fans and the off-gas flow meter. It also has a 10-inch diameter but is constructed of 304 stainless steel. The third straightener has been installed just before the expansion spool piece. It has a 12-inch diameter and is constructed of 304 stainless steel. The last two straighteners were fabricated by Fluidic Techniques, Inc. The first was supplied with the alpha/beta monitor.

7.8 NESHAPS Stack Upgrades

As part of the Laboratory-wide NESHAPS compliance effort, engineering studies are underway to determine whether the existing stack sampling point is appropriate for new monitoring equipment. Modifications may be needed depending upon the outcome of the study.

8.0 PIPING

Many piping changes have been made to the CAI system to increase containment reliability and to minimize maintenance.

8.1 General Piping Replacement

Although general piping replacement was briefly covered in the RCRA engineering description, it is reiterated here. Much of the piping associated with the original CAI system (fiberglass reinforced plastic) was not designed to provide high levels of confidence that containment was being provided and thus has been replaced. Process wetted piping is now constructed of Schedule 40 Hastelloy C-276 for corrosion and heat resistance. All flanges are 150# raised-face types. This change will increase the reliability of the CAI system, offer superior corrosion resistance, and thus provide a high level of confidence that process fluids will be contained.

8.2 Quench Booster Pump Inlet Block Valve

The block valve was added to facilitate maintenance.

8.3 Absorber Tower Makeup Water Line

A check valve has been added to prevent backflow into water lines. There is also some consideration being given to replacing the existing hand valve with a solenoid valve and flow meter to aid in backflushing the demister pad and monitoring water flow into the CAI process.

8.4 Steam Lances and Nozzles

Due to corrosion of the original steam lances and nozzles, they will be replaced with identical equipment. The original steam line supplying the lances has also been upgraded to stainless steel from carbon steel and slightly rerouted to accommodate new strainers.

8.5 Liquid Feed Line

The original liquid feed line was 1/2-inch piping with screwed fittings that leaked regularly. A new line has been installed consisting of 1/2-inch tubing and modified compression-type fittings. Welded joints may also be considered in the future.

8.6 Caustic Addition Line

Caustic was originally added directly to the process sump tank to neutralize acid gases. Because of pH control problems, this addition point was moved upstream of the sump tank before the scrubber liquid return pump. This did not produce the expected results. The addition point will now be moved to the quench tower liquid inlet. This change will result in a more consistent scrub solution pH. In addition the plastic caustic addition line may be replaced with one constructed of stainless steel.

8.7 Blowdown / Scrub Solution Recycle Changes

Minor plumbing changes such as relocating the pH probes will be made to the scrub solution filtering, recycle, and blowdown streams to increase control and improve performance.

8.8 Instrument Air Supply Lines

The existing instrument air supply lines were upgraded to Duraplus plastic piping to maintain the quality of the air supply. Piping runs were also straightened and consolidated. These changes will not affect incinerator performance; however, instrument life should be extended and maintenance reduced.

8.9 Natural Gas and Combustion Air Piping

These piping runs were upgraded to meet standards set by Industrial Risk Insurers (IRI) and to allow for the new control schemes described below in the Section 9.0. These changes will not affect incinerator performance.

8.10 Main Ram Feeder Glovebox Air Supply

The air supply for the main ram feeder glovebox was changed. Originally it was obtained from room air processed through an 8-inch HEPA filter. Air is now supplied by the underfire air blower. A control valve has been added to modulate the flow of air during box feeding. These changes will not affect incinerator performance.

8.11 Replacement of Control Valves

Control valves on the air supply and natural gas supply lines have been replaced with newer, updated control valves. These valves will control the mass flow of fuel and air supplies as outlined in Section 9.0, below. These changes will not affect incinerator performance.

8.12 Process Pump Replacements

All process pumps handling scrub solution were upgraded. New pumps contain Hastelloy wetted parts for corrosion protection. They also are sealless, thus eliminating the water seals and in-leakage associated with the original pumps. These changes slightly increase the required water make-up to the scrub solution system because there is no longer in-leakage. No impact on CAI system performance will be noted.

9.0 INSTRUMENTATION AND CONTROLS

Many modifications have been made to the instrumentation and controls of the CAI system. These changes were required because of the age of many components, wiring problems, and updated control strategies.

9.1 PLC / Logic / Operator Interface

An Allen Bradley 5/15 Programmable Logic Controller (PLC) replaced mechanical relay based logic. This unit will allow more flexible operations, provide more reliable interlock control, aid in data collection, and provide an additional operator interface with the process.

Logic for the PLC is being written to control many of the interlocks associated with the CAI system. Data collection and operator interface will be provided by Allen Bradley Control View Software and an IBM-based PC.

These modifications are designed to enhance CAI process information available to the operator and the reliability of this information.

9.2 Wiring / Instrumentation

The entire CAI system has been rewired to eliminate bad connections and other related problems. Significant attention was given to routing power (high voltage) wiring separately from instrumentation wiring to eliminate induced signals.

Numerous instruments were also upgraded because of their age. Critical instruments are discussed below. Outdated process recorders and controllers have been upgraded with multipoint digital controllers.

These changes are designed to make the CAI process more reliable and controllable and to enhance the quality of recorded data.

9.3 Combustion Gas Monitor

With the removal of the combustion air glovebox face, the probability of combustible gases accumulating there has been eliminated. Therefore, a monitor originally located in this glovebox used to detect the presence of combustible gases, such as natural gas, has been removed. This deletion will not influence incinerator operations. The unit may be relocated to the liquid feed room exhaust ducting.

9.4 Primary Combustion Chamber Burner Control Logic

The primary combustion chamber burner (high-intensity vortex burner) combustion air and fuel gas control logic is being updated to automatically control the fuel-to-air ratios needed for good combustion. These changes include the following:

- The mechanical linkage control of fuel and combustion air has been removed. They are now controlled independently of each other.
- The use of lead-lag logic for fuel-to-air ratio control. This logic will compensate for the sluggish response of the air supply versus the quick response of the fuel supply.
- The liquid feed control system will compensate for changes in the liquid waste supply and can adjust for different combustion air requirements for liquid wastes.
- A control loop will be added that automatically relates liquid waste feed rates to equivalent natural gas feed rates. The control loop will sum and adjust all fuel sources so that the heat release capacity of the burner, the combustion air capacity of the burner, nor the thermal duty of the CAI is exceeded.

Previously many of these adjustments were made manually. These modifications will allow tighter control of the high-intensity vortex burner and thus more efficient combustion. The degree of improvement will be verified in upcoming verification trials.

9.5 Off-gas Pressure Control Valve Control Logic

The induced draft fans continuously pull combustion products through the air pollution control system. This negative draft also provides containment for radioactive constituents. The original CAI system employed a feedback control logic on the pressure control valve located in front of the induced draft fans. During solid waste campaigns, excess air entered the incinerator during box charging resulted in uneven control with significant pressure fluctuations. Using a new feed forward logic, the control valve will essentially anticipate load changes rather than react to them. This control loop will use the following data to manipulate fan speed (see Subsection 9.7, below):

- estimates of total combustion air and products of combustion
- notification of charging each waste box.
- notification of reduction in underfire air
- amount of combustion air being fed to the secondary (upper) combustion chamber

This change in the control of the off-gas pressure control scheme will result in a more constant draft in the secondary combustion chamber.

9.6 Induced Draft Fans Variable Frequency Drives

Variable frequency drives (VFDs) are being added to the induced draft fans. VFDs will allow precise control of the speed (and thus the draft provided) within the process.

9.7 Off-gas Alpha/Beta Monitor

Off-gas from the CAI facility is continuously sampled for radioactive contamination at the exhaust stack where a small stream is drawn across a filter. This filter is removed and counted on a weekly basis.

To provide more real-time data and to comply with RCRA permit requirements, an EG&G Nuclear Instruments continuous alpha/beta monitor (Berthold Model LB 150 D-R) will be installed between the second stage process HEPA filter bank and the carbon bed. Included with the monitor will be a 10-inch diameter by 10-inch long AL-6XN spool piece with flow straighteners, an isokinetic sampling train, and various mass and velocity measurement instrumentation. The monitor will use pseudocoincidence and alpha energy range discrimination to distinguish artificial radioactivity from naturally occurring background radioactivity (such as radon/thoron daughters).

9.8 Off-gas Total Hydrocarbon Monitor

A total hydrocarbon (THC) monitor will be added to the off-gas stream as required by the current RCRA Part B permit. The location for this monitor will be just before the stack. The addition of this monitor will not affect incinerator performance. It will provide additional data for analysis. A Byron Instrument Model 401 analyzer was originally used for similar monitoring but was removed due to reliability problems.

The monitor selected for this application is the Rosemount Analytical Incorporated Model 402 Hydrocarbon Analyzer. The analysis performed by this unit is based on a flame ionization detector with a minimum detection limit as low as 0.15 ppm at 99% confidence level. The sample analyzed is extracted from the flow to the main stack.

9.9 Off-gas NO / NO_X / SO_2 Monitor

An continuous NO/NO_X/SO_2 monitor will be installed to replace the Thermo Electron Model 10 NO_X analyzer that was originally used. The location of the replacement instrument will be just upstream of the stack. The addition of this monitor will not affect incinerator performance and is not required by the current RCRA permit or TSCA approval. It will provide additional data for analysis that could be used in tuning the CAI system. The system selected is the Bomen model 9100 Multicomponent Fourier Transform Infrared (FT-IR) Gas Analyzer with a heated sample extractor. The following are the measurement ranges associated with this analyzer.

SO_2	0 - 30 to 2000 ppm (adjustable)
HCL	0 - 30 to 200 ppm (adjustable)
NO	0 - 50 to 1500 ppm (adjustable)

NO_2	0 - 30 to 500	ppm (adjustable)
CO	0 - 30 to 500	ppm (adjustable)
NH_3	0 - 70 to 125	ppm (adjustable)
HF	0 - 20 to 200	ppm (adjustable)
H_2O	0 - 1 to 30	vol% (adjustable)
CO_2	0 - 1 to 20	vol% (adjustable)

9.10 Off-gas CO / CO_2 / H_2O Monitor

Off-gas will be monitored for CO, CO_2, and H_2O using a Lear Siegler Incorporated model EX 4700A combustion gas analyzer. This monitoring is required under the current RCRA permit and TSCA approval. This insitu analyzer uses a narrow-band, nondispersive infrared (NDIR) adsorption measurement technique and replaces the aging original CO/CO_2/H_2O monitor. Gas measurement ranges are as follows.

CO	0 - up to 5000 ppm v/v wet
CO_2	0 - 20% v/v wet
H_2O	0 - 50%, corresponding to a maximum dew point of 178 °F

Various measurement corrections and compensations are also performed by the unit. Automatic on-stack calibration (zero and span) can be selected at intervals ranging from 1 to 24 hours. The unit will be located just upstream of the stack on the sampling trombone.

9.11 O_2 Monitors

The original Ametek O_2 monitors located on the primary and secondary chamber exhausts have been updated with new Ametek model WDG-HPII Flue Gas Analyzers. These analyzers employ a zirconium oxide electrochemical cell to measure O_2 concentrations ranging from 0.1 to 100%. The new models transport the extracted sample by convection thus eliminating air pumps and check valves which were clogging with ash on the original model. The new model also has an automatic calibration option.

9.12 Neutron Monitors

Neutron monitors may be installed in the CAI process area. They will monitor accumulation of nuclear materials in selected areas of the process in which the possibility of criticality may exist. Because these monitors are located outside of the process, they will have no effect on CAI system performance.

9.13 Backup Power and Switching Equipment

A new uninterruptible power supply (UPS) was installed to replace existing aging battery racks. During a site power loss, this unit will run critical process control systems until power from the backup diesel generator is brought up or line power is restored. New transfer switching equipment has also been added to replace outdated and less reliable equipment. A load bank is also being added to the generator system so that this unit can be kept running under load during operations thus minimizing switch over time if line power is lost. The generator is sized to run only critical process equipment and controls.

9.14 Liquid Feed System

A new Micro Motion gyroscopic/Coriolis massflow meter was installed on the liquid feed line. This flowmeter provides

instantaneous mass flow rates of the waste liquid being fed to the high-intensity vortex burner. A variable frequency drive was also added to the liquid feed pump.

9.15 Mass Flowmeter on the Main Ram Glovebox

A venturi flowmeter with mass calculator was added to the main ram glovebox to measure air in-leakage flow into the incinerator during box feed operations and during liquid waste incineration.

9.16 Other Massflow Meters

Flowmeters on lines supplying the quench tower, venturi scrubber, absorber column, filter recycle, and process blowdown were upgraded to Micro Motion gyroscopic/Coriolis massflow meters.

9.17 Scrub Solution pH Control

Process pH meters are being relocated to obtain better control of scrub solution pH. The old locations resulted in inadequate control because of erratic signals.

9.18 Secondary / Tertiary Cooling Loop Breakthrough Detection

An engineering study and independent review determined how best to detect a double breakthrough from the process scrub system through the secondary cooling loop in the CAI system into the primary cooling tower loop. A conductivity meter will monitor the secondary loop water to detect the presence of process scrub solution in the secondary system. The loops are presently protected by pressure differential. This will continue.

9.19 Cooling Tower Blowdown Control

Investigations are being performed to determine how best to control cooling tower blowdown. The results of these investigations may initiate changes. These changes should not affect CAI performance.

9.20 Scrub Solution Blowdown Control

Studies are being conducted to determine how to minimize scrub solution blowdown. These studies may show that changes are warranted to reduce waste generation. These types of changes should not affect incinerator performance but will be evaluated if they are proposed.

9.21 HEPA Filter Differential Pressure Measurement

Individual differential pressure gauges will be added to each HEPA filter in the off-gas stream to detect blinding and breakthroughs. The present system measures the total differential pressure across the primary and secondary HEPA filter banks. This addition will provide information on when HEPA filters must be changed and thus minimize waste generation.

10.0 SUPPORT SYSTEMS

10.1 Caustic Supply

Sodium hydroxide solution used for acid gas neutralization was originally prepared by mixing flaked NaOH with water. Because this operation was labor intensive and exposed operating personnel to chemical hazards, commercially available caustic solutions were selected for use. Originally 20-30% caustic was used. It is planned to use 50% caustic in the future.

The original caustic tank was removed and a larger capacity tank installed with the appropriate hook-ups for caustic filling. A variable-speed tubular diaphragm pump will meter caustic solution for pH control. The old system employed a centrifugal pump and flow control valve.

The type of caustic used (mixed versus premixed), the caustic delivery system, and the caustic storage tank will have no effect on the incineration process. Because of the increased caustic concentration, less caustic solution will be required to neutralize a given quantity of acid gas and thus the need for make-up water to the process will be slightly increased.

10.2 Instrument Air Supply

The original oil-lubricated instrument air compressor has been replaced with an Ingersoll Rand oilless duplex compressor specifically designed for instrument air systems. This change will not affect incinerator performance; however, instrument life should be extended and maintenance reduced.

Molecular sieve dryers were also added to replace the less reliable refrigeration-type dryers.

10.3 Cooling Towers

Critical components in the original cooling towers needed replacement. Cost estimates to repair the original towers were excessively high. Two new cooling towers identical to the originals were purchased as replacements.

Cooling tower blowdown and silica treatment options are now also being considered; these options could result in changes or additions to the cooling tower system. These changes or additions will not affect incinerator performance since they are external to the CAI process.

10.4 Natural Gas Supply

The natural gas supply system was significantly upgraded to meet new code requirements and to allow for more precise control. Line size was increased from 1.25-inches to 1.5-inches. A new gas meter was installed. An earthquake shutoff valve may also be installed.

11.0 BUILDING

Various upgrades were and are being done to the building that houses the CAI (TA-50-37) to meet new requirements and to aid in waste handling operations. None of these modifications will affect the performance of the CAI system.

11.1 Seismic Upgrades

The original CAI facility was not designed to meet current seismic requirements outlined in DOE Order 5480.28, Natural Hazards Mitigation. Engineering studies are being performed to determine building and process equipment upgrades necessary to meet these requirements. When these studies are complete and proposed solutions approved, upgrades will be made. The effect of these upgrades cannot be determined until they are further defined.

11.2 Ash Pit

To accommodate the new GARS, a pit was constructed below the ash drop-out door on the primary (lower) chamber. This change will have no affect on incinerator performance.

11.3 Airlocks

Modifications are being made to comply with DOE Order 6430.1A, General Design Criteria (containment criteria). These modifications include adding personnel and material airlocks and replacing of roll-up doors.

11.4 Fan Expansion Joints

Because existing rubber expansion joints on the building exhaust fans deteriorate and have to be replaced periodically, new stainless steel joints are being installed.

11.5 HVAC

Replacement of the existing evaporative HVAC system with a new mechanical chiller to provide increased cooling in the process area is being pursued. Ventilation control may also be upgraded. A PLC-based data collection system will also relay critical information to the control room. The three exhaust systems affected include the process area (room 112), the high bay (room 114), and the liquid/solid storage bays (rooms 117/118).

11.6 Loading Dock / Liquid Feed Room / Change Room

The existing loading dock at the CAI is being reconfigured and expanded into a nonwaste dock and a laboratory for the MADAM and x-ray systems. A new waste dock will be added to the south side of TA-50-37.

The liquid feed room containment may be upgraded. It may also be upgraded to a Class 1, Division 1 rating.

The existing change rooms may be expanded and upgraded.

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