MAXIM
TECHNOLOGIES INC

APPENDICES - VOLUME 2
FINAL REPORT

TASK 3 - LANDFILL SURVEY: A SURVEY OF FACILITIES WITH POTENTIAL TO ACCEPT K-65 RESIDUES FROM THE NIAGARA FALLS STORAGE SITE

Contract DACW49-97-D-0001
Delivery Order 012
Maxim Project # 9905006-130

June 2000

Prepared for

United States Army Corps of Engineers
Buffalo District
1776 Niagara Street
Buffalo, New York 14207-3199

1908 Innerbelt Business Center Drive
St. Louis, Missouri 63114
(314) 426-0880
(314) 426-4212 Fax

Aerial Photo - Niagara Falls Storage Site
K-65 Residue Storage Area

APPENDICES

VOLUME 2

APPENDIX 1

Biddability, Constructability, Operability and Environmental Review Comment Sheet

(USACE - BUFF; 01 Feb 00)

BIDDABILITY, CONSTRUCTABILITY, OPERABILITY, AND ENVIRONMENTAL REVIEW COMMENT SHEET

Complete and Return to: Judith Leithner, CELRB-ED-EE

Project: NFSS Landfill Survey: A survey of facilities with potential to accept K-65 residues for NFSS

Reviewer/Section: Submitted by Mr Fred Boglione (voice: 716-879-4190 email: frederick.l.boglione@usace.army.mil)

Date: 01 Feb 00

COMMENT NUMBER	PAGE OR SHEET	COMMENT	RESPONSE
1	Cover	Lower right hand corner refers to "R-65" Residue. This should be "K-65"	The cover will be corrected in the revised report.
2	General	Federal repositories should have been investigated.	This survey has essentially been completed.
3	Table of Contents	Section 3.5.5, 3.5.6, and 3.5.7 are on pages 3-5, 3-6, and 3-7, respectively. These are incorrectly listed as being on pages 3-4, 3-5, and 3-6.	The TOC will be corrected in the revised report.
4	Definitions	1.11e(2) should read - Tailings or waste produced by the extraction "or concentration" of uranium...	This definition will be corrected in the revised report.
5	Definitions	2. LLRW - make sure definition matches the definition in Reference 1, "FUSRAP Waste Disposal Alternatives."	This definition will be modified to reflect the LLRW definition presented in Reference 1.
6	Executive Summary 2nd Paragraph	Need to close parentheses around (more than 500,000 picocuries (pCi) per gram)	Parentheses will be added to this sentence in the Executive Summary.
7	Section 1.1 4th Paragraph	"Due to the high ..... for subsequent off-site disposal." This paragraph is only opinion and should be removed from the document.	This paragraph will be removed from the revised report.

8	Section 1.1 Page 1-1, 5th Paragraph	Maxim Technologies is currently performing the first phase of an "RI" not an "RI/FS".	This will be corrected in the revised report.
9	Section 2 Page 2-1, Opening Paragraph	Please what is meant by the last sentence - "in addition, information is presented on the handling methods along which may be used to modify the characterization of the residues to achieve off-site disposal acceptance."	Handling methods are referring to an "pretreatment" of K-65 residues that may be required as a condition for acceptance of the material at a disposal site (landfill or repository). Examples of pretreatment include chemical stabilization/solidification (CSS); dewatering; or other treatment/conditioning steps.
10	Section 2.2 Page 2-2, 1st Paragraph	Insert the word "of" after amount in the last sentence.	This will be corrected in the revised report.
11	Section 3.5.3, Page 3-4 2nd Paragraph	The word "interest" is misspelled.	"Interent" will be changed to "interest" in the revised report.
12	Section 3.5.4, Page 3-5 2nd Paragraph	Last word should be "stream".	This word will be corrected in the revised report.
13	Recommendations, Page 4-2 2nd Last Paragraph	Eliminate the recommendation about a transfer technology seminar.	This recommendation will be eliminated in the revised report.

1		How do you suggest acquiring a K-65 residue sample for a Toxic Characteristic Leaching Procedure (TCLP) in order to fully characterize the waste and assess disposal options?	After further evaluation of this statement, it was concluded that it was made to obtain standard information required when dealing with the disposal of a waste or residue. Maxim is aware that the physical retrieval of a K-65 sample from the Interim Waste Containment Structure will be difficult and costly. Other options that could be considered to get a sample of the K-65 residues include: 1) Obtain a sample from a previous NFSS contractor or the DOE. 2) Obtain a sample of a similar K-65 residue from the Fernald site in Ohio. 3) Wait until a pilot retrieval program is initiated at the NFSS demonstrating how K-65 will be removed from the IWCS for transportation and off-site disposal.

APPENDIX 3.6

DOE-EM FACT SHEET ENTITLED

DOE Preferred Alternatives for Disposal of LLW and MLLW (12/10/99)

EM U.S. Department of Energy
Office Of Environmental Management

Fact Sheet: *Department of Energy Announces Its Preferred Alternatives for Disposal of Low-Level and Mixed Low-Level Radioactive Waste*

Today, the U.S. Department of Energy is announcing its preferences for low-level waste (LLW) and mixed low-level waste (MLLW) disposal sites.

Six DOE sites currently dispose of LLW: Hanford, Idaho, Los Alamos, Nevada Test Site, Oak Ridge, and Savannah River. Of these six, only Hanford and Nevada Test Site have historically served as regional LLW disposal sites. For MLLW, only Hanford and Nevada Test Site have disposal facilities, although neither site currently accepts waste from other sites for disposal. DOE prefers to continue to rely on these six sites that already have LLW disposal facilities and to continue to use the Hanford site and the Nevada Test Site for disposal of LLW from other DOE facilities. For MLLW disposal the DOE prefers to begin using the disposal facilities already constructed at the Hanford site and at the Nevada Test Site for off-site waste.

A formal Record of Decision will follow no sooner than 30 days from this Notice. Final decisions on LLW and MLLW disposal sites will allow DOE to move forward with the closure of former defense nuclear facilities like Rocky Flats and redirect the millions of dollars now being spent on waste storage back into actual cleanup work at the remaining sites.

Under the preferences being announced today, the Department will continue to rely for future disposal on sites that already have the capacity and experience to handle low level and mixed low level waste. These preferences, the result of some two years of study and discussion with affected parties, generally represent a continuation of disposal activities already underway at the identified sites. Because these preferences reflect incremental change, they minimize potential environmental impacts.

Low-Level and Mixed Low-Level Radioactive Waste: Since World War II and the Manhattan Project, DOE and its predecessor agencies have generated LLW and MLLW from a variety of activities including weapons production, nuclear reactor operations, environmental restoration, and research. LLW is defined as all radioactive waste not classified as either high-level waste, transuranic waste, spent fuel, or byproduct tailings containing uranium or thorium from processed ore. MLLW is low-level radioactive waste that also contains hazardous constituents. These wastes are now in storage or will be generated through future activities.

Analysis of Candidate Sites: In May 1997, DOE issued a Waste Management Programmatic Environmental Impact Statement (EIS), which evaluated the potential cost and environmental effects of various alternatives for the management of five waste types at 54 sites, including treatment and disposal of LLW and MLLW. Since then, decisions have been issued for three of the five waste types (high level waste, transuranic waste, and hazardous waste). The decisions for LLW and MLLW will be the last under this EIS. The study analyzed impacts of treating and disposing up to 1.5 million cubic meters of LLW and 219,000 cubic meters of MLLW over the next 20 years. The EIS identified preferred treatment alternatives as minimum LLW treatment at all sites, with additional treatment as required, and regional MLLW treatment at Savannah River, Oak Ridge, Idaho, and Hanford. The preferred disposal alternative was to select two or three regional disposal sites for LLW and MLLW from the six sites that currently dispose LLW (Hanford, Idaho, Los Alamos, Nevada Test Site, Oak

Ridge, and Savannah River). At that time, however, the Department deferred selection of specific sites for disposal until further consultation with States, stakeholders, and Tribes could occur.

Further Analysis and Consultation: The Department has now completed a two year period of additional analysis and discussions with affected parties. Analytic results, published in September 1998 as an "Information Package on Pending Low-Level Waste and Mixed Low-Level Waste Disposal Decisions," showed that approximately 1 million cubic meters of LLW and 176,000 cubic meters of MLLW will require disposal over the next twenty years. Discussions with affected parties have continued throughout 1999. Based on the study and these discussions and analyses, the Department's preferred regional disposal sites are:

- Hanford and Nevada Test Site for LLW disposal (in addition, Idaho, Los Alamos, Oak Ridge, and Savannah River would continue to dispose of their own LLW on-site, to the extent practicable; both Idaho and Savannah River would continue to dispose of LLW generated by the Naval Nuclear Propulsion Program); and

- Hanford and Nevada Test Site for MLLW disposal.

Basis for DOE's Preference: DOE determined its site preferences for disposal of LLW and MLLW on the basis of low impacts to human health, increased operational flexibility and lower implementation cost. The continued use of on-site disposal at Idaho, Los Alamos, Oak Ridge, and Savannah River optimizes use of existing facilities while minimizing the volume of waste which would otherwise have to be transported for disposal. Both Hanford and the Nevada Test Site, the Department's preferred regional disposal sites, provide environmental safety benefits inherent to arid sites, where evaporation rates exceed rainfall by approximately 10 to 1, or more. The local geology at the Nevada Test Site greatly restricts the potential for any contamination to move into the groundwater. In addition, Hanford and the Nevada Test Site each has the ability to dispose of a wide range of radionuclides as well as expansion capability. The use of two regional disposal facilities offers DOE sites greater operational flexibility in aligning their waste streams with specific site waste acceptance criteria and also provides an alternative should disposal activities at one site be interrupted for any reason. Finally, the preferred disposal site configuration takes advantage of existing facilities, thereby avoiding construction impacts and costs.

Availability of Notice/Schedule for Record of Decision: This Notice was published in its entirety in the Federal Register on December 10, 1999 and is posted at http://www.em.doe.gov/em30/ on the Internet . Copies of the Notice are also available by calling 1-800-736-3282 (in D.C. 202-863-5084). This Notice does not re-open the formal public comment period for the EIS and DOE is not formally soliciting comments on the proposed configuration.

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Last Updatead 12/10/1999 (mhp)

United States Department of Energy News

FOR IMMEDIATE RELEASE
February 25, 2000

NEWS MEDIA CONTACT:
Tom Welch, 202/586-5806

DOE Announces Decision for Treatment and Disposal of Low-Level and Mixed Low-Level Radioactive Waste

Today, the Department of Energy (DOE) released its final decision for low-level waste (LLW) and mixed low-level waste (MLLW) treatment and disposal sites.

This decision enables the department to move forward with the closure of former defense nuclear facilities and redirect the millions of dollars now being spent on waste storage back into actual cleanup work. The Department of Energy's decision follows a December 10, 1999 Notice of Preferred Alternatives. The Record of Decision is consistent with those preferred alternatives.

The decision, the result of two years of study and discussion with affected parties, supports a continuation of many of the treatment and disposal activities already underway, relying for future disposal on sites that already have the capacity to handle LLW and MLLW.

For LLW treatment, DOE will continue the practice of each site treating its own waste. For LLW disposal, DOE will continue disposal of onsite waste at sites that already have LLW disposal facilities (Hanford, Idaho, Los Alamos, Nevada Test Site, Oak Ridge, and Savannah River) and will continue to use the Hanford site and the Nevada Test Site for disposal of LLW from other DOE sites that do not have disposal capacity. For MLLW treatment, DOE will continue to use Hanford, Idaho, and Oak Ridge to treat waste from other DOE sites, and will begin to use Savannah River to treat waste from other DOE sites. For MLLW disposal, DOE has decided to begin using the disposal facilities already constructed at the Hanford site and at the Nevada Test Site for off-site waste.

DOE's decision is intended to improve safety and address public health concerns related to untreated waste now in storage at DOE sites around the country. The decision also will improve the efficiency and flexibility of operations, and decrease cost. Selecting regional disposal facilities offers Energy Department sites operation flexibility to align their waste streams with corresponding disposal facility waste acceptance criteria. In addition, the use of existing facilities will avoid potential health and safety impacts associated with new facility construction, as well as avoiding capital construction costs to site new facilities.

Since World War II and the Manhattan Project, the Department of Energy and its predecessor agencies have generated LLW and MLLW from a variety of activities including nuclear weapons production, nuclear reactor operations, environmental restoration, and research. LLW is unwanted radioactive material created in the process of handling and use of radioactive substances. MLLW is low-level radioactive waste that also contains hazardous constituents.

This Record of Decision was published in its entirety in the Federal Register on February 25, 2000, and is posted at http://www.em.doe.gov under "*Publications*" and the "*List of Publications*" on the Internet. Copies of the Record of Decision are also available by calling 1-800-736-3282 (in D.C. 202-863-5084).

- DOE -

R-00-051

Home

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Science Education ▪ Content Map ▪ Search

We'd like your comments or suggestions about the U.S. DOE Home Page. Send your comments to the DOE Webmaster
Updated: 02/26/00

APPENDIX 3.6-1

Hanford Site Information

MAXIM
TECHNOLOGIES INC

Interoffice Memorandum

To: TML, NFSS Project File

From: Bob Bessent (Maxim)

Date: 4/4/00

Job No.: 9905006/170 - DOE Landfill Survey Project

Subject: Call To Glen Triner; Hanford WAC Coordinator @509-372-0771

On Monday PM, I placed a call with Mr. Glen Triner @ the Hanford Site to get insight into the DOE disposal options potentially available for the K-65 residues. I got Glen's name from a previous USACE document addressing K-65 residue disposal.

Unfortunately, Glen is out of the office until mid-April. I will therefore contact an alternative MS. Judith Nielsen to get insight into the K-65 disposal and whether the DOE site @ Hanford could accept this waste.

Please see me if you have any questions or comments regarding this memo.

File: C: nfss4.4

MAXIM
TECHNOLOGIES INC

Interoffice Memorandum

To: TML, NFSS Project File

From: Bob Bessent (Maxim)

Date: 4/11/00

Job No.: 9905006/170 - DOE Landfill Survey Project

Subject: Call From Judith Nielsen; Hanford Site

On Monday AM (4/10/00), Judith Nielsen called me to follow-up our conversations from last week. Basically, she told me had contacted several people at the facility and had concluded that Hanford does not accept any non-DOE LLW from off-site. She said if the waste was generated by the DOE or had ever been considered a DOE waste at a time n the past, then the DOE would accept it at one of its facilities. Classification of the FUSRAP waste was never thought to be DOE. If we required further information, Judith said we could call Rudy Garcia serving as the DOE representative at the Hanford Site.

The overall conclusion regarding this site is that it is not a viable disposal site for the K-65 residues at this time with a significant policy change.

Please see me if you have any questions or comments regarding this memo.

File: C: nfss4.11b

- a basal liner composed of multiple layers of clay, gravel, and geosynthetic liner that direct any liquids into the leachate collection system;
- a leachate collection system (not integral to success of cell);
- material placed in cell compacted into layers to inhibit settling; and
- a multicomponent cover with components to limit radon emissions (compacted clay), water infiltration (geomembrane), and biointrusion (cobblestones). The cell is sloped to deter long-term erosion and inhibit water infiltration.

The cell footprint is approximately 72 acres; the basal liner is approximately 6.5 feet thick; and the cover is approximately 10 feet thick.

A.1.3 Disposal Capacity

Only materials with low levels of contamination originating at Fernald Environmental Management Project will be disposed in this cell. The disposal cell will have a capacity for 1.8 million m^3.

A.1.4 References

"Recommendations on Remediation Levels, Waste Disposition, Priorities, and Future Use," July 1995, The Fernald Citizens Task Force.

A.2 Hanford Site

A.2.1 Background

Location: Managed by the Department, Hanford Site covers approximately 1,500 km^2 (500 mi^2) of government-owned land and is located northwest of the city of Richland, Washington, on the Columbia Plateau; it is bounded on the north by the Saddle Mountains, on the east by the Columbia River, and on the south and west by the Yakima River and the Rattlesnake Hills, respectively.

Historical Activities: In early 1943, the U.S. Army Corps of Engineers selected Hanford Site as the location for reactor, chemical separation, and related facilities and activities involving the production and purification of plutonium. Both the Waste Management and Environmental Restoration programs operate disposal facilities at Hanford Site. A.2.2 details the 200 Area Low-Level Burial Ground (operated by the Waste Management program), and A.2.3 details the Environmental Restoration Disposal Facility (operated by the Environmental Restoration program).

A.2.2 200 Area Low-Level Burial Ground

A.2.2.1 Facility Description

Status: The 200 Area Low-Level Burial Ground is classified as a shallow landfill disposal facility, which covers an area of about 660 ha (1,500 acres). Shallow land disposal of solid waste has occurred at Hanford Site since the late 1940s.

Waste Materials: Until 1970, when the Atomic Energy Commission required that transuranic waste be retrievably stored, no distinction was made between transuranic waste and LLW. In the early 1980s, low-level liquid organic waste was segregated from LLW and stored (retrievably) underground. LLW currently being disposed at Hanford Site consists of many waste streams derived from numerous sources, both on-site and off-site.

General Design Features: The landfill is divided into eight burial grounds, two of which are located in the 200 East Area, and six of which are located in the 200 West Area. The current method of disposing LLW is in

unlined, sloped (about 45 degrees) trenches that are about 6 to 7 m deep and vary in length up to apprximately 500 m. Trenches are typically wide-bottomed (about 8 m wide) or V-shaped (about 3 m wide). Packaged waste in carbon-steel, 55-gallon drums, or wooden boxes is stacked to within about 2.5 m of the surface. In 1987, MLLW was distinguished from LLW, and its disposal was largely discontinued, except on a case-by-case basis. Two types of MLLW typically considered for disposal in the pre-1987 trenches are remote-handled MLLW (with exposures greater than 200 mrem/hr at the container surface) and special waste. Special waste includes unique waste requiring special handling or unusual waste such as decommissioned reactor vessels. Non-remote-handled MLLW is currently stored in above ground buildings. Ultimately, MLLW will be disposed of in a new, Resource Conservation and Recovery Act-compliant disposal facility located within the Low-Level Burial Ground 218-W-5 in the 200 West Area.

A.2.2.2 Disposal Capacity

The amount of waste received by the Low-Level Burial Ground is highly variable and may differ greatly from year to year because of changes in the nature or level of cleanup activities on and off Hanford Site. An engineering study is planned to optimize the total capacity for LLW disposal facilities within the 200 Areas. Engineering estimates indicate that about 85,000 m^3 of space is available for LLW in the 218-W-5 burial ground, and upon completion of construction of the MLLW trenches, at least 43,000 m^3 will be available. The volume for MLLW will increase with planned waste loading optimization of the Resource Conservation and Recovery Act-compliant disposal space. Other burial grounds in the 200 Area have an additional 1.1 million m^3 of current and planned available LLW disposal capacity.

A.2.3 Environmental Restoration Disposal Facility

A.2.3.1 Facility Description

Status: The Environmental Restoration Disposal Facility is regulated by the Comprehensive Environmental Response, Compensation, and Liability Act; its Record of Decision was signed in January 1995. This document discusses site and risk assessments, remedial alternatives, the selected remedy, and statutory determinations for the Hanford Site disposal facility. Construction of the first two cells is underway and operations should begin by August 1996. For the purposes of this Report, this facility is considered current.

Waste Materials: Hanford Site waste accounts for nearly 2/3 by volume of the nuclear waste in the Department of Energy complex. The site contains vast amounts of both radioactive and hazardous wastes. Currently, 10% of Hanford Site's waste is radioactive and 75% is mixed waste. The most abundant contaminants are tritium, carbon tetrachloride, chromium, nitrates, cobalt, strontium, cesium, technetium, iodine, plutonium, and uranium. In the Record of Decision, the total volume of waste potentially projected is cited as less than 21 million m^3. More recent projections indicate that approximately 3.9 million m^3 of LLW and MLLW will be disposed at the Environmental Restoration Disposal Facility.

General Design Features: The Environmental Restoration Disposal Facility is a 70-foot-deep trench composed of two cells (in the initial phase). Each cell is 500 feet by 500 feet at the base. The objective of the facility is to limit migration of contaminants and prevent intrusion for at least 500 years. To meet these objectives, the following features are included:

- a double-lined basal liner composed of multiple layers of clay and geosynthetic liner that direct any liquids into the leachate collection system;
- a leachate collection system; and
- a multicomponent cover with components to limit radon emissions (clay), infiltration (geomembrane and an extra 15 feet of soil), and biointrusion (sand and gravel). The cell is sloped to deter long-term erosion and inhibit water infiltration.

The cell footprint may eventually cover an area approximately 1.6 square miles in size. The initial phase footprint is approximately 165 acres.

A.2.3.2 Disposal Capacity

Only Hanford Site waste resulting from remediation of the 100, 200, and 300 Areas will be disposed in the Environmental Restoration Disposal Facility. The initial two cells will have a capacity of 0.9 million m^3. The Environmental Restoration Disposal Facility Record of Decision states that all projected waste (listed in the Record of Decision as less than 21 million m^3) may be disposed in the Environmental Restoration Disposal Facility. Current projections indicate that 3.9 million m^3 of LLW will be disposed in the Environmental Restoration Disposal Facility.

A.2.4 References

"Record of Decision for the U.S. DOE Hanford Environmental Restoration Disposal Facility, Hanford Site," January 1995.

"Hanford Site Environmental Report for Calendar Year 1992" (PNL-8682, UC-602), 1992, R.K. Woodruff, R.W. Hanf, and R.E. Lundgren, Pacific Northwest Laboratory, Richland, Washington.

Personal communication with Dean Pratt, Westinghouse Hanford Company, regarding correspondence to Steve Storch, IDB Program, ORNL, Oak Ridge, Tennessee, "LLW Data Call," dated July 17, 1995.

"Low-Level Waste Burial Ground Disposal Plan" (WHC-SD-WH-ES-355).

A.3 Idaho National Engineering Laboratory

A.3.1 Background

Location: Idaho National Engineering Laboratory covers nearly 2,300 km^2 (890 mi^2) in Southern Idaho. Idaho National Engineering Laboratory is located within the Medicine Lodge Resource Area and the Big Butte Resource Area, both of which are administered by the Bureau of Land Management.

Historical Activities: In 1949, the site was established as the National Reactor Testing Station, where the Atomic Energy Commission built, tested, and operated various types of nuclear reactors. As of April 1991, 52 reactors had been built at Idaho National Engineering Laboratory, and 13 were still operating or operable. Idaho National Engineering Laboratory is now a multiprogram laboratory with numerous research and site cleanup activities. One LLW disposal facility, the Radioactive Waste Management Complex, is presently operating at Idaho National Engineering Laboratory. The Radioactive Waste Management Complex is located in the southwest portion of the site. Idaho National Engineering Laboratory does not plan to build another disposal facility: Idaho National Engineering Laboratory is currently evaluating disposal options at Envirocare, Hanford Site, and Nevada Test Site.

A.3.2 Radioactive Waste Management Complex

A.3.2.1 Facility Description

Status: The Radioactive Waste Management Complex was established in 1952 for disposal of defense wastes (mostly transuranic), solid LLW, and MLLW generated at Idaho National Engineering Laboratory. Since 1970, transuranic waste has been stored aboveground in specially designed storage facilities, and no mixed waste has been disposed at the complex since April 1984. Today, the facility provides waste management, interim storage of transuranic waste, and disposal of Idaho National Engineering Laboratory-generated LLW, but provides no means for disposing of MLLW. The facility also retrieves, examines, and certifies stored transuranic waste for ultimate shipment to the Waste Isolation Pilot Plant in Carlsbad, New Mexico.

HANFORD
Environmental Excellence

Waste Management

Waste Management
Federal Services, Inc.
Northwest Operations

P. K. Brockman

A key component of the Fluor Daniel Hanford, Inc., approach to Project Hanford Management Contract (PHMC) execution is the commitment to the economic development of the Tri-Cities region. As a central element of that strategy, Fluor Daniel Hanford and its major subcontractors established six new companies in the local area. All these companies were designed to be independent entities--referred to as enterprise companies--to ensure their long-term sustainability in the Tri-Cities. These enterprise companies are separate businesses with the flexibility to pursue and perform non-Hanford work.

Waste Management Federal Services, Inc., Northwest Operations (WNMW) role at the Hanford Site includes privatization of a select group of capabilities that were developed for use at Hanford, but that also have applications in other areas of the Department of Energy complex or in the private sector. These capabilities were selected for privatization because they are unique, state-of-the-art, or simply acknowledged by customers as being among the best available. The capabilities include:

- Transportation Logistics
- Waste Management Engineering
- Environmental Services

Waste Management Federal Services is a division of Waste Management, Inc., the nations largest and most successful manager of hazardous, radioactive, and solid waste. Waste Management which ranked 134th on the Fortune 500 in 1997, has more than 59,000 employees in 23 countries and annual revenues in excess of $9 billion.

Number of Employees:	112
Address:	Waste Management Federal Services, Inc., Northwest Operations (WMNW) 345 Hills Street Richland, WA 99352
General Manager:	P. K. Brockman
Email:	p_k_brockman@rl.gov

[Waste Management Federal Services, Inc. Northwest Operations]
[Waste Management, Inc.]
[Who's Who Page] [Hanford Home Page]

For questions or comments about this page, please send email to p_k_brockman@rl.gov
URL: http://www.hanford.gov/contrctr/wmnw.htm
Information Current as of 3/10/99

US Department of Energy

Welcome to the Hanford Home Page. Hanford is 560 square miles of sand and sagebrush located on the Columbia River in the Southeast portion of the state of Washington, managed by the U.S. Department of Energy's Richland Operations Office (DOE-RL). As a plutonium production complex, Hanford played a critical role in the nation's defense for more than 50 years beginning in the 1940's with the Manhattan Project. Hanford is the world's largest environmental cleanup project, with many challenges to be resolved in the face of overlapping technological, political, regulatory, and cultural interests.

Despite the complex and dangerous nature of the work, progress is being made toward completion of Hanford's missions -- to safely clean up and manage the site's legacy wastes, and to develop and deploy science and technology. The Department of Energy's Richland Operations Office is responsible for this work, in close coordination with the commercial companies hired to manage and complete the work.

If you are new to Hanford, you may want to browse its missions in detail in the Hanford Strategic Plan, review cleanup progress in the latest Annual Report, or find out more about DOE's contractor partners in Who's Who at Hanford or just Quick Facts.The Hanford Home Page also contains thousands of useful and informative features intended to communicate what we're doing and how we're doing it.These features are updated and enhanced regularly, so we hope you will check in frequently.

Hanford Works

For questions or comments, please send email to Webmaster@rl.gov

URL: http://www.hanford.gov/hanford.html
Updated: Fri Aug 13 14:13:45 1999

mid-December. The Board also expects the Department to conduct an extensive public review of its plans and proposed decisions. It is critical that decisions involving intersite transfers of waste and materials await completion of the National Dialogue. Import of offsite wastes and special nuclear materials for long-term storage or disposal at Hanford is an assumption contained in these planning documents that is not consistent with public values and the advice of the Hanford Board. The Board has previously identified criteria for accepting offsite waste, and these were reiterated in the September 5, 1997, transmittal of preliminary comments on the Focus on 2006 Plan from the Board.

Hanford Home Page | HAB | Correspondence Index

For questions or comments, please send email to Hanford_Advisory_Board@rl.gov
HAB Consensus Advice #
Subject:
Adopted:
URL:
Last Updated: Tue Aug 17 08:02:55 1999

HNF-EP-0063
Revision 5

Hanford Site Solid Waste Acceptance Criteria

Prepared for the U.S. Department of Energy

FLUOR DANIEL HANFORD, INC.
Richland, Washington

Hanford Management and Integration Contractor for the
U.S. Department of Energy under Contract DE-AC06-96RL13200

http://www.hanford.gov/wastemgt/wac/index.htm

Refer to Appendix 3.5-24 for a copy of the Hanford Site Solid Waste Acceptance Criteria

APPENDIX 3.6-2

INEEL Information

MAXIM
TECHNOLOGIES INC

Interoffice Memorandum

To: TML, NFSS Project File

From: Bob Bessent (Maxim)

Date: 4/3/00

Job No.: 9905006/170 - DOE Landfill Survey Project

Subject: Call To Sandra Birk; INEEL @ 208-526-1866; National Low-Level Radioactive Waste Coordinator

On Monday PM, I called Sandra Birk @ INEEL to get insight into the DOE disposal options potentially available for the K-65 residues. Apparently, Sandra has something to do with the DOEs Low-Level Radioactive Waste Management program and should have some suggestions for me as to potential options for disposal of the K-65 residues.

Unfortumnately, Sandra was in the office but not at her phone. This meant that I left her a message to call me regarding the above-referenced subject. Hopefully she will call me Tuesday; otherwise, I will re-call her Tuesday PM.

Please see me if you have any questions or comments regarding this memo.

File: C: nfss4.3a

MAXIM
TECHNOLOGIES INC

Interoffice Memorandum

To: TML, NFSS Project File

From: Bob Bessent (Maxim)

Date: 4/5/00

Job No.: 9905006/170 - DOE Landfill Survey Project

Subject: Call From Roger Piscatulla; INEEL @ 208-526-1137; National Low-Level Radioactive Waste Coordinator/Associate

On Tuesday PM, I received a message on my voice mail from Roger Piscatulla regarding my phone call to Sandra Birk @ INEEL to get insight into the DOE disposal options potentially available for the K-65 residues. In the original phone call I had left a message on Sandra's voice mail indicated that I was wanting to know if INEEL accepted LLW from off-site generators specifically from FUSRAP sites. Roger responded to this call to let me know that INEEL only accepts LLW generated within the INEEL complex. If I want to get any additional information about the waste disposal @ INEEL Roger indicated that he would take my call.

In conclusion, I will call Mr. Piscatella back again to get better insight into INEEL waste disposal practices and the prohibition of accepting FUSRAP wastes.

Please see me if you have any questions or comments regarding this memo.

File: C: nfss4.5

MAXIM
TECHNOLOGIES INC

Interoffice Memorandum

To: TML, NFSS Project File

From: Bob Bessent (Maxim)

Date: 4/5/00

Job No.: 9905006/170 - DOE Landfill Survey Project

Subject: Call To Roger Piscatella; INEEL @ 208-526-1137; National Low-Level Radioactive Waste Coordinator/Associate

On Wednesday PM, I returned Mr. Piscatella's call from yesterday or this morning. I wanted to clarify his message on my voice mail. Unfortunately, Mr. Piscatella was not at his deck so I left a message regarding my interest in finding out if INEEL accepts LLW generated offsite. I will call him Thursday PM if I do not hear from him in the morning.

Please see me if you have any questions or comments regarding this memo.

File: C: nfss4.5b

A.2.3.2 Disposal Capacity

Only Hanford Site waste resulting from remediation of the 100, 200, and 300 Areas will be disposed in the Environmental Restoration Disposal Facility. The initial two cells will have a capacity of 0.9 million m^3. The Environmental Restoration Disposal Facility Record of Decision states that all projected waste (listed in the Record of Decision as less than 21 million m^3) may be disposed in the Environmental Restoration Disposal Facility. Current projections indicate that 3.9 million m^3 of LLW will be disposed in the Environmental Restoration Disposal Facility.

A.2.4 References

"Record of Decision for the U.S. DOE Hanford Environmental Restoration Disposal Facility, Hanford Site," January 1995.

"Hanford Site Environmental Report for Calendar Year 1992" (PNL-8682, UC-602), 1992, R.K. Woodruff, R.W. Hanf, and R.E. Lundgren, Pacific Northwest Laboratory, Richland, Washington.

Personal communication with Dean Pratt, Westinghouse Hanford Company, regarding correspondence to Steve Storch, IDB Program, ORNL, Oak Ridge, Tennessee, "LLW Data Call," dated July 17, 1995.

"Low-Level Waste Burial Ground Disposal Plan" (WHC-SD-WH-ES-355).

A.3 Idaho National Engineering Laboratory

A.3.1 Background

Location: Idaho National Engineering Laboratory covers nearly 2,300 km^2 (890 mi^2) in Southern Idaho. Idaho National Engineering Laboratory is located within the Medicine Lodge Resource Area and the Big Butte Resource Area, both of which are administered by the Bureau of Land Management.

Historical Activities: In 1949, the site was established as the National Reactor Testing Station, where the Atomic Energy Commission built, tested, and operated various types of nuclear reactors. As of April 1991, 52 reactors had been built at Idaho National Engineering Laboratory, and 13 were still operating or operable. Idaho National Engineering Laboratory is now a multiprogram laboratory with numerous research and site cleanup activities. One LLW disposal facility, the Radioactive Waste Management Complex, is presently operating at Idaho National Engineering Laboratory. The Radioactive Waste Management Complex is located in the southwest portion of the site. Idaho National Engineering Laboratory does not plan to build another disposal facility: Idaho National Engineering Laboratory is currently evaluating disposal options at Envirocare, Hanford Site, and Nevada Test Site.

A.3.2 Radioactive Waste Management Complex

A.3.2.1 Facility Description

Status: The Radioactive Waste Management Complex was established in 1952 for disposal of defense wastes (mostly transuranic), solid LLW, and MLLW generated at Idaho National Engineering Laboratory. Since 1970, transuranic waste has been stored aboveground in specially designed storage facilities, and no mixed waste has been disposed at the complex since April 1984. Today, the facility provides waste management, interim storage of transuranic waste, and disposal of Idaho National Engineering Laboratory-generated LLW, but provides no means for disposing of MLLW. The facility also retrieves, examines, and certifies stored transuranic waste for ultimate shipment to the Waste Isolation Pilot Plant in Carlsbad, New Mexico.

Waste Materials: Buried waste and retrievably-stored waste include solid beta-gamma contaminated LLW from Idaho National Engineering Laboratory operations, transuranic waste, and contaminated soil. Buried waste is subdivided into contact-handled and remote-handled waste. The beta-gamma contaminated LLW and contaminated soil contain transuranic contaminants less than 100 nCi/g. The buried waste, beta-gamma LLW, and soil are classified as LLW. A 1989 study of a representative section of the Radioactive Waste Management Complex containing the transuranic waste determined that 46% of all past disposed transuranic waste (64,755 m^3) is to be reclassified as LLW. This study also concluded that 95% of the disposed transuranic waste inventory contains hazardous constituents and will be reclassified and managed as MLLW.

General Design Features: The 58-ha (144-acre) complex consists of two main disposal and storage areas: the Transuranic Storage Area for storage and examination of transuranic waste and the Subsurface Disposal Area for disposal of LLW. The Subsurface Disposal Area is a 36-ha (88-acre) fenced area surrounded by a flood control dike and drainage channel. The Subsurface Disposal Area consists of Pad A, trenches, pits, and soil vaults. Two LLW disposal areas are operational: pits and soil vaults. Pits are used to dispose of solid beta/gamma contact-handled LLW. The pits are 30 m x 4 to 6 m (98 ft x 12 to 20 ft) and vary from 60 to 360 m (200 to 1,200 ft) long. Pits are generally excavated to bedrock depth, and the bedrock is covered with soil. After the waste is placed on the soil by high density stacking, the pits are backfilled. Soil vaults are unlined, augered boreholes between 0.41 and 1.8 m (16 to 72 in) in diameter used to dispose of remote-handled LLW. The waste is usually placed into the vaults in bottom discharge shielded casks. When the vaults are full, they are covered with soil. Approximately 210,000 m^3 of LLW was disposed of in the Subsurface Disposal Area (1952-1992). Although there are no plans to expand the existing Radioactive Waste Management Complex Subsurface Disposal Area, new disposal concepts are being evaluated to establish environmental compliance plans and functional and operational requirements for new disposal facilities.

A.3.2.2 Disposal Capacity

The Subsurface Disposal Area has an original disposal capacity of 250,000 m^3. As of January 1993, the remaining capacity in the current active pits was 39,000 m^3. After the year 2000, the complex will be closed to active waste disposal, and periodic monitoring and maintenance activities will be conducted. A new state-of-the-art facility will be developed to replace the Radioactive Waste Management Complex.

A.3.3 References

"Idaho National Engineering Laboratory (INEL) Site Specific Plan for Fiscal Year 1994" (DOE/ID-10253).

"Department of Energy Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Pre-Decisional Draft (Rev. 2) Environmental Impact Statement" (DOE/EIS-0203), April 1994.

A.4 Los Alamos National Laboratory

A.4.1 Background

Location: Los Alamos National Laboratory is located on the Pajarito Plateau in Los Alamos County in north-central New Mexico, approximately 97 km (60 mi) north-northeast of Albuquerque and 40 km (25 mi) northwest of Santa Fe. Los Alamos National Laboratory occupies an area of 112 km^2 (43 mi^2), bounded on the southeast by the Rio Grande.

Historical Activities: The University of California has managed Los Alamos National Laboratory since 1943, and the Department has been the designated federal landlord since 1978. Los Alamos National Laboratory's mission involves the application of science and technology to weapons development, energy supply, and conservation programs.

For additional information, please contact:
Sandra Birk
Phone (208) 526-1866
Email bir@inel.gov

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Hanford Advisory Board

HANFORD ADVISORY BOARD
PREVIOUS CONSENSUS ADVICE
PLUTONIUM DISPOSITION

13. Off-Site Mixed Waste Acceptance

DOE and DOD should not be allowed to transfer waste unless the following criteria are met:

- A general condition of permit and plan approval and subsequent off-site waste acceptance should be on-going substantive compliance with Washington Dangerous Waste laws and the terms, conditions, and schedules of permits, consent orders and clean-up agreements (e.g. the Tri-Party Agreement) between the DOE and the State.
- Acceptance of off-site waste must be contingent on existing facility capacity and on availability of funding to handle processing and storage needs, while having a neutral or positive impact on Hanford clean-up.
- A written reciprocal agreement should be required between the State of Washington, the state of origin of the off-site waste and DOE.
- Technical, economic and equity concerns should be addressed. Prolonged storage of off-site wastes prior to treatment, or of post-treatment residuals, generally should not be approved.
- No pretreatment storage should be allowed at the receiving site unless it has been approved in the written reciprocal agreement between the shipping and receiving states.
- Plans and schedules to treat off-site wastes should be approved only in instances where there is a binding legal obligation on the part of DOE for primary and secondary off-site storage facilities designed to receive post-treatment residuals before wastes are allowed to be shipped to Hanford. Plans and schedules should specify that generally no residuals will be stored or disposed of at Hanford. In the event of substantial noncompliance with Washington requirements, or failure to have off-site facilities available for return of post-treatment residuals, off-site waste will not be accepted at Hanford. Lacking specific agreement between the state, DOE and state of origin, waste residuals should be returned to the site of origin or other compliant facilities to be specified in plans and schedules.
- The sending sites' treatment plan should be scrutinized to determine whether there has been thorough consideration of on site treatment and pre-shipment storage.
- Receipt of any off-site wastes for treatment should require submission by shipping state of a schedule for shipment, treatment, and post-treatment residuals management, and prior written approval by Washington.
- Require careful planning of routes and consideration of weather emergencies to minimize the likelihood of an accident. Emergency preparedness for minimizing the impacts from an accident will require financial support from DOE to state, tribal and local involvement, including adequate equipment and training. When materials are shipped, timely notification should be provided to transportation agencies.
- Cumulative impacts (e.g. of other wastes types) must be analyzed and considered in decisions concerning the movement and treatment of DOE mixed wastes. DOE must fully disclose all projected waste types and quantities that maybe shipped to Hanford prior to any consideration by Washington of TSD permits for mixed wastes generated at other facilities. This information must be part of the PEIS and Draft Site Treatment Plan public comment/public participation process, and of an inter-regional and inter-site advisory board dialogue, prior to development of final Site Treatment Plans and any agreement by Washington State to accept off-site wastes.
- Off-site waste acceptance criteria must include provision for inspection and payment of appropriate permit fees to cover all state costs, including inspection of pre-shipping procedures. Existing Mixed Waste facilities at Hanford must be in substantial compliance with the Tri-Party Agreement milestones, other orders or agreements and RCRA or state law requirements in order for permits to be issued or amended to allow off-site Mixed Wastes to be treated, stored or disposed of at Hanford.

29. Stewardship and Stockpile Scoping Hearings - August 1995

The scope of the Stockpile Stewardship and Management PEIS had been changed so that Hanford is now being added as a site for consideration for interim pit storage and two of the previously selected sites being deleted. This presents a piecemeal and fragmented approach to dealing with waste management and special nuclear materials issues around the former weapons complex. The Board has already advised of the need for an integrated and coordinated approach to allow stakeholders to understand the full impact of all potential importation of waste and special nuclear materials to Hanford and other sites in the former nuclear weapons production complex.

34. Waste Management PEIS and Public Involvement - November 1995

The Board is concerned by DOE-Headquarters' inadequate planning and decisions for public involvement and information for the Waste Management PEIS. There is a need for timely and meaningful disclosure to the public in the Northwest of all relevant waste and nuclear aterials movement actions, impacts and alternatives for the Waste Management Programmatic EIS.

The Board urges DOE to utilize an independently facilitated inter-site stakeholder planning process to cooperatively develop a meaningful integrated public participation process on the Department's proposed actions to ship for storage, treatment or disposal of DOE's nuclear and hazardous wastes and nuclear materials. The HAB requests DOE to keep the WMPEIS comment period open to implement any process resulting from the November 29th intersite meeting.

38. Draft Waste Management Programmatic EIS - December 1995

We urge DOE to work with individual sites to verify and validate the estimates in the Baseline Environmental Report being used to

estimate waste volumes, as well as other identified assumptions.

DOE should develop an effective decision-making process to integrate those EISs dealing with waste storage, treatment and disposal from USDOE's facilities. Please refer to HAB Advice #34, requesting an integrated public participation process. DOE should work with stakeholders to ensure that their values are factored into alternatives being considered in the WMPEIS.

The Board urges Ecology and EPA be fully involved in decisions that would impact the Hanford site, particularly in decisions that could compete with or detract from the site's cleanup mission and the resources it requires.

Opportunity for Public Involvement in Plutonium Disposition

e support the ongoing dialog on improving public involvement opportunities regarding the disposition of the nation's nuclear materials.

45. DOE Financial Support for a Tribal Roundtable

The NW Region, and the HAB in particular, is very concerned that there be an opportunity for meaningful public comment on the upcoming Plutonium PEIS. Our concern has been most clearly demonstrated by our support of the Plutonium Roundtable and the Oregon town meeting process in October of last year. Most recently we requested additional public meetings for our region on this important PEIS.

To date, meaningful tribal involvement has been absent. In order to enhance Tribal involvement on the Plutonium PEIS, we are requesting from DOE financial support for a Tribal Roundtable on this PEIS. This Roundtable deserves DOE's support to allow:

- a National level consultation with Indian Nations to bring the Tribes up to speed concerning disposal options for surplus plutonium and associated issues.
- the Nez Perce to gain experience in facilitation of technical meetings.
- DOE's HQ Office of Fissile Materials to gain experience in tribal consultation.

What is requested from DOE is financial support (estimated $25,000) to bring concerned tribal leaders from across the country to participate in the Roundtable. In light of the absence of tribal consultation during this PEIS, DOE should take this opportunity to address its trust responsibility, conform with the President's memorandum regarding government-to-government consultation, and live up to the spirit of its own Indian policy.

46. Storage and Disposition of Excess Weapons Usable Plutonium and Special Nuclear Materials - May 1996

The draft Plutonium Programmatic Environmental Impact Statement (PEIS) indirectly considers Hanford as a potential site for certain activities within the scope of the plutonium safe storage and disposition program by the virtue of the site's current capability and plutonium possession. The Hanford Advisory Board is opposed to the piecemeal approach to nuclear material storage and disposition like that taken in the PEIS on plutonium disposition. We have on three previous occasions adopted advice to USDOE urging an integrated public discussion on these issues. (Board Advice #13, 34 and 38) We have a commitment from USDOE leadership to initiate such a process. Therefore, a ROD on the narrow choices presented in this EIS is premature pending the National Equity Dialogue.

The Board is opposed to the use of the bore hole option at Hanford. At this time, the Board has not expressed a preference for one of the other disposal options.

The Board does have a number of values/issues which relate to a plutonium (Pu) and spent nuclear material (SNM) program. Many of ese values/issues have been previously provided to you as advice or recommendations for other Hanford programs. These values are:

- Any plutonium or SNM storage or disposal program must be compatible and integrated with the TPA commitments and milestones and should not affect the rate or funding of cleanup. The program would have the safe disposition of Hanford plutonium as a priority.
- Any plutonium program assigned to Hanford must be fully funded from new funding sources. This funding should include appropriate site infrastructure and overhead costs. Funding should fully cover the cost of treatment, storage and disposal of any new waste streams.
- The acceptance of plutonium at Hanford should not delay, defer, or negatively impact Hanford cleanup.

- Appropriate local and regional public information and involvement programs must be conducted by the agencies to ensure that the public is fully informed of the risks, hazards and impacts of such a program. This would be part of the national dialogue on all nuclear materials (noted above) prior to assignment of nuclear materials to a specific site.
- Any permit or plan approval for new Hanford programs/activities must be fully integrated and must comply with all State of Washington public health and safety rules and regulations.
- Equity impacts must be addressed in the assignment of new nuclear materials (including plutonium) to Hanford.
- The transportation of plutonium and special nuclear materials to Hanford storage will require careful planning of routes and consideration of weather emergencies to minimize the likelihood of an accident. Emergency preparedness for minimizing the impacts from an accident will require financial support from DOE for state, tribal, and local involvement, including adequate equipment and training. When materials are shipped, timely notification should be provided to transportation agencies.
- The choice of disposal options re: Pu will be a determinant for sites such as Hanford. Prior to the choice of a disposal option, complete characterization of the material and the impacts of short and long-term disposition technologies must be reviewed by the public and regulatory agencies.
- Acceptable processing techniques including waste processing must be developed as an integrated part of any new Hanford storage and disposal program. Permanent disposal of waste plutonium at Hanford is not acceptable.
- A "systems" analysis approach should be utilized to select the most effective method for processing and interim storage. This analysis should adequately address public and worker health and safety and environmental issues.
- If a plutonium disposition mission is assigned to Hanford, every effort should be made to use existing workforce, facilities, technologies, and other resources.

nally, we note that this PEIS does not address cumulative impacts of nuclear material movement and disposition as required by NEPA.

. Public Participation in Arms Control and Non-Proliferation Assessment for PEIS on Disposition of Fissile Materials - November 1996

It is unreasonable to expect the public to digest such a technical document as the Assessment on Arms Control and Non-proliferation for the Programmatic Environmental Impact Statement on Disposition of Fissile Materials and to prepare meaningful comment on such an important issue without additional local educational efforts.

The current schedule regarding disposition of fissile materials ignores a national initiative to improve public participation in DOE decisions on nuclear materials known as the National Equity Dialogue. The National Equity Dialogue offers an alternative to address the

pros and cons of the entire nationwide disposition problem in an effective, open, representative, rational and equitable fashion. Premature, rushed decisions on fissile materials undermine this national dialogue process.

66. National Dialogue on Nuclear Materials & Waste - February 1997

What commitment does DOE have to the Dialogue? Are all relevant DOE programs on board? This should be in writing in next draft. How much money can DOE commit? Will DOE support the administrative and data acquisition needs of the Dialogue? How will Dialogue recommendations be used in decision process? It is a given that the Dialogue not provide an avenue for DOE to avoid npliance with applicable state and federal environmental laws and agreements.

e over-all goal is to implement a credible and sustainable dialogue for disposition of nuclear materials. Simply "exploring" equity and fairness is not adequate. These are key components of the dialogue. The initial regional and national meetings which define the values and principles upon which the dialogue is based should define what these terms mean in the context of the Dialogue.

There is a lack of clarity regarding who will present material to members of the public. USDOE should not be the sole source of information. Citizens groups need to be able to present background and issue information.

Regarding the regional meetings: We understand these are initially to develop regional values and principles in addition to educating and informing the public about nuclear materials issues. There should be a well defined feedback loop between the national and regional forums. The regional meetings need defined financial support. We recommend that regional stakeholders and the facilitator, not USDOE be supported to publicize the regional meetings.

There should be specific language stating which EISs and PEISs will be covered. Final EISs should not, by default, be taken off of the table. For example, regarding Pu disposition, location of facilities outlined in the recent PEIS must be included. The relationship to the 10-year plan (10YP) should be spelled out including the relationship to the 10YP budget and measurements of progress in the Plan. The first product of the Dialogue should be definition of such key underlying concepts as equity and fairness. These could either shape or evolve from the definition of values and principles.

Dialogue participants should have full access to unclassified information. In keeping with the Openness Initiative, a review of relevant classified information should be conducted, and where possible, that information should be declassified. The statement that DOE will make future decisions within context of the values and principles developed within the Dialogue and where not possible, DOE will present proposed decision to the steering committee and "will provide for the involvement of National Dialogue participants in the decision- making process", is problematic. The section in quotations is very unclear. Involvement needs further definition. Clarification of the role of states, tribes and local governments is needed.

Clarification is needed regarding the sources of the data packages referred to in this section. There must be a systematic independent assessment of these data packages to include validity and reliability testing. Data needs to include cumulative impacts of various waste storage, disposal, processing and transportation decisions. A definition of values and principles such as that used by the Hanford TWRS Task Force is needed.

Additional definition of phrases in this section is needed, specifically: who is meant by "parties not historically active in DOE decisions/issues". Historically active already includes: citizens groups, general public, state and local governments., tribes and more. Who is being targeted by this statement that is not included in general public/tribes/ governments? What does "decision-testing" and "degree of commonality without" mean? Who will "strategically use mass media for broadest possible outreach"? We are not convinced at DOE will do a good job of this, since DOE generally not doing a good job of using mass media to involve public.

e time line is ambitious - especially for activities in early 97. Need to account for turnover, new Secretary of Energy, etc. With a pilot effort in the near-term, the overall timeline should be revised to be more realistic. There needs to be adequate time for the development and the verification of reliable data, the outreach and discussion of the issues, the development of regional meetings with coordination into a national discussion. There should also be a time for a return to the regional participants for a reality check.

We agree with the establishment of a steering committee with broader representation. The planning committee was chosen rather randomly. How will the steering committee be balanced as far as regions/issue/and stakeholder participation? It is important to have the participation all shipper and receiver states in the Dialogue. Especially at the outset the participation of all large USDOE sites in the planning group is critical. These should also include stakeholders at Savannah River, Oak Ridge, LANL and NTS. There should be a commitment from participants that there will be no side-deals either between sites or with sites and DOE which would undercut the comprehensive nature of the Dialogue.

68. Ten Year Plan - April 1997

Information seen regarding the direction of the national Ten Year Plan seems out of step with ongoing cleanup at Hanford. The draft assumptions for the EM Integration Initiative and the national Ten Year Plan show Hanford as receiving, treating, and disposing a substantial portion of DOE's waste. While these decisions are not final, the ongoing internal DOE discussions without a clearly defined public process, alarms the Board. Disposition decisions such as these should be part of a national dialogue on disposition of nuclear materials.

The relationship between the National Dialogue on Nuclear Materials Disposition and the Ten Year Plan is not clearly defined. These two processes are inseparable and their relationship must be clarified before intersite community workshops are held.

74. Surplus Plutonium - July 1997

Using the framework of the National Equity Dialogue, DOE should establish a clearly defined process that allows adequate time for discussion and public comment on the proposed locations for a) plutonium pit and metal conversion, b) mixed oxide fuel preparation, and c) vitrification and treatment, storage or disposition of other radioactive wastes.

To avoid piecemeal decision-making, DOE should establish a schedule and rationale for making location decisions for the disposition of plutonium and other related chemical and radioactive waste materials. The schedule for comment should be extended to at least September to allow adequate opportunity for public review and input.

78. Focus on 2006 Plan & Contractor Integration Report - November 1997

The Contractors Integration Report recommendations are based on unsupported economic efficiencies. They need to also consider transportation and risks to worker and public health and safety and the environment. The Contractors Integration Report and Focus on 2006 Plan need to clearly explain proposals for intersite waste transfers (e.g., ship cesium and strontium capsules to INEEL for storage exchange for an equivalent number of curies being shipped from INEEL to Hanford).

Currently, DOE-RL budget planning does not provide for intersite shipping and handling of wastes. Funding to cover the costs of treatment, storage, and disposal, as appropriate, should be transferred from the site of origin to the receiving site along with the waste itself.

No contingency plan or funding exists to cover an accident during an intersite waste transfer.

The Board expects the Department to involve the HAB in development of waste disposition maps prior to submittal to DOE-HQ in

Low-Level Radioactive Waste

DOCUMENT INFORMATION SYSTEM©

State and Compact Documents

National LLW Program Documents

Nuclear Regulatory Commission Documents

Search this database to find publications on the management and disposal of radioactive waste (nuclear waste).

A more advanced, Windows-based version of the *Low-Level Radioactive Waste DOCUMENT INFORMATION SYSTEM(c)* is now available for installation on your computer free of charge from the National Low-Level Waste Management Program. It is easy to use, responds instantly to queries, and has reporting features not found on this Internet demo version. Contact Bill Newberry (208-526-5163, email: wfn@inel.gov) for more information.

For information on how to obtain copies of Federal Government documents found in this database, contact the National Technical Information Service (NTIS).

Who We Are — Learn more About the National Low-Level Waste Management Program, its history and functions. See summary descriptions of the Program's products and services.

National Status — NEW! National LLW Management State and Compact Status Update. Detailed Compact Map. Map of agreement states. What is an agreement state?

Data Searches — Explore searchable databases (Manifest Information Management System, Document Information System, Technologies Databaseand Question-and-Answer Database) for information pertinent to LLW and MLLW management. Download the Low-Track software for user-specific applications involving LLW inventory management and tracking.

LLW Reports — View and/or download recent reports (complete text) on low-level radioactive waste topics published by the National Low-Level Waste Management Program, the Department of Energy, and other organizations.

Links to Other Sites — Explore other internet sites of interest to LLW management professionals via links to federal agencies, statutes and regulations, state and compact LLW programs, and other useful information.

The primary function of the National Low-Level Waste Management Program is to provide technical assistance to states and compact regions in developing management systems for commercial low-level radioactive waste.

Requests from customer organizations are utilized in identifying the specific types of assistance that are needed and associated schedule requirements.

The Program fulfills a responsibility assigned to the Department of Energy by federal statute. Program activities are managed through the DOE's Idaho Operations Office and supported by technical staff within Bechtel BWXT Idaho, LLC .

INEEL 5 years of innovation

INEEL

Idaho National Engineering & Environmental Laboratory

August 17, 1999

Welcome

About INEEL

Engineering & Science

Environment

National Programs

Opportunities

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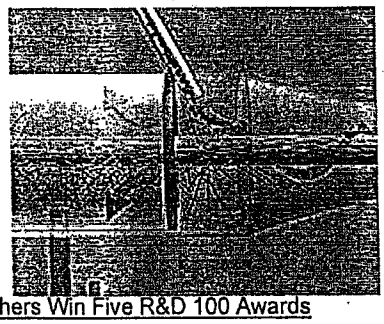
What's New



INEEL Researchers Win Five R&D 100 Awards

Energy Department, Bureau of Land Management Create Sagebrush Steppe Reserve at INEEL

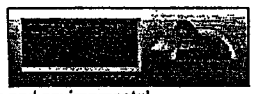
Public Meetings Scheduled on Remediation of Central Facilities Area

NEWS at the INEEL

Citizen Inquiry Line:
1 800 708-2680
Webmaster

U.S. Department of Energy
IDAHO Operations Office

LOCKHEED MARTIN



The Idaho National Engineering and Environmental Laboratory is a multi-program engineering and environmental laboratory doing quality research and solving national problems for the U.S. Department of Energy. The INEEL is operated by Lockheed Martin Idaho. Click for a closer look at the long-range plan for the INEEL.

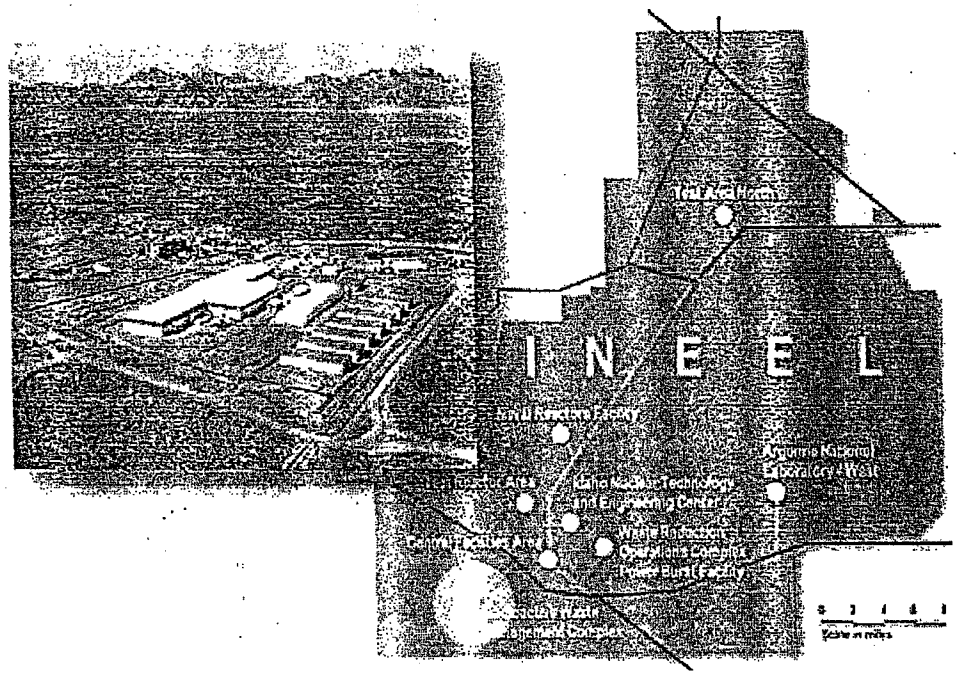
Long Range Plan

Vision

Mission

Guiding Principles

Core Capabilities

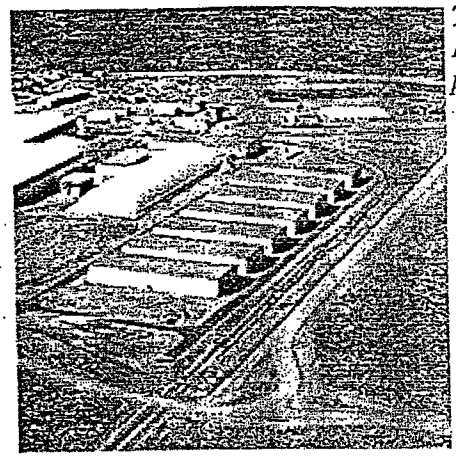


Radioactive Waste Management Complex

The Radioactive Waste Management Complex is a restricted-access area located seven miles southwest of the Central Facilities Area at the INEEL. The characteristics of the land surrounding the Radioactive Waste Management Complex are favorable for its mission. This facility is located in the southwest quadrant of the INEEL in a depression circumscribed by basaltic and lava ridges. The ground surface is relatively flat. The elevation is about 5,000 feet above sea level. The Snake River Plain Aquifer lies beneath the facility at a depth of about 600 feet.

The mission of the facility is to manage, in a safe and environmentally sound manner, the disposal of low-level radioactive waste and the storage of transuranic (activity greater than 100 nanocuries/gram) radioactive waste. In addition, the recent award of the contract for the Advanced Mixed Waste Treatment Project will expand the complex's waste management operations to include treating and preparing these wastes for shipment out of Idaho, along with the development of technologies that will serve the waste management needs of current and planned facilities at the INEEL. About 40,000 cubic feet of low-level radioactive waste are disposed at the facility each year. Two hundred thirteen people are currently employed at this facility.

For planning purposes, the Radioactive Waste Management Complex is divided into four zones. The Administrative Area, located in the northeast section of the facility, consists of buildings used for office space and other activities that support operations. The Operations Zone, a 10-acre area located west of the Administrative Area, consists of buildings and storage sheds used for operations and maintenance activities that support the Radioactive Waste Management Complex. The Subsurface Disposal Area, a 97-acre area located in the western section of the facility, is dedicated to permanent shallow-land disposal of solid, low-level waste. The Subsurface Disposal Area is surrounded by a security fence and contains pits, trenches, and vaults for underground waste disposal. The Transuranic Storage Area, a 56-acre area located in the southern section of the facility, is dedicated to the temporary storage of contact- and remote-handled solid transuranic wastes. This area is also contained within a security fence and includes the Stored Waste Examination Pilot Plant, the Air Support Weather Shield, the Certification and Segregation Building, the Drum Venting Facility (where filters are installed in the lids of waste drums to prevent hydrogen buildup), a maintenance shop, the Transuranic Package Transporter Loading Station, and the Waste Storage Facility. The Transuranic Storage Area will also contain the facility for the proposed Advanced Mixed Waste Treatment Project.



Type II Storage Modules at the Radioactive Waste Management Complex provide storage for mixed transuranic waste.

Transuranic waste generated by national defense programs was disposed in the Subsurface Disposal Area from 1954 to 1970 and placed in storage from 1970 to the present. At the facility's Stored Waste Examination Pilot Plant, some of the transuranic waste is being vented, examined, and certified for eventual disposal at a permanent national repository, such as the Waste Isolation Pilot Plant in New Mexico. Personnel at the Stored Waste Examination Pilot Plant use nondestructive examination techniques to verify that transuranic waste meets the acceptance criteria for the Waste Isolation Pilot Plant. Certified containers are stored in the Waste Storage Facility until shipment to the Waste Isolation Pilot Plant for permanent storage.

The current emphasis at the Radioactive Waste Management Complex is on supporting the Waste Isolation Pilot Plant during a five-year experimental test program that will demonstrate compliance of the plant with Federal regulations. As part of the testing, waste is being retrieved from the Certification and Segregation Building and examined at the Stored Waste Examination Pilot Plant and Argonne National Laboratory-West. Shipping via the Transuranic Package Transporter II is being implemented to support shipments to the Waste Isolation Pilot Plant.

As part of an effort to comply with the Resource Conservation and Recovery Act, a consent order agreement is in force to reconfigure 100% of the waste containers in the Air Support Weather Shield and the Certification and Segregation Building to the new Waste Storage Facility by January 1, 1998. This effort includes preparation of documents, operational readiness reviews, reconfiguration of waste, sampling, and inspection.

The treatment operations at the complex are scheduled to begin in 2003 with the startup of the facility for the Advanced Mixed Waste Treatment Project. A major part of that facility's mission is to retrieve and treat 65,000 cubic meters of INEEL low-level and transuranic waste currently stored at the Transuranic Storage Area. In conjunction, the facility operations will ensure the waste is prepared for shipment to New Mexico's Waste Isolation Pilot Plant and/or a low-level disposal site in accordance with the settlement agreement among the State of Idaho, the DOE, and the Navy.

Personnel in the Environmental Restoration Program are conducting remedial investigations of the Subsurface Disposal Area. Site characterization activities included in the investigation consist of drilling wells for characterizing and monitoring purposes, sampling various aspects and features of the area, and characterizing waste disposed in it.

Remedial design/remedial actions are also under way at the Subsurface Disposal Area under the Environmental Restoration Program. These remedial actions include retrieval and treatment of wastes from Pit 9 by Lockheed Martin Advanced Environmental Systems and treatment of volatile organic contamination in the vadose zone using vapor vacuum extraction technology. Long-term monitoring of the Snake River Plain Aquifer will be done to characterize any potential releases to the aquifer.

Virtually all of the buildings at the Radioactive Waste Management Facility are in good or excellent condition. Power comes from the Experimental Breeder Reactor I main feeder line, which originates at the Central Facilities Area Scoville Substation. Security lighting, emergency power lines, a warning system beacon, sirens, and telephones are used and maintained throughout the facility. Domestic water is pumped from an area deep well and is then stored in a 250,000-gallon water storage tank. The well also supplies a 250,000-gallon fire water tank. Water pumps distribute both domestic and fire water to the area buildings. The facility also includes its own sanitary sewer system. Propane is distributed via underground lines.

Expansion will continue at the facility. However, this expansion is not expected to require any land outside of the current boundaries of the facility. The DOE Idaho Operations Office awarded a privatization contract for construction and operation of the Advanced Mixed Waste Treatment Project in December 1996. British Nuclear Fuels Limited, the owner of the facility, will be directly responsible for the integrated treatment of INEEL transuranic and alpha low-level waste, as well as supporting services. These services will include the retrieval, storage, and packaging of the waste for shipment out of State in accordance with the settlement agreement among the State, DOE, and the U.S. Navy.

Construction and demolition projects for the Radioactive Waste Management Complex can be found in Table 14. The area planning map depicts construction and demolition projects. An additional map shows DOE Headquarters Secretarial Office responsibility for area buildings. Table 15 is an existing and planned building profile of the area.

Past disposal practices once thought to be state-of-the-art have been found to be potentially detrimental to the environment. The full extent of environmental contamination due to the use of these practices at the Radioactive Waste Management Complex is being investigated. Decisions to remediate the contamination will be based on the risk to human health and the environment. Cleanup of contamination that does not pose a significant risk can take a considerable amount of time and money. The DOE is committed to using environmentally sound waste management practices that minimize waste, handle waste properly, clean up contamination to the greatest extent feasible, and restore the environment of the site.

The Resource Conservation and Recovery Act precipitated the need to monitor, upgrade, and build new structures at the facility. Several new buildings that meet the requirements of this act and the Comprehensive Environmental Response, Compensation, and Liability Act have been constructed. The Waste Storage Facility was completed in 1995. It is composed of one Type I Storage Module and seven Type II Storage Modules. The Type I Storage Module will harbor venting and aspiration activities of mixed transuranic waste retrieved from the Transuranic Storage Area. The Type II Storage Modules comply with the Resource Conservation and Recovery Act for storage of mixed transuranic waste. The waste will be stored and managed there until it can be treated or transferred to the Waste Isolation Pilot Plant for permanent storage.

Imminent and ongoing activities include closure of the Air Support Weather Shield by about 1998 and closure of the Certification and Segregation Building by about 1999. Plans are also under way to move the earthen-covered, radioactive-element wastes from the Transuranic Storage Area to the storage modules that comply with the Resource Conservation and Recovery Act. A consent order agreement for control of wastes addressed in the Toxic Substances Control Act is being negotiated. In addition, the Landfill Stabilization Focus Area, located just south of the Subsurface Disposal Area, is a simulated waste pit used to demonstrate technologies that may be useful for remediating buried waste.

IDAHO NATIONAL ENGINEERING AND ENVIRONMENTAL LABORATORY

INEEL's Long-Range Plan

Mission, Vision, and Future

Prepared for the
U.S. Department of Energy

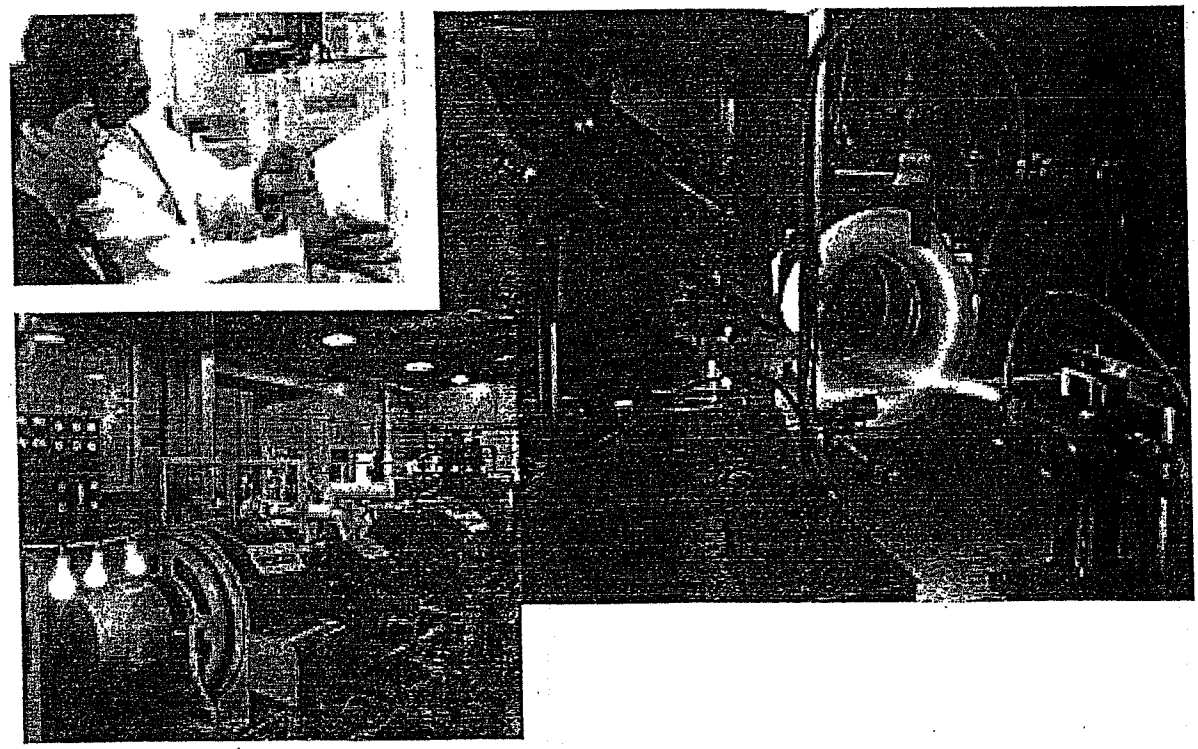
Published December 1998

Introduction

This Long Range Plan is an update of the first Idaho National Engineering and Environmental Laboratory (INEEL, also referred to throughout this document as the Laboratory) Long Range Plan completed in 1996. This Plan focuses INEEL activities around four mission objectives and is designed to provide the Department of Energy (DOE) and the public with a greater understanding of where the INEEL is today and where it is headed in the future. Today, the INEEL is built on capabilities and competencies derived from missions in the past. In much the same way, the INEEL of the future will be based on today's capabilities and competencies. For many years the INEEL was the site of the largest nuclear power research and development effort in the world. During the 1970's the Laboratory's mission broadened into such areas as biotechnology, energy and materials research, and conservation and renewable energy. At the end of the Cold War waste treatment and cleanup of previously contaminated sites became a priority. Today the INEEL is a science-based, applied engineering national laboratory dedicated to completing its waste cleanup mission and meeting the nation's environmental, energy, nuclear science and technology, and national security needs. The Laboratory is a multiprogram, federally funded research and development center dedicated to providing solutions that can be applied across the DOE laboratory complex, as well as regionally, nationally, and around the world.

The INEEL operates under the sponsorship of the DOE's Office of Environmental Management (EM), and is the DOE's premier environmental laboratory. Its designation as the lead laboratory for EM reflects the underpinning science and technology role it provides to the implementation of the EM Office of Science and Technology programs. In keeping with the multiprogram nature of the Laboratory, the INEEL is also the lead laboratory for DOE's Office of Nuclear Energy, Science and Technology (NE). As the lead laboratory for NE programs the INEEL assists NE in defining and maintaining the nation's nuclear energy options. A major focus of the INEEL is the interaction between energy needs and environmental impacts. In addressing these needs, the INEEL maintains, enhances, and uses its capabilities to assist portions of the DOE's national security and energy efficiency needs.

The INEEL has a broad and varied customer base. In addition to serving as the lead lab for DOE EM and NE, INEEL's DOE customers include Defense Programs, Office of Science, Energy Efficiency and Renewable Energy, Fossil Energy, and Nonproliferation and National Security. The laboratory also does



work for a variety of other federal agencies including the Nuclear Regulatory Commission, the Environmental Protection Agency, and the Department of Defense. The INEEL is engaged in numerous partnerships with universities and industry. INEEL also partners in critical arenas with collaborators outside the United States.

Science, research and development and programmatic operations at the INEEL are bound together within a single entity. One key to INEEL's strength is its ability to identify and respond to opportunities that require integration of science, and research and development with programmatic operations. Solutions developed at INEEL benefit its operations and can be applied throughout the DOE laboratory complex. The approach of integrating operations, science, and applied engineering to problem solving, while using the unique facilities on the 890 square miles of the INEEL, makes the INEEL a valuable asset in the DOE system of national laboratories. The large land area, facilities, and infrastructure unique to the INEEL also positions it to consider new and very different missions. A recent example of this is the proposal by the State of Idaho to develop a commercial spaceport on the INEEL under a cooperative use agreement with the Department of Energy. Such a mission would fit well with current land use and laboratory operations and would also serve to greatly diversify the regional economy and stimulate a new generation of space science and manufacturing technology research and development at the Laboratory.

The INEEL is committed to enhancing the nation's science and technology capabilities through university, industry, and other DOE laboratory partnerships and technology leveraging. In the future the INEEL will continue to apply its unique capabilities to a broader range of national environmental, energy, nuclear science and technology and national security missions.

Mission

The mission of the INEEL is to develop and apply enduring solutions to national environmental and energy challenges.

Vision

The vision of the INEEL is to be the premier provider of integrated, science-based, engineered solutions to national environmental and energy challenges.

Guiding Principles

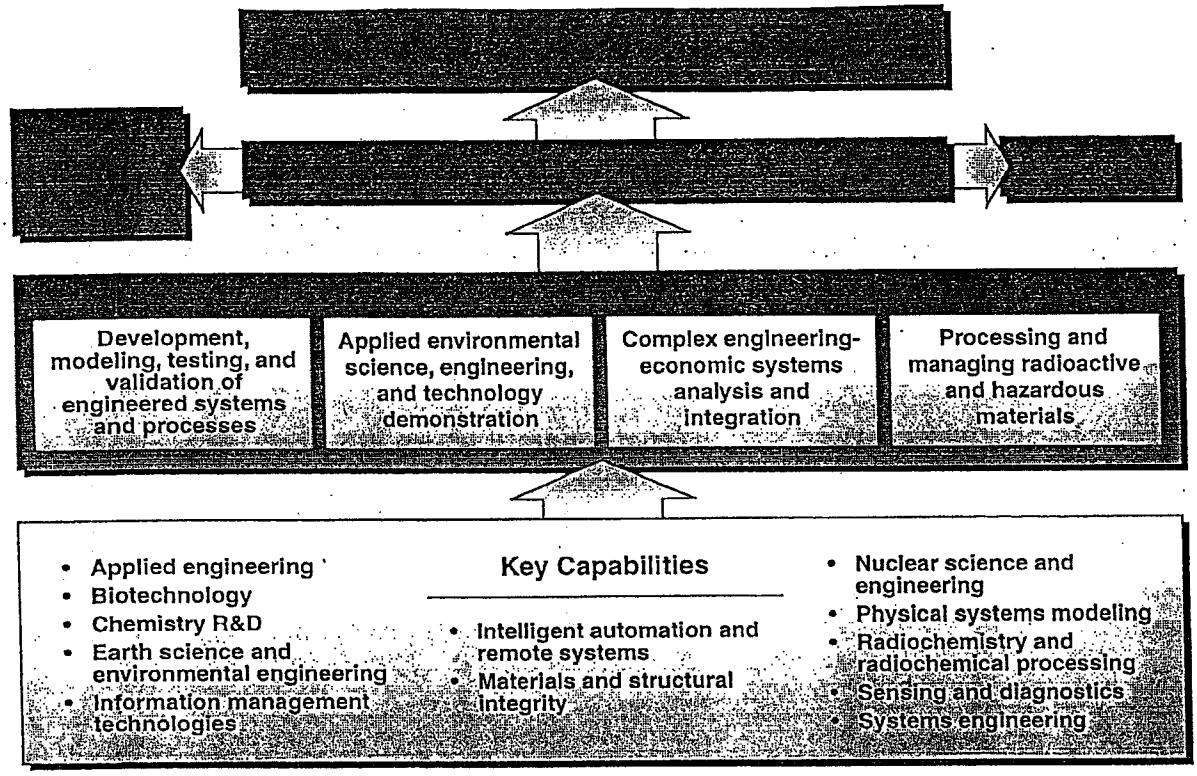
The guiding principles that govern the INEEL's mission and vision are as follows:

1. Environmental, Safety and Health Excellence. All INEEL activities are conducted with environment, safety and health being the first priority. Safe, environmentally compliant operations define operational excellence at the INEEL. Its commitment to excellence is embodied in its full implementation of Integrated Safety Management principles.
2. Research and Development/Operations Integration. The INEEL is committed to leveraging its science and research and development to enhance the success of programmatic operations. The linkage between science, research and development and operations maximizes the laboratory's ability to fulfill its missions. The INEEL will make strategic investments in its science and research and development portfolio to bring innovative solutions to its customers.
3. Commitment to Science and Technology Leveraging. The INEEL is committed to sharing the science and technologies developed at the laboratory with the public, and will partner with the private sector to bring new technologies to the marketplace to benefit the nation.
4. Customer Satisfaction. The INEEL is committed to fully understanding and satisfying the nation's science and technology needs by providing exceptional service to its customers, which include the federal government and multiple nonprofit and commercial partners. The Laboratory is dedicated to continual process improvement to deliver a superior product to the customer.
5. Strategic Partnerships. The INEEL is committed to forming strategic partnerships with other DOE laboratories, other federal agencies, universities, industry, and local, state and regional governmental entities to develop the best science and technology for addressing critical national needs.

Core Competencies

The core competencies of the INEEL define its expertise and are why customers seek this laboratory out for solutions. Its skilled, experienced and motivated workforce translate technical competencies into mission success. Over its 50 year history the INEEL has developed four major core competencies:

1. Development, Modeling, Testing, and Validation of Engineered Systems and Processes., Since its inception, the INEEL has been regarded for its expertise in designing, constructing, operating, and testing complex systems. Many of these were pioneering, first of a kind facilities. They include 52 experimental nuclear reactors, spent nuclear fuel reprocessing facilities, high level liquid waste solidification facilities, a seminal geothermal energy plant, hydropower systems and numerous semi or pilot scale facilities. The INEEL continues to operate the Advanced Test Reactor, develop



This Diagram shows how the INEEL translates its Key Capabilities into support for its customers via four Core Competencies.

and deploy applied environmental technologies, work on nuclear plant life extension, the development of high burn-up fuels, and advanced reactor design.

2. Applied Environmental Science, Engineering, and Technology Demonstration. INEEL has established capabilities in earth and environmental sciences and engineering, environmental characterization and monitoring, analysis, remediation, biotechnology and bioengineering. These capabilities have grown from a long history of managing the treatment, storage and disposal of a range of radioactive and hazardous materials. The designation of the INEEL as a National Environmental Research Park also contributed to development of key skills and capabilities in this area.

3. Complex Engineering-Economic Systems Analysis and Integration. From its long history in design, construction, operation, and decommissioning of large-scale systems, the INEEL has developed the expertise to implement a multidisciplinary approach to solving complex problems. The projects undertaken by the Laboratory have required a broad base of science and engineering to be brought together to move ideas from the basic research and development phase, through pilot scale testing to full scale demonstration. Much of the historical work has been on behalf of industrial sectors looking to commercialize these technologies, which necessitated a broad understanding and integration of market forces and economics into the testing programs.

4. Processing and Managing Radioactive and Hazardous Materials. The INEEL has a long history as a major processor of DOE and Navy spent nuclear fuels, as well as radioactive and hazardous waste treatment storage and disposal. The Lab has developed expertise in processing, handling, using, transporting, storing, and disposing of radioactive materials that include low-level, high-level, transuranic, mixed, and hazardous wastes. Expertise in intelligent automation and remote systems, chemistry and radiochemistry and radiochemical processing are central to this core competency.

Aligned with its core competencies, the INEEL has outstanding key technical capabilities in a wide range of the following disciplines:

- Applied engineering
- Biotechnology
- Chemistry research and development
- Earth science and environmental engineering
- Information management technologies
- Intelligent automation and remote systems
- Materials and structural integrity
- Nuclear science and engineering
- Physical systems modeling
- Radiochemistry and radiochemical processing
- Sensing and diagnostics
- Systems engineering.

Mission Objectivies

The INEEL, with the integral support of its research and development capabilities, will continue to focus on completing the EM cleanup missions, leveraging its science and technology, and developing regionally. It will also aggressively expand its national contributions to the EM and other program customers to significantly develop and grow the Laboratory. As the lead laboratory for DOE NE, INEEL will assist NE in defining and maintaining the nation's nuclear energy options. INEEL's strengths in environmental management are now being blended with our systems integration and energy technology capabilities to focus on environmentally sound energy production, industrial processes, and use for our nation's future.

Technology transfer and commercialization also has an important role at the INEEL. As a derived benefit, technology transfer leverages programmatic funds to accomplish commercialization, facilitate regional economic development, and bring technology advances to the public. In recent years more than four dozen technology licenses have been granted, and more than two dozen new businesses have been spun out of the INEEL.

In order to sharpen its focus, the Laboratory and its programs are aligned around four main mission objectives: providing environmental, energy, nuclear science and technology, and national security solutions. Combined, these objectives complement and are aligned with DOE's mission and vision.

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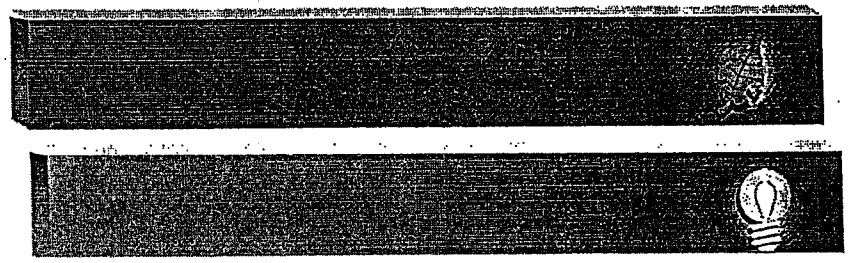
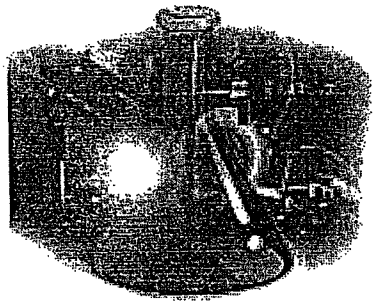


Objective 1—Environmental Solutions

The INEEL Environmental Mission Today

Today, the INEEL's primary DOE customer is the Office of Environmental Management (EM). EM is responsible for ensuring that DOE's environmental problems, which exist due to the Department's historic nuclear weapons and energy research missions, are effectively dealt with. The key thrust of the INEEL's environmental mission today is completion of the clean up activities as laid out in the DOE's Paths To Closure plan, while continuing the development of technologies to allow for cost effective and timely completion of these activities.

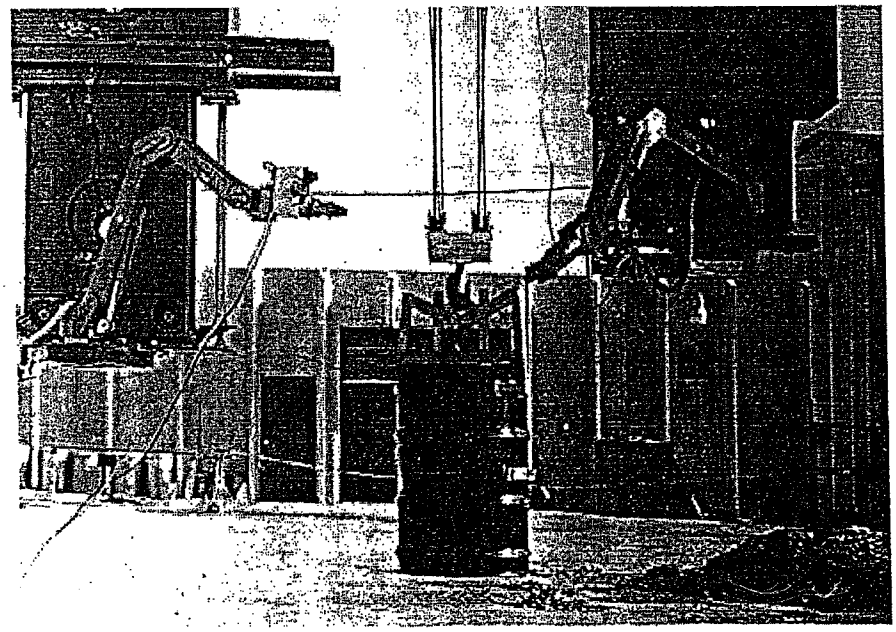


INEEL core competencies, coupled with strategic investments in EM science and technology, are the basis for enduring environmental solutions.

The INEEL's primary operational focus is the effective execution of an environmental clean-up program mandated by several agreements negotiated between the DOE and the Environmental Protection Agency and/or the State of Idaho. These agreements include a 1991 Federal Facilities Agreement and Consent Order, a 1995 Site Treatment Plan under the Federal Facilities Compliance Act, a comprehensive clean up blue print for the Lab known as the Idaho Settlement Agreement, and several consent orders. The INEEL is using its operational expertise, scientific experience, technology development capabilities, and infrastructure to meet these commitments.

For much of its 50 year history the INEEL has effectively managed all of the various waste streams (transuranic, highlevel, low-level, various "mixed" wastes, and spent nuclear fuel) that DOE is now responsible for cleaning up. While not minimizing the scope of environmental contamination, it should be noted that the majority of the Laboratory site is free of environmental contaminants. In fact, in 1974 the Laboratory was designated a National Environmental Research Park where extensive studies can be done on flora, fauna, geology, and hydrology that have been relatively unaffected by human activity.

INEEL is the lead laboratory for DOE's Office of Environmental Management. As the lead laboratory for DOE EM, the INEEL has lead laboratory and program responsibilities for the entire DOE complex, as well as clean-up of the Idaho site. One of the



The INEEL provides innovative solutions and technical support in the area of waste transportation and handling.

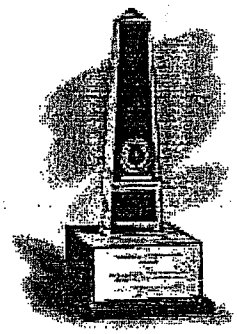
INEEL's most important roles is to provide technical skills to the EM Office of Science and Technology's (OS&T) national programs. The INEEL applies its core competencies and key capabilities to the full spectrum of OS&T programs. This includes leadership of EM's complex-wide integration effort as well as serving as a major science and technology resource for the major problem solving arms (Focus Areas) of OS&T. The INEEL provides "honest broker" and expert technology assistance to the Focus Areas and the EM program. In accomplishing this, the INEEL serves as a conduit to science and technology expertise resident in the system of DOE-supported National Laboratories, the academic community and the private sector. The INEEL participates in the full range of science and technology programs critical to EM, from the provision of science underpinnings of waste and remediation problems to technology deployment. To this end, the Laboratory maintains programs focused on maintaining and growing the critical scientific capabilities EM will need to complete its mission. The INEEL ultimately serves as the verification and validation center for EM's National Science and Technology Program. To do this, INEEL leverages its knowledge of multiple waste streams, its environmental restoration experience, the size and diversity of facilities resident on the INEEL's large, remote land area, and its operational know-how into EM's science and technology development programs. This knowledge, combined with INEEL's multi-program-derived core competencies and capabilities, provides both the fundamental scientific knowledge needed for competent decision making and real-time, full scale technology validation and verification services to meet the technology deployment objectives of the National EM program.

The Lab's history and current challenge in the environmental arena has created both a reservoir of experience managing a wide range of radioactive materials and the science and engineering base needed to advance the technological and management frontiers for effectively treating, storing, and disposing of these materials. A unique strength of the INEEL is its ability to bridge the gap between understanding complex environmental problems and developing and deploying integrated, timely, and cost effective solutions to these problems. These are not new capabilities. For example, the INEEL has been solidifying liquid high-level waste for 35 years.

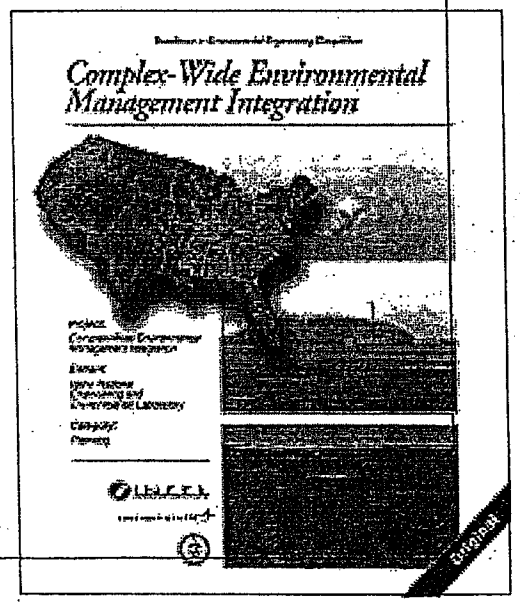
Many of the actions to carry out the mandates of these compliance agreements require either advancing existing technologies or developing new technologies to allow for timely, cost effective, permanent solutions to these problems. Advancement of the management systems for this complex undertaking is also needed. To assist the DOE in completing its environmental clean up mission and address other national and

Expanding our Environmental Management Integration Role

The INEEL will continue to expand its integration role to assist DOE's Office of Environmental Management in meeting its 2006 accelerated cleanup goal. We have led the comprehensive effort to identify cleanup efficiency opportunities and barriers and technology needs throughout the DOE complex. The INEEL will employ its integration expertise to achieve affordable, validated, minimum risk, engineered environmental solutions. We will build on our systems engineering and integration successes by: (1) identifying scientific and technology capabilities from within the DOE complex and facilitating their application to eliminate cleanup barriers throughout the DOE complex, nationally and internationally; (2) developing INEEL science and technologies to eliminate identified cleanup barriers.



The INEEL lead the award winning Complex-Wide EM integration effort that has the potential to save the taxpayer $24 billion.



global environmental needs, the Laboratory is engaged in a wide range of environmental science and technology research. The Laboratory possesses strong capabilities in areas such as materials and structural dynamics and the science associated with identifying and characterizing materials. Other research concentrations include environmental surface chemistry; various earth sciences important to understanding the means by which environmental contaminants move through soils, water, and the atmosphere; and the mathematical and computational modeling of complex environmental phenomena. Today, the INEEL is moving aggressively toward deploying its research and engineering results so that other DOE locations can effectively address their environmental problems. The Lab is also engaged in leveraging and applying these technologies and systems to meet a broad range of other national and private sector problems.

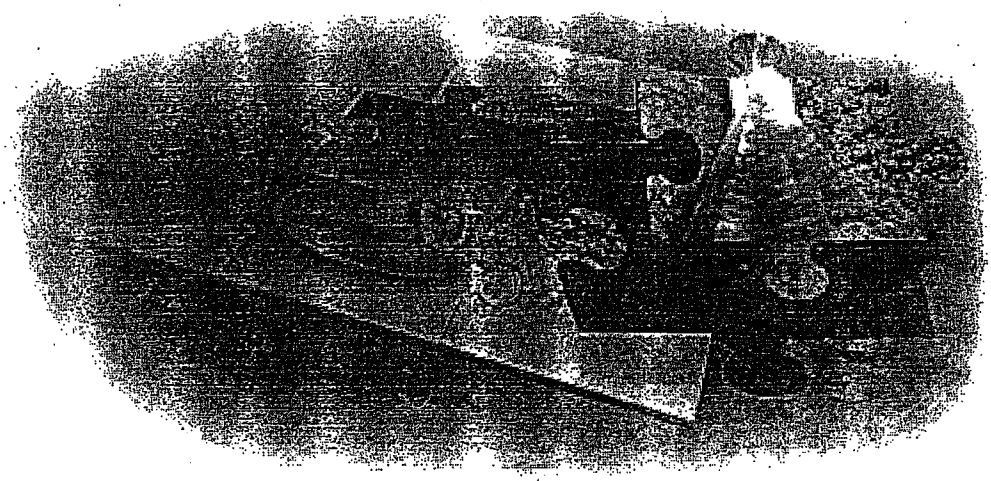
Environmental Path to the Future

The INEEL will be involved in environmental clean up for a number of years—compliance agreement activities will not be completed until the year 2035. In the near term, the Laboratory will continue to focus on developing and deploying new or enhanced environmental technologies for cleaning up the INEEL and other DOE sites across the country. This will include continuation of efforts to better integrate DOE's EM Program.

The Laboratory is evolving from a specific focus on DOE's EM program to a future where it will work on finding solutions to a variety of broad, complex environmental problems. Areas where the INEEL's unique competencies and assets can be applied include studying the effects of environmental factors on the nation's infrastructure, the causes and effects of global warming, and reducing the environmental effects of energy production technologies. One of the key assets of the INEEL is its size. Verification and validation activities can be performed on a range of environmental technologies without adverse risk. In addition, the Laboratory will couple its core competencies with its systems integration expertise to effectively broker local, regional, and national solutions to a range of environmental problems.

The Laboratory will leverage and deploy these technological advancements into a much broader range of applications. A key example is the Defense Surety Program. This effort couples the Lab's systems integration experience with its knowledge and understanding of minimization of waste generation and pollution prevention techniques to reduce the environmental impacts of the maintenance of the nuclear weapons stockpile. Other examples include the non-destructive evaluation of materials and containers; a wide range of robotics applications; biotechnology; engineering of complex systems; large scale treatment of complex matrices of radioactive and hazardous wastes and the safe, effective transportation of hazardous materials; understanding the effects of extreme environmental conditions on a wide range of materials.

The laboratory's future success will depend on forming strategic alliances and partnerships. These partnerships will couple the INEEL's unique skills with those of a partner to secure the best possible solution to environmental problems. These partnerships will include a range of universities, other federal laboratories, and the private sector. Among the key partners are Argonne National Laboratory-West, the University of Idaho, Idaho State University, and the Massachusetts Institute of Technology. The Laboratory also collaborates on the international front to look at identifying and addressing environmental problems throughout the world. A key initiative for the future is working with Russia and other Republics of the former Soviet Union on a broad range of environmental problems resulting from Soviet nuclear weapons and research and development programs. Initial agreements for these collaborations have been drafted and the INEEL will be working with other laboratories and agencies of the government in this effort.



INEEL's uniquely integrated laboratory science and site operations provides environmental solutions that benefit DOE EM and the Nation.

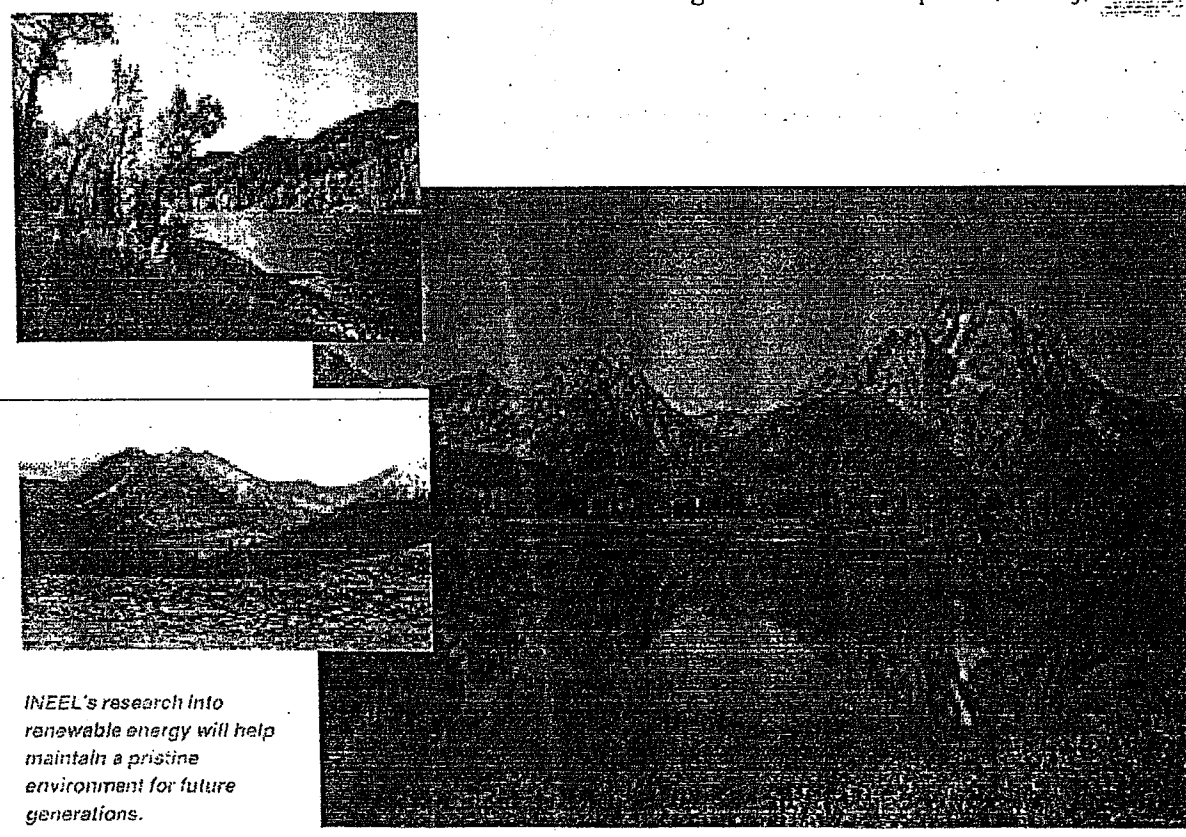
Objective 2—Energy Solutions

INEEL's Energy Mission Today

The INEEL provides vital energy solutions to the nation and the world. From its inception as the nation's first laboratory devoted to civilian nuclear power through its seminal and ongoing work in energy efficient and renewable technologies, the INEEL excels in innovation to meet U.S. energy needs and policies. The INEEL's current research portfolio covers the broad spectrum of national energy needs, but has a major focus in areas at the intersection where energy issues crosscut our strong capabilities in environmental science and technology, and our skill in analyzing and integrating complex systems.

The INEEL is creating solutions for many of today's energy problems. Solutions are developed using the INEEL's core capabilities and its distinguished history in renewable energy technologies. In 1972 the INEEL began, and is still leading, one of the first major alternate energy program undertaken in the U.S. called the Geothermal Energy Program. INEEL also leads the National Hydropower Program. This program resulted in deploying successful low-head, low environmental impact hydropower turbines that still produce power today. The INEEL conducts continuing research in these areas. For example, the Advanced Hydropower Turbine System Program is conducting research on both fish behavior and turbine design to develop fish friendly turbines.

The INEEL's agriculture initiative develops prescription farming techniques which reduce the environmental and energy impacts of agriculture and improve agriculture yields for food production and biomass powered renewable energy systems. The Fossil Fuel Research Programs at the INEEL work with industry and the public sector to develop innovative solutions to problems faced by the domestic petroleum industry including environmental compliance, toxicity, corro-



INEEL's research into renewable energy will help maintain a pristine environment for future generations.

sion, reduced well performance, offensive odors, and high operating costs. The INEEL applies biotechnology to reduce energy usage and the environmental impacts of industrial processes. Examples include remediating hydrocarbon vapors from leaking fuel tanks, reducing the sulfur compounds and heavy hydrocarbon vapors associated with asphalt processing, control of nitrogen oxide compounds, and reducing volatile organics released by wood drying.

The expertise of the INEEL in materials joining, developed out of support for its nuclear reactor and energy research programs, now includes advanced welding technology for metals and alloys and new techniques for ceramic joining and developing functionally gradient materials. The INEEL's joining capabilities are being used by automobile manufacturers, the U.S. Navy, and other commercial partners to improve manufacturing processes and reduce the waste energy and materials that result from joining failures. The INEEL is also DOE's lead laboratory for advanced high-power energy storage testing and evaluation for the Partnership for New Generation Vehicles and the United States Advanced Battery Consortium (PNGV/USABC) hybrid vehicle propulsion programs.

INEEL's Energy Path to the Future

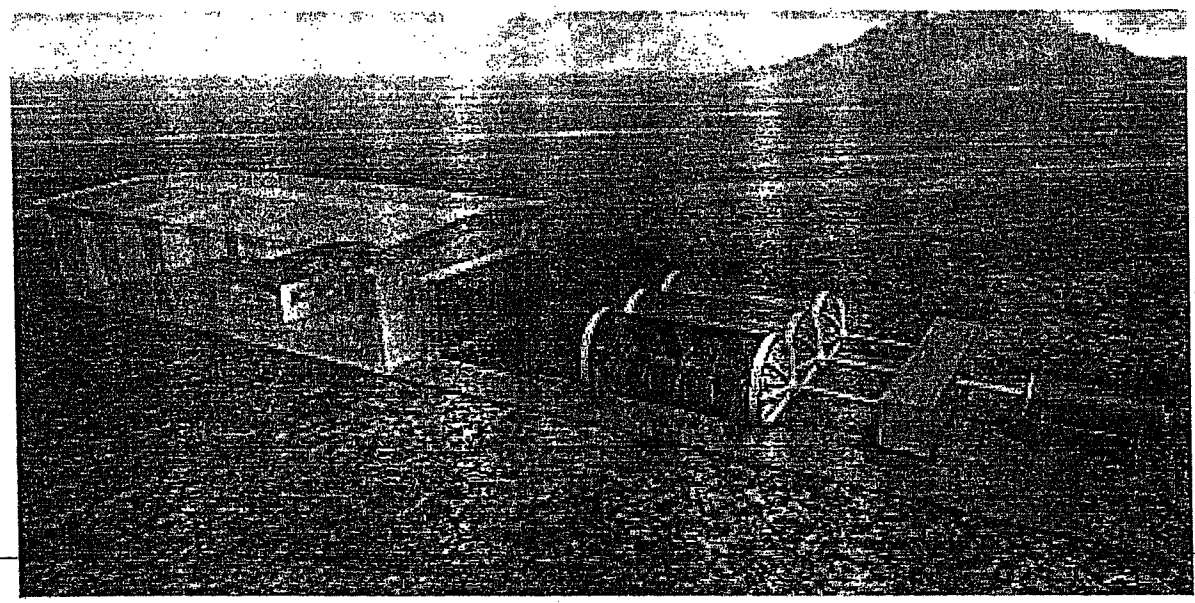
In addition to INEEL's ongoing contribution to various energy disciplines, the INEEL will take on the challenge of looking for ways to combine energy production with improving the environment and sustainability of the ecosystem. Initial studies in many areas are underway. Some of the areas being researched are (a) how to convert currently wasted process energy into useful energy; (b) how to produce completely closed loop systems and large system pollution prevention design; and (c) how to use biological and geological processes to synthesize and clean low carbon energy sources. To do this the INEEL will continue to build on its historic expertise in energy issues while applying the extensive environmental knowledge and systems analysis and engineering expertise gained from its role as the EM Laboratory.

To achieve these goals, the INEEL will continue and enhance its research into the fundamental science that underlies energetic processes. In addition to the research performed within the Laboratory, the INEEL will partner with the best in academia, research institutions, and the private sector to develop the fundamental knowledge necessary for designing revolutionary energy processes and systems. Within the INEEL a center of excellence called the Natural Resources Institute is being established that combines applied science, engineering and environmental expertise developed at the INEEL. Its purpose is to support the planning and scientific research that bridges the gap between science and natural resource and energy policy.

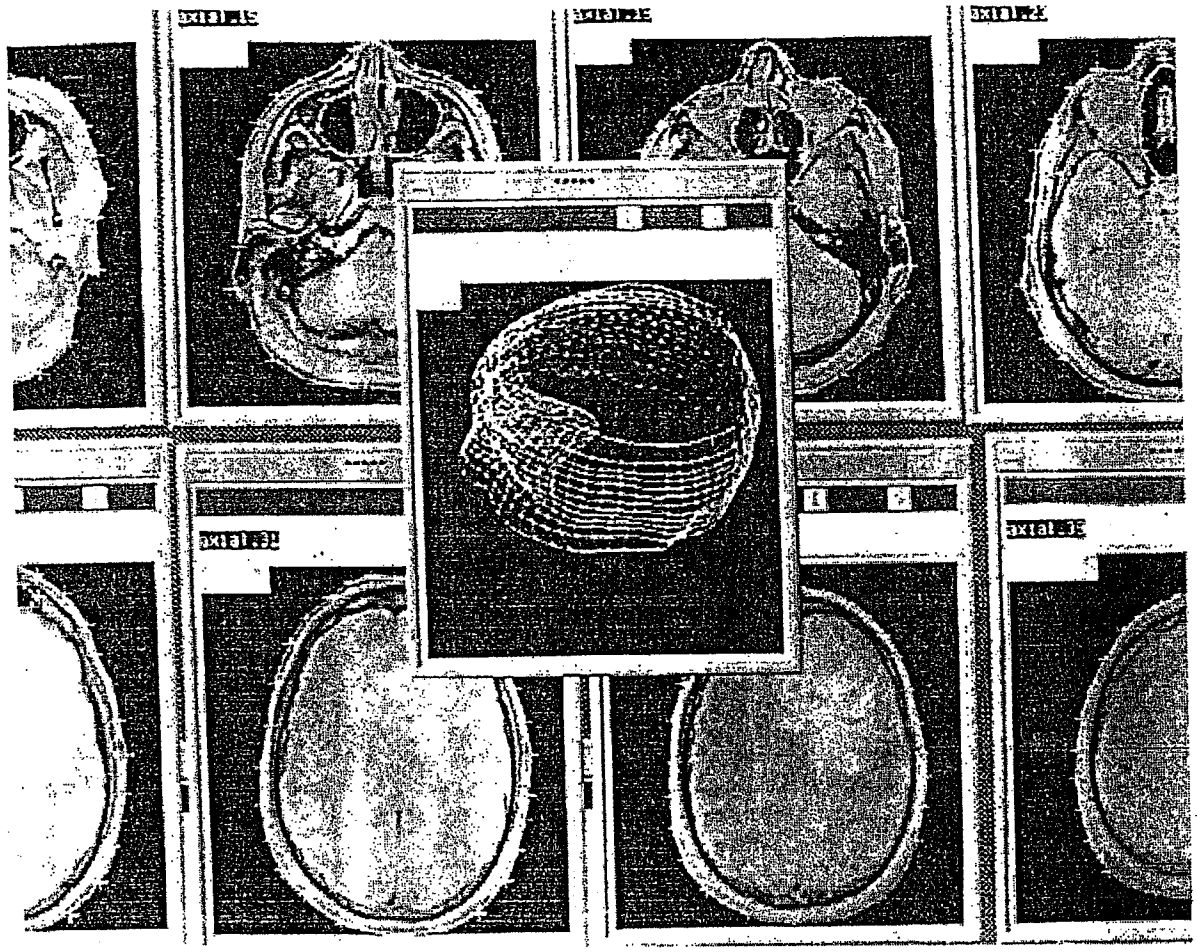
The INEEL is a premier laboratory in systems engineering disciplines and will bring to bear its systems engineering and integration core competence, along with relevant scientific and technical capabilities, on important energy problems. In the future, the INEEL will use its systems capabilities and other key resources to focus on the following national energy challenges:

- **Effects of energy production and use, with an emphasis on subsurface macro and micro systems, their ecologies and interactions.** The INEEL is performing both fundamental and applied science looking at multiple subsurface processes. INEEL's bio-geochemical expertise uniquely positions it to harness subsurface processes for beneficial activities including innovative methods of oil and gas production, exploitation of vast untapped gas hydrate resources, and intrinsic and accelerated bioremediation of contaminated media and ecosystems. In addition to its science base in this area, the INEEL has experience in large-scale field testing, simulation and analysis. The wealth of knowledge regarding the site's hydrology and biogeochemistry make the INEEL an ideal site for calibration, validation, and verification of predictive mathematical models.
- **Increased industrial process efficiency involving more than just pollution minimization from energy consumption.** The INEEL will focus its research on reducing energy costs and environmental emissions associated with industrial processes. This work includes (but is not limited to) developing revolutionary new processes, innovative low-energy separation technologies, and on demand-real time sensors and process controls. In addition to traditional manufacturing industries, potential growth areas include agricultural, mining and forest products.

- Reduction of carbon emissions from fossil fuels. This is accomplished by expanding our research and development activities exploiting high hydrogen to carbon ratio fuels, i.e. methane hydrates exploration, natural gas liquefaction and production, and continuing research in process efficiency. The INEEL has recognized expertise and active research and development programs in areas that are directly related to hydrogen production and use, including materials science, plasma technologies, biotechnology, fossil energy production, and alternative fuel transportation systems. In addition, the INEEL's efforts to understand the origins of methane hydrates are unique in the National Laboratory system. The INEEL is developing better techniques for analyzing seismic data to locate and characterize petroleum, natural gas, and hydrate deposits. It is also working to understand how methane hydrates are assembled naturally in their undersea environment.
- Energy costs and disaster reduction. The INEEL will be the place where many energy efficient technologies are developed; but, no matter where technologies are developed, the INEEL will lead in validating them at full-scale to ensure they meet energy and environmental standards. The INEEL will build on its competencies in full-scale validation of industrial technologies to develop full-scale validation of construction methods and technologies. The energy efficiency and durability of assembled structures, such as houses, can be improved with the dual benefit of reduced emissions, improved quality of life for U.S. citizens, and resistance to natural disaster such as hurricanes, tornadoes, and earthquakes.



The Pilot WindStorm Center tests full-size buildings in hurricane-force winds. The data aquired will enable weather-resistant structures that will reduce the costs of natural disasters.



The INEEL has been designated the center for measurement and development of the Boron Neutron Capture Therapy, a revolutionary cancer treatment technology.

and other areas of science and basic research. The Advanced Test Reactor (ATR) is a world-class test reactor at the INEEL, providing materials irradiation data and testing to the U.S. Naval Reactors program and to scientists and engineers in other government programs, international agencies, and private industry. The ATR is also a critical producer of medical and industrial isotopes such as iridium-192 and cobalt-60. Its isotope processing and marketing was recently commercialized, affording customers a reliable supply while reducing program costs to DOE NE. The INEEL is also a key provider of neutron dosimetry and medical technology, with special strengths in analytical boron chemistry, patient treatment planning software, reactor- and accelerator-based neutron source design, and dosimetry measurements.

INEEL's Nuclear Science and Technology Future

Nuclear energy, and particularly the DOE's role in a nuclear future, faces challenges and opportunities associated with changes in U.S. and world energy markets, environmental concerns about fossil fuels, national security concerns about proliferation of nuclear materials, and public acceptance of spent fuel and nuclear waste programs. The DOE has a broad need to:

- Ensure that a viable nuclear energy option is maintained
- Continue its global influence on international nuclear policy matters
- Maintain technical competencies to ensure the long-term availability of nuclear expertise, capabilities, and vital infrastructure.

As the lead laboratory for DOE NE, the INEEL will proactively assist DOE in defining specific needs and opportunities such as the Nuclear Energy Research Initiative (NERI) and Nuclear Energy Plant Optimization (NEPO) programs, as well as other new programs. This includes the development of strategic, technical, and collaborative thrusts.

The INEEL will participate at strategic levels in planning nuclear programs with DOE, NRC, the nuclear industry (through its Nuclear Energy Institute), and with the broader research community at other national laboratories and universities. Recently the INEEL conceived and facilitated a high-level national forum for the Senate Nuclear Issues Caucus to develop actions that would revitalize and advance the use of nuclear energy. Plans developed by this Forum are being actively implemented by the Congress, DOE, NRC, and the nuclear industry.

The INEEL will continue its technical advancement of many nuclear technologies. This includes advancing neutron therapies, developing world-class services based on the ATR, and development of risk and performance based regulatory technology for the NRC. The INEEL program for neutron capture therapy will follow a well-planned transition from current clinical trials to deploying an established therapy for human cancers. A growing demand for INEEL nuclear safety and regulatory skills and technologies is found in Asia, which is experiencing a major growth in nuclear power. The same is true of Russia and Eastern Europe, where many nations are focused on improving the safety of Soviet-designed nuclear power plants. The INEEL is pursuing lead roles in new DOE nuclear missions, such as developing and testing high performance nuclear fuels, and advanced nondestructive examination and aging management technology for nuclear power plant components and systems. The INEEL is also focused on designing and developing advanced reactor systems that will be economically competitive in the 21st century, and space nuclear power and propulsion systems that will enable greatly expanded and cost-effective exploration and development of outer space.

The INEEL will continue to establish key alliances that will enhance its critical science and research and development programs. The INEEL is partnering with Argonne National Laboratory-West, who has complementary facilities, capabilities, and interests. Together, the team will pursue new missions in nuclear fuel science, development and testing, advanced reactor design and development, and international nuclear safety and environmental security. The INEEL has initiated a strategic nuclear research collaboration with the Massachusetts Institute of Technology for the cooperative development of risk-based regulatory technology, advanced reactor concepts for the next generation of economical nuclear power systems, and advanced low-waste fuel cycle research. The INEEL is also establishing an alliance with Idaho State University to develop and conduct joint research programs at the Idaho Accelerator Center. This includes a new, photoneutron-based source of epithermal neutrons for eventual deployment of neutron therapies for cancer. Finally, the INEEL is teaming with nuclear fuel and nuclear system vendors, universities, and other national laboratories to meet the needs of DOE's Nuclear Energy Research Initiative.

Objective 4—National Security Solutions

INEEL's National Security Program Today

By leveraging its multidisciplinary programs, the INEEL has had a long-standing role in providing solutions to national security challenges. The Laboratory is engaged in a spectrum of activities addressing national security problems, such as increasing the protection and survivability of our armed forces through research and production of high-density armor materials, and working with DOE Defense Programs to ensure a sound approach to the environmental and cost issues associated with maintaining the present-day nuclear weapons stockpile. The INEEL's Demilitarization Programs play a critical role in U.S. and foreign demilitarization programs by developing integrated deployable systems for chemical weapons assessment. The INEEL also assists nonproliferation, counter-terrorism, and law enforcement through research and development of sensors to detect threat devices and contraband, and by transferring technologies to support the intelligence community. In addition, the INEEL maintains a strong role in improving information security encompassing information warfare, command and control, computer and network reliability, and communications and data protection.

INEEL'S National Security Program Future

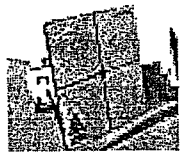
In the future, the INEEL will apply the science, technologies and core competencies developed as part of its environmental and energy missions to the Nation's national security goals. The Laboratory's Specific Manufacturing Capability project will continue to develop new techniques and production methods for high-density armor materials, thereby increasing the protection and survivability of U.S. armed forces. In addition, these processes will be adapted and applied to a number of private sector activities to improve commercial processes. The INEEL will strengthen and expand its DOE Defense Programs work to address issues associated with the nuclear materials production cycle while continuing work to mitigate environmental effects from activities associated with maintaining the present day nuclear weapons stockpile.

The INEEL's Demilitarization Programs will continue to develop innovative chemical weapons assessment systems for the U.S. Army Non-Stockpile Chemical Materiel Program (NSCMP). This work directly supports the United States obligation to identify and destroy more than 31,000 tons of chemical agents by the April, 2007 deadline under the international Chemical Weapons Convention. By applying the Laboratory's system engineering and integration core competencies, the INEEL in collaboration with U. S. Army, will integrate its various NSCMP assessment and destruction technologies to achieve a cost-effective solution for eliminating thousands of existing and newly discovered munitions and related materials. In addition, the INEEL will address alternatives to incinerate chemical warfare agents and apply these alternatives to systems deployable at actual recovery sites.

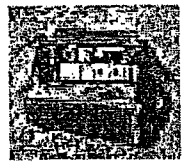
The INEEL will combine its cutting edge demilitarization assessment technologies (isotopic neutron spectroscopy, real-time x-ray, and secondary ion mass spectrometry) with an extensive array of other sensing technologies (including ion mobility spectroscopy, portable Raman spectroscopy, antibody-based sensors, and acoustic sensors) into field-deployable systems to support the Defense Threat Reduction Agency (DTRA). The laboratory's science and technology expertise will assist in countering emerging threats of chemical and biological warfare materials, unexploded conventional munitions, and improvised radioactive material devices.

The INEEL will expand its participation in the arms control and threat reduction research area coordinated by the interagency Non-Proliferation and Arms Control Technical Working Group. DOE's Office of Nonproliferation and National Security's (NN) Office of Research and Development funds INEEL participation in the Idaho Accelerator Center for low power nuclear and optical physics and accelerator application research and development. The INEEL Law Enforcement Programs will increase research and technology development assistance to the law enforcement communities under the sponsorship of the National Institute of Justice, Office of National Drug

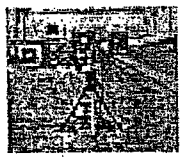
Mobile Munitions Assessment System



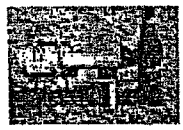
Communications



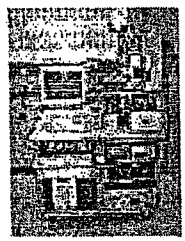
Air Monitor



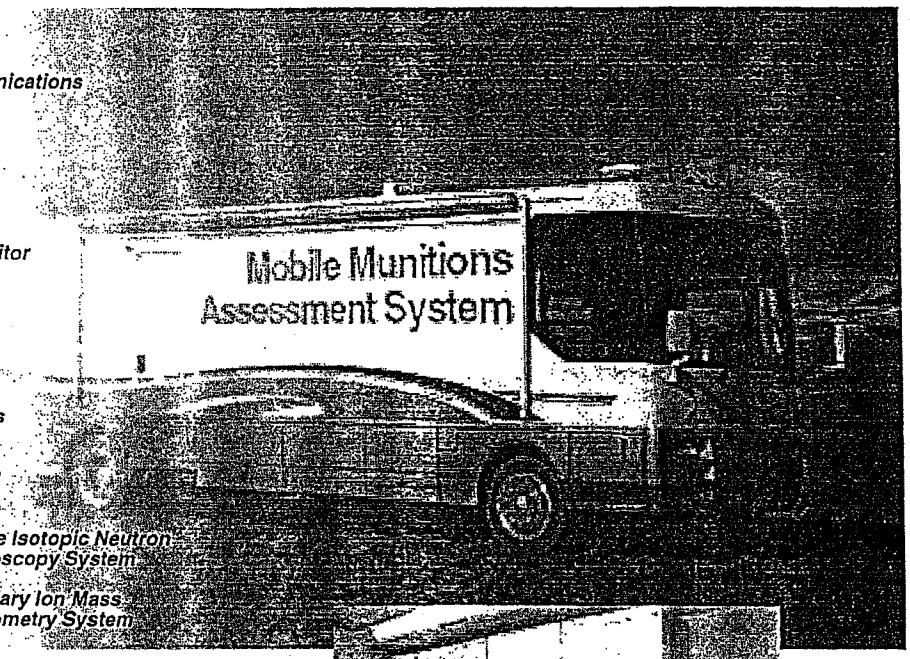
Records



Portable Isotopic Neutron Spectroscopy System

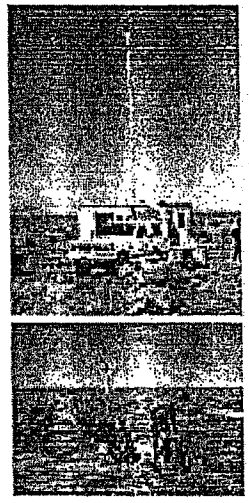


Secondary Ion Mass Spectrometry System

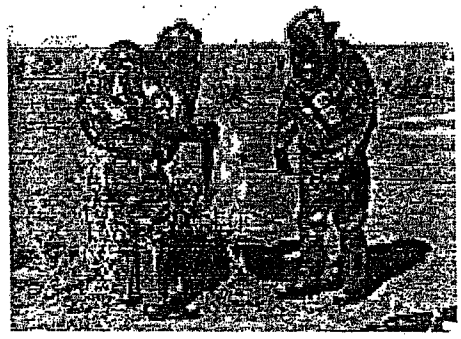


Data Acquisition

Real-Time X-ray



Weather



OSHA Level A Responder Suits

The INEEL supports the defense community through its Specific Manufacturing Capability, used to make M-1 Abrams tank armor

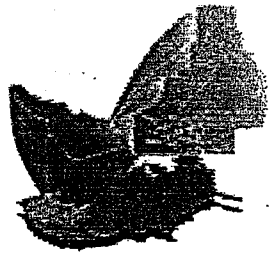
Control Policy, U.S. Customs, and Federal Bureau of Investigation by developing new sensor and data communication technologies. These technologies will detect unauthorized movement of radiological materials, explosives, armaments, concealed weapons, narcotics, and other contraband wherever such movement may constitute a threat. The INEEL will continue to expand its assistance to the interagency counter-terrorism communities, including the Special Operations Command, with new integrated sensor systems and special technologies required to counter emerging national security threats. The intelligence community will continue to rely on INEEL's skills to develop and demonstrate new, innovative concepts and technology prototypes. Many of these new concepts and technologies will leverage INEEL successes with unattended terrestrial sensors and Internet-based communication systems.

The INEEL will continue to work internationally to reduce the threat of proliferation of all weapons of mass destruction. The Lab's growing participation with DOE-NN's Office of Arms Control and Nonproliferation through the Initiatives for Proliferation Prevention program will continue collaboration with the newly independent states of the former Soviet Union to play a vital role in assuring that Russian scientists are no longer employed in developing nuclear weapons.

The Lab will exploit its information security heritage that encompasses information warfare, command and control, computer and network reliability, and communications and data protection. The INEEL will build on its strong information science and technology program base with the Air Force Information Warfare Center. This heritage also positions the INEEL for participation in the President's Critical Infrastructure Protection (CIP) Initiative. For example, protecting the nation's electric power and water distribution systems from cyber intruders is a major thrust of the CIP. Key research and development agencies participating in this initiative include the FBI's National Infrastructure Protection Center, DOE's Critical Infrastructure Assurance Office, and the Department of Commerce's Critical Infrastructure Assurance Office.

The breadth of INEEL's technical and programmatic capabilities assure that we will maintain a critical role in DOE's mission to provide innovative solutions to National security concerns.

Positioning for the Twenty-First Century



Treatment, Storage & Disposal

Treatment, Storage and Disposal

Waste management activities are centered on managing waste from previous, current and future operations to avoid further contamination that may impact human health, safety, or the environment. Each of the INEEL's major waste streams is managed with aggressive waste minimization, treatment, storage and disposal practices. The major types of waste and materials at the INEEL include industrial/commercial, hazardous, mixed, low-level, high-level, and transuranic wastes, and spent nuclear fuel.

Treatment

Treatment of liquid low-level and high-level waste streams takes place at the Idaho Nuclear Technology and Engineering Center. Liquid high-level waste was turned into solid calcine at the New Waste Calcining Facility located at the Idaho Nuclear Technology and Engineering Center. Sodium-bearing waste is currently being calcined.

Another important treatment facility is the Waste Experimental Reduction Facility, located within the Power Burst Facility area. It is the only site in the DOE complex that currently accepts off-site mixed low-level waste for treatment. In the future, transuranic wastes may be treated at the Advanced Mixed Waste Treatment Project Facility pending a record of decision on the upcoming environmental impact statement. The proposed location of the facility is the Radioactive Waste Management Complex.

Storage

The Radioactive Waste Management Complex is the main storage area for transuranic waste. Stored transuranic wastes will be sent to the Waste Isolation Pilot Plant near Carlsbad, New Mexico, for final disposal. Mixed low-level waste is stored at permitted facilities across the INEEL. Low-level waste is stored primarily at the Waste Experimental Reduction Facility and the Idaho Nuclear Technology and Engineering Center (formerly the Idaho Chemical Processing Plant). The Idaho Nuclear Technology and Engineering Center is the primary management and storage location for liquid and solid high-level wastes and spent nuclear fuel. Spent nuclear fuel and vitrified high-level waste will be sent out of the state to a geologic repository or monitored retrievable storage location.

Disposal

Waste is disposed of at only two locations at the INEEL. Non-hazardous industrial/commercial waste is disposed of at the Central Facilities Area landfills and low-level radioactive waste at the Subsurface Disposal Area at the Radioactive Waste Management Complex. Combustible mixed low-level wastes are treated at the Waste Experimental Reduction Facility. The

In the News

News Releases

Plan spells out INEEL's strategic direction -- February 10, 2000

INEEL Opens Office In Jackson, Wyo. -- December 6, 1999

DOE Selects Foster Wheeler Team for Dry Fuel Storage -- November 11, 1999

Previous Press Releases

Publications

On the Road to the WIPP --

Contact Us

process results in very small quantities of ash. This residue is characterized and stabilized as required before disposal at the Radioactive Waste Management Complex or transport to commercial disposal facilities.

EM Home | Trtmnt, Strg & Dspsl | Env. Assess. | Env. Research | Contacts

Treatment, Storage & Disposal Low-Level Waste

Low-Level Waste

Low-level waste is radioactive material that is not classified as high-level waste, transuranic waste, spent nuclear fuel or natural uranium and thorium byproduct material. Low-level waste that contains hazardous substances is categorized as mixed low-level waste and managed differently. Most nuclear activities generate low-level waste at some point. These activities include weapons production, spent fuel reprocessing, facility deactivation, and treatment and handling of transuranic waste and mixed low-level waste. Much of the low-level waste at the INEEL consists of contaminated rugs, wood, tools, soils and personal protective equipment.

The INEEL has 4,700 cubic meters of low-level waste in inventory and is projected to generate about 115,000 cubic meters of additional low-level waste in the next 35 years. New waste will come from decontamination and dismantlement of various facilities at the INEEL, treating and characterizing other waste streams and ongoing processes.

The INEEL disposes of its low-level waste in the active pit at the Radioactive Waste Management Complex Subsurface Disposal Area. Prior to disposal, some low-level waste is incinerated, sized or compacted at the Waste Experimental Reduction Facility, reducing the overall volume and improving safety in handling.

A major improvement to the low-level waste program in 1998 was the introduction of soft-sided containers for disposal of contaminated soil and debris. Soft-sided containers are large, cube-shaped bags made of three layers of woven polypropylene with integrated nylon lifting straps. As safe to handle as the steel and wood containers they replace, the soft-sided containers are easier to load, hold more than four times as much waste and allow more efficient use of space within the disposal pit. Compared to steel and wood containers, they save approximately $14 and $19 per cubic foot, respectively.

1998 Accomplishments

- Disposed of 3,264 cubic meters of low-level waste at the Radioactive Waste Management Complex
- Treated 3,690 cubic meters of low-level waste at the

In the News

Related Links

INEEL Reusable Property, Recyclable Material, and Waste Acceptance Criteria (RRWAC)

News Releases

Waste Experimental Reduction Facility begins 100th campaign -- May 13, 1999

Previous Press Releases

Publications

Proposed Plans/Record of Decision

Low-Level Waste Record of Decision

Virtual Tour of Low-Level Waste Facilities

Contact Us

Waste Experimental Reduction Facility

1999 Goals

- Dispose of 6,500 cubic meters of low-level waste at the Radioactive Waste Management Complex
- Treat 5,200 cubic meters of low-level waste at the Waste Experimental Reduction Facility
- Reduce the backlog of contact-handled low-level waste awaiting disposal in the active pit to less than 2,000 cubic meters

EM Home | Trtmnt, Strg & Dspsl | Env. Assess. | Env. Research | Contacts

Treatment, Storage & Disposal | Mixed Low-Level Waste

Mixed Low-Level Waste

Mixed low-level waste contains both radioactive waste subject to the Atomic Energy Act and hazardous waste subject to the Resource Conservation and Recovery Act. Mixed low-level waste can contain a broad spectrum of radionuclides, depending upon its source. Hazardous constituents may include metals, organic solvents, cyanides, explosive compounds and acids and caustics. Like low-level waste, mixed low-level waste is generated through a broad array of processes and activities. Mixed low-level waste is managed separately from ordinary low-level waste because of its hazardous content. In contrast, high-level waste and transuranic waste, which often contain hazardous components, are managed primarily for their radioactive components rather than their hazardous components.

The INEEL has 1,174 cubic meters of mixed low-level waste in inventory, most of it resulting from activities other than weapons production.

The INEEL serves as a regional treatment center for DOE mixed low-level waste. The INEEL's Waste Experimental Reduction Facility is currently the DOE's only incinerator licensed to treat solid mixed low-level waste generated at other DOE facilities. The state of Idaho has approved this facility to treat more than 840 cubic meters of incinerable mixed low-level waste currently stored throughout the DOE complex and an estimated 1,600 cubic meters expected to be generated in the next five years. The Waste Experimental Reduction Facility is not approved to treat some of the INEEL's mixed low-level waste. The INEEL plans to ship this waste to treatment facilities outside the state of Idaho when these facilities are approved.

The INEEL plans to fully treat incinerated waste through ash stabilization or macroencapsulation. Several new and proposed regulations may delay start-up of the INEEL's mixed low-level waste treatment units for approximately one year. In 1999, the EPA plans to publish its "Maximum Achievable Control Technology" regulation. The proposed regulation has an aggressive compliance schedule that may negatively affect the Waste Experimental Reduction Facility's ability to meet the 1995 Site Treatment Plan commitments.

1998 Accomplishments

- Completed a high-temperature trial burn at the Waste Experimental Reduction Facility under the Resource Conservation and Recovery Act
- Incinerated 126.5 cubic meters of the INEEL's mixed low-level waste and 79 cubic meters of mixed low-level waste from other DOE facilities
- Dismantled 10.88 cubic meters of lead casks

In the News

Related Links

INEEL Site Treatment Plan

Idaho Generator Report

News Releases

Waste Experimental Reduction Facility begins 100th campaign -- May 13, 1999

Previous Press Releases

Publications

Proposed Plans/Record of Decision

Mixed Low-Level Waste Record of Decision

Virtual Tour of Mixed Low-Level Waste Facilities

Contact Us

- Disposed of 12.7 cubic meters of fly ash

1999 Goals

- Reduce the incinerable mixed low-level waste backlog by 25 percent
- Dismantle seven lead casks to complete 75 percent of the lead cask backlog
- Treat and dispose of 50,000 pounds of lead classified as mixed low-level waste
- Complete 10 incineration campaigns at the Waste Experimental Reduction Facility
- Obtain permits needed to begin ash stabilization and waste macroencapsulation at the Waste Experimental Reduction Facility

EM Home | Trtmnt, Strg & Dspsl | Env. Assess. | Env. Research | Contacts

Contacts

To request specific documents; request a speaker or briefing on a particular topic; inquire about public meetings or public comment periods; schedule a tour of INEEL; or request other information, call the INEEL toll-free number at **(800) 708-2680.**

Stacey Francis
Waste Management
Community Relations
208-526-0075
syf@inel.gov

Erik Simpson
Environmental Restoration
Community Relations
208-526-4700
eas@inel.gov

The INEEL Administrative Record is available to the public at the following locations:

INEEL Technical Library
DOE Public Reading Room
1776 Science Center Drive
Idaho Falls, ID 83415
208-526-1185

Albertsons Library
Boise State University
1910 University Drive
Boise, ID 83725
208-385-1621

University of Idaho Library
University of Idaho Campus
434 2nd Street
Moscow, ID 83843
208-885-6344

INEEL Community Relations Offices

The INEEL Community Relations Office is located in Idaho Falls and can provide information and briefings on environmental topics.

Environmental
Management Program
P.O. Box 1625
Idaho Falls, ID 83415-3911

There is also an INEEL Regional Office in Boise that can provide information and other resources. The office is located at

805 West Idaho Street,
Suite 301
Boise, Idaho 83703
(208) 334-9572

Who We Are

INTRODUCTION

Note: For additional information about the National Low-Level Waste Management Program, Please contact:

Sandra Birk
Lockheed Martin Idaho Technologies Company
Phone: (208) 526-1866
Email: BIR@inel.gov

The National Low-Level Waste Management Program (NLLWMP) at the Idaho National Engineering and Environmental Laboratory (INEEL) assists the U.S. Department of Energy (DOE) in fulfilling its responsibilities under the Low-Level Radioactive Waste Policy Amendments Act of 1985 (the Act). The NLLWMP assists the DOE by providing technical assistance to states and compact regions as they develop new commercial low-level radioactive waste (LLW) management systems.

The objective of the NLLWMP is to provide technical expertise, information, and other resources to states and compact regions in support of the development of their LLW management facilities. The NLLWMP maintains contact with state and compact region officials to identify and provide general and specific assistance. Principal areas of activity include providing workshops, fulfilling state-specific requests, developing technical documents, distributing general information on LLW and providing information management, providing technical coordination of organizations, LLW management projects, and supplying other assistance.

PRODUCTS AND SERVICES

WORKSHOPS

The NLLWMP conducts many workshops across the country each year. The workshops can be custom designed to meet customer and audience needs. We can provide workshops from our established offerings or develop workshops to address new topics of interest. Our Program also has the unique capability of assembling speakers for special meetings, such as LLW generator annual meetings and meetings of professionals with varying backgrounds. Below is a list of the workshops the Program staff has developed and conducted throughout the years.

Biomedical Mixed LLW This workshop provides information about mixed waste treatment

technologies to low-level biomedical mixed waste generators. It discusses which mixed waste streams can be minimized and with what technologies, and examines treatment variances and delisting petitions. Packaging, transportation, and permitting are addressed along with updates to mixed waste legislation.

Conflict Resolution/Negotiations This workshop provides state and compact region officials with intensive training in efficiently addressing and resolving situations that may arise regarding siting of LLW management facilities.

Contracts Management The purpose of this workshop is to provide a basic understanding of the contracting process, including a comprehensive approach to meet the cost, schedule, quality, and administrative requirements of the contract.

Fundamentals of Radiation and LLW Management This 6- to 8-hour workshop is intended for citizens advisory groups, public service groups, or staff with little technical background in LLW management. Subjects include atomic structure, types and sources of radiation, health effects of radiation, the basis of radiation regulations, an overview and history of LLW disposal, and LLW classification (10 CFR 61).

Low-Level Radioactive Waste Minimization This workshop assists LLW generators with ideas on how to reduce volumes and minimize production of LLW at their facilities. LLW generated in academic facilities, research laboratories, medical fields, and industrial areas is specifically addressed. Some topics covered include nonradioactive alternatives, decay-in-storage, segregation, and technologies used to minimize LLW.

Low-Level Radioactive Waste Storage This workshop provides information to generators regarding temporary storage. Some topics covered include licensing and regulatory issues, waste treatment methods for LLW prior to storage, and storage experience from areas such as Michigan and Canada.

Low-Level Radioactive Waste Transportation This workshop is designed for state and compact region personnel who may be involved with the transportation of LLW. Some topics included in the discussions are packaging requirements in 49 CFR 173 and 10 CFR 71; contamination and radiation levels for shipment; marking, labeling, and placarding; shipping manifests; and emergency response.

Media Relations Training This workshop provides comprehensive training to those in the states and compact regions who will be working with the public and the media. Background information is provided to help individuals better prepare for interacting with television, radio, and news reporters.

Mixed Waste This workshop provides NRC and Resource Conservation and Recovery Act (RCRA) regulations and guidance, mixed waste minimization and treatment technologies, storage requirements, permit and variance approaches, and related management techniques. The main emphasis of the workshop is to better understand how to work with the regulations governing mixed waste.

Performance Assessment This workshop provides training and instruction to state and compact region personnel on all parameters involved in completing performance assessments. Participants will learn about geology, hydrology, atmospheric and groundwater transport, dose assessment, and sensitivity/uncertainty analysis. Specific workshops may focus on particular performance assessment codes. These hands-on workshops explore the limitations and capabilities of various computer codes used for radiological performance assessments.

Project Management This workshop provides training in basic project management skills. Topics include program assessment, contracts management, developing project management plans, problem solving, developing budgets and schedules, and lessons learned.

Providing Testimony This workshop provides guidance on how to give testimony in formal hearings or court cases, including what protocol to observe, how to make your point, and limiting answers to the questions. This hands-on workshop provides experience in a mock hearing or court case. Information on depositions, attorney/client privilege, and establishing a record are also discussed.

Public Meeting Skills Training This workshop provides skills to state and compact region personnel on how to conduct effective public meetings.

Quality Assurance/Auditing This workshop provides states with background information on quality assurance (QA) and insight about QA requirements for licensing a LLW management facility. It also helps prepare state officials to conduct audits of LLW site characterization and the design, construction, and operation of LLW management facilities.

Regulatory Issues This workshop provides state and compact region personnel and LLW generators with information regarding pertinent regulations governing storage, treatment, transportation, and disposal of LLW.

Risk This workshop presents aspects of risk assessment, management, and communication. The assessment portion defines risk, discusses bias in risk assessment, and risk as a positive and negative force. The management section involves the use of risk-based decision making techniques and how they enhance public trust and communication. The risk communication segment addresses public perception, trust and credibility, and approaches to risk communication.

Socioeconomic Impact Assessment The purpose of this workshop is to provide a basic understanding of socioeconomic impacts and the issues involved when conducting a socioeconomic impact assessment as part of an environmental impact assessment.

Speaker's Bureau Training This workshop trains officials to organize a speaker's bureau, to present information with a speaker's bureau, and to address difficult issues and questions.

Team Building This workshop is designed for state agencies or groups of employees working together to achieve a common goal. This interactive workshop provides an opportunity for groups to develop effective teamwork skills to accomplish their common goals.

Total Quality Management This workshop provides an overview of Total Quality Management (TQM) principles, starting with a discussion of what TQM is and is not. Contributors to the quality movement, trends, and concepts are discussed along with the elements of a quality program. Training in the tools used and the process for implementing TQM completes the workshop.

Volunteer Approach to Siting The purpose of this workshop is to provide information to states and compact regions about the volunteer approach and how this approach can be used to site a LLW facility in a willing community.

LLW INFORMATION PRODUCTS

LLW information products include brochures, technical documents and bulletins, technical modules, conferences and conference proceedings, and information management systems.

Brochures

Examples of the more popular brochures published by the National Low-Level Waste Management

Program are as follows:

Low-Level Radioactive Waste Management Perspectives This brochure provides basic information for public use. It addresses numerous topics and issues pertinent to LLW disposal, such as definitions of terms, radiation basics, United States LLW policy, state and compact responsibilities, disposal technologies, disposal facility siting and licensing, and waste packaging and transportation.

Answers to the Most Frequently Asked Questions about Low-Level Radioactive Waste Disposal in the United States The DOE receives many letters from citizens requesting information and expressing concern about LLW disposal. Many of these letters come from citizens who live near areas that have been identified by state agencies as possible locations for LLW disposal facilities. This pamphlet is a compilation of the most frequently asked questions, and responses to those questions.

Concepts for the Disposal of LLW This brochure describes various methods and engineering designs for LLW disposal.

Low-Level Radioactive Waste: A Legislator's Guide This booklet summarizes the Low-Level Radioactive Waste Policy Act of 1980, its 1985 amendments, and state actions needed to meet statutory requirements. It also addresses basic information on LLW properties and disposal methods, interstate compacts, disposal facility siting, LLW transportation, and public participation in disposal facility siting and licensing processes.

Technical Documents

The National Low-Level Waste Management Program has prepared technical documents that cover a broad range of topics pertinent to low-level radioactive waste management. Examples of these topics include low-level waste management options and strategies, waste acceptance criteria comparisons, disposal facility economics, disposal facility operations, waste characterization, waste disposal data, mixed waste issues, performance assessment, site characterization, site selection methods, waste storage and transportation, waste treatment technologies, and national status summaries. A partial list of sample technical document titles is as follows:

Matrix and Cross-References for Current, Former, and Proposed/Suggested LLW Acceptance Criteria, Revision 6, January 1996

Economics of a Small-Volume Low-Level Radioactive Waste Disposal Facility, DOE/LLW-170

Directions in Low-Level Radioactive Waste Management: A Brief History of Commercial LLW Disposal, DOE/LLW-103, Rev.1

Training Curriculum for Low-Level Radioactive Waste Disposal Facility Operations, DOE/LLW-220

1995 State-by-State Assessment of Low-Level Radioactive Wastes Received at Commercial Disposal Sites, DOE/LLW-237

GTCC LLW Characterization: Estimated Volumes, Radionuclide Activities, and Other Characteristics, DOE/LLW-114, Rev. 1

Manifest Information Management System (MIMS), DOE/LLW-84

National Institutes of Health: Mixed Waste Minimization and Treatment, DOE/LLW-218

Mixed Waste Management Options: 1995 Update, DOE/LLW-219

Introduction to Radiological Performance Assessment, DOE/LLW-187

Site Characterization Handbook for Low-Level Radioactive Waste Disposal Facilities, DOE/LLW-67T, Rev. 1

Comparative Approaches to Siting Low-Level Radioactive Waste Management Facilities, DOE/LLW-199

Annotated List of Regulations and Guidance Applicable to Temporary Storage of Commercial Low-Level Radioactive Waste, DOE/LLW-146

Commercial LLW Transportation Liability and Radiological Risk, DOE/LLW-153

Treatment Methods and Waste Forms for Long-Term Storage and Ultimate Disposal of Radioactive Biological Materials, DOE/LLW-151

Selected Radionuclides Important to Low-Level Radioactive Waste Management, DOE/LLW-238

Annual Reports to Congress

Annual Rebate Expenditure Report

Compact region and state officials can request available documents and publications from the Program's document center at (208)526-6927. Documents are available to others through the Office of Scientific and Technical Information (OSTI) at the following address:

Office of Scientific and Technical Information
U.S. Department of Energy
P.O. Box 62
Oak Ridge, TN 37831
ATTN: Information Services

Phone: 423-576-8401
Fax: 423-576-2865
E-mail: usertalk@adonis.osti.gov

You can access the Internet for more information about OSTI at the URL address http://apollo.osti.gov/html/osti/ostipg.html

Bulletins

The purpose of the Technical Bulletins is to give state and compact region officials and other interested parties information related to LLW. The following technical bulletins are currently available:

- *Managing Commercial LLW Beyond 1992: Issues and Potential Problems of Temporary Storage*, EGG-LLW-8843, 91-1
- *Managing Commercial LLW Beyond 1992: Transportation Planning for a LLW Disposal Facility*, EGG-LLW-10135, 92-1

- *Commercial LLW Transportation Safety History*, EGG-LLW-10135, 92-2
- *Impact of Revised 10 CFR 20 on Existing Performance Assessment Computer Codes Used for LLW Disposal Facilities*, EGG-LLW-10135, 92-3
- *LLW Disposal Technologies Used Outside the United States*, EGG-LLW-11026, 94-1

Technical Modules

The technical module activities fulfill information needs that have potential generic applicability to all states and compact regions that are developing LLW management systems. Examples of recent technical modules are:

3R-STAT Computer Code Topical Report Review This code and topical report provide a more accurate tool for estimation of the iodine-129 and technetium-99 source term that is required for the license submittal for a LLW disposal facility.

Comparative Approaches Reports have been prepared to document comparative approaches taken by states and compacts to accomplish specific tasks involved in the development of a LLW management facility.

Tribal Leaders Guide to LLW This guide provides information to tribal leaders interested in LLW management and its potential impacts on American Indian tribes.

LLW Verification System The NLLWMP and a private sector partner have cooperatively developed a mobile LLW verification system that will provide state regulators a tool for verifying the contents of waste shipments received from waste generators. The cooperative development includes using instrumentation technologies developed at the INEEL along with equipment and data supplied by the private sector partner.

Fissure Evaluation, Trench Surveillance, and Geologic Analogs Three efforts are underway with the University of Texas through the Texas LLW Disposal Authority for technical studies related to the development of a LLW disposal facility in arid soils, such as in Texas. These studies, funded jointly by the Program and the Texas LLW Disposal Authority, address fissure evaluations, trench surveillance system development, and geologic analogs.

DOE Low-Level Radioactive Waste Management Conference

The DOE LLW Management Conference, cosponsored by the University of Idaho, provides a forum for interested parties in which activities, concerns, and issues on LLW management can be identified and discussed. These annual conferences, once held annually, are now convened about every two years. The conference normally covers three days, with concurrent sessions each day. The focus of the conference is on presenting and discussing current issues facing development of a national LLW management system.

Conference proceedings are published on computer diskettes by the NLLWMP and are available through the Internet and are accessible via the National Program's home page. Information on the next planned conference is also accessible via the home page.

If you have other questions about the conference, please contact Sandra Birk, Project Manager, at (208)526-1866 (e-mail bir@inel.gov) or Donna Lake, Administrator, at (208)526-0234 (e-mail lrd@inel.gov).

LLW Information Management Systems

- The ***Manifest Information Management System (MIMS)*** provides a "one-stop" location for detailed low-level radioactive waste disposal data. MIMS data have been used to support a variety of projects, ranging from research being performed by college students to Federal agencies making policy decisions. MIMS data are used to validate fee collection at the state level and to evaluate potential markets for new waste treatment technologies. MIMS also provides waste stream data to support performance assessment work, general disposal volume/activity, and isotopic content data. Information from MIMS can be summarized at various levels, from national totals to individual generator codes.

- The ***Low-Track System*** is a computerized low-level radioactive waste inventory management system developed by the NLLWMP at the request of state representatives. States and compact regions requested a system that could assist them with LLW management and tracking, and specifically for generating shipping manifests. Low-Track is a Windows-based system designed to run on a variety of personal computers (including laptops). It supports LLW inventory management by waste stream to the package level, shipping manifest generation (including the new uniform manifest), interface options with other inventory management systems, waste package consolidation with history, data transfer through electronic media, and inventory management using two-dimensional bar code technology.

- The ***Document Information System*** is a PC-based system that provides access, including search capability, to information on over one thousand documents (reports, newsletters, fact sheets, etc.) on low-level radioactive waste management. These reports include not only those generated by the Program, but also those prepared by other organizations, such as the Nuclear Regulatory Commission, states, and LLW compact agencies. In addition to search capability, the system provides numerous pre-formatted lists of documents on topics of possible interest. The system is contained on two 3-1/2-inch diskettes, one for software and the other for data files. An abbreviated version is also available via the Program's home page on the internet.

STATE AND COMPACT REGION SUPPORT

Host State Technical Coordinating Committee

The Host State Technical Coordinating Committee (TCC) evaluates technical issues related to managing LLW and developing new LLW management facilities. The TCC is made up of technical representatives from states designated to host LLW management facilities. A Program representative serves as chairperson of TCC meetings.

The objectives of the TCC are: (1) to coordinate and promote the exchange of information among states actively working toward developing LLW management facilities, (2) to address technical issues and management strategies of mutual interest to states developing LLW management facilities, and (3) to focus and suggest priorities on LLW research and development activities.

State-Specific Assistance

The National Low-Level Waste Management Program provides focused support for projects requested to address an identified state or compact need. State-specific assistance provides information and services that may not otherwise be available to states. Recent examples include:

- **Performance Assessment Task, Pennsylvania**The Program received a request from Pennsylvania to evaluate potential doses at a hypothetical LLW disposal facility located in the eastern U.S. and to determine the relative importance of engineered barriers in keeping the

contaminants from the facility from reaching the public.

- **Development of 3-D Model of a LLW Management Facility, Massachusetts**The Program received a request from Massachusetts to develop a 3-D model of a LLW management facility. The model depicts a facility that will allow retrieval of waste packages in intact containers.

- **Assistance to the Texas Low-Level Radioactive Waste Disposal Authority, Texas**The NLLWMP is providing facilitation, conflict resolution, negotiation, and mediation services to groups in Hudspeth County, Texas.

- **Assistance to the New Jersey Low-Level Radioactive Waste Disposal Facility Siting Board, New Jersey**The Program received a request from New Jersey to provide assistance with two technical assistance tasks. One of these tasks involves developing a resource library for voluntary host communities. The other project involves developing a booklet containing questions and answers to commonly raised concerns.

State and Compact Region Liaisons

The National Low-Level Waste Management Program technical staff maintains close contact with state and compact region officials, Federal agencies, and other nuclear industry representatives involved in developing laws, regulations, technologies, and facilities for managing and disposing of LLW.

In their liaison and coordination roles, National Program staff respond to inquiries or requests for information concerning LLW management activities from state and compact region representatives, other agencies, and the public. The staff provides comments on state and regional documents and activities, as requested. They also attend state agency and compact commission meetings, and participate in Federal interagency meetings. Compact and state officials should contact their technical liaison for requests for technical assistance from the NLLWMP. The liaison will ensure that the best resources are available to handle your request.

| Who We Are | National Status | Data Searches | LLW Reports | Links | Home |

APPENDIX 3.6-3

LANL Information

MAXIM
TECHNOLOGIES INC

Interoffice Memorandum

To: TML, NFSS Project File

From: Bob Bessent (Maxim)

Date: 4/11/00

Job No.: 9905006/170 - DOE Landfill Survey Project

Subject: Call to Los Almos National Laboratory Waste Management Group; Mr. Kenneth M. Hargas; 505-667-2347

Called LANL Waste Management Group and was given Mr. Hargis' name as a source to call regarding theLANL policy of accepting FUSRAP wastes/residue for disposal. No one was at the number called so I left a message asking someone to call me back. Will call back Wednesday if I do not hear from Mr. Hargis.

Please see me if you have any questions or comments regarding this memo.

File: C: nfss4.11h

MAXIM
TECHNOLOGIES INC

Interoffice Memorandum

To: TML, NFSS Project File

From: Bob Bessent (Maxim)

Date: 4/17/00

Job No.: 9905006/170 - DOE Landfill Survey Project

Subject: Call To Mr. Ken Hargis; Los Almos National Laboratory (New Mexico); Waste Management, OSR Program Office @ 505-667-2347

On Friday AM (4/14/00), I called Mr. Hargis to see if he could provide me with some insight into the disposal of LLW at the Los Almos Site. Mr. Hargis was not in when I called him so I left a message for him to call me if possible.

Mr. Hargis did call me back (Monday AM) and indicated that LANL cannot accept any LLW from off-site generators as specified in the 1998 DOE ROD/EIS. They can, however, accept some waste from Sandia National Labs , and TRU wastes for characterization purposes with disposal at the WIPP. Ken indicated that the only DOE facilities which can now accept off-site generator waste for disposal are the NTS and Hanford.

In conclusion, LANL cannot accept the K-65 as it stands now. Please see me if you have any questions or comments regarding this memo.

File: C: nfss4.17b

Waste Materials: Buried waste and retrievably-stored waste include solid beta-gamma contaminated LLW from Idaho National Engineering Laboratory operations, transuranic waste, and contaminated soil. Buried waste is subdivided into contact-handled and remote-handled waste. The beta-gamma contaminated LLW and contaminated soil contain transuranic contaminants less than 100 nCi/g. The buried waste, beta-gamma LLW, and soil are classified as LLW. A 1989 study of a representative section of the Radioactive Waste Management Complex containing the transuranic waste determined that 46% of all past disposed transuranic waste (64,755 m^3) is to be reclassified as LLW. This study also concluded that 95% of the disposed transuranic waste inventory contains hazardous constituents and will be reclassified and managed as MLLW.

General Design Features: The 58-ha (144-acre) complex consists of two main disposal and storage areas: the Transuranic Storage Area for storage and examination of transuranic waste and the Subsurface Disposal Area for disposal of LLW. The Subsurface Disposal Area is a 36-ha (88-acre) fenced area surrounded by a flood control dike and drainage channel. The Subsurface Disposal Area consists of Pad A, trenches, pits, and soil vaults. Two LLW disposal areas are operational: pits and soil vaults. Pits are used to dispose of solid beta/gamma contact-handled LLW. The pits are 30 m x 4 to 6 m (98 ft x 12 to 20 ft) and vary from 60 to 360 m (200 to 1,200 ft) long. Pits are generally excavated to bedrock depth, and the bedrock is covered with soil. After the waste is placed on the soil by high density stacking, the pits are backfilled. Soil vaults are unlined, augered boreholes between 0.41 and 1.8 m (16 to 72 in) in diameter used to dispose of remote-handled LLW. The waste is usually placed into the vaults in bottom discharge shielded casks. When the vaults are full, they are covered with soil. Approximately 210,000 m^3 of LLW was disposed of in the Subsurface Disposal Area (1952-1992). Although there are no plans to expand the existing Radioactive Waste Management Complex Subsurface Disposal Area, new disposal concepts are being evaluated to establish environmental compliance plans and functional and operational requirements for new disposal facilities.

A.3.2.2 Disposal Capacity

The Subsurface Disposal Area has an original disposal capacity of 250,000 m^3. As of January 1993, the remaining capacity in the current active pits was 39,000 m^3. After the year 2000, the complex will be closed to active waste disposal, and periodic monitoring and maintenance activities will be conducted. A new state-of-the-art facility will be developed to replace the Radioactive Waste Management Complex.

A.3.3 References

"Idaho National Engineering Laboratory (INEL) Site Specific Plan for Fiscal Year 1994" (DOE/ID-10253).

"Department of Energy Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Pre-Decisional Draft (Rev. 2) Environmental Impact Statement" (DOE/EIS-0203), April 1994.

A.4 Los Alamos National Laboratory

A.4.1 Background

Location: Los Alamos National Laboratory is located on the Pajarito Plateau in Los Alamos County in north-central New Mexico, approximately 97 km (60 mi) north-northeast of Albuquerque and 40 km (25 mi) northwest of Santa Fe. Los Alamos National Laboratory occupies an area of 112 km^2 (43 mi^2), bounded on the southeast by the Rio Grande.

Historical Activities: The University of California has managed Los Alamos National Laboratory since 1943, and the Department has been the designated federal landlord since 1978. Los Alamos National Laboratory's mission involves the application of science and technology to weapons development, energy supply, and conservation programs.

Los Alamos National Laboratory has one operating facility (Technical Area-54MDA Area G) and one planned facility (Technical Area-67); each is discussed in turn.

A.4.2 Technical Area-54 MDA Area G

A.4.2.1 Facility Description

Status: Beginning in 1957, Area G within Technical Area-54 was used to dispose of waste generated from operations involving radioactive materials and waste that would now be classified as mixed waste.

Waste Materials: In 1970, the Atomic Energy Commission directed its facilities to begin storing transuranic waste so that it could eventually be retrieved. Los Alamos National Laboratory then began segregating LLW from transuranic waste and dedicating specific areas within Area G for management of these wastes. Since 1986, LLW has been segregated for storage at Technical Area-54 Area G.

General Design Features: Area G occupies 64 acres and currently consists of 39 landfill cells (pits and trenches) and 237 land disposal shafts. An additional 24 acres, immediately adjacent to Area G, is dedicated for future expansion of the LLW disposal area.

A.4.2.2 Disposal Capacity

Four disposal units within Area G are active for disposal of LLW and asbestos LLW. Closed units include 36 landfill cells (pits and trenches) and 208 land disposal shafts. Current remaining disposal capacity is approximately 24,000 m^3. Future construction will provide for the disposal of an additional 280,000 m^3 of waste.

A.4.3 Technical Area-67

The second site at Los Alamos National Laboratory used for LLW disposal is Technical Area-67, located in the west-central portion of Los Alamos National Laboratory and bounded on the north by Pajarito Canyon and on the south by Three Mile Canyon. Technical Area-67 is the projected location of the Mixed Waste Disposal Facility. The capacity for the Technical Area-67 Mixed Waste Disposal Facility was planned at approximately 400,000 m^3. The planned Technical Area-67 disposal facility is very preliminary; therefore, its design capacity was not considered in the Report.

A.4.4 References

"Performance Assessment of the LANL TA-54 Area G LLW Disposal Facility," August 1995, Los Alamos National Laboratory.

"RFI Work Plan for Operable Unit 1148" (LA-UR-92-855), May 1992, Los Alamos National Laboratory, Los Alamos, New Mexico.

"RFI Work Plan for Operable Unit 1085 (DRAFT)," March 1994, Los Alamos National Laboratory, Los Alamos, New Mexico.

"RCRA Part B Permit Application, Volume 1" (Project No: 301608.07), September 1993, Los Alamos National Laboratory, Los Alamos, New Mexico.

Personal communication with Charles Peper, University of California, regarding correspondence to Alan Icenhour and Steve Storch, IDB Program, ORNL, Oak Ridge, Tennessee, "Subject Reports for 1995 Low-Level Waste," CST 14-95-383, dated July 31, 1995.

Multiple Results

Name	E-mail Address	Work Phone	Group
Elefio J Abeyta	eja@lanl.gov	+1 505 667 4301	FWO-WFM : WASTE FACILITY MANAGEMENT
Rick A Alexander	raa@lanl.gov	+1 505 665 7020	FWO-WFM : WASTE FACILITY MANAGEMENT
Robert G Anderson		+1 505 665 9960	FWO-WFM : WASTE FACILITY MANAGEMENT
Orlando R Archuleta	ora@lanl.gov	+1 505 665 0472	FWO-WFM : WASTE FACILITY MANAGEMENT
Paul J Brown III	pjb@lanl.gov	+1 505 665 9552	FWO-WFM : WASTE FACILITY MANAGEMENT
Alain Carpenter			FWO-WFM : WASTE FACILITY MANAGEMENT
Michael Chochoms	mchocho@lanl.gov	+1 505 667 8959	FWO-WFM : WASTE FACILITY MANAGEMENT
Terrance L Connors	tconnors@lanl.gov	+1 505 665 3872	FWO-WFM : WASTE FACILITY MANAGEMENT
Anne R Elliott	are@lanl.gov	+1 505 665 6155	FWO-WFM : WASTE FACILITY MANAGEMENT
Larman A Everett	larman@lanl.gov	+1 505 665 2629	FWO-WFM : WASTE FACILITY MANAGEMENT
Stephen D Francis	sdf@lanl.gov	+1 505 665 5918	FWO-WFM : WASTE FACILITY MANAGEMENT
Mark A Gardner	mgardner@lanl.gov	+1 505 667 4301	FWO-WFM : WASTE FACILITY MANAGEMENT
Gary G Garrett	ggg@lanl.gov	+1 505 667 5761	FWO-WFM : WASTE FACILITY MANAGEMENT
Jose E Gomez	gmz@lanl.gov	+1 505 667 4301	FWO-WFM : WASTE FACILITY MANAGEMENT
William A Greene		+1 505 667 4301	FWO-WFM : WASTE FACILITY MANAGEMENT
Jacqueline M Griego	jackieg@lanl.gov	+1 505 665 8345	FWO-WFM : WASTE FACILITY MANAGEMENT
Charles O Grigsby	grigsby@lanl.gov	+1 505 667 9421	E-WMOSR : WASTE MANAGEMENT/OSR PROGRAM OFFICE
Gary D Hagermann	ghagermann@lanl.gov	+1 505 667 6036	FWO-WFM : WASTE FACILITY MANAGEMENT
Robert L Hahn			FWO-WFM : WASTE FACILITY MANAGEMENT
Kenneth M Hargis	khargis@lanl.gov	+1 505 667 2347	E-WMOSR : WASTE MANAGEMENT/OSR PROGRAM OFFICE
Trisha L Harshbarger	trishah@lanl.gov	+1 505 665 1661	FWO-WFM : WASTE FACILITY MANAGEMENT

Sarah C Hoffman	sch@lanl.gov	+1 505 667 9067	E-WMOSR : WASTE MANAGEMENT/OSR PROGRAM OFFICE
Darla J Huff	dhuff@lanl.gov	+1 505 667 4504	FWO-WFM : WASTE FACILITY MANAGEMENT
Patricia A Kirk			FWO-WFM : WASTE FACILITY MANAGEMENT
Stephen C Kosler	sck@lanl.gov	+1 505 665 8829	FWO-WFM : WASTE FACILITY MANAGEMENT
Leroy E Leonard	lleonard@lanl.gov	+1 505 665 8292	E-WMOSR : WASTE MANAGEMENT/OSR PROGRAM OFFICE
Shelby J Leonard	sleonard@lanl.gov	+1 505 667 6701	E-WMOSR : WASTE MANAGEMENT/OSR PROGRAM OFFICE
Edward A Lopez	eal@lanl.gov	+1 505 665 8676	FWO-WFM : WASTE FACILITY MANAGEMENT
Diana C Lovato	dlovato@lanl.gov	+1 505 665 1383	FWO-WFM : WASTE FACILITY MANAGEMENT
Sherrye L Lovato	sll@lanl.gov	+1 505 665 8293	E-WMOSR : WASTE MANAGEMENT/OSR PROGRAM OFFICE
Steven J Madrid	sjmadrid@lanl.gov	+1 505 665 7299	FWO-WFM : WASTE FACILITY MANAGEMENT
Beverly Martin	beverly@lanl.gov	+1 505 665 0714	E-WMOSR : WASTE MANAGEMENT/OSR PROGRAM OFFICE
Andrea D Martinez	admtz@lanl.gov		FWO-WFM : WASTE FACILITY MANAGEMENT
Danette L Martinez	dxm@lanl.gov	+1 505 665 8688	FWO-WFM : WASTE FACILITY MANAGEMENT
Mary A Martinez	mmtram@lanl.gov	+1 505 665 5872	FWO-WFM : WASTE FACILITY MANAGEMENT
James L Matzke	jmatzke@lanl.gov	+1 505 665 8300	FWO-WFM : WASTE FACILITY MANAGEMENT
Julie E Meadows	jum@lanl.gov	+1 505 665 7167	FWO-WFM : WASTE FACILITY MANAGEMENT
Stephen F Mee	sfm@lanl.gov	+1 505 665 8468	FWO-WFM : WASTE FACILITY MANAGEMENT
Kathie A Pavlovsky	kpav@lanl.gov	+1 505 665 7775	FWO-WFM : WASTE FACILITY MANAGEMENT
Charles W Peper	peper@lanl.gov	+1 505 667 6382	FWO-WFM : WASTE FACILITY MANAGEMENT
Russell J Powers	powers@lanl.gov	+1 505 667 7876	FWO-WFM : WASTE FACILITY MANAGEMENT
Germaine Romero	germaine@lanl.gov	+1 505 665 6213	FWO-WFM : WASTE FACILITY MANAGEMENT
Neomi Salazar	salazar_neomi@lanl.gov	+1 505 667 4301	FWO-WFM : WASTE FACILITY MANAGEMENT

Kimberly A Sanchez	kasanchez@lanl.gov	+1 505 665 6772	E-WMOSR : WASTE MANAGEMENT/OSR PROGRAM OFFICE
Amanda Sutherland	amandas@lanl.gov	+1 505 665 8674	FWO-WFM : WASTE FACILITY MANAGEMENT
Bruce A Swanton	swanton@lanl.gov	+1 505 665 0484	FWO-WFM : WASTE FACILITY MANAGEMENT
Joseph A Tompkins	jatompkins@lanl.gov	+1 505 667 6701	E-WMOSR : WASTE MANAGEMENT/OSR PROGRAM OFFICE
Steve R Torrez	storrez@lanl.gov	+1 505 665 7774	FWO-WFM : WASTE FACILITY MANAGEMENT
Jene N Vance	vance@lanl.gov	+1 505 665 6584	E-WMOSR : WASTE MANAGEMENT/OSR PROGRAM OFFICE
Carmen Velasquez	carmen@lanl.gov	+1 505 665 8688	FWO-WFM : WASTE FACILITY MANAGEMENT
Ronnie Vigil	ronniev@lanl.gov	+1 505 665 6155	FWO-WFM : WASTE FACILITY MANAGEMENT

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PHONE BOOK

Information about current LANL and DOE Area workforce, including contractors.

Phone: 505-667-5061

Mailing address:
P.O. Box 1663
Los Alamos, NM 87545

Shipping address:
Bikini Atoll Rd., SM 30
Los Alamos, NM 87545

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To update locations, other phones, home address, and **nickname, go to the Personnel Directory. Changes appear the day after.

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Los Alamos, NM 87544
505 667-5105

Who are we?

The Los Alamos Area Office (LAAO) is the Albuquerque Operations U.S. Department of Energy (DOE) management office in oversight of the Los Alamos National Laboratory. (LANL)

Mission

The Los Alamos Area Office (LAAO), as DOE's on site presence,

- Is a steward for the preservation and enhancement of the Los Alamos National Laboratory (LANL) as a national resource for scienceand technology,
- Assures that LAAO and LANL activities comply with applicable law andrequirements in a manner that protects employees, the public and the environment,
- Represents DOE with other Federal Agencies, state and local agencies, American Indian Tribes, and the public regarding LAAO and LANL activities,
- Manages DOE resources as necessary to support LANL, including providing assistance to Los Alamos County and the Los Alamos Public Schools,
- Is the administrative contracting office for the LANL Management & Operating Contract

[Send comments to mjbyrne@doe.lanl.gov]
Last updated 11/24/98

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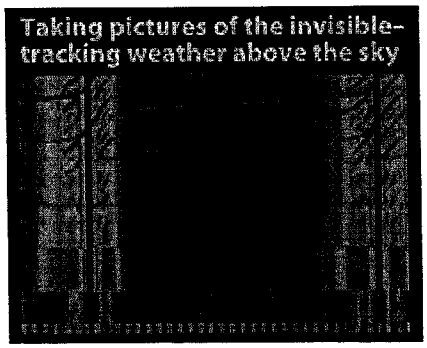

news releases

Fri, Mar 24, 2000

- Los Alamos scientists make seven bit quantum leap
- Laboratory appoints Research Park project leader
- Research develop method for rapid fingerprinting of bacterial DNA
- Los Alamos announces agreement to develop second-generation superconductor tapes

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To meet the Department of Energy's goals and requirements for the technology transfer initiative, Laboratory collaborations must benefit both Los Alamos and its partner. In addition, collaborations must be consistent with the Laboratory's mission and complementary to programs that are ongoing at the Laboratory. One way to determine whether or not a prospective partner's needs fit within these criteria is to compare the proposed work with the Laboratory's core competencies. These eight core competencies, or distinguishing capabilities required for the successful performance of our mission, include the following:

- complex experimentation and measurement;
- theory, modeling, and high-performance computing;
- analysis and assessment;
- nuclear weapons science and technology;
- earth and environmental systems;
- nuclear and advanced materials;
- bioscience and biotechnology; and
- nuclear science, plasmas, and beams.

LOS ALAMOS NATIONAL LABORATORY

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Environmental Sciences

The Los Alamos National Laboratory offers researchers access to over 50 User Facilities for conducting research and development via a User Facility Agreement. User Facilities are designated with an asterisk.

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Los Alamos National Environmental Research Park (User Facility) *
Materials Corrosion and Environmental Effects
Nuclear Criticality Safety
Supercritical Fluids Applications
Supercritical Fluids Experimental (User) Facility *

APPENDIX 3.6-4

NTS Information

MAXIM
TECHNOLOGIES INC

Interoffice Memorandum

To: TML, NFSS Project File

From: Bob Bessent (Maxim)

Date: 4/3/00

Job No.: 9905006/170 - DOE Landfill Survey Project

Subject: Call To Wendy Griffin ; NTS WAC Coordinator; 702-295-5751

On Monday PM, I called Wendy Griffin of the NTS to get insight into the DOE disposal options potentially available for the K-65 residues. Wendy was contacted previously during the preparation of the USACE document on the K-65 disposal. After I explained some of the project specifics to Wendy and brought up the phrase K-65, she knew what is was talking about. She said that she was familiar with the waste material and brought up the fact that some K-65 was to be shipped to the NTS from the Fernald Site. When asked if NTS could accept this waste, Wendy indicated that she was not aware of any policy changes and that since the waste came from a FUSRAP site it could not be accepted. As a response to her comment, I asked why the NTS could accept the K-65 from Fernald but not from NFSS. Wendy indicated that it all depends on the "point of origin". Apparently, some DOE disposal facilities can accept waste from off-site DOE generators or off-site generators performing DOE related activities.

In closing, Wendy suggested that if we want clarification on the DOE's position of FUSRAP waste, we should call Mr. Marty Laterno @ 301-903-7656. In addition, Wendy also suggested that we contact Fernald to check how they are proceeding with the K-65 waste there. I explained to Wendy that Maxim did prepare the "Fernald Paper" describing the latest in the disposition of the K-65 @ Fernald so we are somewhat aware of how another facility is dealing with that particular waste. I also mentioned that our project manager at the Corps has promised a trip to Fernald which has yet to materialize; I mentioned that she was in communication with the Fernald representatives.

In conclusion, Wendy indicated that I could call her if questions arose. Based upon Wendy's suggestion, I will call Marty Laterno later this week to get his insight into DOE's policy on FUSRAP wastes/residues.

Please see me if you have any questions or comments regarding this memo.

File:nfss4.3b

A.5 Nevada Test Site

A.5.1 Background

Location: Nevada Test Site is a Department of Energy nuclear testing facility occupying 3,500 km^2 (1,400 mi^2) of federally owned land in southeastern Nevada. Located about 105 km (65 mi) northwest of Las Vegas, the site is bordered to the west, north, and east by the Nellis Air Force Base Bombing and Gunnery Range and the Tonopah Test Range.

Historical Activities: Nevada Test Site has been the primary location for testing the nation's nuclear weapons and devices since 1951. Other functions include environmental restoration efforts throughout Nevada Test Site and operation of the Liquefied Gaseous Fuels Spill Test Facility. Waste disposal facilities for LLW and MLLW are located in Areas 3 and 5.

A.5.2 Area 3 Radioactive Waste Management Site

A.5.2.1 Facility Description

Status: The Area 3 Radioactive Waste Management Site is located on Yucca Flat and covers an area of approximately 20 ha (50 acres).

Waste Materials: Contaminated debris from the Nevada Test Site Atmospheric Testing Debris Disposal Program and packaged bulk LLW from offsite Department of Energy facilities are disposed in subsidence craters produced from underground nuclear tests using conventional landfill techniques.

Description: U3ahat is an active disposal cell that currently receives LLW from approved offsite generators. U3axbl is an inactive, covered disposal cell discontinued in January 1988. Because waste received in the past contained lead, U3axbl may contain mixed waste; formal closure will commence when the Resource Conservation and Recovery Act closure cap plan is approved. Three other sites in Area 3 are in reserve (U3az, U3bg, and U3bh).

A.5.2.2 Disposal Capacity

The total remaining capacity for LLW in the Area 3 Radioactive Waste Management Site is estimated to be 1.8 million m^3.

A.5.3 Area 5 Radioactive Waste Management Site

A.5.3.1 Facility Description

Status: Beginning in 1961, the Area 5 Radioactive Waste Management Site was used to dispose of LLW and classified LLW generated by Nevada Test Site operations.

Waste Materials: In 1978, Nevada Test Site began accepting LLW generated by offsite Department of Energy facilities. Pit 3 has received mixed waste in the past, but under agreement with the state has suspended receipt pending resolution of waste acceptance criteria. This landfill unit has accepted pondcrete, a mixture of MLLW sludge and cement, from the Rocky Flats Environmental Technology Site in Colorado. Pit 6, opened in 1990, and Pit 5, opened in 1995, are used for the disposal of LLW.

General Design Features: The total area allocated to the Area 5 Radioactive Waste Management Site is 296 ha (732 acres). The developed portion of Area 5 occupies 37 ha (92 acres) in the southeast corner and contains

17 landfill cells (pits and trenches), 13 Greater Confinement Disposal Units boreholes, and a Transuranic Waste Storage Pad. Three pits are currently in operation in Area 5, one for disposal of MLLW and two for disposal of LLW. Three trenches in Area 5 are operational and designated to receive classified LLW: Trench T07C, Trench T08C, and Trench T09C. Trenches T03U and T04C have been closed.

The Mixed Waste Disposal Unit (currently designed to consist of 10 cells) is a landfill proposed for location on about 18 ha (45 acres) of the Area 5 Radioactive Waste Management Site, immediately north of the developed Radioactive Waste Management Site landfill area. The design has been completed, the unit is included in the Resource Conservation and Recovery Act permit application, and the environmental assessment is being updated.

A.5.3.2 Disposal Capacity

The total remaining capacity for LLW in the Area 5 Radioactive Waste Management Site is estimated to be 1,200,000 m^3.

A.5.4 References

"Nevada Field Office Annual Site Environmental Report-1991" (DOE/NV/10630-33), September 1992, U.S. Department of Energy.

Carol Shelton, Nevada Operations Office.

"Site Book for Waste Management," May 1994, Reynolds Electrical and Engineering Co., Inc.

Personal communication with Carlos Gonzales, Reynolds Electrical & Engineering Company, Inc., regarding correspondence to Jou Hwang, The Cadmus Group, Inc., Maryland, "Existing and Planned Low-Level Waste (LLW) Facility Tables for the 1995 Integrated Data Base (IDB)," dated September 7, 1995.

A.6 Oak Ridge Reservation

A.6.1 Background

Location: The Oak Ridge Reservation is located in a valley between the Cumberland and southern Appalachian Mountain ranges in eastern Tennessee about 10 km west of Knoxville. Oak Ridge Reservation covers an area of 35,252 acres and contains three major facilities: Oak Ridge National Laboratory, Oak Ridge K-25 Site, and Oak Ridge Y-12 Plant.

Historical Activities: Oak Ridge Reservation is located in the west end of Bethel Valley and was originally constructed as a research and development facility to support plutonium production and research. Today, the facility conducts research on the fission nuclear fuel cycle and nuclear fusion.

Oak Ridge National Laboratory is the only facility of the three at Oak Ridge Reservation which operates a disposal site for LLW, Solid Waste Storage Area 6.

A.6.2 Facility Description

Status: Located in the southwest region of Oak Ridge Reservation, the 28-ha (68-acre) Solid Waste Storage Area 6 has been used by Oak Ridge National Laboratory since 1969 for the disposal of on-site generated LLW. Until 1986 all LLW generated at Oak Ridge National Laboratory (including MLLW) was disposed of by shallow land burial, generally in unlined trenches and auger holes. This practice came under closer scrutiny by Federal and State regulators and Department of Energy officials, and as a result in 1986, major changes in the operation of Solid Waste Storage Area 6 were initiated. Because of the disposal practices conducted before

DOE/NV-325

NTSWAC (Rev. 2)
May 1999

Nevada Test Site Waste Acceptance Criteria

Prepared by the

Department of Energy
Nevada Operations Office
Waste Management Division

Approval Signatures

To the best of our knowledge, this document is correct and the process and criteria stated within meet the U.S. Department of Energy and appropriate federal regulation requirements.

Approved and Issued by: STEPHEN A. MELLINGTON
(print name)

[redacted] Date: 8/13/99
DOE/NV Assistant Manager for Environmental Management
(sign)

Concur: Kenneth W. Powers
(print name)

[redacted] Date: 9/9/99
Manager, DOE/NV
(sign)

Concur: E. WAYNE ADAMS
(print name)

[redacted] Date: 9-8-99
Director, DOE/NV Safeguards and Security Division
(sign)

Concur: E. Frank DiSanza
(print name)

[redacted] Date: 8/11/99
Director, DOE/NV Waste Management Division
(sign)

Developed by: GARY C. PYLOS
(print name)

[redacted] Date: 8/11/99
Representative, Radioactive Waste Acceptance Program Technical Lead
(sign)

Contents

Contents

Introduction

This document provides the requirements, terms, and conditions under which the Nevada Test Site (NTS) will accept low-level radioactive and mixed waste for disposal; and transuranic and transuranic mixed waste for interim storage at the NTS.

Review each section of this document. This document is not intended to include all of the requirements; rather, it is meant as a guide toward meeting the regulations. All references in this document should be observed to avoid omission of requirements on which acceptance or rejection of waste will be based.

The Department of Energy/Nevada Operations Office (DOE/NV) and support contractors are available to assist you in understanding or interpreting this document.

For assistance, please call:

DOE/NV WMD: phone 702-295-3181 fax 702-295-1153

This report has been reproduced directly from the best available copy.

Available to DOE and DOE contractors from the Office of Scientific and Technical Information, P.O. Box 62, Oak Ridge, TN 37831; prices available from (423) 576-8401.

Available to the public from the National Technical Information Service, U.S. Department of Commerce, 5285 Port Royal Rd., Springfield, VA 22161, telephone (703) 487-4650.

Contents

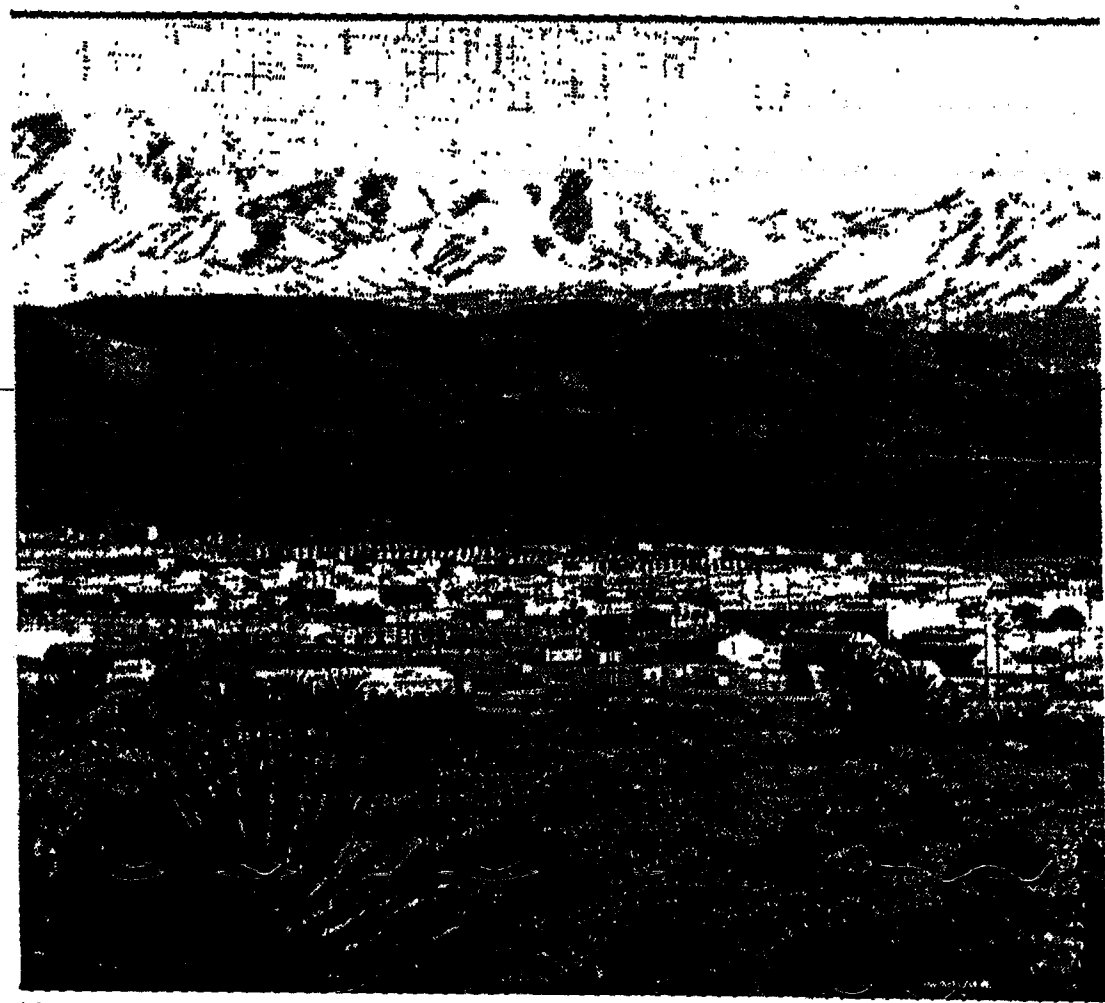
Acronyms

ALARA	As Low As Reasonably Achievable
ALLW	Asbestiform Low-Level Waste
AMEM	Assistant Manager for Environmental Management
ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
BN	Bechtel Nevada
CAR	Corrective Action Request
CFR	Code of Federal Regulations
DOE	U.S. Department of Energy
DOE/NV	U.S. Department of Energy/Nevada Operations Office
DOT	U.S. Department of Transportation
DQO	Data Quality Objectives
EPA	U.S. Environmental Protection Agency
ETA	Estimated Time of Arrival
HRI	Human Readable Interpretation
LDR	Land Disposal Restrictions
LLW	Low-Level Waste
MC&A	Materials Control and Accountability
MW	Mixed Waste
NDEP	Nevada Division of Environmental Protection
NQA-1	Quality Assurance Program Requirements for Nuclear Facilities
NRC	Nuclear Regulatory Commission
NTS	Nevada Test Site
NTSWAC	Nevada Test Site Waste Acceptance Criteria
PCB	Polychlorinated Biphenyls
PCL	Package Certification Label
PK	Process Knowledge
PSDR	Package Storage and Disposal Request

QA	Quality Assurance
QC	Quality Control
RACM	Regulated Asbestos-Containing Material
RCRA	Resource Conservation and Recovery Act
RTR	Real-Time Radiography
RWAP	Radioactive Waste Acceptance Program
RWMS	Radioactive Waste Management Site
SAP	Sampling and Analysis Plan
SOW	Scope of Work; Statement of Work
SW-846	EPA Document SW-846, "Test Methods for Evaluating Solid Waste, Physical/ Chemical Methods"
TCLP	Toxicity Characteristic Leaching Procedure
TRU	Transuranic
WAC	Waste Acceptance Criteria
WCO	Waste Certification Official
WCPP	Waste Certification Program Plan
WMD	Waste Management Division
WP	Waste Profile

1.0

Radioactive Waste Management at the Nevada Test Site



Radioactive Waste Management at the Nevada Test Site 1.0

Purpose and Scope 1.1

This document establishes the U. S. Department of Energy, Nevada Operations Office (DOE/NV) waste acceptance criteria (WAC). The WAC includes requirements for the generator waste certification program, characterization, traceability, waste form, packaging, and transfer. The criteria apply to radioactive waste received at the Nevada Test Site (NTS) Area 3 and Area 5 Radioactive Waste Management Sites (RWMSs) for storage or disposal.

Policy 1.2

1.2.1 DOE/NV Policy

The DOE/NV policy is to:

- ensure safe and compliant storage and disposal of radioactive waste;
- protect the environment and personnel from chemical and radiological hazards in accordance with Title 40 Code of Federal Regulations (CFR), the Resource Conservation and Recovery Act (RCRA); 10 CFR 835, "Occupational Radiation Protection;" DOE Order 5820.2A, "Radioactive Waste Management;" state of Nevada and applicable Department of Transportation (DOT) regulations;
- ensure that present and future radiation exposures are kept as low as reasonably achievable (ALARA) and do not exceed the radiation protection standards established in 10 CFR 835, "Occupational Radiation Protection;"
- ensure Quality Assurance (QA) programs are established and implemented to fulfill the requirements of DOE Order 5820.2A, "Radioactive Waste Management"; and 10 CFR 830.120, "Quality Assurance," and
- be consistent with applicable federal, state, and local regulations.

1.2.2 Process

Waste will be accepted from generators approved by DOE/NV. The approval process is described in Section 2.0.

1.2.3 Waste Type

Low-Level Waste (LLW) and mixed waste (MW) will be accepted for disposal at the NTS. However, to verify current acceptance status of waste types, please contact DOE/NV Waste Management Division (WMD).

1.2.4 Regulators and Stakeholders

DOE/NV will facilitate appropriate regulatory oversight by state agencies and support the involvement of the stakeholders. Where appropriate, to the extent possible, and in accordance with applicable DOE/NV authority, DOE/NV will provide regulatory agencies and stakeholders access to information related to NTSWAC activities, including waste characterization data, from all generators. Upon request by such parties, arrangements may be made to observe NTSWAC- related facility evaluations and participate in other activities such as NTSWAC revisions.

1.3 Requirements

Requirements are identified by "shall" or "must." The source of the requirement is identified by a superscript number which correspond to the reference list. Statements not identified in this manner are provided as guidance. Section 2 requirements do not have corresponding references because the approval process is DOE/NV policy.

1.4 Responsibilities

The following offices and personnel have responsibilities for management and acceptance of radioactive waste at the NTS. The offices identified are within the DOE/NV, unless otherwise stated.

1.4.1 Manager

Responsibilities and authorities as assigned in DOE Order 5820.2A.

1.4.2 Assistant Manager for Environmental Management (AMEM)

Responsible for the DOE/NV Radioactive Waste Management Program according to DOE Order 5820.2A. Provides approval to waste generators to dispose of or store radioactive waste at the NTS and grants any deviations from the requirements of this document. Responsible for suspension of any generator. May delegate his/her responsibilities except for approval and suspension.

1.4.3 Director, Waste Management Division

Responsible for management of radioactive waste at the NTS. Responsible for radioactive waste management operation of the Areas 3 and 5 RWMSs in compliance with applicable DOE Orders and federal and state regulations.

1.4.4 Radioactive Waste Acceptance Program (RWAP) Personnel

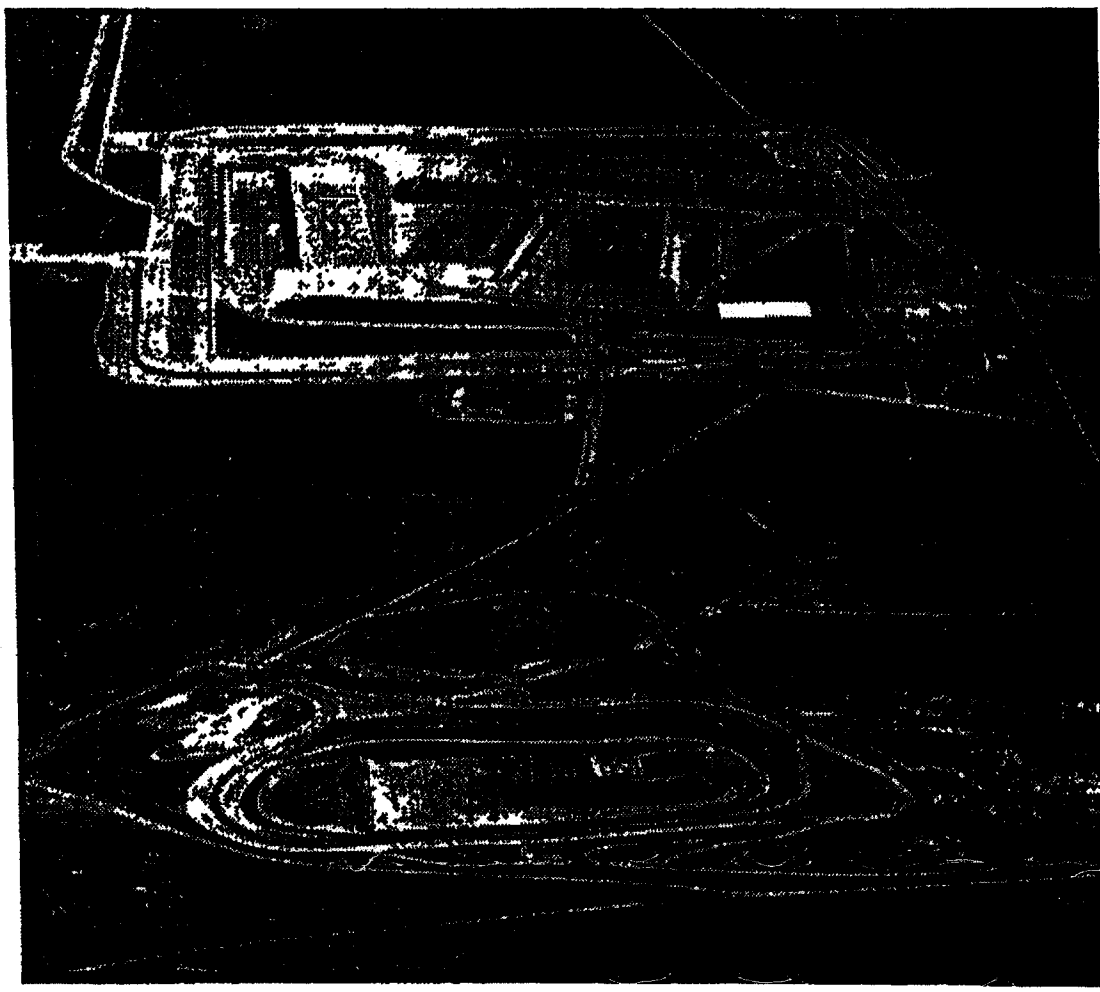
Responsible for development, implementation, and maintenance of the RWAP and the NTSWAC. Responsible for providing guidance to generators shipping radioactive waste to the NTS.

1.4.5 Director, Safeguards and Security Division

Responsible for acceptance of documentation for classified/unclassified accountable or special nuclear material waste. Coordinates acceptance of classified waste shipments at the NTS.

2.0

Approval Process



Approval Process 2.0

The approval process is a series of steps the generator and DOE/NV follow resulting in the generator receiving an approval to ship waste to the NTS. A flow chart of the approval process can be found in Appendix A.

All official interactions referenced in this section between the generator and DOE/NV take place through the generator's appropriate oversight office.

Generator Document Requirements 2.1

Prior to document development, the generator ***shall*** contact DOE/NV WMD to verify that the waste form can be accepted at the NTS. The generator is responsible for the development, implementation, and maintenance of NTSWAC compliant documents. The documents listed below ***shall*** be developed and/or completed.

2.1.1 Waste Profiles

A Waste Profile (WP) ***must*** be submitted for each waste stream in the format found in Appendix B. The WP summarizes the characterization and WAC compliance of the waste stream (see Sections 3.0 and 4.0 for requirements). A list of referenced procedures, citing the number and title of the procedures ***shall*** be included as an attachment to the WP.

The WP number is the waste stream identification number. This unique two-part, 13-character alphanumeric code identifies the generator and the generator's waste code. The first part of the number is a four-character alphanumeric code used by RWMS personnel to identify the generator (see Appendix C). The second part is a nine-character, generator-assigned alphanumeric code for each waste stream (e.g., BCLA-HWM000001. BCLA is the designation for Lawrence Livermore National Laboratory and HWM000001 is the Laboratory's assigned waste stream code).

2.1.2 Waste Certification Program Plan

The Waste Certification Program Plan (WCPP) ***shall*** be documented in accordance with Section 5.0. A controlled copy of the WCPP ***shall*** be sent to DOE/NV.

2.1.3 Certification Personnel List

A list of the Waste Certification Official(s) and Package Certifier(s) ***shall*** be developed. The list contains the telephone and telefax number for the WCO(s). It is used by RWMS personnel to ensure signatures on certified packages and shipments are from authorized personnel. Any packages or shipments certified by personnel not on this list ***will not*** be accepted by the RWMS.

2.1.4 Document and Personnel Changes

Generators ***shall*** notify DOE/NV in writing of changes to the above documents and any key personnel changes.

2.2 RWAP Review

DOE/NV's process of approval for a generator's certification program and waste streams includes document reviews and evaluations of implementation at the generator facility. Corrective Action Requests (CARs) will be issued to generator sites when conditions adverse to quality are identified by DOE/NV. CARs require the generator to document a root cause, corrective action, and action to preclude recurrence. Failure to respond to CARs could lead to delays in approval or suspension in accordance with Section 2.4.

2.2.1 Facility Evaluations

Facility evaluations (audits, surveillances, and annual assessments) are conducted according to periodic review requirements.

2.2.1.1 Triennial Audit

An audit of the generator is conducted on a triennial basis. New generators are audited prior to program approval. New generators ***shall*** submit the documents described in Section 2.1 to DOE/NV prior to the audit. Approved generators (triennial audit) ***shall*** submit a list of those documents that have changed since their last Annual Assessment.

The audit will verify by examination and evaluation of objective evidence that the documents contain the necessary elements and have been adequately implemented. The audit scope will include an on-site evaluation of the characterization, quality assurance, and traceability waste certification program elements.

2.2.1.2 Annual Assessment

An annual assessment of generator performance is conducted every year after the generator's initial pre-approval or triennial audit. Generators receive an "Annual Assessment Generator Survey" from DOE/NV and send the completed survey back with any requested information. Requested information may include nonconformance reports, internal audit reports, etc. The scope of the annual assessment includes program changes, operational concerns, and internal assessments. Based upon the results of the annual assessment, a surveillance of the generator's facility may be conducted.

2.2.1.3 Surveillance

A surveillance may be performed to verify the effectiveness of corrective actions, review a new waste stream or program element, resolve discrepancies, ensure compliance with specific requirements of the NTSWAC, or at the discretion of DOE/NV.

2.2.2 Waste Profiles

Waste profiles are reviewed by the DOE/NV Waste Acceptance Review Panel (WARP). The WARP may require additional information from the generator, recommend the waste stream for approval, or recommend a surveillance of the waste stream. Once a generator has completed the pre-approval audit and received approval to ship from DOE/NV, waste profiles for new waste streams or modifications to approved waste streams may be submitted to DOE/NV at any time.

2.2.3 Document And Personnel Changes

Depending on the significance of the change, the approval to ship may be temporarily suspended until the change(s) is reviewed and accepted.

2.2.4 Split Sampling

The purpose of the split sampling program is to independently assess or confirm the results of waste analysis. DOE/NV may choose waste streams based on the annual volume, the potential for finding hazardous components, or the scope and complexity of the sampling process being performed. For mixed waste, DOE/NV may require split sampling prior to the waste stream being approved.

Samples will be collected by the generator's sampling team under the observation of an RWAP representative. DOE/NV may split a representative waste sample with the generator for independent analysis. Samples will be sent to the generator laboratory and to an independent laboratory chosen by DOE/NV. The samples will be analyzed by the same analytical methods. Results of the analyses from both laboratories will be compared by RWAP after data validation. Differences between the two sets of data may require further investigation.

2.3 Approval

RWAP personnel recommend to DOE/NV AMEM that approval be granted after the generator has demonstrated satisfactory implementation of the NTSWAC. Current copies of the following documents ***must*** be maintained by the organizations identified below while the generator's approval to ship waste is in effect:

- Waste profiles by DOE/NV RWAP, RWMS, and generating facilities
- Controlled copy of the WCPP by DOE/NV RWAP and generating facilities
- Certification List by DOE/NV RWAP, RWMS and generating facilities

The DOE/NV AMEM will provide written notice of approval, identifying facility evaluation number(s) and acceptable waste stream(s) by identification number, title, profile revision and date. Any conditions affecting the waste stream approval will be identified. Approval letters will be issued after successful completion of facility evaluation(s) and/or waste profile WARP review(s). Each approval letter will detail current approved waste streams and WCPPs.

2.4 Suspending Approval

DOE/NV may suspend approval if the generator's waste or documents do not meet the NTSWAC requirements. Individual waste streams or the generator's entire program may be suspended. Reasons for suspension may include but are not limited to:

- Improper manifesting (e.g., incorrect activity reported)
- Repetitive programmatic deficiencies.
- Incorrect waste characterization.
- Waste container integrity deficiencies.
- Nuclear safety limits violations.
- Facility evaluation results.

Suspension may be issued verbally by DOE/NV representatives and followed by official written notification.

2.5 Terminating an Approved Waste Stream

Generators ***will*** notify DOE/NV in writing if they no longer need an approved waste stream (project is complete, one-time-only waste stream has been shipped, etc.).

Site Visit 2.6

Generators may request a site visit by RWAP personnel to provide guidance in the development and implementation of documentation. Identification of areas requiring assistance should be communicated to RWAP to ensure the appropriate personnel participate in the site visit. The site visit is documented but does not require a response from the generator. The site visit documentation may be used by DOE/NV in the preparation of facility evaluations.

DOE/NV Policy 2.7

Due to changes in regulatory requirements, NTS policies, and changes instituted as a result of lessons learned, any aspect of the waste certification process may be subject to a full review to ensure its continued compliance and effectiveness. This review may entail imposing additional requirements or reversing previous decisions. Unannounced facility evaluations may be performed at the discretion of DOE/NV.

Options for Low-Volume Generators 2.8

Generators may elect to become low-volume generators (LVG) if the total volume of waste to be shipped to the NTS per fiscal year does not exceed 200 m^3 (7,063 ft^3). The LVG status exempts the generator from the triennial audit described in Section 2.2.1.1.

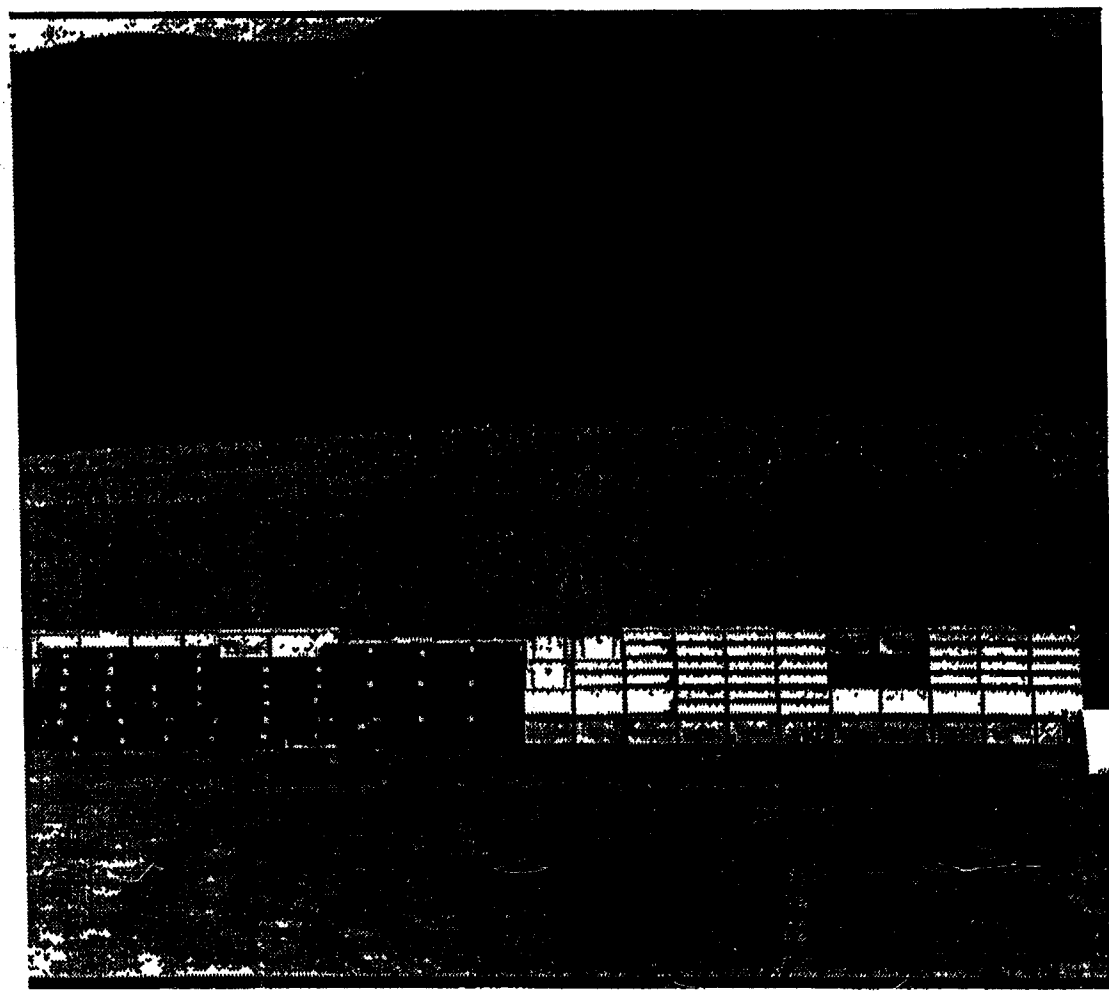
LVGs ***must*** complete and submit: waste profile(s), a list of certification personnel, and a master list of applicable procedures. DOE/NV may perform a limited-scope facility evaluation based on the uniqueness of the waste type, discrepancies identified by the NTS RWMS, or the generator's internal assessment results.

LVGs ***must*** meet the requirements described in Section 5.0 commensurate with their program for certifying the waste (e.g., apply required standards to the waste generation and characterization process without developing a full waste certification program).

If a LVG determines that it would not be cost effective to establish a program that meets the requirements of the NTSWAC, DOE/NV encourages the LVG to team with a DOE/NV approved generator to dispose of their waste. All arrangements between a LVG site and an approved generator should receive concurrence from DOE/Headquarters, the approved site's DOE oversight office, and DOE/NV.

3.0

Waste Criteria



Waste Criteria 3.0

Waste accepted at the NTS ***must*** be radioactive and ***shall*** meet the waste form criteria outlined below.[6.13] Generators must ensure waste is handled, stored, and shipped in accordance with applicable DOE, DOT, EPA, State and Local regulations and requirements. Waste streams deviating from these requirements will be evaluated in accordance with Section 3.4, WAC Deviations[7.5].

General Waste Form Criteria 3.1

These waste form criteria are based on current DOE LLW management policies and practices.

3.1.1 Transuranics

The concentration of alpha-emitting transuranic nuclides with half-lives greater than 20 years ***must not*** exceed 100 nCi/g.[6.8] The net weight of the waste (excluding the weight of the container and shielding) ***must*** be used to calculate the specific activity of the waste in each container.[6.7] The following isotopes ***shall***[6.6] be considered when making the TRU waste determination: ^{236}Np, ^{237}Np, ^{238}Pu, ^{239}Pu, ^{240}Pu, ^{242}Pu, ^{244}Pu, ^{241}Am, ^{242}Am, ^{243}Am, ^{243}Cm, ^{245}Cm, ^{246}Cm, ^{247}Cm, ^{248}Cm, ^{250}Cm, ^{247}Bk, ^{249}Cf, and ^{251}Cf. Also see Appendix E for radionuclide reporting requirements.

3.1.2 Radionuclide Content or Concentration

Radionuclide concentration ***must*** be reported in accordance with Appendix E, "Radionuclide Characterization and Reporting Requirements."[6.9/6.10/6.15] Radionuclide limits for disposal are listed in Table E-1, "Radionuclide Action Levels for Waste Characterization and Reporting." Waste having radionuclide concentrations above these limits may be acceptable for disposal upon further review by DOE/NV.

3.1.3 Greater-than-Class C Waste

Commercial waste designated as Greater-than-Class C (GTCC), as defined in 10CFR 61.55 and DOE waste that, if commercially generated, would meet the GTCC definition, may be evaluated for disposal on a case-by-case basis depending on site-specific waste classification limits. This review may involve considering non-routine disposal options (i.e., controlling depth of disposal, considering other waste forms and package integrity, limiting the other types of wastes disposed nearby) or the development of a specific radiological performance assessment.

3.1.4 Hazardous Waste

LLW offered for disposal ***must not*** exhibit characteristics of, or be listed as, hazardous waste as identified in Title 40 CFR, state of Nevada regulations, or state-of-generation hazardous waste regulations.[3.4/5.6] State of Nevada regulations require that waste regulated as hazardous in the state of generation ***must*** be regulated as hazardous when brought into the state of Nevada.[5.5]

3.1.4.1 The use of lead shielding in containers of LLW is an acceptable practice provided the shielding is necessary for radiation protection and not radioactively contaminated when introduced.[7 11]

3.1.5 Free Liquids

Liquid waste and waste containing free liquids ***must*** be converted into a form that contains as little freestanding and noncorrosive liquid as is reasonablely achievable.[6 22] Liquid waste and waste containing free liquids should be processed to a solid form or packaged in sufficient sorbent for twice the volume of the liquid. The free liquid ***must*** not exceed 1 percent of the volume of the waste when the waste is in a disposal container; or 0.5 percent of the volume of the waste processed to a solidified form.[1 1/6 22] Provisions for additional sorbent should be made when significant temperature and atmospheric differences exist between the generating site and the disposal site.

Waste ***must*** be evaluated to determine its potential to release liquid during handling, storage, and transportation.[7 6] High moisture content waste is defined as waste that has the potential to release moisture from its final waste form in excess of the NTSWAC requirement. Generators ***must*** document the decisions made when characterizing and determining sorbents for high moisture content waste (See the Nevada Test Site Generator Work Group "Position Paper for High Moisture Content Waste" revision 0, dated 11/3/98 for use as guidance).[7 5]

3.1.6 Particulates

Fine particulate wastes ***shall*** be immobilized so that the waste package contains no more than 1 weight percent of less-than-10-micrometer-diameter particles, or 15 weight percent of less-than-200-micrometer-diameter particles.[7 6] Waste that is known to be in a fine particulate form or in a form that could mechanically or chemically be transformed to a particulate during handling and interim storage ***must*** be immobilized.[7 6]

Secure packaging may be used in place of immobilization. Examples of acceptable packaging are overpacking (i.e., 55-gallon drum inside 85-gallon drum) and steel boxes. Drums and wooden boxes with sealed 6-mil (minimum) liners will also satisfy this requirement. Disposal containers with contents individually wrapped and sealed in plastic are also acceptable.

3.1.7 Gases

LLW gases ***must*** be packaged at a pressure that does not exceed 1.5 atmospheres at 20°C.[6 25/7 6] Compressed gases as defined by Title 49 CFR ***shall not*** be accepted.[4 8/6 25] Examples of compliance methods include puncturing aerosol cans and removing the valve mechanism from expended gas cylinders.

3.1.8 Stabilization

Where practical, waste ***must*** be treated to reduce volume and provide a more stable waste form.[6 19] Wastes ***must not*** react with the packaging during storage, shipping, handling, and disposal.[6 17]

3.1.8.1 Structural stability can be accomplished by crushing, shredding, or placing a smaller piece inside an opening of a larger piece, such as nesting pipes.

3.1.8.2 Chemical stability and compatibility ***must*** be demonstrated to ensure no reactions occur and significate quantities of harmful gases, vapors, or liquids are not generated.[6 16/6 24] Specifically when different waste forms are combined in a single waste container.

3.1.9 Etiologic Agents

LLW containing pathogens, infectious wastes, or other etiologic agents as defined in Title 49 CFR ***shall not*** be accepted.[13]

3.1.10 Chelating Agents

LLW packages containing chelating or complexing agents in amounts greater than 1 percent of the waste ***shall not*** be accepted unless stabilized or solidified.[6 18/7 6]

3.1.11 Polychlorinated Biphenyls (PCBs)

PCB-contaminated LLW ***shall not*** be accepted for disposal unless the PCB concentration meets municipal solid waste disposal levels of 50 ppm.[3 16/5 1] Refer to Title 40 CFR, state of Nevada, and state-of-generation regulations for PCB disposal requirements.

3.1.12 Explosives

Waste ***must not*** be readily capable of detonation or of explosive decomposition or reaction at normal pressures and temperatures, or of explosive reaction with water.[6.23]

3.1.13 Pyrophorics

Waste ***must not*** be pyrophoric.[6.26] Pyrophoric materials contained in the waste ***shall*** be treated, prepared, and packaged to be nonflammable.[6.26] Pyrophoric materials that are blended in a hardened concrete matrix are considered to be treated to be nonflammable.

3.1.14 Sealed Sources

Sources containing transuranic nuclides ***must*** be individually evaluated against the transuranic criteria (section 3.1.1), considering only the mass of the source and any component integral to the source.[7.3]

Sealed sources that have an activity of less than 3.7 MBq (100μCi) can be a component of waste streams such as contaminated trash. The total volume of the waste can be used for waste classification and for determination of the radionuclide concentration. Characterization of non-transuranic sources on an individual source basis is not required provided the characterization method used is adequate to ensure compliance with the radionuclide reporting criteria.

Sealed sources that have an activity of 3.7 MBq (100μCi) or greater ***shall*** be segregated from other waste and profiled as a separate waste stream.[7.3] These sealed sources ***shall*** be characterized on an individual basis using the volume or mass of the source to determine

the radionuclide concentration.[71] Sealed sources may be co-packaged with other waste streams provided Section 3.0, Waste Acceptance Criteria are met. See Appendix E for more information on the encapsulation of sealed sources.

3.1.15 Low-Level Waste Containing Asbestos

Asbestiform Low-Level Waste (ALLW) is defined as any LLW containing friable asbestos material, Category I nonfriable asbestos containing material (ACM) that has become friable, Category I nonfriable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading, or Category II nonfriable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder. ALLW ***must*** be packaged, marked, and labeled in accordance with the requirements of Title 40 CFR, state of Nevada, state of generation, and the NTS Management Plan for the Disposal of Low-Level Waste with Regulated Asbestos Waste, dated August 1996 or subsuquent revisions.[31,52] Packages containing ALLW ***must*** meet the applicable shipping requirements for the radioactive contents of the package.[47] ALLW ***must*** be wetted with a water and surfactant mixture and packaged in a plastic bag which is not less than 6 mils in thickness, a combination of plastic bags which equal at least 6 mils in thickness, or a container which is lined with plastic.[51]

If free liquid is present, sorbent ***must*** be added to ensure compliance with the free-liquids criteria.[6,22] Sharp edges and corners in the package ***must*** be padded or protected to prevent damage to the plastic bag during handling, shipping, and disposal.[76]

Each container used to dispose of ALLW ***must*** bear a label that contains one of the following statements:[54]

(1) CAUTION CONTAINS ASBESTOS FIBERS AVOID OPENING OR BREAKING CONTAINER BREATHING ASBESTOS IS HAZARDOUS TO YOUR HEALTH	
(2) CAUTION CONTAINS ASBESTOS FIBERS AVOID CREATING DUST MAY CAUSE SERIOUS BODILY HARM	(3) DANGER CONTAINS ASBESTOS FIBERS AVOID CREATING DUST CANCER AND LUNG DISEASE HAZARD

ALLW ***must*** be segregated into a separate waste stream.[79] Due to state notification requirements and disposal cell capacity, ALLW ***must*** be packaged separately from other waste streams.[52,76] Call DOE/NV WMD at (702) 295-3181 for assistance and a copy of the current NTS Management Plan for the Disposal of Low-Level Waste with Regulated Asbestos Waste which includes specific requirements for pre-shipment notifications.

3.1.16 Radioactive Animal Carcasses

Animal carcasses containing, or contained in, radioactive materials ***shall*** be packaged with the biological material layered with lime and placed in a metal container meeting applicable requirements.[1,2/1,3] If the resultant waste matrix is capable of gas generation, the container ***shall*** be vented with a carbon composite High-Efficiency Particulate Air (HEPA)-rated filtration device.[1,2/7,6] DOE/NV may require analysis of the waste decomposition gases. Animal carcasses preserved with formaldehyde ***shall not*** be accepted for disposal.[3,5]

Waste Package Criteria 3.2

Waste packages ***must*** meet applicable DOE Orders, 10CFR, 40 CFR, and 49 CFR requirements such as: design, nuclear safety, radiation levels, external contamination, activity limits, nuclear heating, and multiple hazards. Waste packages ***must*** be capable of withstanding the stresses associated with the loading, handling, stacking, and shipping of the package.[4,5]

DOE/NV has adopted the following waste package criteria to assure that the NTS RWMSs are operated safely and efficiently.

3.2.1 Nuclear Criticality Safety

3.2.1.1 The quantity of fissionable (fissile) material in a waste package ***shall*** be limited so that an infinite array of such packages will remain subcritical.[6,2] This quantity ***shall*** be determined on the basis of a specific Criticality Safety Evaluation (CSE). A CSE ***shall*** be performed for the following wastes:[7,11]

3.2.1.1.1 Waste packages containing greater than 15 g of uranium with a ^{235}U enrichment equal to or greater than 0.90% by weight (Wt%). Any level of enriched uranium present in the waste ***must*** be identified and reported on the waste profile in Section E.[8,7,4]

3.2.1.1.2 Waste shipments with natural or depleted uranium exceeding 36,000 Kg.

3.2.1.1.3 Waste packages containing fissionable nuclides, other than enriched uranium nuclides, will be assessed on a case-by-case basis. Fissionable nuclides are listed in DOE Order 420.1, "Facility Safety," Table 4.3-1.

3.2.1.2 The CSE shall be performed in accordance with DOE Order 420.1, "Facility Safety" and applicable ANSI/ANS standards.[7,11] DOE Standard STD-3007-93, Change Notice 1, "Guidelines for Preparing CSEs at Department of Energy Non-Reactor Nuclear Facilities," September 1998, is recommended as guidance for developing CSEs.

3.2.1.3 The CSE ***shall*** consider the actual materials in the waste and the accident condition where the waste would be flooded with water.[6][7][11] An array of 7 packages by 7 packages by 7 packages may be assumed to approximate an infinite array.

The infinite array of waste packages ***must*** remain subcritical given the following conditions for water leaking into the waste container:[7][11]

3.2.1.3.1 maximum reactivity of the fissionable material present is attained,

3.2.1.3.2 the most reactive credible configuration consistent with the chemical and physical form of the material (e.g., lumped source, cylindrical, sphere, dispersed, etc.),

3.2.1.3.3 moderation by water to the most reactive credible extent, and

3.2.1.3.4 full reflection of the waste by water.

3.2.2 Closure

The package closure ***must*** be sturdy enough that it will not be breached under normal handling conditions.[4][10]

3.2.3 Strength

The disposal package (packaging and contents) ***must*** be capable of supporting a uniformly distributed load of 16,477 kg/m² (3,375 lbs/ft²).[7][4] This is required to support other waste packages and earth cover without crushing during stacking and covering operations. Actual physical testing or design engineering calculations can be used to demonstrate this requirement. This section does not apply to bulk waste, waste packaged in steel drums, or SEALAND® containers.

3.2.4 Handling

Waste packages ***must*** be provided with cleats, offsets, rings, handles, permanently attached or removable skids, other auxiliary lifting devices to allow handling by means of forklifts, cranes, or similar handling equipment.[7][6] Removable skids are preferred to assist in meeting NTS PA objectives for reducing disposal cell subsidence. Lifting rings and other auxiliary lifting devices on the package are permissible, provided they are recessed, offset, or hinged in a manner that does not inhibit stacking the packages. The lifting devices ***must*** be designed to a 5:1 safety factor based on the ultimate strength of the material.[7][1] All rigging devices that are not permanently attached to the waste package ***must*** have a current load test based on 125 percent of the safe working load.[2][1][2][2]

Handling procedures and ALARA documentation ***must*** be referenced on the WP for wastes requiring remote handling.[7][6] The disposal site may request this documentation. Packages exceeding 200 mR/hr dose rate on contact are usually considered for remote handling.

3.2.5 Size

1.2- × 1.2- × 2.1-m (4- × 4- × 7-ft) or 1.2- × 0.6- × 2.1-m (4- × 2- × 7-ft) boxes (width × height × length, plus or minus 1/2 inch) or 208-liter (55-gallon) drums should be used. These sizes allow optimum stacking efficiency in disposal cells. Alternate packages (i.e. supersacks, burrito wraps) will be considered; however, RWMS operations personnel need to be consulted to ensure equipment compatibility.

Bulk waste generally exists in a form not suited to the conventional packaging requirements. Bulk LLW ***must*** meet the requirements of Title 49 CFR.[4.11] Large items of bulk waste, such as machinery, may be considered for disposal unpackaged. For the transfer of unpackaged bulk material having external contamination, the contamination ***must*** be fixed, covered, or contained sufficiently for safe transfer.[4.12]

Bulk waste shipping containers may be returned to the generator after decontamination. Decontamination and return of bulk waste shipping containers will incur additional operational costs for the generator.

3.2.6 Weight

In addition to the weight limits for specific packaging designs, packages ***shall*** not exceed 4,082 kg (9,000 pounds) per box and 544 kg (1,200 pounds) per drum.[2.1] This weight limit does not apply to bulk waste.

3.2.7 Loading (Void Space)

Waste packages ***must*** be loaded to ensure that the interior volume is as efficiently and compactly loaded as practical to minimize void space.[4.21] More than one waste stream may be packaged in a disposal container (see Appendix C and D). High-density loading will allow efficient RWMS space utilization and provide a more stable waste form that will reduce subsidence and enhance the long-term performance of the disposal site.

3.2.8 Package Protection

The following precautions ensure the integrity of the waste characterization and the certification processes.

Methods ***must*** be employed to ensure that the integrity of the in-process waste package is not compromised (i.e., prohibited items are not introduced into the waste package).[7.5]

Once the waste package certification activities have been completed and the packages have been sealed, the packages ***must*** be stored in a secure, protected area to prevent deterioration and unauthorized intrusion.[7.5] Tamper indicating devices, clips, or banding can be used to indicate that the package has not been opened.

3.2.9 Marking and Labeling

Each waste package ***must*** be marked and labeled according to Appendix C.[4.2]

3.2.10 Bar Coding

The shipment and package numbers ***must*** be bar coded according to the standards in Appendix C.[7.6]

3.3 Mixed Waste

MW offered for disposal ***must*** meet the applicable requirements of the NTSWAC, Title 40 CFR, state of Nevada, state of generation, package criteria and disposal site permit requirements for identification, treatment, and disposal.[3.3][3.1][4][5][6]

3.3.1 Mixed Waste Generated Within the State of Nevada

3.3.1.1 Free Liquids

MW ***must*** contain no free liquids.[3.1] Any sorbents used in the waste ***must*** be non-biodegradable.[3.1]

3.3.1.2 Treatment

MW accepted for disposal at the Mixed Waste Management Unit ***must*** meet applicable Title 40 CFR, "Land Disposal Restrictions."[3.1]

3.3.1.3 Incompatible Wastes

Incompatible MW ***must*** be packaged in accordance with Title 40 CFR, "Special Requirements for Incompatible Wastes."[3.1]

3.3.1.4 Marking and Labeling

MW packages of 416 liters (110 gallons) or less ***must*** be marked in accordance with Title 40 CFR.[3.9] Marking and labeling of the waste packages ***must*** be for the hazardous and radioactive waste.[3.7][3.8][4][3.4][4] Limited quantity MW ***must*** be classified according to the requirements for hazardous components as defined by Title 49 CFR.[4][5][4.9]

3.3.1.5 Containers

The requirements of Title 40 CFR, "Use and Management of Containers," ***must*** be met.3.10

3.3.2 Mixed Waste Generated Outside the State of Nevada

(Reserved for future use) Call DOE/NV Waste Management Division for information at (702) 295-3181.

WAC Deviations 3.4

Deviations from the NTSWAC that do not compromise the performance objectives for the disposal site or violate permit requirements may be accepted. The following information ***must*** be included with the WP:[6 10/6.27/7 5] the NTSWAC requirement that cannot be met; the justification for not meeting the requirement; the duration of the deviation, if applicable; and the action plan to correct the deviation, if applicable.

Example:

Requirement: NTSWAC, Revision 0, Section 3.1.E, Gases, requires that expended gas cylinders have the valve mechanism removed.

Justification: The pressure container and manifold valves cannot be removed, but each waste item will be documented by procedure and signed verification that the container/manifold internal pressure has been emptied to less than 1.5 atmospheres at 20°C. This method allows for direct venting, depressurization of the container/vessel without the potential of radioactive tritium gas exposure, and is in keeping with mandated DOE ALARA principles and practices. Even when a tritium vessel is depressurized, there is a certain amount of residual tritium that remains in the vessel. If the valve stem is removed, the cylinder will continue to emit tritium to the atmosphere and possibly result in exposure to personnel. The generator seeks to avoid unnecessary or accidental venting of tritium to the atmosphere by allowing the valve stem to remain on the vessel. The waste packaging procedure provides details about the handling of these waste items. The WCO procedure details the internal pressure verification.

Duration: The duration of the deviation is the lifetime of the waste stream.

Corrective Action: There is no action required.

Shipping Arrangements 3.5

After a generator secures written approval from the DOE/NV AMEM to send waste to an NTS RWMS, the generator should contact Bechtel Nevada (BN) to arrange for transfer of the waste and accompanying records. BN will coordinate unclassified waste shipment transfers at NTS. Classified waste shipments will be coordinated by DOE/NV Safeguards and Security Division.

3.5.1 To expedite waste receipt and handling at NTS, waste generators ***shall***, at a minimum comply with the following:[7.6]

3.5.1.1 Prior to departure of a waste shipment to the NTS, the generator ***shall*** attach security seals to the shipping trailer's door latches or to each package if not enclosed in a trailer.[7 6]

3.5.1.2 Before a waste shipment arrives at the NTS, the generator ***shall*** enter the following pre-notification information on the DOE/NV VAX traffic database.[76] If the generator is unable to enter information on the DOE/NV VAX, pre-notification should be made by phone to BN. For classified/ unclassified accountable or special nuclear material shipments, generators should also contact DOE/NV Safeguards and Security Division (phone: 702-295-0082). For all shipments, the following information ***must*** be provided:[76]

- Time of departure from shipping point and estimated time of arrival (ETA) at NTS;
- Carrier, trailer, and security seal numbers;
- Description of load (number and type of pieces [e.g., boxes, drums, SEALAND®], volume and weight);
- Waste type (LLW, MW, TRU, or Transuranic Mixed Waste); and
- Any additional information (e.g., special handling requirements).

3.5.2 Consign unclassified waste shipments to:

Bechtel Nevada
For U.S. Department of Energy
Waste Management
Nevada Test Site-Zone 2
Mercury, NV 89023

Consign classified/unclassified accountable or special nuclear material waste shipments to:

U.S. Department of Energy
Attn: Security Specialist
DOE/NV Safeguards and Security Division
For Bechtel Nevada
Waste Management
Nevada Test Site-Zone 2
Mercury, NV 89023

Because unclassified and classified shipments are consigned differently, they should be shipped separately; i.e., on different trailers and have different shipment numbers and separate shipping papers. Under small volume conditions, combined shipments can be arranged. Contact BN and DOE/NV Safeguards and Security Division for guidance.

3.5.3 If the shipment's ETA should change, the generator ***shall*** enter the changes on the DOE/NV VAX traffic database at the earliest opportunity and provide the new ETA.[76] Generators unable to update information on the DOE/NV VAX account ***shall*** notify BN by phone.[76] For classified shipments, generators should contact DOE/NV Safeguards and Security Division.

3.5.4 The hours for receiving waste at the RWMS are from 0700 to 1530, Monday through Thursday, except holidays. If a shipment arrives after 1530, trailers (except classified loads) may be left at the parking area outside gate 100 of the NTS after conferring with the NTS Duty Officer. Shipments may be subject to off-loading delays at any time due to NTS operational schedules.

Shipping Documentation 3.6

The following records are required:

3.6.1 When accountable quantities of nuclear materials are involved, a "Nuclear Material Transaction Report" (DOE/Nuclear Regulatory Commission [NRC] Form 741) ***shall*** be completed for transfers of nuclear material between facilities having differing Reporting Identification Symbols and received by the DOE/NV Safeguards and Security Division and RWMS prior to shipment arrival.[6.3] For additional information, call Safeguards and Security at (702) 295-0082 and RWMS at (702) 295-6811. The shipment may be refused if a Form 741 is not on file.

3.6.2 For materials regulated by DOT, completed shipping papers with shippers certification, as required by Title 49 CFR, ***must*** accompany each shipment.[4.1]

A "Uniform Hazardous Waste Manifest" or equivalent state-of-generation manifest, accompanied by the appropriate documentation, ***shall*** be used when shipping MW.[3.6/3.15] For onsite shipments of MW an onsite Waste Manifest may be used.

3.6.3 The original completed and signed PSDR or the original of an equivalent, ***shall*** accompany each shipment.[6.12/7.6] An electronic version of the PSDR ***shall*** be transferred to BN prior to shipment arrival (internet address: wmdata).[7.6] If the PSDR is considered "classified," DOE/NV Safeguards and Security Division ([702] 295-0082) ***must*** receive the PSDR prior to arrival of waste.[7.6] Classified shipments will not be accepted if a PSDR is not on file.

3.6.4 An appropriate Waste Certification Statement ***shall*** be signed by the WCO (see below).[6.14/7.6]

Low-Level Waste Certification

"I certify that containers:

(Container I.D. number[s])

do not contain hazardous waste as defined in Title 40 CFR 261 or _____ (state-of-generation) hazardous waste regulations:

(1) according to the results of tests performed in accordance with the requirements as specified in Subpart C of Title 40 CFR 261; and/or

(2) according to the supporting documentation provided to me about the materials and processes that produced this waste.

To the best of my knowledge, I believe the information I have submitted is true, accurate, and complete

_____ _____

Generator Waste Certification Official (Print Name/Sign) Date

Mixed Waste Certification for Land Disposal Restrictions:

I certify under penalty of law that I personally have examined and am familiar with the waste through analysis and testing or through knowledge of the waste to support this certification that the waste in containers:

(Container I.D. number[s])

complies with the treatment standards specified in Title 40 CFR 268, Subpart D, and all applicable prohibitions set forth in 40 CFR 268.32, RCRA Section 3004(d) or _____ (state-of-generation) hazardous waste regulations.

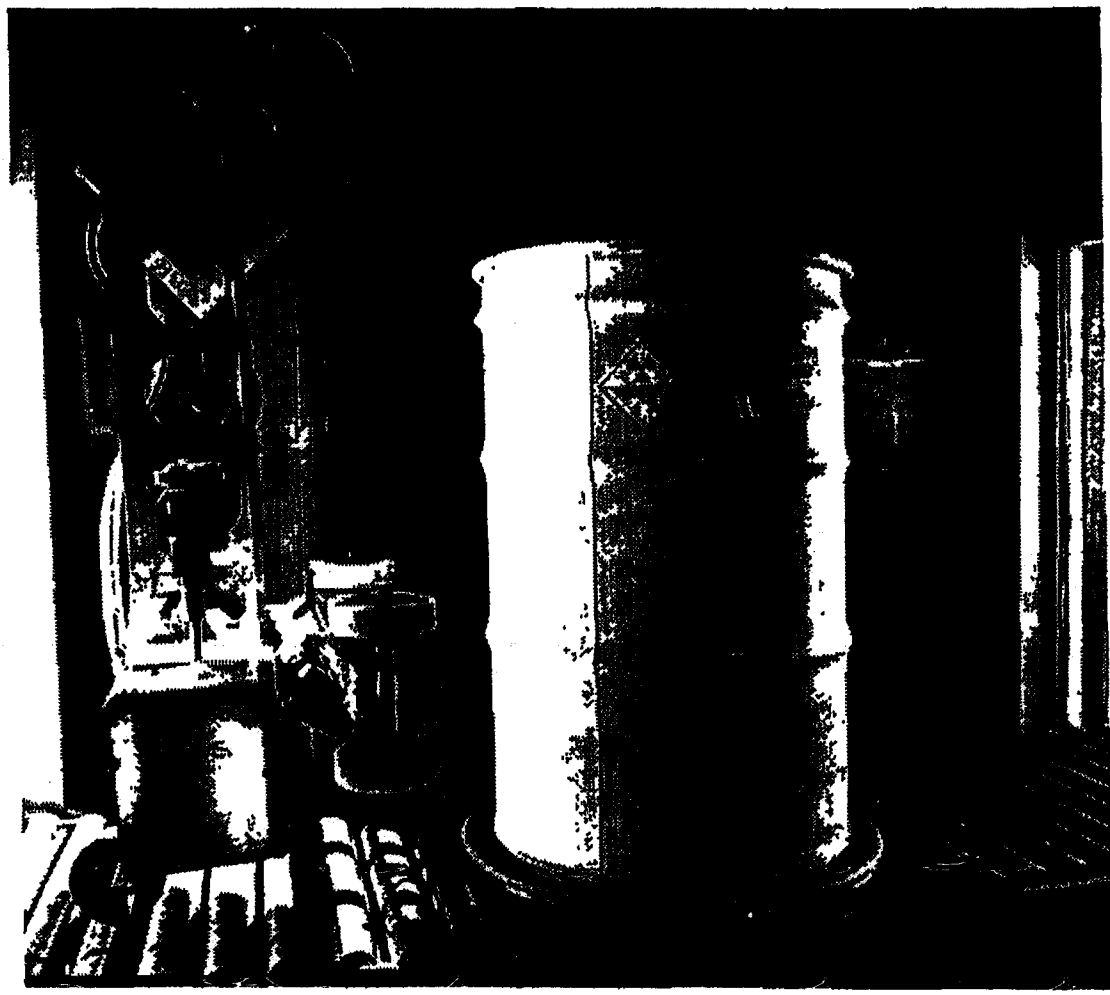
I believe that the information I submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting a false certification, including the possibility of a fine and imprisonment.

_____ _____

Generator Waste Certification Official (Print Name/Sign) Date

4.0

Waste Characterization



Waste Characterization 4.0

Generators ***must*** characterize waste destined for disposal at NTS.[6.9] When similar requirements are listed in separate regulations, the most stringent ***shall*** be met.[7.5] Waste is considered MW until the generator, through chemical analysis, process knowledge (PK), or a combination of both, demonstrates the LLW or TRU waste contains no hazardous waste as identified in 40 CFR, state-of-generation, and state of Nevada hazardous waste regulations (Nevada Administrative Code [NAC] 444) and that the waste meets the WAC. For waste characterized as MW, generators ***must*** demonstrate that the MW meets the applicable 40 CFR Land Disposal Restrictions (LDR) and WAC.[3.14] Generators ***shall*** characterize waste with sufficient accuracy to permit proper segregation, treatment, storage, and disposal.[6.9] The characterization methods and procedures employed by the generator ***shall*** ensure that the physical, chemical, and radiological characteristics of the waste are recorded and known during all stages of the waste management process.[6.9] Characterization methods should undergo a peer review by personnel with appropriate expertise.

Waste ***shall*** be characterized prior to waste profile submittal.[7.5] Generators ***must*** prepare and submit a Waste Profile (WP) for each waste stream (see Appendix B) which provides DOE/NV with a summary of waste characterization information.[6.15/6.20/7.5] Generators ***shall*** provide waste characterization documentation that supports the WP (see Appendix E for radiological requirements) to DOE/NV for review during facility evaluations or upon DOE/NV request.[6.9/6.20/7.5] Waste characterization documentation shall be traceable to the WP and disposal packages.[6.10/6.27/8.8b] Isotopic distributions and corresponding activity concentrations ***shall*** be traceable to the package.[6.10/6.27] Traceability to a parcel level shall be required if characterization is being conducted at that level (e.g., individual sealed sources, bags, or components characterized on an individual basis but packaged together).[6.9/6.15/7.5]

Waste characterization may be conducted using process knowledge (PK), sampling and analysis, or a combination of both. The following sections provide specific information and requirements for these characterizations methods.

Process Knowledge 4.1

Process Knowledge (PK) is a characterization technique that relies on the generator's knowledge of the physical, chemical, and radiological properties of the materials associated with the waste generation process(es), the fate of those materials during and subsequent to the process, and associated administrative controls.

PK sources include historic records, historic analytical data, system descriptions, plans and drawings, manufacturing specifications, mass balance documentation, literature searches, living memory, and procedures.

When PK consists of historic analytical data, generators ***must*** document the data limitations.[7.10] Historical data should be routinely verified through controlled analytical methods such as verification sampling and analysis; however, if the data can successfully undergo a full validation, this verification may not be necessary.

When PK relies on living memory, the individual's knowledge ***must*** be documented and signed by both the interviewer and the interviewee.[§ 17b] For telephone interviews, a statement outlining relevant information ***must*** by signed by the interviewer (and interviewee if possible).[§ 17b]

PK can be used for waste characterization in lieu of sampling and analysis if the generator's PK is of sufficient detail to qualify as acceptable. Acceptable PK is PK that is based on detailed information on the waste obtained from existing waste analysis data, studies on similar waste generating process(es), or detailed information relative to the properties of the waste that are known due to site-specific and/or process-specific factors.

Generators should conduct a documented evaluation of compiled PK against criteria. The generator should identify the following items in the evaluation: uncertainties, consistencies, limitations, and usefulness.

4.2 Sampling and Analysis

Generators ***shall*** obtain legally and scientifically defensible data that can be used to identify the physical, chemical, and radiological properties of the waste.[3,2/7.7] When waste streams are characterized by sampling and analysis, the process ***shall*** be controlled and documented.[6] Propagation of error throughout the sampling and analytical process ***shall*** be evaluated and considered when ascertaining usability of data for characterization of waste.[6]

Sampling and Analysis Data Quality Objectives (DQOs) should meet Environmental Protection Agency (EPA) guidelines (see the seven-step process in EPA QA/G-4, "Guidance for the Data Quality Objectives Process," September 1994). A supplementary document is available from RWAP upon request which contains sample laboratory audit plates and EPA-type forms.

Generators ***shall*** demonstrate that controls are in place to trace each sample number to a specific package number.[§ 8b] All sampling and analysis efforts, including verification and confirmatory sampling, should include screening analyses such as gamma spectroscopy, gross beta, and gross alpha.

DOE/NV may evaluate sampling and analysis documentation to ensure that 1) samples will be representative of the waste inventory, 2) appropriate analytical procedures are used, and 3) sufficient quality controls have been established to allow measurement and documentation of data quality.

4.2.1 Data Validation

Data validation is a comprehensive analysis and review of analytical data, conducted against a set of predetermined criteria and leading to the assignment of relative useability (i.e., completely usable, estimated value, unusable) for each analytical result. The validation criteria should be developed using the DQO process and depend upon the type(s) of data involved and the purpose for which the data are collected. Data should be validated by technically qualified personnel who are independent of those performing the analyses.

A portion of all data, historical or current, should be validated prior to use of the data for characterization purposes. Validation reports should cite the guidelines or procedures used to validate the data.

The complete validation report should be available to DOE/NV, if requested. Validation reports should include:

4.2.1.1 Review and evaluation of the adequacy of the analytical methods used (taking into consideration expected contaminants, nuclide inventory, expected activity, decay mode, radiation energy, and any other relevant parameters).

4.2.1.2 An evaluation as to whether the requirements of the Scope/Statement of Work (SOW) have been met (i.e., required detection limits, 90 percent confidence, acceptable error, standards for precision and accuracy).

4.2.1.3 A data confidence statement and a determination of useability including an evaluation as to whether the DQOs have been met. DQOs and the other criteria are generally presented in the SOW, applicable procedures, and/or the SAP.

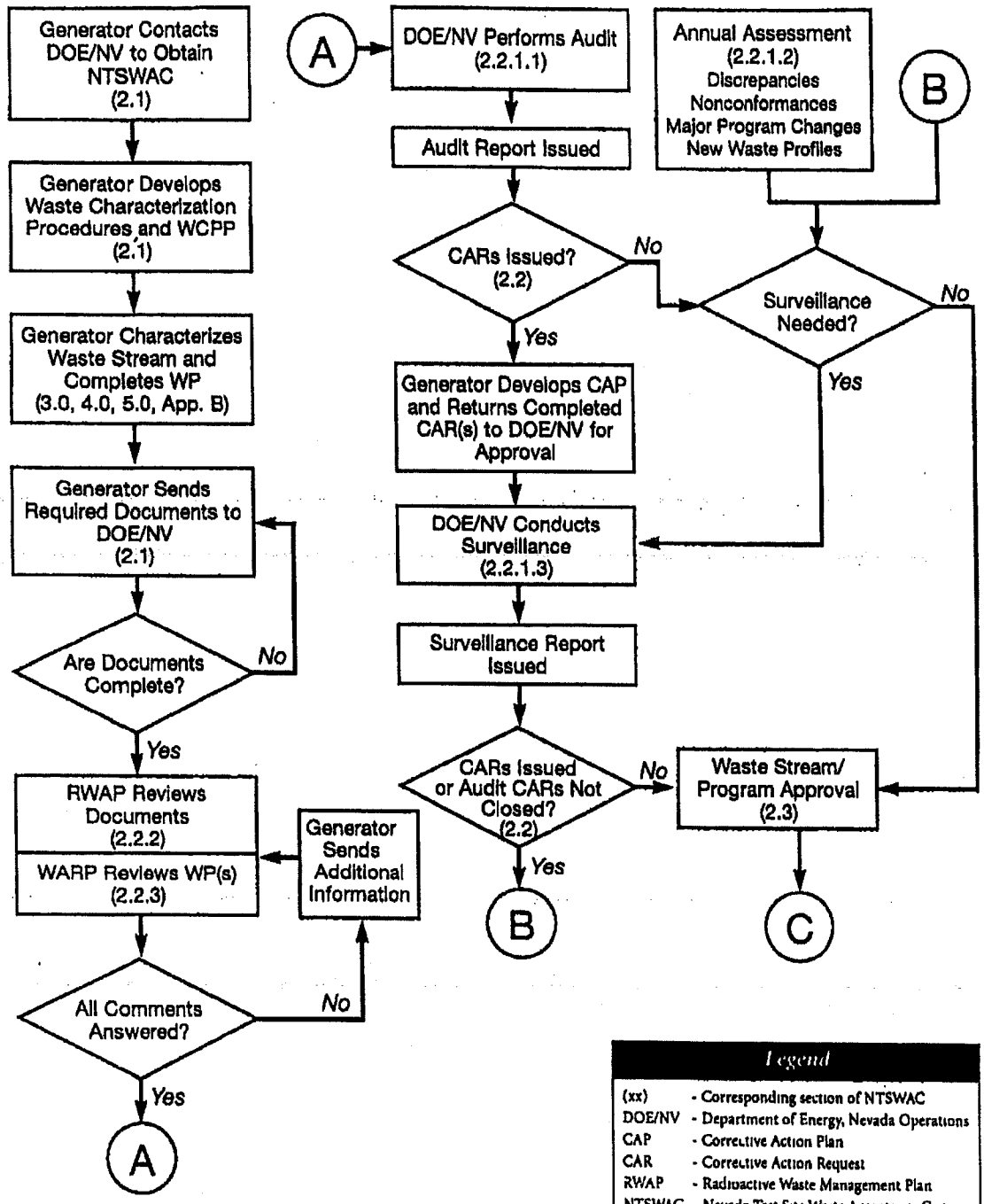
Appendix A

Waste Generator Approval Process Flow Diagram

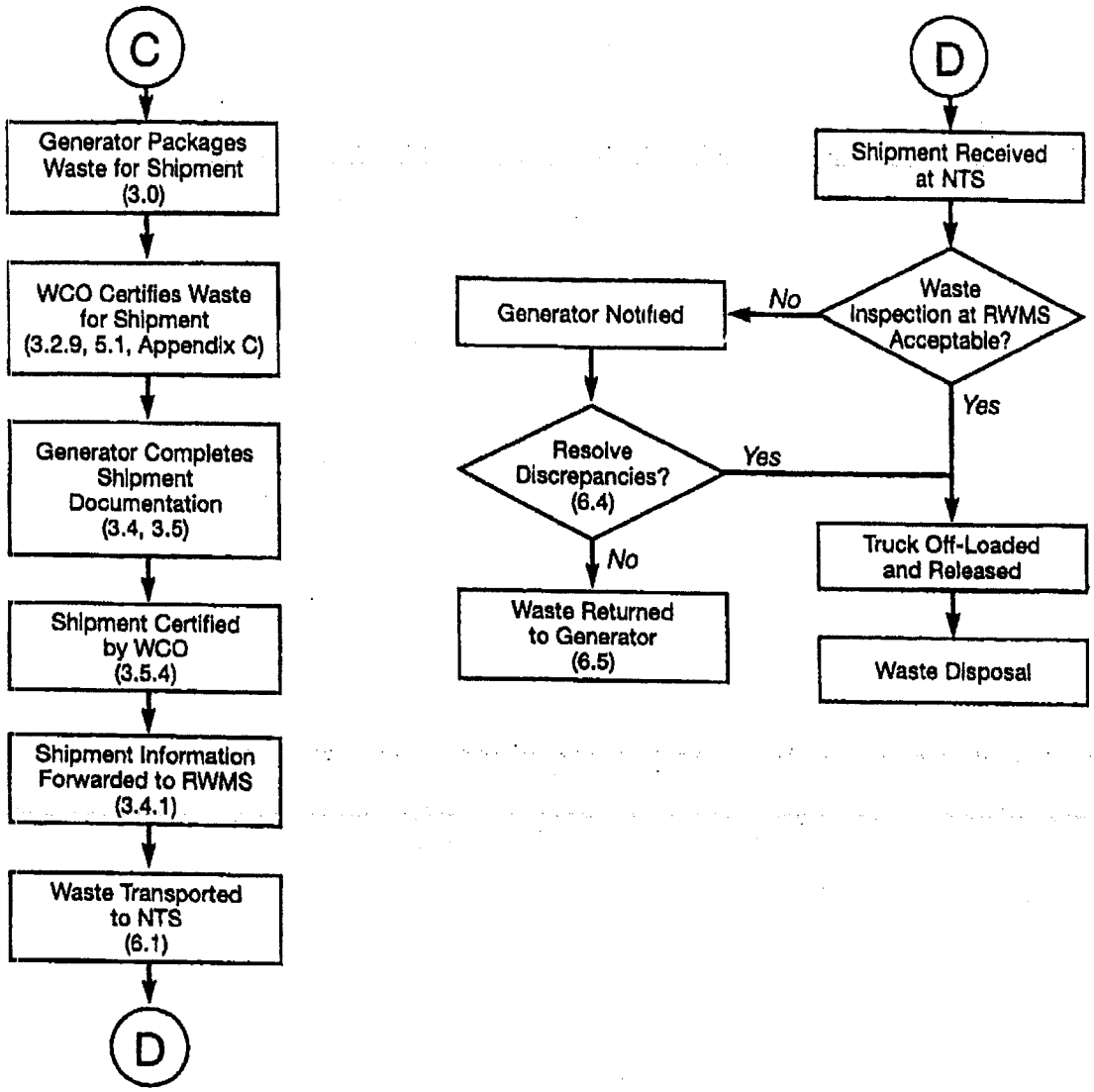
Waste Generator Approval Process Flow Diagram

A

The following diagram identifies key process steps. Operations and logistics may influence the order in which these activities are conducted. A Site Visit (Section 2.6) may be requested by the generator at any time during the process.



Legend	
(xx)	- Corresponding section of NTSWAC
DOE/NV	- Department of Energy, Nevada Operations
CAP	- Corrective Action Plan
CAR	- Corrective Action Request
RWAP	- Radioactive Waste Management Plan
NTSWAC	- Nevada Test Site Waste Acceptance Criteria
WCPP	- Waste Certification Program Plan
WARP	- Waste Acceptance Review Panel
WP	- Waste Profile



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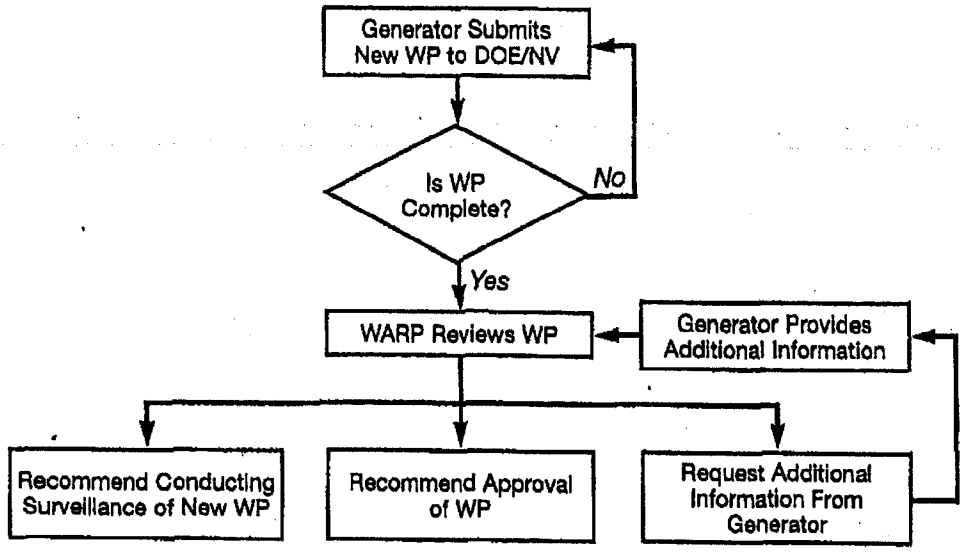
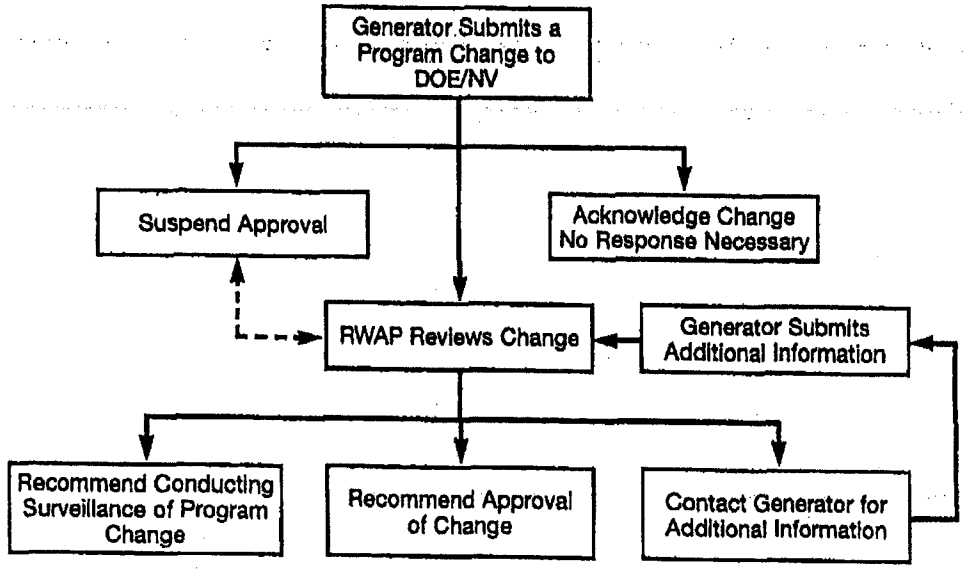
WARP	- Waste Acceptance Review Panel
WP	- Waste Profile

Section 2.2.2 Waste Profile



Section 2.2.3 Document and Personnel Changes



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WCPP	- Waste Certification Program Plan
WARP	- Waste Acceptance Review Panel
WP	- Waste Profile

Appendix F

Glossary

Glossary

F

Certified Waste: Waste that has been confirmed to comply with disposal site WAC under an approved certification program.

Chelating Agents: Amine polycarboxylic acids (e.g., EDTA, DPTA), hydroxy-carboxylic acids, and polycarboxylic acids (e.g., citric acid, carbolic acid, and gluconic acid).

Corrective Action: Measures taken to rectify conditions adverse to quality and, where necessary, to preclude repetition.

Disposal: The emplacement of LLW or MW in a manner which is considered permanent in that routine recovery is not provided for.

Facility Evaluation: A documented review to evaluate a generator's program to be in compliance with the waste acceptance criteria. Facility evaluations are conducted by RWAP personnel in the form of an audit, surveillance, annual assessment, or a combination of these.

Free Liquid: Liquids which readily separate from the solid portion of the waste including liquid that has been released during handling, storage, or transportation.

Generator: An individual, facility, corporation, government agency, or other institution that offers waste material for certification, treatment, storage, or disposal.

Hazardous Waste Component: Waste identified or listed in Title 40 CFR 261, or that otherwise meets the RCRA definition of hazardous, or waste identified by applicable state-of-generation hazardous waste regulations.

Incompatible Waste: Waste type that might react adversely with its containment materials or commingled waste as defined in Title 40 CFR 260.10.

Item: An all-inclusive term used in place of any of the following: assembly, component, equipment, material, part, structure, or system. The term "item" may also include technical data, documents, computer codes, or samples.

Land Disposal Restricted Waste: Waste that is prohibited from land disposal in accordance with Title 40 CFR 268.

Low-Level Waste: Radioactive waste not classified as high-level waste, spent nuclear fuel, TRU waste, uranium mill tailings, MW or 11e(2) by-product material as defined in DOE Order 5820.2A. Test specimens of fissionable material irradiated for research and development only, and not for the production of power or plutonium, may be classified as LLW, provided the concentrations of TRU is less that 100 nCi/g.

Mixed Waste: Waste containing both radioactive and hazardous components as defined by the Atomic Energy Act and the RCRA. MW must meet the LDRs as listed in Title 40 CFR 268.

Nonconformance: A deficiency in characteristic, documentation, or procedure that renders the quality of an item or activity unacceptable or indeterminate.

Package: The packaging together with its contents; a container (usually a drum or box) of waste in final form for disposal, one or more of which may constitute a shipment.

Packaging: The assembly of components necessary to ensure compliance with DOT, EPA, and DOE/NV requirements. It may consist of one or more receptacles, absorbent materials, radiation shielding, spacing structures, thermal insulation, and devices for cooling or absorbing mechanical shocks. The conveyance, tie-down system, and auxiliary equipment may sometimes be designated as part of the packaging.

Parcel: An individual component, item, or bag of waste, two or more of which may make up a package.

Pyrophoric Material: A material which under normal conditions is liable to cause fires through friction, retain heat from processing, or which can be ignited readily and, when ignited, burns so vigorously and persistently as to create serious transportation, handling, or disposal hazards.

Qualification: The characteristics or abilities gained through education, training, or experience, as measured against established requirements, such as standards or tests, that qualify an individual to perform a required function.

Qualified: Having complied with the specific requirements or precedent conditions.

Quality Assurance: All those planned and systematic actions necessary to provide adequate confidence that a structure, system, or component will perform satisfactorily in service.

Radioactive Waste: Solid, liquid, or gaseous material that contains radioactive nuclides regulated under the Atomic Energy Act of 1954, as amended.

Radioactive Waste Management Site: Designated locations where radioactive waste handling, storage, or disposal operations are conducted.

Real-Time Radiography (RTR): X-ray unit used to examine waste packages.

Removable Contamination: Removable radioactive material on the package surface or shipping vehicle.

Stabilization and Solidification: A technique that limits the solubility and mobility of waste constituents. Solidification immobilizes a waste through physical means and stabilization immobilizes the waste by bonding or chemically reacting with the stabilizing material.

Supplier: Any individual or organization who furnishes items or services in accordance with a procurement document. An all-inclusive term used in place of any of the following: vendor, seller, contractor, subcontractor, fabricator, consultant, and their subtier levels.

Tamper-Indicating Devices: Devices that may be used on containers and that, because of their uniqueness in design or structure, reveal violations of containment integrity.

Transuranic Mixed Waste: Waste containing both TRU and hazardous components.

Transuranic Waste: Radioactive waste containing alpha-emitting radionuclides having an atomic number greater than 92, and half-lives greater than 20 years, in concentrations greater than 100 nCi/g.

Treatment: Any method, technique, or process designed to change the physical or chemical character of waste to render it less hazardous; safer to transport, store, or dispose; or reduce in volume. Five basic treatments are (a) volume reduction, (b) immobilization of radioactive/hazardous components, (c) change of composition, (d) removal of radioactive or hazardous components from the waste, and (e) solidification of liquids.

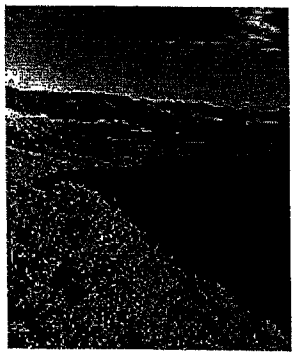
Uniform Hazardous Waste Manifest: The shipping document EPA Form 8700-22 originated and signed by the generator in accordance with the instructions included in the Appendix to Title 40 CFR 262.

Verification Sampling: A DOE/NV program which confirms the accuracy and precision of a generator's analytical data by obtaining split samples of the waste from the generator, and having them analyzed.

Waste Characterization: Determination of the physical, chemical, or radiological properties of waste.

Waste Stream: A waste or group of wastes from a process or a facility with similar physical, chemical, and radiological properties.

Nevada Test Site



A unique national resource, the Nevada Test Site is a massive outdoor laboratory and national experimental center that cannot be duplicated. Larger than the state of Rhode Island, it is 1,350-square-miles, making this one of the largest secured areas in the United States. The remote site is surrounded by thousands of additional acres of land withdrawn from the public domain for use as a protected wildlife range and for a military gunnery range, creating an unpopulated land area comprising some 5,470 square miles.

Established as the Atomic Energy Commission's on-continent proving ground, the Nevada Test Site has seen more than four decades of nuclear weapons testing. Since the nuclear weapons testing moratorium in 1992 and under the direction of the Department of Energy (DOE), test site use has diversified into many other programs such as hazardous chemical spill testing, emergency response training, conventional weapons testing, and waste management and environmental technology studies.

- More About the Nevada Test Site
- Facilities, Laboratories, and Locations
- Nevada Test Site Tours
- Infrastructure
- Nevada Test Site Historical Foundation
- Resource Management Plan
- National Environmental Research Park

Last Updated February 15, 2000
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Environmental Management

DOE's Environment Management National Programs and Centers of Excellence

- National Environmental Training Office - coordinates and delivers uniform, high-quality environmental management training, education, and professional development to Department of Energy employees
- Risk Management - provides technical expertise and support to help field offices implement Department of Energy environmental management risk initiatives
- Low-level and Mixed Low-Level Waste - committed to helping the public understand low-level and mixed low-level waste management issues and providing Department of Energy and industry with solutions to their challenges
- National Transportation Program - coordinates transportation activities for all non-classified shipments of hazardous materials, including radioactive, mixed wastes, and other commodities such as coal, other fuels, maintenance materials, supplies, etc.

Accelerating Cleanup: Paths to Closure

- Draft Cleanup Strategy Released for Public Comment
  Significant Step Forward in Implementing Cleanup of Nuclear Waste Sites - Press Release
- Accelerating Cleanup: Paths to Closure - Document

  This document is the U.S. Department of Energy, Environmental Management Program's strategy for site cleanup. It is a project-by-project projection of the technical scope, cost, and schedule required to complete all 353 projects at DOE's remaining cleanup sites in the United States.

Radioactive Waste Acceptance Program (RWAP)

- RWAP Mission Statement
- RWAP Contacts and Expertise
- Facility Evaluation Schedules
- Approved Generators (Waste Streams/Profiles)
- Generator Point of Contact List, dated December 28, 1999 (PDF, 17KB)
- Nevada Test Site Waste Acceptance Criteria (NTSWAC)
- Overview of the Nevada Test Site Waste Generator Approval Process (PDF,

27KB)
- Position Paper on the Proper Characterization and Disposal of Sealed Radioactive Sources (PDF, 66KB)
- Position Paper for High Moisture Content Waste, dated November 3, 1998 (PDF, 24KB)
- Position on the Use of Lead Shielding for Disposal of Low-Level Radioactive Waste at the Nevada Test Site (PDF, 5KB)

Site Technologies Coordination Group (STCG)

- Summary
- Implementation Plan
- Charter
- Technology Needs
- Minutes of Meetings
- Team Members (PDF, 42KB)
- Site Technology Deployment Plan (PDF, 147KB)

Last Updated March 21, 2000
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Nevada Test Site Waste Acceptance Criteria (NTSWAC)

Revision 2 - May 1999

This document provides the requirements, terms, and conditions under which the Nevada Test Site will accept low-level radioactive and mixed waste for disposal; and transuranic and transuranic mixed waste for interim storage at the Nevada Test Site.

Last Updated February 22, 2000
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APPENDIX 3.6-5

ORNL Information

MAXIM
TECHNOLOGIES INC

Interoffice Memorandum

To: TML, NFSS Project File

From: Bob Bessent (Maxim)

Date: 4/11/00

Job No.: 9905006/170 - DOE Landfill Survey Project

Subject: Call to ORNL Waste Management Group; 423-574-1365

Called the ORNL Waste Management General Group phone number on 4/6/00 to talk with someone regarding the laboratory policy of accepting FUSRAP wastes/residue for disposal. No one was at the general number so I left a message asking someone to call me back.

On 4/10/00, Mr. Martin Toll called me back from the Laboratory Waste Services Group. Mr. Toll indicated that the ORNL does not really have what is considered a TSDF; what space is available for waste disposal is limited to on-site LLW disposal.

Mr. Toll also indicated that DOE no longer administers its on-site waste disposal activities. Instead, ir is contracted with Bechtel/Jacobs Corporation which is presently the EM contractor for this particular site. Mr. Toll indicated that we should call Mr. Mike West to get further insight into this facility with respect to waste handling.

Please see me if you have any questions or comments regarding this memo.

File: C: nfss4.11f

MAXIM
TECHNOLOGIES INC

Interoffice Memorandum

To: TML, NFSS Project File

From: Bob Bessent (Maxim)

Date: 4/11/00

Job No.: 9905006/170 - DOE Landfill Survey Project

Subject: Call to Mr. Mike West of the BJC(ORNL); 423-576-1733

Called BJC phone number on 4/10/00 to talk with someone regarding the ORNL policy of accepting FUSRAP wastes/residue for disposal. No one was at the general number so I left a message asking someone to call me back. Will call back Wednesday if I do not hear from Mr. West.

Please see me if you have any questions or comments regarding this memo.

File: C: nfss4.11g

MAXIM
TECHNOLOGIES INC

Interoffice Memorandum

To: TML, NFSS Project File

From: Bob Bessent (Maxim)

Date: 4/17/00

Job No.: 9905006/170 - DOE Landfill Survey Project

Subject: Call To Mr. Mike West ; Legacy Waste (BJC/ORNL) ; Waste Disposal Contractor for the DOE @ the Oak Ridge Site @ 423-576-1733

On Friday AM (4/14/00), I called Mr.West to see if he could provide me with some insight into the disposal of LLW at the Oak Ridge National Laboratory. Mr. West was not in when I called him so I left a message for him to call me if possible. This was about the 3rd call to Mr. West regarding the K-65 residues.

As previously indicated, an ORNL representative did imply that the DOE was not accepting any off-site generator waste at OENL but they had turned over site waste disposal over to a contractor (Bechtel Jacobs aka . Legacy Waste) and they were not sure if that was still the policy. I guess I will have to wait to get a confirmation.

In conclusion, if no one calls me back, it is probably a safe bet that the facility does not accept any off-site wastes. In addition, this facility is not included in the list of DOE regional disposal facilities identified in the ROD/EIS. In fact, the person I talked with initially regarding this issue did not think that the facility accepted any FUSRAP wastes.

Please see me if you have any questions or comments regarding this memo.

File: C: nfss4.17c

17 landfill cells (pits and trenches), 13 Greater Confinement Disposal Units boreholes, and a Transuranic Waste Storage Pad. Three pits are currently in operation in Area 5, one for disposal of MLLW and two for disposal of LLW. Three trenches in Area 5 are operational and designated to receive classified LLW: Trench T07C, Trench T08C, and Trench T09C. Trenches T03U and T04C have been closed.

The Mixed Waste Disposal Unit (currently designed to consist of 10 cells) is a landfill proposed for location on about 18 ha (45 acres) of the Area 5 Radioactive Waste Management Site, immediately north of the developed Radioactive Waste Management Site landfill area. The design has been completed, the unit is included in the Resource Conservation and Recovery Act permit application, and the environmental assessment is being updated.

A.5.3.2 Disposal Capacity

The total remaining capacity for LLW in the Area 5 Radioactive Waste Management Site is estimated to be 1,200,000 m^3.

A.5.4 References

"Nevada Field Office Annual Site Environmental Report-1991" (DOE/NV/10630-33), September 1992, U.S. Department of Energy.

Carol Shelton, Nevada Operations Office.

"Site Book for Waste Management," May 1994, Reynolds Electrical and Engineering Co., Inc.

Personal communication with Carlos Gonzales, Reynolds Electrical & Engineering Company, Inc., regarding correspondence to Jou Hwang, The Cadmus Group, Inc., Maryland, "Existing and Planned Low-Level Waste (LLW) Facility Tables for the 1995 Integrated Data Base (IDB)," dated September 7, 1995.

A.6 Oak Ridge Reservation

A.6.1 Background

Location: The Oak Ridge Reservation is located in a valley between the Cumberland and southern Appalachian Mountain ranges in eastern Tennessee about 10 km west of Knoxville. Oak Ridge Reservation covers an area of 35,252 acres and contains three major facilities: Oak Ridge National Laboratory, Oak Ridge K-25 Site, and Oak Ridge Y-12 Plant.

Historical Activities: Oak Ridge Reservation is located in the west end of Bethel Valley and was originally constructed as a research and development facility to support plutonium production and research. Today, the facility conducts research on the fission nuclear fuel cycle and nuclear fusion.

Oak Ridge National Laboratory is the only facility of the three at Oak Ridge Reservation which operates a disposal site for LLW, Solid Waste Storage Area 6.

A.6.2 Facility Description

Status: Located in the southwest region of Oak Ridge Reservation, the 28-ha (68-acre) Solid Waste Storage Area 6 has been used by Oak Ridge National Laboratory since 1969 for the disposal of on-site generated LLW. Until 1986 all LLW generated at Oak Ridge National Laboratory (including MLLW) was disposed of by shallow land burial, generally in unlined trenches and auger holes. This practice came under closer scrutiny by Federal and State regulators and Department of Energy officials, and as a result in 1986, major changes in the operation of Solid Waste Storage Area 6 were initiated. Because of the disposal practices conducted before

1986, some areas in Solid Waste Storage Area 6 were remediated under a Resource Conservation and Recovery Act interim status closure agreement with the Tennessee Department of Environment and Conservation. The remediation activities were coordinated with ongoing Greater Confinement Disposal units waste operations. Remediation of Solid Waste Storage Area 6 will occur under the Comprehensive Environmental Response, Compensation, and Liability Act.

Waste Materials: Solid Waste Storage Area 6 does not accept any mixed waste for disposal. A new radioactive solid waste disposal facility, the Interim Waste Management Facility, was also constructed during this period for interim solid LLW disposal until long-term facilities become available. Solid Waste Storage Area 6 is also the currently active disposal site for fission-product LLW in Greater Confinement Disposal units and for suspect waste in shallow land burial units.

General Design Features: Below-grade disposal methods used at Solid Waste Storage Area 6 include concrete silos, wells in concrete silos, pipe-lined auger hole wells, unlined trenches, and landfills. Oak Ridge National Laboratory began phasing out some of the below-grade disposal operations in December 1992 at a Tennessee Department of Environment and Conservation request because of concerns about shallow land disposal in the trenches and landfill and concerns that the wells would not meet the long-term performance objectives of Department of Energy Order 5820.2A. The wells in concrete silos and the pipe-lined auger hole wells are still used for retrievable storage of very high range remote-handled LLW. The landfill was also closed in 1992 for disposal of very low activity waste. The unlined trenches were phased out for animal wastes in 1992 and for other biological wastes in early 1993.

The Interim Waste Management Facility is the only active above-grade tumulus disposal facility in Solid Waste Storage Area 6, occupying an area of approximately 3.8 ha (9.5 acres) in the southwest portion of Solid Waste Storage Area 6. The Interim Waste Management Facility began operation in December 1991 and will provide interim disposal for contact-handled LLW. The original facility was designed for six tumulus pads. Each tumulus pad is approximately 18.2 m x 27.4 m (60 ft x 90 ft) and 30.5 cm (12 in) thick, constructed using high-density concrete and reinforced with epoxy-coated steel. The pad has concrete curbs 0.30 m (1 ft) high on the north, south, and west sides. The east side is used for vehicle access. Each pad provides disposal for approximately 330 vaults (approximately 897 m^3) stacked three high. The Interim Waste Management Facility is designed to divert water into three sumps, located in a monitoring station adjacent to the tumulus pads. The monitoring station is equipped for receiving, monitoring, and collecting samples from flows received from the storm water, underpad, and infiltration drain systems. The underpad sump is designed to allow monitoring of any groundwater that may accumulate under the pads. The storm water sump collects water from the pad that is in operation. The infiltration sump is used to collect water from the pads that have been filled with vaults. A principal feature of tumulus disposal is the inherent capability for monitoring groundwater and surface water for contamination. The sealed concrete pad is the primary barrier from the groundwater. The pad is sloped 1 percent to one side where a curb and gutter collects all surface pad runoff and drains the water to a monitoring station. A liner below the pad provides a secondary barrier from the groundwater and collects any water that may have penetrated the pad, which is then also diverted to the monitoring station.

Other auxiliary facilities at the Interim Waste Management Facility include the following: the Waste Classification and Certification Facility; Class L-III/L-IV Above Ground Storage (for long-term storage and monitoring requirements for Class L-III/L-IV solid LLW); and the Bulk Contaminated Soil Facility.

A.6.3 Disposal Capacity

The remaining disposal capacity of the Interim Waste Management Facility pads is 6,700 m^3.

A.6.4 References

"Performance Assessment for Continuing and Future Operations at Solid Waste Storage Area 6" (ORNL-6783), February 1994, Martin Marietta Energy Systems, Inc., Oak Ridge, Tennessee.

"Environmental Analysis of the Operations of Oak Ridge National Laboratory (X-10 Site)" (ORNL-5870), November 1982, Union Carbide Corp.

A. L. Rivera, Lockheed Martin Energy Systems, Inc., Tennessee, correspondence to S. N. Storch, IDB Program, ORNL, Oak Ridge, Tennessee, "Low-Level Waste (LLW) Management Data Call for 1995," dated July 31, 1995.

A.7 Rocky Flats Environmental Technology Site

The Rocky Flats Environmental Technology Site waste management complex is being planned to provide for on-site disposal capacity. The waste management complex comprises a sanitary waste disposal cell and a Resource Conservation and Recovery Act waste cell for LLW and MLLW generated through remediation activities with a capacity of approximately 77,000 m^3. Rocky Flats Environmental Technology Site is also evaluating whether to site a Resource Conservation and Recovery Act-permitted MLLW disposal cell at this facility (capacity approximately 77,000 m^3).

A.7.1 Background

Location: Located about 16 miles northwest of Denver in Jefferson County, CO, Rocky Flats Environmental Technology Site covers 11 square miles, including a buffer zone, and consists of production facilities, laboratories, and storage areas.

Historical Activities: From 1952 to 1989, Rocky Flats Environmental Technology Site's primary mission was the production of nuclear weapon components. Activities included metalworking, component assembly, and plutonium recovery and purification. Starting in 1989, manufacturing activities were reduced, and in 1992, production of nuclear components ceased altogether. The plant's mission shifted to environmental restoration.

A.7.2 Facility Description

Status: The Conceptual Design Report was completed in 1995; this document can be considered the transition from the Record of Decision to the final design stage. This document lays out assumptions, design criteria, data gaps, etc. for remediating the site (as well as the proposed land disposal facility for treated wastes). The Corrective Action Management Unit will be regulated under the Resource Conservation and Recovery Act. This facility will manage all environmental restoration LLW and MLLW requiring disposal.

Waste Materials: Buildings, surface water, groundwater, and soil at Rocky Flats Environmental Technology Site are contaminated with chemical and radioactive materials, such as plutonium, uranium, and americium. Volatile organic compounds, including cleaning solvents, are the most prevalent contaminants in surface water and groundwater. Most of the contaminated soil occurs near the 903 Pad temporary storage area. This soil contains plutonium particles that have escaped from steel storage drums.

General Design Features: The objective of the Waste Management Facility is to limit the migration of contaminants and remain stable for at least 1,000 years. To meet this objective the following features are included:

- a 20-foot-thick barrier of soil maintained between cell and uppermost aquifer;
- a basal liner composed of multiple layers of clay, gravel, and geosynthetic liner that direct any liquids into the leachate collection system;
- a leachate collection system;
- a passive gas venting system; and
- a multicomponent cover with components to limit radon emissions (2 feet of compacted clay), infiltration (geomembrane), and biointrusion (cobblestones), as well as to facilitate drainage (soil and gravel). The

ATTACHMENT 3.6-6

SRS Information

MAXIM
TECHNOLOGIES INC

Interoffice Memorandum

To: TML, NFSS Project File

From: Bob Bessent (Maxim)

Date: 4/11/00

Job No.: 9905006/170 - DOE Landfill Survey Project

Subject: Call to SRS Waste Management Group (4/6/00); Mr. Bill Noll; 803-725-2219

Called SRS Waste Management Group and specifically called for Mr. Bill Noll (I got his name off of an organizational chart). Mr. Noll was called regarding the SRS policy of accepting FUSRAP wastes/residue for disposal. No one was at the number called so I left a message asking someone to call me back. Will call back Wednesday if I do not hear from Mr. Noll.

Please see me if you have any questions or comments regarding this memo.

File: C: nfss4.11i

MAXIM
TECHNOLOGIES INC

Interoffice Memorandum

To: TML, NFSS Project File

From: Bob Bessent (Maxim)

Date: 4/11/00

Job No.: 9905006/170 - DOE Landfill Survey Project

Subject: Call to SRS Waste Management Group (4/10/00); Mr. Bill Noll; 803-725-2219

Mr. Bill Noll called me back in response to my phone call from 4/6/00. He indicated that the SRS is limited by the State of SC in its acceptance of FUSRAP wastes/residue for disposal. Bottom line is that they can't accept this waste. They can accept some off-site waste as directed by the DOE such as Navel waste and some power plant waste. Primarily, they use their capacity disposing of on-site generated wastes.

At the conclusion of our conversation, I asked Mr. Noll if he was aware of a DOE policy which prohibits disposal of FUSRAP waste in DOE disposal facilities. He did not no of a specific policy, but suggested that we call Mr. Jay Rhoderick of DOE Headquarters (301-903-7211). Mr. Rhoderick apparently wrote the recent "Policy on LLW Disposal" for the DOE. I will call him on Wednesday 4/12/00.

Please see me if you have any questions or comments regarding this memo.

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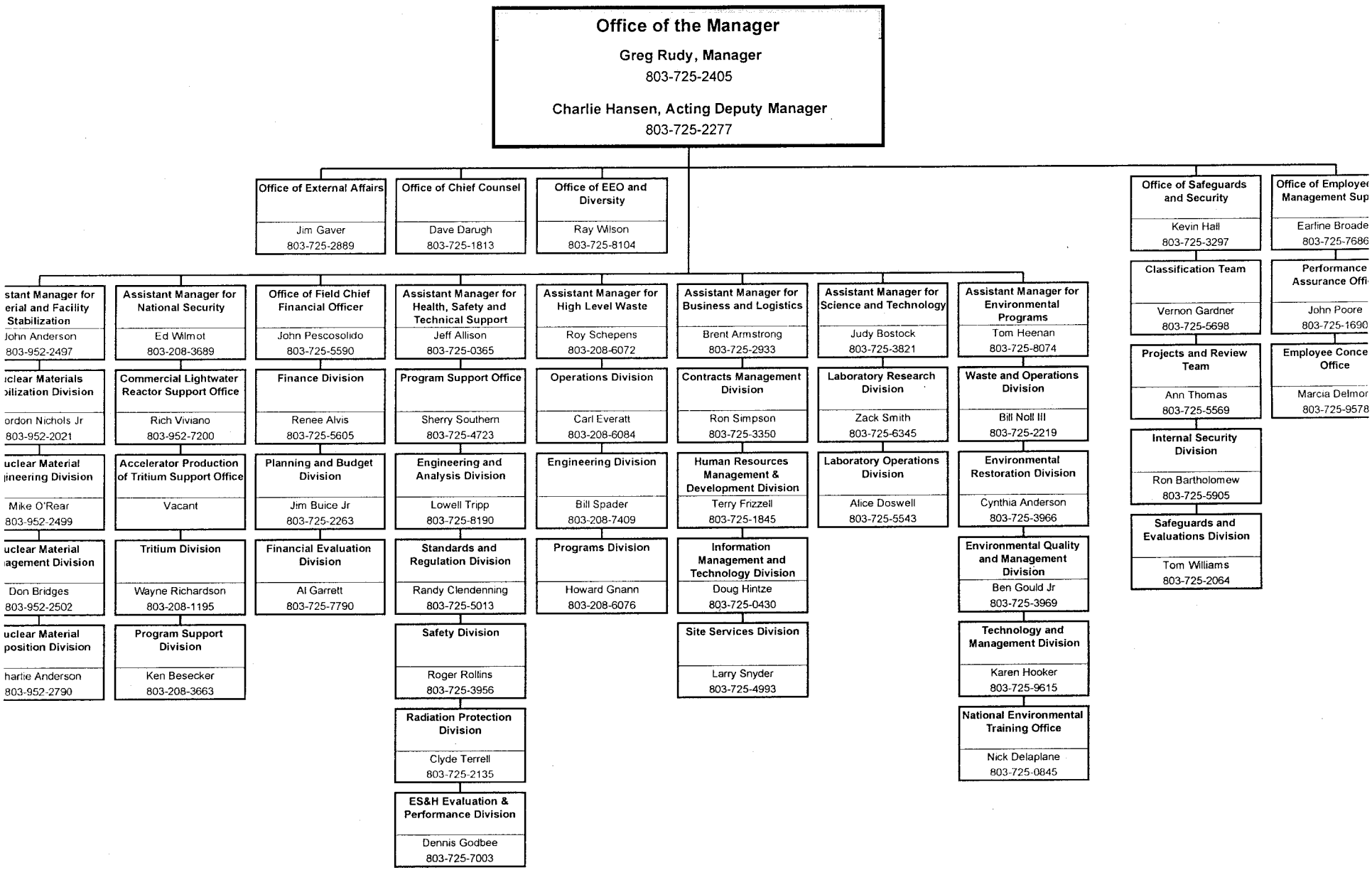
SAVANNAH RIVER OPERATIONS OFFICE



vegetated surface of the cell can deter long-term erosion and inhibit water infiltration.

The disposal cell is also designed to allow recovery of waste if necessary. Careful mapping and documentation of disposed waste will facilitate any recovery actions. A controlled survey point will be installed for grid-block mapping. The cell area is approximately 120 ft x 50 ft; the basal liner is approximately 6 ft thick; the cover is approximately 10 ft thick.

A.7.3 Disposal Capacity

Physical Capacity: Only Rocky Flats Environmental Technology Site waste will be disposed of in this cell. The disposal cell will have a capacity for 77,000 m^3 comprised of the following: investigation derived materials in drums; LLW/MLLW in boxes, drums, or other containers; and bulk remediation wastes, e.g., soils and demolition debris.

A.7.4 References

"Conceptual Design Report: Waste Management Facility for Rocky Flats Environmental Technology Site, Golden, Colorado," August 1995, U.S. Department of Energy, Rocky Flats Field Office.

A.8 Savannah River Site

A.8.1 Site Description

Location: Savannah River Site is located in south-central South Carolina and occupies an area of approximately 300 mi^2 (192,000 acres). Ranging from 25 m to 130 m above mean sea level, the site's major geophysical feature is the Savannah River, which forms the area's southwestern boundary.

Historical Activities: The U.S. government began constructing Savannah River Site in 1950. The facility's missions are site remediation and safe processing of nuclear materials. Westinghouse Savannah River Co. currently operates the E-Area Vaults. In 1987, the Department directed new disposal facilities constructed in humid climates to be "decoupled from the groundwater table." To comply with this directive, a project to build disposal vaults, called the E-Area Vaults, was initiated.

A.8.2 E-Area Vaults

A.8.2.1 Facility Description

Status: E-Area occupies a 78.9-ha (195-acre) area, approximately 10 km (6 miles) from the nearest plant boundary. All radioactive solid waste produced at Savannah River Site, as well as offsite Department of Energy shipments, are disposed in one centrally located site. The original 31-ha area began to receive waste in 1953 and was filled in 1972, when operations were shifted to a contiguous 48.1-ha site. In 1986, part of the site was closed and designated as a mixed waste facility because it contains hazardous material. Because these older facilities are filled, disposal is now shifted to the 40.5-ha (100-acre) E-Area Vaults to the north.

Waste Materials: LLW handled at E-Area Vaults is segregated into three categories: Low Activity Waste, Intermediate Activity Waste, and Tritiated Waste. Waste material that radiates þ200 mR/hr at 5 cm from an unshielded container is designated as Low Activity Waste. Intermediate Activity Waste is defined as LLW that produces a radiation dose rate þ200 mR/hr at 5 cm from an unshielded container. Tritiated waste is waste material that contains greater than trace quantities of tritium (trace quantity is defined as þ10 Ci of H^3 per waste container) regardless of the radiation rate. Low Activity Waste containing only trace quantities of H^3 is disposed in the Low Activity Waste Vault. All wastes containing greater than trace quantities of H^3 are disposed in the Intermediate Level Tritium Vaults. Intermediate Activity Waste containing only trace quantities

of H^3 is disposed in the Intermediate Level Non-Tritium Vaults. Currently, one Low Activity Waste Vault and one Intermediate Level Vault have been constructed: one more of each is planned to be operational by the end of 2005. Eventually, 18 Low Activity Waste Vaults and eight Intermediate Level Vaults will be constructed contingent upon funding and Department of Energy approval.

General Design Features: Each Low Activity Waste Vault is 643 ft long by 145 ft wide by 27 ft tall. Two vaults each have approximately 32,000 m^3 of disposal capacity and 19 vaults each have approximately 48,000 m^3 of disposal capacity. Each Intermediate Level Non-Tritium Vault is 189 ft long by 48 ft wide by 29 ft tall with approximately 5,700 m^3 of disposal capacity for each of the 10 vaults. The tritium vaults are structurally identical to the Intermediate Level Non-Tritium Vault except for the length, which is only 57 ft. The tritium vaults have a disposal capacity of 1,613 m^3 for each of the 10 vaults.

A.8.2.2 Disposal Capacity

E-Area Vaults have current and planned capacity of approximately 1,100,000 m^3 of LLW.

A.8.3 References

"Location Standards Demonstration, Hazardous Waste/Mixed Waste Disposal Vaults, Rev. 0," September 30, 1993.

Nathaniel S. Roddy, Westinghouse Savannah River Company, South Carolina, correspondence to Steven Storch, IDB Program, ORNL, Oak Ridge, Tennessee, "Low-Level Waste (LLW) Management Data Call for 1995," SWE-SWE-95-0357, dated July 31, 1995.

"Radiological Performance Assessment for the E-Area Vaults Disposal Facility," Westinghouse Savannah River Company.

"RCRA Part B, Volume IX, Hazardous Waste/Mixed Waste Disposal Vaults" (WSRC-IM-91-53), September 30, 1993.

Table of Contents

EM HOME | DOE HOME | SEARCH | WEBSITE OUTLINE
FEEDBACK | INTERACTIVE MAP | WHAT'S NEW
PRIVACY AND SECURITY NOTICE

About This Document
Last Updated 01/27/1997 (mes)

Return to: Fact Sheet Menu
Return to: Main Menu

Solid Low-Level Waste Management

Typically, low-level waste has small amounts of radioactivity dispersed in large amounts of material. Some low-level waste material requires shielding during handling and transportation to minimize exposure to transporters and waste handling operators. The Savannah River Site (SRS) generates low-level radioactive waste in both solid and liquid forms. Low-level waste refers to radioactive waste that does not meet the definition of high-level or transuranic waste. (High-level waste is highly radioactive material resulting from the reprocessing of spent nuclear fuel. Transuranic waste is waste contaminated with alpha-emitting transuranium radionuclides with greater than 20-year half-lives and concentrations greater than 100 nCi/g).

The site's solid low-level waste includes such items as protective clothing, tools and equipment that have become contaminated with small amounts of radioactive material. In October 1994, SRS opened new engineered vaults for the permanent disposal of solid low-level waste, making SRS the first facility in the nation to dispose of solid low-level wastes in these state-of-the-art concrete vaults. Two types of vaults are used, one for low-activity waste (LAW — waste radiating less than 200 mrem/hour) and one for intermediate-activity waste (waste radiating greater than 200 mrem/hour). The concrete used in both was specially formulated to mitigate cracking, extending the vault life.

Low-Activity Waste Vaults

Low-activity waste (LAW) will be placed in Low-Activity Waste Vaults. E Area vaults, including LAW and intermediate level vaults, handle only solid low-level waste. The first vault began accepting waste in October 1994. The original plan was to construct 20 vaults during the next 20 years to meet waste disposal needs. As the site has changed missions, waste generation has decreased significantly. The U.S. Department of Energy (DOE), which owns the site, and the Westinghouse Savannah River Company (WSRC), which operates SRS for DOE, are currently re-evaluating the timing of future vaults.

Each concrete vault is 650 feet long, 150 feet wide and 30 feet tall and consists of 12 cells. Each cell will hold 1,000 standard B-25 waste boxes (carbon steel boxes, 6 feet long by 4 feet wide by 4 feet high). Doorways in the front of each cell allow fork trucks to drive into the cells and stack the waste boxes. When the cell is full, the door will be sealed with concrete, as will the openings used for two removable ventilation fans.

Three drain systems keep water from accumulating in the vaults.

- The roof is slightly peaked, with steel rain gutters along the edges. These gutters direct rainwater into downspouts that flow into underground pipes, which carry the runoff away from the facility into a drainage ditch.

- The base of the vault rests on a layer of crushed stone, varying in thickness from about 3.5 feet thick in the center of the vault to about 7.5 feet along the sides. Water that gets into this crushed stone layer is routed to a dry well, where it seeps into the ground. Water in the LAW vault sub-drainage system is clean. The sub-drainage system serves to keep rainwater that penetrates the clay cap closure away from vault walls, thus extending the life of the buried vault.

- Floor drainage trenches collect any water that may enter the cells. These trenches drain through a sub-surface pipe into concrete sumps, 5 feet in diameter. These sumps are emptied, using a portable pump, and the water is sampled to detect contamination. If uncontaminated, it is released to a drainage ditch. If contaminated, the water is sent to a radioactive wastewater treatment facility, the Effluent Treatment Facility (ETF).

Intermediate-Level Vaults

The intermediate-level vaults provide disposal for waste radiating greater than 200 mrem/hour. In these vaults, waste that is contaminated with tritium is disposed separately from non-tritium waste to provide isolated monitoring of highly mobile tritium. To ensure tritium waste is retained in the vaults, they will be monitored for 100 years after closure. By isolating the tritiated waste, the number of vaults that must be monitored is minimized.

The non-tritium vault is 25 feet wide by 188 feet long by 27 feet deep and consists of seven cells. The concrete is 2.5 feet thick at the ends of the vaults, 2 feet thick on the sides of the vaults and 2.5 feet thick on the floor. (The tritium vault is identical but consists of only two cells.) The vault opens at the top. To dispose of the waste, a crane straddles the vault and lowers the waste box into the cell. A rain cover protects the open cell until it is filled.

The tritium vault consists of two types of cells. One type is for packaged waste. The other contains a silo system, consisting of tubes surrounded by concrete, for the disposal of intermediate radioactive waste, such as tritium crucibles. These crucibles, each 20 feet tall by 18 inches in diameter, are a byproduct waste of the process that produces tritium. The next set of intermediate-level vaults will not include tritium silos because the current capacity is sufficient for existing tritium crucibles.

Two drain systems serve the vault:

- The sub-drainage system prevents water from seeping into the vaults by keeping the earthen areas under and around the vault dry. Like the LAW vault, the intermediate-level vault rests on crushed stone over a compacted surface. The stone layer varies from 1.5 feet thick at one side of the vault to 4.5 feet thick at the other. Any water entering this layer flows into a stone-filled trench containing a perforated pipe, which routes the water to a dry well where it seeps into the ground. The system is checked monthly to verify that it is draining properly. As with the LAW vault, water in the intermediate level vault sub-drainage system is clean.

- The floor of each cell slopes to a drainpipe in the center, which routes liquid to a sump imbedded in the floor slab in the center of the wall. There is one sump for each cell. The floor is covered with two layers of washed, crushed stone, separated by geotextile fabric. The inside cell walls are lined with a drainage net, which routes all moisture forming on the cell wall to the crushed stone layers at the cell floor for drainage to the drainpipe and sump. Monthly, each sump is checked for liquid by inserting a measuring device through a pipe down through the vault wall. If any liquid is present, it is removed by a pump and sampled to detect contamination. If the water is not contaminated, it is released to a surface drainage ditch; if contamination is present, the water is sent to the ETF. This system is included as a precaution; no liquid is expected to accumulate in the vaults.

The first vault began accepting waste in 1994. The original plan called for construction of 10 vaults. DOE and WSRC are re-evaluating the timing of future vaults.

Long-Lived Waste Storage

Some low-level waste contains long-lived isotopes, such as carbon-14, that cannot be placed in the

ground. New SRS facilities, which opened in April 1993, provide temporary storage until a suitable means of treatment and disposal can be found for long-lived waste. No specific time is defined for the temporary storage of this waste. The storage for this type of waste consists of a metal building placed over a concrete slab. Containers of this waste come to the storage facility in shielded packaging by the site's railroad system or by truck.

Low-Level Radioactive Waste Disposal Facility

In the past, before the E Area LAW vaults began accepting solid low-level waste for disposal, solid low-level waste was disposed in the site's Low-Level Radioactive Waste Disposal Facility (LLRWDF, previously called the Low-Level Burial Grounds). This 195-acre LLRWDF no longer accepts waste for disposal.

Before being placed in the LLRWDF, waste was packaged and separated by the type and amount of radioactivity. Low-activity beta-gamma waste (waste that radiates less than 300 mrem/hour) was packaged in 90-cubic-foot steel boxes and put in engineered low-level trenches, which are about 22 feet deep. Sides of the trenches were sloped to prevent cave-ins, and the floors were slightly sloped so that rainwater runs into a sump at one end. The higher-activity portion of the low-level waste was disposed in separate trenches or in greater confinement disposal, consisting of fiberglass-lined cylindrical holes or concrete trenches.

The waste placed in the LLRWDF will remain there. Regulatory closure will be accomplished to minimize settling, and placement of a geosynthetic clay cap will be added to minimize water intrusion into the waste. Monitoring of the surrounding groundwater will continue to detect radioactivity that may have migrated from the disposal facility.

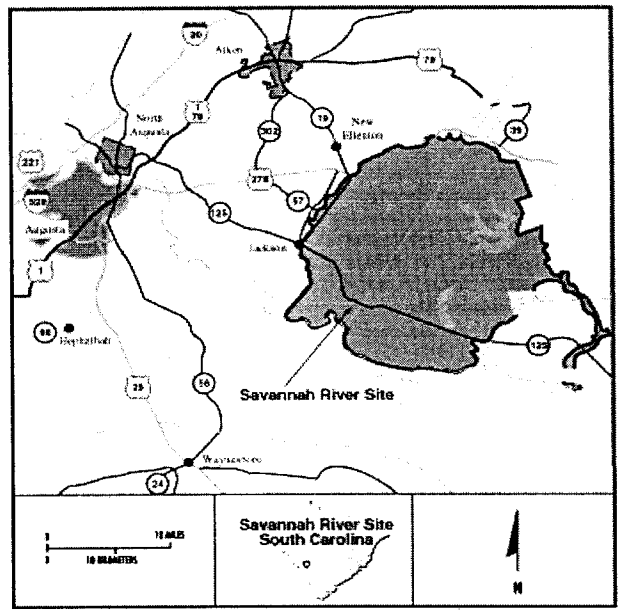
These facilities were replaced with the new engineered vaults described previously.

November 5, 1998

EM U.S. Department of Energy
Office of Environmental Management

Savannah River Site
Site Information

- Savannah River Site *Exit EM*
- 1996 Baseline Environmental Management Report Site Narrative (Historical)



Last Updated 11/12/1999 (mes)

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- Information
- Opportunities
- Environment
- Technology
- Happening Now
- Feed Back
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- Mission Statement
- Organization Chart
- SRS Strategic Plan
- Savannah River News
- Citizens Advisory Board
- Contract Solicitations
- SRS Contractors
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- Technology
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- Feed Back
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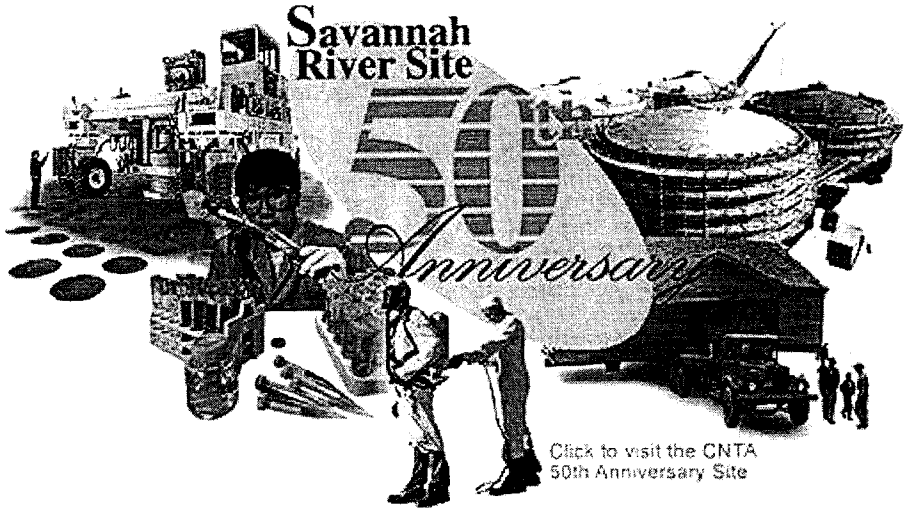

Welcome to the Department of Energy's Savannah River Operations Office and the Savannah River Site

- Mission Statement
- Organization Chart
- SRS Strategic Plan
- Savannah River News
- Citizens Advisory Board
- Contract Solicitations
- SRS Contractors
- DOE Home Page
- DOE Phonebook
- Crimestoppers Program
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- Information
- Opportunities
- Environment
- Technology
- Happening Now
- Feed Back

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- National Environmental Policy Act Information
- U. S. Forest Service - Savannah River

Publications

- Environmental Bulletin
- NEPA/CERCLA Integration (pdf)
- Savannah River Site Environmental Reports
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Savannah River Site

- Information
- Opportunities
- Environment
- Technology
- Happening Now
- Feed Back

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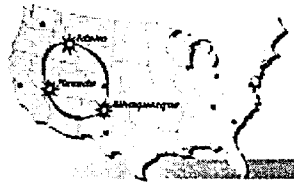
APPENDIX 3.6-7

LFRG Information

EM U.S. Department of Energy
Office Of Environmental Management



PERFORMANCE ASSESSMENTS - LLW FEDERAL REVIEW GROUP

Table of Contents:

What is a Performance Assessment (PA)?

A Radiological Performance Assessment (PA) is an analysis of the performance of the low-level waste disposal facility relative to the containment of the waste. The purpose of the analyses in the PA is to provide the technical basis for the determination of a reasonable expectation of acceptable performance of the disposal facility over time, based on the total radionuclide inventory in the waste. "Acceptable performance" means that the facility will not result in exceeding the performance objectives contained in DOE Order 435.1, Radioactive Waste Management, and related measures associated with protection of the public from the management of LLW.

What is a Composite Analysis (CA)?

A Composite Analysis is an estimate of the potential cumulative impacts to a hypothetical future member of the public from the active or planned LLW disposal facility and other sources of radioactive material in the ground that may interact with the LLW disposal facility (not all sources of radioactive material on a DOE site, but all of those that could interact with the LLW disposal facility). The projected total dose from the CA is compared with the DOE primary dose limit of 100 mrem in a year plus ALARA (as low as reasonably achievable) set forth in DOE Order 5400.5.

Low-Level Waste Disposal Facility Federal Review Group

On June 27, 1997, the Deputy Assistant Secretaries for Waste Management (WM) and Environmental Restoration (ER) in the Office of Environmental Management (EM) established the Low-Level Waste (LLW) Disposal Facility Federal Review Group (LFRG) to develop and implement a Performance Assessment (PA) and Composite Analysis (CA) review process for LLW disposal sites and facilities. The LFRG was chartered with providing EM management with information necessary to determine that low-level waste disposal facilities are designed, constructed, operated, maintained, and closed in a manner that protects the public and environment.

The establishment of the LFRG is an important element of DOE's response to the Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 94-2 and meeting the requirements of DOE Order

435.1, Radioactive Waste Management, and its revision (i.e., DOE O 435.1, Radioactive Waste Management). The creation of the LFRG centralizes the LLW disposal facility PA and CA review process, assigns responsibility for the review and recommendation for approval of PAs and CAs to Federal employees, and focuses senior DOE management officials on the review process and results.

The LFRG is made up of federal employees from Headquarters and Field organizations. LFRG members have been selected to ensure the overall membership of the LFRG reflects the necessary policy, technical, regulatory, and programmatic perspectives to conduct an effective review of the PAs and CAs. The LFRG is co-chaired by representatives from the Offices of Waste Management and Environmental Restoration, and reports to the Deputy Assistant Secretaries for Waste Management and Environmental Restoration.

The LFRG approves the staffing of the teams that review the PAs and CAs of LLW disposal sites and facilities; ensures that the PAs and CAs are reviewed; verifies the results are documented in a report; and recommends either approval or revision of the PAs and CAs based on the results of the reviews.

Low-Level Waste Disposal Facility
Federal Review Group (LFRG)
For Performance Assessment and Composite Analysis
Revised June 28, 1999

Name	Mailing Address	Parcel Address	Phone #	Fax #	E-mail Address
Jay Rhoderick, ***Co-Chair***	U.S. Department of Energy, EM-35 19901 Germantown Road (Cloverleaf) Germantown, MD 20874-1290	SAME	301-903-7211	301-903-9770	jay.rhoderick@em.doe.gov
Bill Murphie, ***Co-Chair***	U.S. Department of Energy, EM-42 19901 Germantown Road (Cloverleaf) Germantown, MD 20874-1290	SAME	301-903-2328	301-903-2385	william.murphie@em.doe.gov
Rex Borders	DOE Albuquerque Operations Office P.O. Box 5480 Albuquerque, NM 87185-5480	DOE Albuquerque Ops. Office Pennsylvania and H Street Albuquerque, NM 87185-5480	505-845-5076	505-845-6714	rborders@doeal.gov
Joel Case	DOE Idaho Operations Office 850 Energy Drive, MS: 11118 Idaho Falls, ID 83401	SAME	208-526-6795	208-526-0160	casejt@inel.gov

Doug Hildebrand	DOE Richland Operations Office P.O. Box 550, MS:H0-12 Richland, WA 99352	DOE Richland Operations Office 3350 George Washington Way Richland, WA 99352	509-373-9626	509-376-4360	r_d_doug_hildebrand@rl.gov
Randy Janke	U.S. Department of Energy P.O. Box 538705 Cincinnati, OH 45253-8705	U.S. Department of Energy 7400 Willey Road Hamilton, OH 45013-9402	513-648-3123	513-648-3076	randy_janke@fernald.gov
Bill McMillan	DOE Oak Ridge Operations P.O. Box 2001 Oak Ridge, TN 37831	DOE Oak Ridge Operations 200 Administration Road Oak Ridge, TN 37830	423-241-6426	423-576-6074	mcmillanwg@oro.doe.gov
Beth Moore	DOE Nevada Operations Office P.O. Box 98518 Las Vegas, NV 89193-8518	DOE Nevada Operations Office 232 Energy Way North Las Vegas, NV 89030	702-295-5753	702-295-1153	moore@nv.doe.gov
Bill Noll	DOE Savannah River Ops Office P.O. Box A, Road 1 Aiken, SC 29802	DOE Savannah River Ops. Office Road 1 Aiken, SC 29802	803-725-2219	803-725-1440	william.noll@srs.gov
Rod Rimando, Jr.	DOE Savannah River Ops. Office P.O. Box A Aiken, SC 29802	DOE Savannah River Ops. Office SRS Road 1, Bldg 703-A Aiken, SC 29802	803-725-4118	803-725-7548	rodrigo.rimando@srs.gov
Andy Wallo	U.S. Department of Energy, EH-41 1000 Independence Avenue, SW Washington, DC 20585	SAME	202-586-4996	202-586-3915	andrew.wallo@eh.doe.gov
Others Associated with the LFRG					

Ross Bradley	U.S. Department of Energy, EM-42 19901 Germantown Road (Cloverleaf) Germantown, MD 20874-1290	SAME	301-903-7646	301-903-2385	ross.bradley@em.doe.gov
Alexander Williams	U.S. Department of Energy, EM-42 19901 Germantown Road (Cloverleaf) Germantown, MD 20874-1290	SAME	301-903-8149	301-903-2461	alexander.williams@em.doe.gov
Jennifer Clay	U.S. Department of Energy, EM-43 10527 Eagle View Drive Oak Ridge, TN 37922	SAME	423-675-5297 301-903-7905	423-675-5286 301-903-3183	jennifer.clay@em.doe.gov
Marty Letourneau	U.S. Department of Energy, EM-35 19901 Germantown Road (Cloverleaf) Germantown, MD 20874	SAME	301-903-7656	301-903-9770	martin.letourneau@em.doe.gov
Ed Regnier	U.S. Department of Energy, EH-412 1000 Independence Avenue, SW Washington, DC 20585	SAME	202-586-5027	202-586-3915	edward.regnier@eh.doe.gov
Jane Talarico	U.S. Department of Energy, EM-35 19901 Germantown Road (Cloverleaf) Germantown, MD 20874-1290	SAME	301-903-7131	301-903-9770	jane.talarico@em.doe.gov
Defense Nuclear Facilities Safety Board					
Steven A. Stokes	Defense Nuclear Facilities Safety Board 625 Indiana Avenue, N.W. (Suite 700) Washington, DC 20004	SAME	202-208-6407	202-208-6518	stevens@dnfsb.gov

Technical Support to LFRG					
Robert Curl	Lockheed Martin Idaho Tech. Co. P.O. Box 1625, MS: 3425 Idaho Falls, ID 83415-3425	LMITCo (WCB-2E1) 2525 North Fremont Avenue Idaho Falls, ID 83415-3425	208-526-2823	208-526-9165	ruc@inel.gov
William Schwinkendorf	Lockheed Martin Idaho Tech. Co. P.O. Box 5800 Albuquerque, NM 87185-0726	Sandia National Laboratory 1515 Eubank Blvd., SE Albuquerque, NM 87123-0701	505-284-3993	505-844-3321	schwwe@inel.gov
Mike Hashem	Project Performance Corporation 7600 Colshire Drive, 5th Floor McLean, VA	SAME	703-345-2131	703-345-2200	mhashem@ppc.com
Steve Loftus	MACTEC, Inc. 12800 Middlebrook Road, Suite 100 Germantown, MD 20874	SAME	301-353-9444	301-353-9447	sloftus@mactec.com
Danny Smith	2305 North Fillmore St. Arlington, VA 22201	SAME	703-358-9315 703-358-9252 703-505-7845	703-358-9315	danny_smith_rpe@email.msn.com

PA and CA Review Team Leaders

Low-Level Waste Disposal Facility Federal Review Group
Performance Assessment and Composite Analysis
Review Team Leads

- Los Alamos National Laboratory TA-54 Area-G Performance Assessment and Composite Analysis

  Team Lead: Randy Janke
  U.S. Department of Energy
  PO Box 538705
  Cincinnati, Ohio, 45253-8705
  Phone: 513-648-3123
  Fax: 513-648-3076

APPENDIX 3.6-8

DOE Headquarters Information

MAXIM
TECHNOLOGIES INC

Interoffice Memorandum

To: TML, NFSS Project File

From: Bob Bessent (Maxim)

Date: 4/11/00

Job No.: 9905006/170 - DOE Landfill Survey Project

Subject: Call to Mr. Marty Laterno of the DOE - Headquarters

Based upon a recommendation from Ms. Wendy Griffin of the NTS, I called Mr. Martin Laterno of the DOE on Thursday (4/6/00). Ms. Griffin thought that Mr. Laterno could provide me (the project) with better insight into DOEs policy on the disposal of FUSRAP waste at DOE facilities. Unfortunately, Marty was away from his desk so I left a message for him to call me back if possible.

Please see me if you have any questions or comments regarding this memo.

File: C: nfss4.11c

MAXIM
TECHNOLOGIES INC

Interoffice Memorandum

To: TML, NFSS Project File

From: Bob Bessent (Maxim)

Date: 4/11/00

Job No.: 9905006/170 - DOE Landfill Survey Project

Subject: Call to Mr. Marty Laterno of the DOE - Headquarters

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Please see me if you have any questions or comments regarding this memo.

File: C: nfss4.11doe

MAXIM
TECHNOLOGIES INC

Interoffice Memorandum

To: TML, NFSS Project File

From: Bob Bessent (Maxim)

Date: 4/11/00

Job No.: 9905006/170 - DOE Landfill Survey Project

Subject: Call to Mr. Marty Laterno of the DOE - Headquarters; 301-903-7656

Mr. Laterno called me back on 4/7/00 in the AM. He indicated to me that DOEs policy on FUSRAP wastes/residues had not changed from what it has been since the Corps took over the administration of the program in 1997. Essentially, FUSRAP wastes will not presently be accepted at DOE disposal facilities. Apparently, the General counsels of the DOE and the Corps have not finalized their Memorandum of Understanding and the issues related to the FUSRAP wastes have yet to be resolved. Based upon further conversation with Marty, things look break for FUSRAP wastes going to DOE disposal wastes at the present time. However, if policy changes art implemented through the MOU between the Corps and the DOE, things may change and the possibility exists where this waste could go to the DOE.

The biggest conclusion regarding this communication is that the DOE won't take the FUSRAP waste and commercial facilities were suggested (e.g.- Envirocare).

Please see me if you have any questions or comments regarding this memo.

File: C: nfss4.11e

MAXIM
TECHNOLOGIES INC

Interoffice Memorandum

To: TML, NFSS Project File

From: Bob Bessent (Maxim)

Date: 4/17/00

Job No.: 9905006/170 - DOE Landfill Survey Project

Subject: Call To Mr. Jay Rhoderick ; DOE Headquarters @ 301-903-7211; LLW Disposal Policy

On Friday AM (4/14/00), I called Mr. Rhoderick on the suggestion of Mr. Bill Noll of the SRS. Mr. Noll thought we should talk with Mr. Rhoderick since he was the person involved in the development of the LLW policy for DOE and specifically the FUSRAP wastes. Jay was not in when I called him so I left a message for him to call me if possible.

Jay called me back Friday PM. I explained who I am and what project I am working on and asked him if there was specific policy within the DOE to not accept FUSRAP wastes and residues in it disposal facilities. Mr. Rhoderick explained that the DOE presently has 2 regional disposal sites where wastes generated within the DOE complex can be sent. These disposal sites include NTS and Hanford. Typically, the disposal site capacity is reserved for the DOE and wastes from other agencies such as FUSRAP wastes cannot be excepted. Jay did indicate that there was one exception to this policy outlined in a **Memorandum of Agreement (MOA)** between the Corps of Engineers and the DOE. Jay indicated that the MOA was signed sometime in 1998 after the FUSRAP program had been transferred to the USACE and should be available through the USACE. The protocol for this exception specifies that for FUSRAP (an possibly other wastes), the DOE will consider a petition of acceptance if:

- All commercial avenues for disposal have been exhausted and no home has been identified for the waste (a DOE facility is the last hope for acceptance).
- The generating agency submits a letter to the DOE requesting consideration for acceptance along with the description of the waste requiring disposal.
- Additional protocol is identified in the MOA (I will try to obtain a copy of this agreement if public.

If the waste is acceptable to the DOE, it could potentially be sent to either NTS or Hanford.

This conversation was sort of a breakthrough because it is the one I have had regarding FUSRAP waste which does not absolutely lockout FUSRAP waste from going to DOE disposal facilities.

MAXIM
TECHNOLOGIES INC

Interoffice Memorandum

As a follow-up to this conversation, I will try to get the MOA off of the Internet or call the LLW coordinator at the USACE in DC.

Please see me if you have any questions or comments regarding this memo.

File: C: nfss4.17a

MAXIM
TECHNOLOGIES INC

Interoffice Memorandum

To: TML, NFSS Project File

From: Bob Bessent (Maxim)

Date: 6/13/00

Job No.: 9905006/170 - DOE Landfill Survey Project

Subject: Call From Marty Letourneau of the DOE Headquarters (301-903-7656)

On Monday AM (June 12th), I received a response to my recent call to Mr. Letourneau and Mr.Rhoderick of the DOE . The purpose of my call was to get clarification on the MOU mentioned to me regarding the agreement between USACE and the DOE about the FUSRAP wastes. Essentially, Mr. Rhoderick had indicated to me that in the past that this agreement present procedure/protocol to follow in the event that no commercial facilities exist to take the Fusrap wastes.

Marty indicated that he had been talking with Jay R. (who I had been trying to contact for the last few weeks) and was told that the new MOU does address the disposal protocol for petitioning DOE for disposal in a DOE facility, but the agreement is with the Corps and DOE lawyers. Marty's opinion ios that the document is presently a legal matter and is in the hands of the Corps since DOE is not excluded from FUSRAP. The agreement is an extension of the original MOU signed when the DOE turned the FUSRAP program over to the CORPS in 1997. Mary indicated that this new agreement could pave the way for sending the K-65 to NTS.

Marty suggested that we contact the legal department of the Corps (DC) to get a copy of the agreement (if public) because they (DOE) are now out of the loop.

In conclusion, the agreement exists but I have yet to get a copy of it. I will make an attempt to contact the Corps PR department in DC to get a feel for who to call to get a copy of this. It should be noted that I did spend a significant amount of time on the internet searching for this document with little success.

Please see me if you have any questions or comments regarding this memo.

File: C: nfss6.13b

MAXIM
TECHNOLOGIES INC

Interoffice Memorandum

To: TML, NFSS Project File

From: Bob Bessent (Maxim)

Date: 6/15/00

Job No.: 9905006/170 - DOE Landfill Survey Project

Subject: Call From Marty Letourneau of the DOE Headquarters (301-903-7656); Department of Technical and Program Integration

On Thursday AM (June 15th), I received a response to my recent call to Mr. Letourneau on June 14th. Again, the purpose of my call was to get further clarification on the MOU mentioned to me regarding the agreement between USACE and the DOE about the FUSRAP wastes. Below is an summary of the conversation held between Marty and I:

- When asked about the status of the MOU, Marty indicated that it has been completed, it is policy and is ready to go.

- The language and protocol associated with the MOU was developed and ultimately negotiated at the very highest levels of the Corps and the DOE. Negotiators were mainly comprised of lawyers; no "program people" like Marty were involved in its development.

- The MOU has not yet been used or tested out ("no one knows about it"). Because of the document's obscurity, Marty indicated that the biggest problem we may have is finding someone that knows something about the MOU and provide us with specific details about its contents.

- The MOU is actually for sending 11e(2) FUSRAP material the NTS for disposal. It is a part of the transfer of the FUSRAP program from the DOE to the Corps. Marty mentioned that the State of NV would have to be involved in the approval process since waste shipments would be going to NV.

In closing, I thanked Marty for the information and that I had contacted a person at USACE in DC to get more about the MOU. He indicated that if we had trouble getting information about the MOU, as a last resort he could make some calls to see if anyone on his end had access to the MOU specifics. We may at some point want to take Marty up on his offer.

MAXIM
TECHNOLOGIES INC

Interoffice Memorandum

Please see me if you have any questions or comments regarding this memo.

File: C: nfss6.15

MAXIM
TECHNOLOGIES INC

Interoffice Memorandum

To: TML (Maxim), Dr. Judith Leithner (USACE-BUFF), NFSS Project File

From: Bob Bessent (Maxim)

Date: 6/16/00

Job No.: 9905006/170 - DOE Landfill Survey Project

Subject: Call From Al Johnson of the DOE Headquarters (301-903-7226); Germantown, MD

On Friday AM (June 16th), I received a call from Mr. Johnson of the DOE regarding the MOU. Mr. Johnson indicated that Mr. Jay Rhoderick of his office had asked him to call me regarding the MOU and to get me a copy of the document. Mr. Johnson is the former director of the FUSRAP program for the DOE before it was transferred to the USACE. Essentially, Mr. Johnson indicated that the MOU was an understanding between the CORPS and DOE to send waste to the DOE only after exhausting all other commercial sources. The DOE wanted to keep the agreement relatively restrictive to keep the "floodgates" from opening up (non-DOE wastes to DOE sites). The MOU limits the outside wastes going to DOE sites.

A faxed copy of the MOU will be sent to each of you for review. Please call me (314-426-0880) if you have any questions or comments regarding this memo.

File: C: nfss6.16

EM U.S. Department of Energy Office Of Environmental Management

DOE Completes Analysis of Final LLRW Disposal Policy

From the Weapons Complex Monitor (WC Monitor, Vol. 10 No. 44) and US Department of Energy Press Release

DOE's "new" policy governing the disposal of low-level and low-level mixed radioactive waste was issued the week of March 10, 1999. The policy gives preference to the use of Department of Energy disposal sites while allowing for exemptions to dispose of waste at commercial sites. The policy contained in the final report—*Commercial Disposal Analysis for Low Level and Mixed Low Level Wastes*–"is to dispose of low-level and low-level mixed waste...at DOE facilities, coupled with the use of...incentives for commercial disposal under the [existing] exemption process."

EM officials analyzed five options identified in the draft policy, outlined in Table I, and rejected:

- Providing direct financial assistance to private vendors to cover the costs of licensing and permitting a disposal facility;
- Disposing of DOE waste at a facility not licensed by either an Agreement State of the Nuclear Regulatory Commission;
- Disposing of waste at privately operated, but DOE regulated, contractor facilities.
- No further disposal of LLW and MLLW at DOE Facilities.

Table 1. Options Evaluated in Policy Analysis On Use of Commercial Disposal Facilities

Option	Description
1	Current policy and practice – disposal at DOE facilities and, through the existing exemption process, at commercial facilities licensed by NRC or an Agreement State (referred to as "licensed commercial facilities" in this analysis).
2	Disposal at DOE sites only using both CERCLA cells and waste operations facilities; three-year phase-out of the use of commercial facilities as existing contracts with these facilities expire. After three years, DOE would no longer use commercial disposal facilities.
3	Current policy and practice; in addition, the Department would provide funding to new commercial facilities to obtain licenses to NRC to an Agreement State and would pay the cost of maintaining the facility during its efforts to obtain a license. (This option reflects the proposal of Laidlaw Environmental Services. These facilities are referred as "licensed facilities funded by DOE.")
4	Current policy and practice; in addition, the Department would regulate new commercial facilities under its Atomic Energy Act authority. (This option reflects the proposal of Waste Control Specialists (WCS). These facilities are referred to as "commercial facilities regulated by DOE.")

5	No further disposal of LLW and MLLW at DOE facilities. Disposal at all three types of commercial facilities: licensed facilities funded by DOE; and commercial facilities regulated by DOE.

Low Activity Waste To Landfills

The new DOE policy also makes clear that under the current practices, department waste that meets current standards for "free release" (i.e.: below the personal property release standard) can be disposed of "without further radiological restrictions under the Atomic Energy Act." This is identical to the current practice of the U.S. Army Corps of Engineers, which is disposing of Formerly Used Site Remedial Action Program waste in Resource Conservation and Recovery Act-permitted hazardous waste disposal sites.

Volume Estimated at 8.85 Million m^3

The volume of waste DOE projects in the disposal policy as requiring disposal capacity is consistent with that estimated in the Accelerated Cleanup: Paths to Closure Report. But, in a new table, DOE outlines disposal plans for waste for which the Department formerly had no disposition plan. The table reveals just how much waste in each category is destined to go where (see Table 2):

- 100,000 m^3 of LLRW initially falling into the to-be-determined category is now projected to go to commercial sites, while 330,000 m^3 is now slated for disposal at DOE waste operations facilities;
- 80,000 m^3 of the same category of mixed waste is now projected to go to commercial sites, with 90,000 m^3 proposed to go to DOE waste facilities.

Table 2. Estimated Volume and Projected Disposition of DOE's Low-Level and Mixed Low-Level Waste

Projected Disposition	Estimated Volume (in cubic meters)		Total
	Low-Level Waste	Mixed Low-Level Waste	
DOE CERCLA Disposal Cells	5,800,000	360,000	6,160,000
DOE Waste Operations Facilities	1,400,000	100,000	1,500,000
Commercial Disposal Facilities	510,000	80,000	590,000
To Be Determined	430,000[a]	170,000	600,000
Total	8,140,000	710,000	8,850,000

[a] Two DOE sites (Mound and Rocky Flats) reported that they may send a total of 100,000 cubic meters of low-level waste to either a DOE facility or a commercial facility. For the purposes of this analysis, these 100,000 cubic meters are included in the category of To Be Determined (TBD).
Source: *Accelerating Cleanup: Paths to Closure* (1998).

Last Updated 04/20/1999 (mhp)

EM U.S. Department of Energy
Office Of Environmental Management

Range of Disposal Costs for DOE and Commercial Sites

The following table is range of costs, as of March 1999, associated with LLW and MLLW disposal at DOE and Commercial Sites. Where available, additional resources for information have been listed.

Range of Disposal Costs for DOE and Commercial Sites

Operating Commercial Facilities		
Envirocare LLW (Utah)	Envirocare of Utah, (801) 532-1330	$170 - $600/m^3
Envirocare MLLW (Utah)	Envirocare of Utah, (801) 532-1330	$700 - $1,800/m^3
US Ecology LLW (Washington)	Joe Nagel (208) 331-8400	$1,000 - $3,000/m^3
Barnwell LLW (South Carolina)	Carl Rowland (803) 758-1860	$8,000 - $14,000/m^3
Proposed Compact Facilities (Commercial)		
*Ward Valley LLW (California)		$5,000 - $21,000/m^3
DOE Operations Waste Disposal Facilities – For Additional Information on the following see – *The US DOE Information Package on Pending Low-Level and Mixed Low-Level Waste Disposal Decision*, September 1998 (http://www.em.doe.gov/em30/info.html)		
Nevada Test Site LLW (Nevada)		$350 – $650/m^3
Los Alamos National Laboratory LLW (New Mexico)		$450 – $700/m^3
Hanford LLW (Washington)		$500 - $850/m^3
Savannah River Site LLW (South Carolina)		$800 – $1,200/m^3
Idaho National Engineering and Environmental Laboratory LLW (Idaho)		$1,000 - $2,400/m^3
Oak Ridge National Laboratory LLW (Tennessee)		$2,500 - $3,500/m^3

DOE CERCLA Cells		
Environmental Restoration Disposal Facility – Hanford LLW/MLLW (Washington)	For more information on waste acceptance criteria at this facility see http://www.bhi-erc.com/library/bhi/bhi00139.pdf	$50 - $60/m^3
Fernald LLW/MLLW (Ohio)	Ralph Holland (816) 983-3580	$70 - $80/m^3

* The Ward Valley LLW Repository may begin to receive LLRW by 2001.

Reprinted from the US Department of Energy final report, *"Commercial Disposal Analysis for Low Level and Mixed Low Level Wastes."*

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FEEDBACK | INTERACTIVE MAP | WHAT'S NEW
PRIVACY AND SECURITY NOTICE

Last Updated 04/23/1999 (mhp)

Robert Bessent

To: jay.rhoderick@em.doe.gov
Subject: Follow-Up; Disposal of FUSRAP waste in a DOE disposal facility

Mr. Rhoderick: Several weeks ago I called you regarding the above-referenced subject. During our conversation, you indicated that the Corps and the DOE had a MOA opening the door for FUSRAP waste disposal at selected DOE sites only after exhausting available commercial sources. In addition, the Corps would have to follow a specific protocol to achieve waste acceptance at a DOE facility. Since our conversation, I have tried to find documentation regarding the agreement and protocol and neither my associates or the internet have been productive. During my internet search, I did discover your name referenced on an EM site along with your e-mail address. Would it be possible for you to provide me with a reference for the agreement/protocol so I can obtain a copy for documentation?

Again, thanks for the time and assistance.

Bob Bessent
Maxim Technologies
314-426-0880(phone)
314-426-4212 (fax)

APPENDIX 3.6-9

Memorandum of Understanding

Between DOE and USACE Regarding

Administration and Executive of FUSRAP

(3/99)

MEMORANDUM OF UNDERSTANDING BETWEEN THE U.S. DEPARTMENT OF ENERGY AND THE U.S. ARMY CORPS OF ENGINEERS REGARDING PROGRAM ADMINISTRATION AND EXECUTION OF THE FORMERLY UTILIZED SITES REMEDIAL ACTION PROGRAM (FUSRAP)

ARTICLE I - PURPOSE AND AUTHORITY

A. This Memorandum of Understanding (MOU) is entered into by and between the U.S. Department of Energy (DOE) and the U.S. Army Corps of Engineers (USACE), ("The Parties") for the purpose of delineating administration and execution responsibilities of each of the parties for the Formerly Utilized Sites Remedial Action Program (FUSRAP).

B. USACE is administering and executing cleanup at eligible FUSRAP sites pursuant to the provisions of the Energy and Water Development Appropriations Act. 1998, (Title I, Public Law 105-62,111 Stat 1320.1326), the Energy and Water Development Appropriations Act, 1999, (Title I, Public Law 105-245,112 Stat. 1838,1843), and in accordance with, and subject to regulation under, the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA), 42 U.S.C. 9601 et seq., and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R., Chapter 1, Part 300.

C. DOE and USACE acknowledge that DOE does not have regulatory responsibility or control over the FUSRAP activities of USACE or USACE contractors.

D. This MOU addresses the responsibilities of the parties with regard to the 25 completed sites, listed in Attachment "A" hereto, where response actions were completed by DOE as of October 13, 1997, and the 21 active sites listed in Attachment "B" hereto, where response actions were not completed by DOE as of October 13,1997.

E. This MOU also addresses the responsibilities of the parties for determining the eligibility of any new sites and vicinity properties for response actions under FUSRAP, determining the extent of response actions necessary at any eligible site, and dealing with other matters necessary to carry out this Program.

F. USE OF TERMS.

1. The term "accountability" in regards to real property refers to the obligation imposed by law or regulation to keep an accurate record of real property, regardless of whether the person or agency charged with this obligation has actual possession of the real property, or any control over activities occurring on the real property.

2. The term "active site" means any "eligible FUSRAP site" which is undergoing or is programmed to undergo response actions by USACE, or which is determined to require initial or additional response action in accordance with the provisions of Article III, below.

3. The term "cleanup" means all response actions performed under FUSRAP

4. The term "closeout" means the completion of cleanup and publication of notice in accordance with the provisions of CERCLA, the NCP and USACE procedures.

5. The term "completed site" means any site listed in Attachment "A", or any site closed out by USACE as defined in paragraph 4, above.

6. The term "completion of FUSRAP activities" means the conclusion of USACE responsibilities at active sites in accordance with the provisions of this MOU.

7. The term "eligible FUSRAP site" means any geographic area determined by DOE to have been used for activities in support of the Nation's early atomic energy program, or placed into FUSRAP pursuant to Congressional direction. (See Article III. section D, for designation of sites not part of FUSRAP on October 13, 1997).

8. The term "management" in regards to real property means the safeguarding of the Government's interest in property, in an efficient and economical manner consistent with the best business practices, including administering applicable National Pollutant Discharge Elimination System (NPDES) permits, National Emissions Standards for Hazardous Air Pollutants (NESHAPS) reports, and other applicable administrative environmental requirements.

9. The term "protection" in regards to real property means the provision of adequate measures for prevention and extinguishment of fires, special inspections to determine and eliminate fire and other hazards, and necessary guards to protect property against thievery. vandalism, and unauthorized entry.

10. The term "response" shall have the same meaning as in CERCLA at 42 U.S.C. § 9601(25).

11. The term "vicinity properties" means properties adjacent to or near eligible FUSRAP sites which have been contaminated by radioactive and/or chemical waste materials attributable to activities which supported the nation's early atomic energy program.

12. For purposes of this MOU, "active sites" become "completed sites" upon USACE determination that completion of FUSRAP activities has occurred with necessary regulatory approvals under CERCLA and the NCP.

13. For purposes of this MOU, "completed sites" become "active sites" upon USACE determination that further response action is necessary in accordance with Article III of this MOU.

ARTICLE II - INTERAGENCY COMMUNICATION

To provide for consistent and effective communication between DOE and USACE, each shall appoint a Principal Representative to serve as its headquarters-level point of contact on matters relating to this MOU.

ARTICLE III - RESPONSIBILITIES

A. PROGRAM MANAGEMENT AND FUNDING.

1. USACE shall manage all activities and prepare program estimates, funding requirements. and budget justifications for all FUSRAP activities for which it is responsible under the terms of this MOU. USACE shall request FUSRAP appropriations in the annual Energy and Water Development Appropriations Act for these activities. USACE shall respond to inquiries from public officials, Congressional interests, stakeholders, and members of the press regarding USACE activities under FUSRAP. Except as otherwise provided in this MOU, USACE is responsible for all response action activities at FUSRAP sites until two years after closeout.

2. DOE shall use resources appropriated to it to meet its responsibilities under the terms of this MOU. Except as otherwise provided in this MOU, DOE is responsible for any required activities at FUSRAP sites beginning two years after closeout.

B. COMPLETED SITES.

1. DOE:

a. Shall be responsible for: surveillance, operation and maintenance, including monitoring and enforcement of any institutional controls which have been imposed on a site or vicinity properties; management, protection, and accountability of federally-owned property and interests therein; and any other federal responsibilities, including claims and litigation, for those sites identified as completed in Attachment "A". Should it be necessary to undertake further administrative actions to finalize the completion of those sites in Attachment "A", DOE will identify the administrative actions to be taken, coordinate funding requirements for those actions with USACE, and upon receipt of funds from USACE, complete the necessary administrative actions to finalize completion of those sites;

b. Shall request USACE to conduct additional FUSRAP cleanup in a manner consistent with those procedures described in Article III section D, FUSRAP ELIGIBILITY (NEW SITES);

c. Shall be successor to USACE in Federal Facility Agreements for long-term surveillance, operation and maintenance, for which DOE is responsible under the provisions of this MOU;

d. Shall be responsible for administration of payments in lieu of taxes for any federally-owned lands held in connection with FUSRAP; and

e. Upon completion of FUSRAP activities by USACE, shall be responsible for surveillance, operation and maintenance, including monitoring and enforcement of any institutional controls which have been imposed on a site or vicinity properties; management, protection and accountability of federally-owned property and interests therein; and any other federal responsibilities, including claims and litigation, not directly arising from USACE FUSRAP response actions.

2. USACE:

a. Shall assume no responsibility for the completed sites listed in Attachment "A" unless additional response actions are determined to be necessary under the provisions of Article III paragraph B.1 a. and Article III section D; and

b. In accordance with Article III section B.1.a., will provide funding to DOE for administrative actions required to finalize completion of the sites in Attachment "A". Such funding will be requested in USACE FUSRAP budget requests, or provided through Congressionally-approved reprogramming actions.

C. ACTIVE SITES.

1. DOE:

a. Upon request from USACE, shall provide USACE with site designation decision documents and reports, contractual documents, program administration files, technical records, and documents related to federally-owned property, including associated financial records, cost estimates, schedules of program activities, and supporting data;

b. Hereby provides USACE with authorization for access to such lands or interests in land for which DOE has administrative accountability or to which DOE otherwise is authorized to provide access pursuant to statute, permit, license or similar agreement, to the extent that it may do so under the terms of any such agreements;

c. Upon request from USACE, to the extent permitted by law, shall acquire, using funds appropriated for FUSRAP activities, such additional real property and interests therein as may be required by USACE to execute the program, if USACE cannot otherwise accomplish the acquisition under its own authority;

d. To the extent permitted by law, hereby agrees to provide such authorization to USACE as may be required to terminate any existing leases, licenses, permits, or other agreements for access to, and the use of, land or facilities which USACE determines are no longer required to execute FUSRAP;

e. Beginning two years after closeout, shall be responsible for long-term surveillance, operation and maintenance, including monitoring and enforcement of any institutional controls which have been imposed on a site or vicinity properties, and, upon closeout, shall accept the transfer of federally-owned real property and interests therein, acquired by USACE for FUSRAP execution;

f. Shall be responsible for administration of payments in lieu of taxes for any federally-owned lands held by either USACE or DOE in connection with FUSRAP;

g. Shall be responsible, only after a determination of liability by a court of competent jurisdiction and exhaustion of applicable appeal rights, for payment of claims by property owners for damages to property and personal injuries due to DOE's actions prior to October 13,1997, provided that:

i. This MOU does not alter or diminish the right of DOE to raise any defenses available under law, including sovereign immunity, in the case of any third party claims, whether in an administrative or a judicial proceeding; and

ii. Nothing in this agreement shall be interpreted to require any obligation or payment of funds in violation of the Anti-Deficiency Act (31 U.S.C. § 1341);

h. Shall have accountability for federally-owned real property interests acquired by or transferred to DOE, including inventory reporting to the General Services Administration as may be required by that agency; and

i. To the extent permitted by law, hereby agrees to make such outranks on federally owned real property interests, referred to in paragraph h. above, as may be requested by USACE in connection with the relocation of utilities and facilities or to otherwise facilitate FUSRAP execution.

2. USACE:

a. Shall be responsible for property management and response action activities at active FUSRAP sites, except for DOE's inventory reporting of federally owned real property interests related to FUSRAP under Article III paragraph C. 1 .h. and as otherwise provided in this section;

b. Shall be responsible for site cleanup in accordance with its obligation to administer and execute FUSRAP imposed by Public Law 105-62; Public Law 105-245, any subsequent laws specifically relating to FUSRAP; CERCLA; and the NCP;

c. Shall accordingly be responsible for site closeout in accordance with CERCLA, the NCP and USACE procedures;

d. During cleanup operations and for the first two years after site closeout, shall be responsible for surveillance, operation and maintenance, as required, and for management and protection of federally-owned real property in connection with FUSRAP;

e. Shall establish cleanup standards in consultation with federal, State and local regulatory agencies;

f. Within its authorities, may acquire real property and interests therein required for FUSRAP execution;

g. Shall maintain accountability for real property and interests therein which USACE acquires under its authorities for FUSRAP execution, until such time as such real property and interests therein are transferred to DOE;

h. Shall be responsible, in cooperation with the Department of Justice, for identifying and for seeking recovery from Potentially Responsible Parties (PRPs) under CERCLA for response actions performed at eligible FUSRAP sites;

i. Shall accept responsibility as DOE's successor for all response actions required by Federal Facility Agreements executed between DOE and EPA at eligible FUSRAP sites;

j. Shall determine the need for response actions under FUSRAP of any vicinity property;

k. Shall conduct a technical review of the adequacy of USACE-selected remedies on the fifth anniversary of site closeout where necessary;

l. Shall execute and sign new FFA's and permits required for FUSRAP activities;

m. Shall coordinate with DOE as appropriate on issues relating to activities on:

i. DOE's inventory reporting of federally-owned real property referred to in Article III paragraph C.1.h., above;

ii. Any DOE outgrants on federally-owned real property interests referred to in Article III paragraph C.1 i. above; and

iii. Changes to existing FFA provisions or to new provisions that relate to long-term surveillance, operation and maintenance by DOE referred to in Article III paragraphs C.2.i. and l. above;

n. Shall be responsible, only after a determination of liability by a court of competent jurisdiction and exhaustion of applicable appeal rights, for damages due to the fault or negligence of USACE or its contractors, and shall hold and save harmless DOE free from all damages arising from USACE FUSRAP activities to the extent allowable by law, provided that:

i. This MOU does not alter or diminish the right of USACE to raise any defenses available under law, including sovereign immunity, in the case of any third party claims, whether in an administrative or a judicial proceeding; and

ii.Nothing in this agreement shall be interpreted to require any obligation or payment of funds in violation of the Anti-Deficiency Act (31 U.S.C. § 1341);

o. Upon completion of FUSRAP activities, shall provide a copy of surveys, findings, decision documents, and access agreements for property not owned by the government, as well as close out documents, to DOE for the historical record. This includes all sites determined eligible. whether or not any response action was taken.

D. FUSRAP ELIGIBILITY (NEW SITES)

1. DOE:

a. Shall perform historical research and provide a FUSRAP eligibility determination, with historical references, as to whether a site was used for activities which supported the Nation's early atomic energy program;

b. Shall provide USACE with the determination, a description of the type of processes involved in the historical activities at the site, the geographic boundaries of those activities, (as reflected by documentation available to DOE), and the potential radioactive and/or chemical contaminants at the site; and

c. Shall maintain records of determination of eligibility and other files, documents and records associated with the site.

2. USACE:

a. Upon receipt of DOE's determination and its description of the type of processes involved in the historical activities at the site and potential radioactive and/or chemical contaminants, shall conduct necessary field surveys and prepare a preliminary assessment in accordance with CERCLA and the NCP;

b. Shall determine the extent of FUSRAP-related contamination at the eligible site, at vicinity properties, and at other locations where contamination originated from the eligible site;

c. Shall determine if the contamination is a threat to human health or the environment;

d. Shall consult with DOE if USACE surveys, investigations, and data analyses are inconsistent with the DOE description of the potential radioactive and/or chemical contaminants and processes involved in the historical activities at the site;

e. Shall determine the extent to which response action under CERCLA is required to address FUSRAP-related contamination at the site; and

f. Upon completion of FUSRAP activities, shall provide a copy of surveys, findings, decision documents, and access agreements for property not owned by the government, as well as close out documents, to DOE for the historical record. This includes all sites determined eligible, whether or not any response action was taken.

ARTICLE IV - FURTHER ASSISTANCE

DOE and USACE shall provide such information, execute and deliver any agreements, instruments and documents, and take such other actions, to include DOE assistance with technical and waste disposal matters, as may be reasonably necessary or required, which are not inconsistent with the provisions of this MOU, in order to give full effect to this MOU and to carry out its intent.

ARTICLE V - DISPUTE RESOLUTION

A. Every effort will be made to resolve issues between USACE and DOE by the staff directly involved in the activities at issue through consultation and communication or other forms of non-binding alternative dispute resolution mutually acceptable to the parties. If a mutually acceptable resolution cannot be reached, the dispute will be elevated to successively higher levels of management up to, and including, the Secretary of Defense and the Secretary of Energy.

B. In the event such measures fail to resolve the dispute, the parties shall refer the matter to the Office of Management and Budget (OMB) for resolution, unless the dispute involves questions of law, which shall be referred to the Office of Legal Counsel of the Department of Justice pursuant to Executive Order 12146.

ARTICLE VI - AMENDMENT AND TERMINATION

This MOU may be modified or amended in writing by the mutual agreement of the parties. Either party may terminate the MOU by providing written notice to the other party. The termination shall be effective sixty (60) days following notice, unless a later date is agreed to by the parties.

ARTICLE VII - EFFECTIVE DATE

This MOU shall become effective when signed by authorized officials of DOE and USACE.

U.S. Department of Energy

James M. Owendoff
James M. Owendoff
Acting Assistant Secretary
For Environmental Management

Date: 3/17/99

U.S. Army Corps of Engineers

Russell L. Fuhrman
Major General, U.S. Army
Director of Civil Works

Date: 16 Mar 99

Attachments:
A. List of Completed Sites
B. List of Active Sites

Attachment A
Completed FUSRAP Sites

Site Name	City and State
Kellex/Pierpont	Jersey City, New Jersey
Acid/Pueblo Canyon	Los Alamos, New Mexico
Bayo Canyon	Los Alamos, New Mexico
University of California	Berkley, California
Chupadera Mesa	White Sands Missile Range, New Mexico
Middlesex Municipal Landfill	Middlesex, New Jersey
Niagara Falls Storage Site Vicinity Properties	Lewiston, New York
University of Chicago	Chicago, Illinois
National Guard Armory	Chicago, Illinois
Albany Research Center	Albany, Oregon
Elza Gate	Oak Ridge, Tennessee
Seymour Specialty Wire	Seymour, Connecticut
Baker & Williams Warehouses	New York, New York
Granite City Steel	Granite City, Illinois
Aliquippa Forge	Aliquippa, Pennsylvania
C.H. Schnoor	Springdale, Pennsylvania
Alba Craft Laboratory	Oxford, Ohio
HHM Safe Company	Hamilton, Ohio
Associate Aircraft	Fairfield, Ohio
B & T Metals	Columbus, Ohio
Baker Brothers	Toledo, Ohio
General Motors	Adrian, Michigan
Chapman Valve	Indian Orchard, Massachusetts
Ventron	Beverly, Massachusetts
New Brunswick Laboratory	New Brunswick, New Jersey

Attachment B
Active FUSRAP Sites

Site Name	City and State
Latty Ave. Properties	Hazelwood, Missouri
St. Louis Airport	St. Louis, Missouri
Vicinity Properties	Hazelwood & Berkley, Missouri
St. Louis Downtown Site	St. Louis, Missouri
DuPont	Deepwater, New Jersey
Maywood	Maywood, New Jersey
Wayne	Wayne, New Jersey
Middlesex Sampling Plant	Middlesex, New Jersey
Ashland 1	Tonawanda, New York
Ashland 2	Tonawanda, New York
Seaway Industrial Park	Tonawanda, New York
Linde Air Products	Tonawanda, New York
Niagara Falls Storage Site	Lewiston, New York
Colonie	Colonie, New York
Bliss & Laughlin Steel	Buffalo, New York
Luckey	Luckey, Ohio
Painesville	Painesville, Ohio
CE Site	Windsor, Connecticut
Madison	Madison, Illinois
Shpack Landfill	Norton, Massachusetts
W.R. Grace	Curtis Bay, Maryland