Department of Energy
Oak Ridge Operations
P. O. Box E
Oak Ridge, Tennessee 37831

To: John Starmer

September 27, 1988

To Those on the Attached List

Ladies and Gentlemen:

MINUTES OF THE SEPTEMBER 14, 1988,
WASTE MANAGEMENT ADVISORY COMMITTEE MEETING

The minutes of the Waste Management Advisory Committee (WMAC) Meeting held in Chattanooga on September 14, 1988, are enclosed for your review. Please let me know at the next quarterly WMAC Meeting (scheduled for December 13) if any changes need to be made to the minutes or if any items need to be clarified.

There were ten (10) action items that resulted from the meeting. As always, each organization assigned responsibility for an item should complete the item prior to the next WMAC Meeting and be prepared to discuss its resolution at the meeting.

If you have any questions or would like to recommend topics for discussion at the next meeting, you may reach me at 615-576-0715 or FTS 626-0715.

Sincerely,

Nelson Wright

for Robert C. Sleeman, Chief
Waste Management Branch
Research and Waste Management Division

RCS:cm

Enclosures:
As stated

406.1.9
WM-3 PH02.4

ADDRESSEES - LETTER DATED SEPTEMBER 27, 1988

Minutes of the
9/14/88 WMAC Meeting

W. D. Adams, DOE/ORO
J. K. Bailey, MMES (Y-12)
R. E. Blake, MMES (PORTS)
C. M. Borgstrom, DOE/HQ
T. A. Bowers, MMES (ORGDP)
G. E. Butterworth, MMES (ORNL/WMTC)
T. R. Butz, MMES (Y-12)
T. C. Chee, DOE/HQ
K. Church, TDHE
B. J. Davis, DOE/ORO
B. M. Eisenhower, MMES (ESA)
R. A. Geiger, DOE/HQ
J. E. Heiskell, MMES (Y-12)
H. W. Hibbitts, DOE/ORO
J. D. Holbert, TDHE
D. R. Hopkins, EPA
G. Irwin, TDHE
E. A. Jordan, DOE/HQ
R. J. Keeling, MMES (PAD)
J. M. Kennerly, MMES (ORNL/WMTC)
R. Kispert, WMCO
E. C. Leming, TDHE
W. N. Lingle, DOE/ORO
A. G. Linton, EPA
E. S. McDougald, MMES (ESA)
L. J. Mezga, MMES (ESA)
M. E. Mitchell, MMES (ESA)
M. H. Mobley, TDHE
J. O. Moore, DOE/ORO
T. E. Myrick, MMES (ORNL)
M. O'Rear, DOE/SR
C. M. Osborne, DOE/HQ
D. Ozier, TDHE
T. P. Perry, MMES (ESA)
S. Riddle, EPA
A. Rogers, EG&G Idaho, Inc.

ADDRESSEES - LETTER DATED SEPTEMBER 27, 1988 (CONT.)

Minutes of the
9/14/88 WMAC Meeting

T. H. Row, MMES (ORNL)
S. F. Seltzer, MMES (PAD)
D. G. Shults, TDHE
M. Shupe, DOE/ID
C. K. Stalnaker, MMES (PORTS)
J. Starmer, NRC
L. Stetar, TDHE
T. S. Tison, DOE/ORO
B. E. Vaughn, MMES (ORGDP)
C. L. Wakamo, EPA
H. D. Whitehead, MMES (ORGDP)

MINUTES OF THE 9/14/88

WASTE MANAGEMENT ADVISORY COMMITTEE MEETING

OPENING REMARKS/REVIEW OF ACTION ITEMS FROM THE 6/15/88 MEETING - R. C. SLEEMAN

The WMAC Meeting began with Bob Sleeman's overview of the day's activities and summary of the status of action items identified at the last WMAC Meeting. Sleeman indicated that two of the five action items identified at the 6/15/88 meeting remained unresolved. The report on the BRC pathways analysis had been completed by ORNL and recently submitted to DOE/ORO, but it had not yet been submitted to TDHE/EPA for their reviews. (Sleeman indicated that DOE's internal review would be complete soon and the report submitted to TDHE/EPA shortly.) In addition, the third-party peer review of the report had not taken place. Nelson Lingle reported on Randi Allen's progress in scheduling the peer review. Allen has received a statement of the scope of work from ORO and submitted it to NAS (the National Academy of Science) for their review and possible scheduling of a date for the peer review.

HAZARDOUS AND MIXED WASTE MANAGEMENT ACTIVITIES - C. P. MCGINNIS, P. E. HOLLENBECK, B. M. EISENHOWER, AND B. E. VAUGHN

HAZWDDD Plan - C. P. McGinnis

Phil McGinnis summarized efforts over the last year to produce a formal, documented "corporate" plan for managing hazardous and mixed wastes at MMES installations. He said that the Central Waste Management Office is committed, under an award-fee milestone, to have a corporate document in place by December 1988 that addresses the strategic issues for hazardous and mixed wastes at MMES facilities. The plan, when complete, will outline the consensus strategy for planning for future MMES waste management needs. The plan right now is still in the first-draft stage (internal reviewers' comments are being incorporated in the first draft that was sent out in July 1988); the second draft for DOE review should be issued around the first of October.

Three data bases (waste characterization, facilities assessment, and technology needs) have been designed implemented, and are being maintained on IBM AT computers for use in the HAZWDDD Program. Over 400 waste streams have been characterized and grouped according to four major categories of waste. The treatment, storage, and disposal facilities available for dealing with these wastes have also been characterized and assessed for their ability to handle the wastes. Where it has appeared there would be insufficient capability to handle certain wastes, the problems have been noted and a priority assigned for resolving the problems. Those wastes that have been assigned a high priority are as follows: (1) waste generated as a result of treating groundwater contamination, (2) contaminated soils removed from the ground, (3) ash

generated via TSCA incineration, (4) sludges, and (5) surface contamination.

The analysis of MMES facility wastes and options for dealing with the wastes has resulted in the identification of some 16 issues (e.g., the conversion of hazardous waste to non-hazardous waste) that need to be addressed in the integrated HAZWDDD plan. The plan to be published in December will address these issues and make recommendations for the efficient management of hazardous and mixed wastes generated at MMES facilities.

Y-12 Sludge Detoxification Demonstration Update - P. E. Hollenbeck

In his presentation, Paul Hollenbeck covered three things: (1) the history of the project underway to demonstrate the successful detoxification of sludge wastes from the ORGDP and Y-12 facilities, (2) the current status of the demonstration, and (3) the process being used at ORGDP to detoxify/solidify sludge wastes.

The project dates back to July 1987 with an interim contract for the detoxification effort. Feed preparation and characterization began in March 1988 when a statistical analysis was done on the two populations of waste to be treated (waste at ORGDP [sludges from K-1232] and waste at Y-12 [sludges from the Central Pollution Control Facility]). From each of the two populations, 24 drums were ultimately selected for the detoxification demonstration.

Permitting efforts to date were discussed and included RCRA, air, and NESHAP. In August 1988 it was determined that a RCRA RD&D permit would not be required. The application for the air permit was submitted in May 1988 and approval was received in August. In July 1988 it was determined that a NESHAP permit would not be necessary since no effluent with a radiological component would be released through the stack.

Delisting efforts were also discussed. Hollenbeck indicated that a sampling and analysis plan has been completed for the treatment of sludge wastes that will be involved in the demonstration, but the sampling and analysis plan for delisting the wastes is not yet complete. He said the current schedule calls for the plan to be completed within two months of the completion of the demonstration.

The EPA pointed out that DOE/ORO should be ironing out the details of the sampling and analysis plan for delisting now and working on getting the plan in place as quickly as possible. Bob Sleeman said DOE/ORO plans to meet with DOE headquarters to discuss this issue the last week in September. Soon thereafter DOE/ORO would try to make arrangements with EPA headquarters to get their input on the plan. Making arrangements with EPA headquarters to discuss the plan for delisting was identified as an action item to be accomplished prior to the next WMAC Meeting.

Hollenbeck indicated that the equipment for the demonstration has been checked out (in Milwaukee) and it is now at ORGDP. Plans are to begin the demonstration in late September. (DOE/ORO will advise TDHE of the exact

startup date as soon as it is decided so TDHE personnel can attend the startup if they wish.) The demonstration is scheduled to be complete by the end of October, and the final report on the project is to be complete by mid-December 1988.

Hollenbeck used a process flow diagram and photographs to describe the detoxification process. He said the feed rate capacity for the Chem Nuclear Systems, Inc. pilot scale unit would be approximately 1 drum (55 gal)/h. The end products of the detoxification would be the solid waste--which would hopefully contain no organics or trace organics and be a candidate for delisting- and the condensate--which would contain some organics and require other forms of treatment (incineration perhaps).

Review of Delisting Issues and Status of Actions - B. M. Eisenhower

Mike Eisenhower identified four major waste streams at MMES facilities that are candidates for delisting and summarized delisting efforts to date. The first of these covered, the K-1407 B&C Pond sludges, are now being removed and stabilized in concrete. A sampling and analysis plan has been approved by EPA and delisting petitions are being prepared for submission by November 1988. (Separate petitions are being prepared for the two ponds.)

The wastewater treatment sludges from ORGDP's K-1232 Building and Y-12's CPCF were the second waste stream mentioned. Eisenhower reiterated what was covered in Hollenbeck's presentation on the Y-12 Sludge Detoxification Demonstration: that delisting of the treated sludges is part of the planned demonstration and DOE and the regulators will be working together in the near future to arrive at an acceptable plan for delisting the end product of the detoxification.

The other two waste streams that are candidates for delisting were only briefly mentioned. Planning for the delisting of sludges from Y-12's West End Treatment Facility and ash generated via TSCA incineration of waste is still in the preliminary stage but delisting these wastes has been identified as important task to be accomplished under the HAZWDDD Program in FY 1989 and 1990.

TSCA Incinerator Update - B. E. Vaughn

Bruce Vaughn provided an overview of the TSCA incinerator project, a description of the incinerator and the process, and an update on the project's status. He traced the incinerator's history back to about 1978 when the incinerator was first conceived. Design and construction efforts took place in the early and mid-80's.

Vaughn used a process flow diagram and photos to show how solid, liquid, and sludge wastes would be processed in the TSCA incinerator. He said the heart of the incinerator is a rotary kiln, wherein the operating temperature is about 2200° F. A combustion chamber (with operating temperatures of 1600-1800° F), off-gas treatment system, and monitoring stack were identified as other key elements of the system. The monitoring stack is considered unique because it, unlike any other systems that are

operating or have been demonstrated, contains various radiological monitoring systems in addition to the means for monitoring carbon monoxide, carbon dioxide, and oxygen. Even with its sophistication, however, Vaughn said the incinerator is a small facility compared with other commercial trash incineration facilities. (Its normal throughput is in the gal/min range for liquids and less than 1000 lb/h for solids.)

A series of tests has recently been completed to ensure the incinerator's safe operation: (1) functional tests in November 1986, (2) vendor performance tests in July 1987, (3) shakedown tests in March 1988, and (4) EPA trial burn tests in June 1988. The unit is expected to be fully operational in November 1988.

The results of the EPA RCRA and TSCA trial burns were discussed in some detail. Vaughn indicated that for the TSCA trial burn, preliminary and final data indicated that the incinerator had met all performance objectives (TSCA performance standards). Preliminary data from the RCRA trial burn test indicated that the incinerator had again met all performance objectives; however, additional testing may be necessary because some samples for the testing had been misplaced. DOE and EPA are currently in negotiations to determine how to best handle this problem.

Near-term efforts at the incinerator will focus on (1) additional testing (e.g., to define operational problems associated with processing wastes not yet tested and to determine the reliability of the NESHAP sampling equipment) and (2) the development of the formal plan for handling ash generated at the incinerator.

The regulators said they would like to see the results of the testing done at the incinerator, and DOE agreed to summarize, at the next MWAC Meeting, all the TSCA sampling data obtained to date.

Evaluation of Alternatives for Managing TSCA Incinerator Ash -
B. M. Eisenhower

Eisenhower discussed alternatives for the management of the mixed waste ash residue that will be the result of TSCA incineration at ORGDP. He said the current plan for handling the ash is to store the ash residues in drums and vaults on the Oak Ridge Reservation (at the ORGDP "K-25" Building) until the ash is delisted and then return the ash to the generating site. At the 9/14/88 meeting, TDHE reaffirmed their endorsement of the policy of returning ash residues to the state where the processed waste originated.

As a starting point for determining what should be done with the ash, a Kepner-Tregoe ("KT") Analysis was conducted by the Central Waste Management Office. The analysis included (1) an identification of the objectives and alternatives for the management of ash residues, (2) an evaluation of the alternatives and their associated risks, and (3) an identification of the preferred approaches for managing the ash.

A total of 8 objectives and 13 alternatives (12 different alternatives and 1 "base case" alternative) were identified. The results of the KT analysis were three "top-scoring" alternatives (Alternatives 1, 8, and 10):

1. No feed constraints with ash storage at ORGDP and ultimate disposal at the waste generating installation.

8. ORNL vs. other 6 waste feed with ash management on the ORR.

10. ORNL vs. other 6 waste feed with ash storage at ORGDP and ultimate disposal at the waste generating installation.

Lance Mezga said that an additional analysis of the alternatives would be necessary before a final decision could be made on the management of the ash residue. All of the alternatives that resulted from the KT analysis would be considered. The analysts would also take another hard look at the issues and questions surrounding the management of TSCA ash (e.g., Is the ash a good candidate for delisting? Will the ash be LLW or BRC waste? Will the unit require decontamination between runs?).

RADIOACTIVE WASTE MANAGEMENT ACTIVITIES - T. E. MYRICK, L. JONES, AND S. D. VAN HOESEN

EASC Status Report - T. E. Myrick

The Emergency Avoidance Solidification Campaign (EASC) was discussed in terms of its four phases of work: (1) solidification contract efforts, (2) facilities construction/checkout, (3) operational planning, and (4) regulatory interface.

One of the major tasks of the solidification effort had been previously mentioned at the June WMAC Meeting: the primary and alternate vendors had completed their waste form certifications and both vendors' formulas passed the 10 CFR 61 Criteria. The ORNL testing of the "hot" waste form begun a few months ago is now nearing completion. The leach indices for the nitrates, cesium, and strontium were about what was expected (comparable to the surrogate leach indices obtained [8.7-8.9 for the nitrates]). The results of the EP-Tox tests have confirmed that the solidified waste form is a non-RCRA waste. Also, the problem noted earlier with the material setting too fast has been remedied; the vendors have modified the sequence in which solids are added (cement is now added last instead of early on in the process).

The cold checkout activities called for in the solidification contract have also gone as expected. (The surrogate waste form behaved as anticipated.) The only problems noted were those typical of this type of operation: problems associated with the transfer of solids.

Facilities construction activities are on schedule. The construction of major facilities was completed in March and the integrated systems test was completed in April. The procurement, testing, and installation of the support equipment (stack monitor, emergency generator, uninterruptible power supply) are on schedule and expected to be complete September 15,

1988. Construction is also complete on the interim storage site that is adjacent to the EASC facilities, and the first batch of casks has been received at the site and is almost ready for use.

All required operational planning documents have been drafted and submitted to TDHE, with the exception of the operating procedures. The preoperational readiness review is in progress, and the recommendation for startup of "hot" operations has been received. Myrick anticipated hot startup would be the week of September 19 or September 26. DOE/ORO will make certain TDHE is informed of the exact startup date as soon as it is known.

Interfaces with the regulators have included transmittal of all requested documentation to TDHE (with no negative feedback) and the completion of the air permit notification and the RCRA permit-by-rule notification. Also, on September 2, TDHE staff observed the solidification process (cold checkout) and toured the interim storage site.

IWMF Concepts for ORNL - T. E. Myrick

Tim Myrick's presentation was an update on the status of planning for the interim waste management facility (IWMF) at the Oak Ridge National Laboratory (SWSA 6 SW). ORNL has been designated the facility responsible for construction and operation of this IWMF since they are the major generator of the Class II waste planned for disposal on the Oak Ridge Reservation. ORNL has proposed the SWSA 6 SW site for construction because it is the most feasible site location at present. ORNL has also proposed the use of a greater confinement disposal technique (the tumulus concept with eventual capping) that would provide for a five-year interim storage capacity and 300-year performance period.

Myrick used several artists' renderings to show the proposed location of the IWMF and the important features of the facility. The key elements of the facility would be as follows: (1) a modular design with five or six tumulus pads per module, (2) vertical loading of the disposal vaults via a straddle crane system, (3) performance monitoring for each module, (4) phased capping of the facility, and (5) engineered site drainage controls for surface and groundwater management.

The current schedule for construction of the facility calls for the initial proposal to be submitted to DOE by January 1989, a facility design and review phase extending from March 1989 to February 1990, an award for construction in May 1990 (following completion of the EIS), and facility construction from May 1990-December 1991, with startup in September 1991.

Myrick concluded his presentation with the identification of issues that need to be addressed as soon as possible. One of these had to do with the interface of IWMF activities with the SWSA 6 closure. It was pointed out that Remedial Action Program personnel involved in SWSA 6 closure activities and the regulators would need to work with IWMF planners to ensure SWSA 6 closure and IWMF (SWSA 6 SW) planning and closure activities all run smoothly. Internal (DOE/MMES) meetings were planned to address key

issues, and it was agreed that an update on these activities would be provided at the next RAP Meeting scheduled for November 1, 1988.

A second issue Myrick felt needed to be addressed was the discontinuation of the first flush sampling off a tumulus facility. A recent study conducted on this type of sampling at the current tumulus facility has shown that a first flush sampling is often invaluable; the composite samples taken later provide more meaningful data. TDHE requested a copy of the report written on this subject, and DOE agreed to send a copy to them and to EPA. A final decision on the matter was postponed until the regulators could review the information and make their recommendations.

Y-12 Site-Specific LLWDDD Implementation Plan - L. S. Jones

The status of the uranium lysimeter demonstration project was the first topic discussed. The lysimeter design was finished in March 1988 and the project test plan in April 1988. The laboratory characterization phase was completed in June and a report on the work should be out by the end of September 1988. In July the only bid was received and it was double engineering's estimate for the work. The work was rescoped and another call for bids sent out. Project managers are still aiming for construction to begin in mid-November, construction to end by April 1989, and loading to begin in mid-April 1989.

A second implementation activity covered was the transportation of Y-12 LLW to ORGDP for storage (some 400 B-25 boxes of baled wastes, carbon, and contaminated filters and 400 drums of uranium oxide). Jones emphasized that Y-12 is relying heavily on ORGDP for storage and is taking the necessary steps to ensure that no more waste (with the possible exception of some debris-type waste) will be sent to the old burial grounds after the end of this calendar year.

Jones also talked about (1) efforts to characterize an East Chestnut Ridge site for Class I LLW disposal, (2) work to modify the TDHE permit for the Y-12 Centralized Landfill II, and (3) work aimed at improved waste monitoring and certification. Two types of monitoring devices--waste curie monitors and crated waste assay monitors--are in the initial testing stages and are planned for use sometime in late 1989.

At the conclusion of Jones's presentation, TDHE asked if anything new had been learned as a result of the recent workshop on uranium treatment. Bob Sleeman said a "white paper" was being finalized on the subject of uranium treatment and he would see that a copy was sent to TDHE and EPA.

Report on the Trip to France (The French Tumulus Technology) -
S. D. Van Hoesen

Dirk Van Hoesen reported on what he had learned about the French technology for managing LLW during his June trip to France. He talked briefly about French characterization, acceptance, and certification activities. (The details of the French characterization, acceptance, and certification process, he said, would be available soon in a report to be issued by the

French contractor, SGN.) The majority of his presentation focused on the way the French operate the disposal portion of their systems for waste management. He provided details on the facility in operation at La Manche, the facility where cover experiments are being conducted at St. Sauvert, and the new facility planned for L'Aube.

In his description of the La Manche facility, Van Hoesen covered the receiving operation, the grout injection operation, the compaction activity, the placement of monoliths and tumulus vaults on the disposal facility, the facility's drainage operation, the handling of remote material, the moving of wastes from one location to another, and the storage of material not acceptable for disposal at the facility. Some of the noteworthy features of the facility were the two-tier (two-pad) operation, the use of monoliths for encapsulating waste, the stabilization and immobilization of the waste, the disposal of both high-activity waste and lower-activity waste at the facility, and a sophisticated drainage system.

St. Sauvert was only briefly discussed. It is at this site where the French are conducting experiments on a cover for the La Manche facility. Van Hoesen said the French believe the construction of the cap according to their final design will take approximately five years.

The distinguishing features of the new site planned for L'Aube would be an all above-grade operation where the tumulus units would be separated from the monoliths. The facilities would be constructed on the sandy soil portion of the site that overlies a clay formation to provide subsurface drainage. Approximately 70 persons would be employed to operate the facility and it is expected the facility will begin operating about the same time our IWMF is complete (in late 1991).

CONCLUDING REMARKS/REVIEW OF ACTION ITEMS - R. C. SLEEMAN

Bob Sleeman set a date for the next WMAC Meeting (December 13, 1988) and summarized action items that needed to be accomplished prior to the meeting. The action items follow on the next page.

ACTION ITEMS IDENTIFIED

AT THE 9/14/88 WMAC MEETING

(Issues To Be Addressed Prior to the 12/13/88 WMAC Meeting)

1. Talk with EPA Headquarters and get input on the sampling and analysis plan for delisting the K-1232 sludge - R. C. Sleeman, DOE/ORO

2. Notify TDHE of the date when solidification of sludges will begin at the Melton Valley Storage Tanks - W. N. Lingle, DOE/ORO

3. Send TDHE/EPA a copy of the study on alternatives for disposing of ash generated via TSCA incineration (following DOE/ORO's receipt of the documented study around October 1) - R. C. Sleeman, DOE/ORO

4. Provide TDHE/EPA with the data obtained from the initial flush off the tumulus pad (the week of 9/19/88) - W. N. Lingle, DOE/ORO

5. Send TDHE/EPA a copy of the peer review report on the lysimeter test plan - L. Jones, Y-12

6. Send TDHE/EPA a copy of the Waste Management Technology Center's "white paper" on the uranium workshop - L. J. Mezga, MMES

7. Send TDHE/EPA a copy of the report on the BRC pathways analysis - W. N. Lingle, DOE/ORO

8. Follow up with NAS to schedule the third-party peer review of the report on the BRC pathways analysis (review to take place within 30 days of the report's transmittal to TDHE/EPA) - R. Allen, DOE/HQ

9. Make presentations on the SWSA 6 closure and its interface with the IWMFs at the November 1 RAP Review Meeting - DOE and MMES

10. Make presentations on the EIS alternatives and the results of the data obtained to date on TSCA sampling at the December 13 WMAC Meeting - DOE and MMES

ATTENDEES

AT THE 9/14/88 WMAC MEET.NG

T. A. Bowers, MMES (ORGDP)
E. Cox, TDHE
M. R. Dolenc, EG&G Idaho, Inc.
B. M. Eisenhower, MMES (ORNL)
J. D. Holbert, TDHE
D. R. Hopkins, EPA
G. Irwin, TDHE
D. W. Lee, MMES (ORNL)
E. C. Leming, TDHE
W. N. Lingle, DOE/ORO
A. G. Linton, EPA
E. S. McDougald, MMES (Y-12)
C. P. McGinnis, MMES (ORNL)
L. E. McNeese, MMES (ORNL)
L. J. Mezga, MMES (ORNL)
C. L. Mills, Analysas Corp.
M. H. Mobley, TDHE
T. E. Myrick, MMES (ORNL)
J. Okoreeh-Baah, TDHE
T. P. Perry, MMES (ORNL)
R. C. Sleeman, DOE/ORO
Lisa Stetar, TDHE
J. T. Sweeney, DOE/ORO
S. D. Van Hoesen, MMES (ORNL)
B. E. Vaughn, MMES (ORGDP)
B. V. Wojtowicz, MMES (ORGDP)

HAZARDOUS AND MIXED WASTE MANAGEMENT ACTIVITIES MARTIN MARIETTA ENERGY SYSTEMS

Presented to the Waste Management Advisory Committee

on

September 14, 1988

Mike Eisenhower
Environmental and Safety Activities
Central Waste Management Office

Management of Hazardous and Mixed Wastes

- A need for an integrated approach to managing hazardous and mixed wastes generated at Energy Systems installations was recognized in 1986.

- A strategic plan was formulated consisting of the following components:
  - Waste Stream Characterization
  - Waste Minimization
  - Interim Storage of Mixed Wastes
  - Continual utilization of Commercial Sector for treatment/disposal of hazardous waste with an evaluation of internalizing certain hazardous waste streams
  - Identifying and demonstrating technologies for treatment/disposal, particularly mixed wastes
  - Planning and design for future facilities

Enter the HAZWDDD Program

- HAZWDDD serves as the implementing arm of the strategic plan for multi-installational hazardous and mixed waste management activities.

- The HAZWDDD approach for addressing the strategic components includes:

1) Waste Stream Database - Characterization - Categorization - Flow Sheets	WHAT ARE THE PROBLEM WASTE STREAMS?
2) Inventory of Current TSD Capabilities	WHAT DO WE HAVE?
3) Assessment of Capabilities	WHAT DO WE NEED?
4) Technology Demonstrations	WHAT ARE THE <u>BEST</u> SOLUTIONS?
5) Waste Management Planning - Onsite Facilities - Mobile Units - Onsite vs Private Sector	WHAT IS THE MOST COST EFFECTIVE OPTION THAT GETS THE JOB DONE?

HAZWDDD Organization

- Central Waste Management Office has overall responsibility for the HAZWDDD Program.

- Waste Management Technology Center serves as the Program Manager for core HAZWDDD activities.

- Individual installations are the bonding elements for the Program. HAZWDDD IS THEM: THEY ARE HAZWDDD.

HAZARDOUS WASTE DEVELOPMENT, DEMONSTRATION, AND DISPOSAL (HAZWDDD) PROGRAM

An Exercise In Corporate Planning

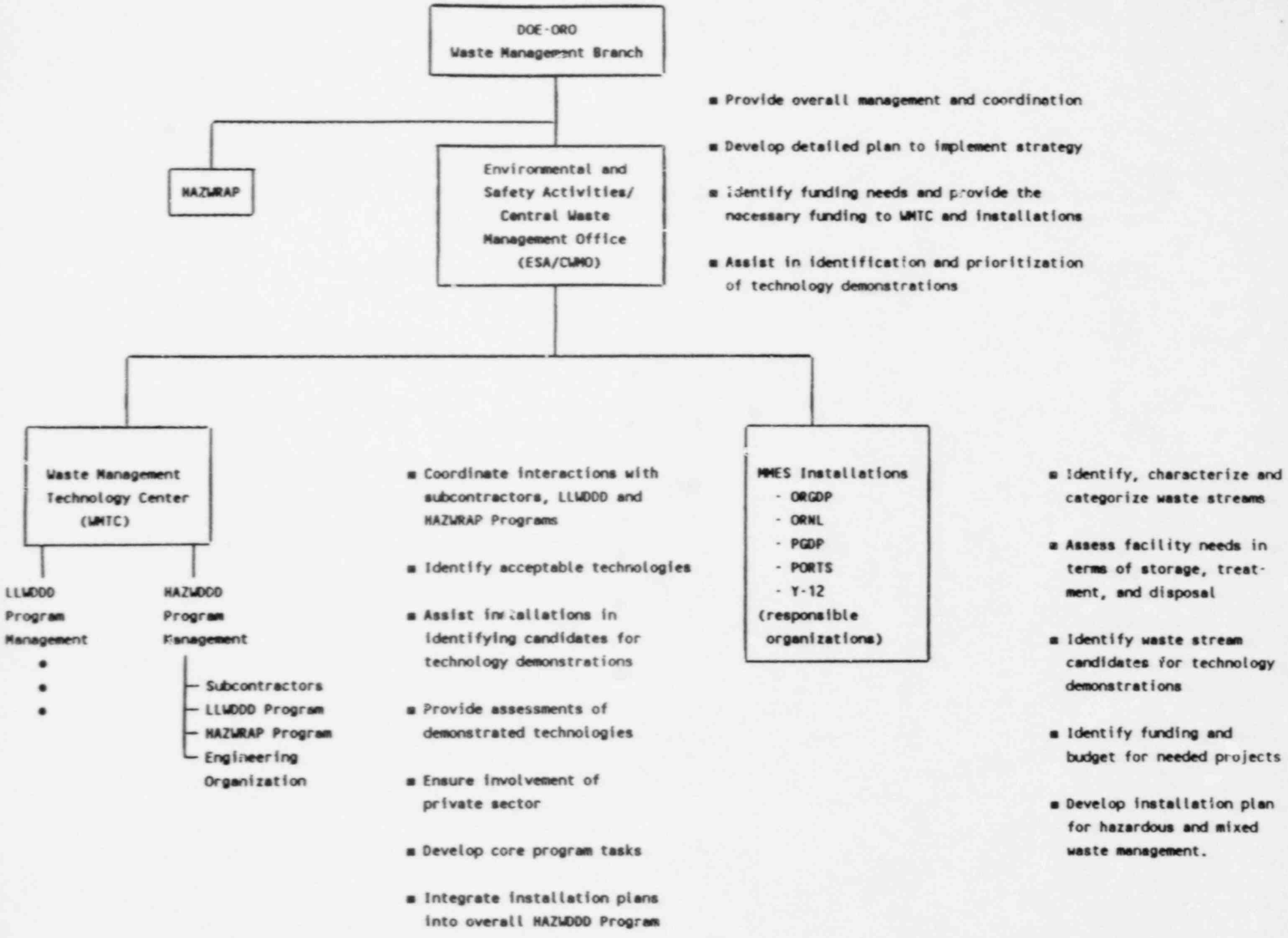
September 14, 1988

Phil McGinnis
PROGRAM MANAGER

Mike Eisenhower
Lance Mezga
CENTRAL WASTE MANAGEMENT OFFICE

DOE-ORO AND ENERGY SYSTEMS RECOGNIZE THE NEED TO PLAN FOR HAZARDOUS AND MIXED WASTE NEEDS

- CORPORATE DOCUMENT BY DECEMBER
- 5 INSTALLATION DOCUMENTS BEING FINALIZED
- ACTIVE CORPORATE AND INSTALLATION HAZWDDD TEAMS
- PROGRAM FUNDED BY TAX ON INSTALLATIONS



INTEGRATED SYSTEM ANALYSIS APPROACH DESCRIBED ABOVE IS SHOWN IN THIS CONCEPTUAL FRAMEWORK

HAZWDDD RESPONSIBILITIES FOR FY 1988 EMPHASIZE PLANNING

- Establish Program Office
- Develop Installation Plan format, help establish teams, coordinate installations activities
- Design, implement, and maintain waste characterization, facilities assessment, and technology needs data bases
- Prepare Corporate Plan draft and issue for review
- Currently second draft is in preparation
- Coordinate technology transfer
- Conduct demonstrations

PROGRAM INTERFACES WITH OTHER SIMILAR INITIATIVES

- LLWDDD IS SISTER PROGRAM IN WMTC
- HAZWRAP (NATIONAL PROGRAM) FUNDS SOME DEMONSTRATIONS, USES OUR DATA BASES
- RAP PROGRAMS FEED MATERIAL TO HAZWDDD

BOTTOM-UP APPROACH TO DATA COLLECTION AND IMMEDIATE PRIORITIES WAS UNDERTAKEN

- INPUT INTO DATA BASE NEEDS
- CORPORATE TEAM HELPED PLANTS GATHER AND QA DATA
- CURRENT PROBLEM RESOLUTION COORDINATION

TOP-DOWN APPROACH USED FOR STRATEGIC ISSUES DEVELOPMENT

- Technology needs
- Facility planning
- Long-term recommendations
- Engineering and consultant assistance
- Peer review
- Periodic updates

SITE PLANS AND DATA COLLECTION ESTABLISHED THE PLAN FACTS

- Standard format
- ~400 waste streams characterized
- All Energy Systems TSD facilities categorized
- Problems prioritized across entire corporation

INSTALLATION DOCUMENTS USED
STANDARD OUTLINE

I. Introduction

II. Waste Stream Identification and Evaluation

III. Current Capabilities Assessment

IV. Evaluation of Treatment, Storage, and Disposal Alternatives

V. Technology Development and Demonstration Needs

VI. Facilities Planning and Development

VII. Schedule and Budget Summary

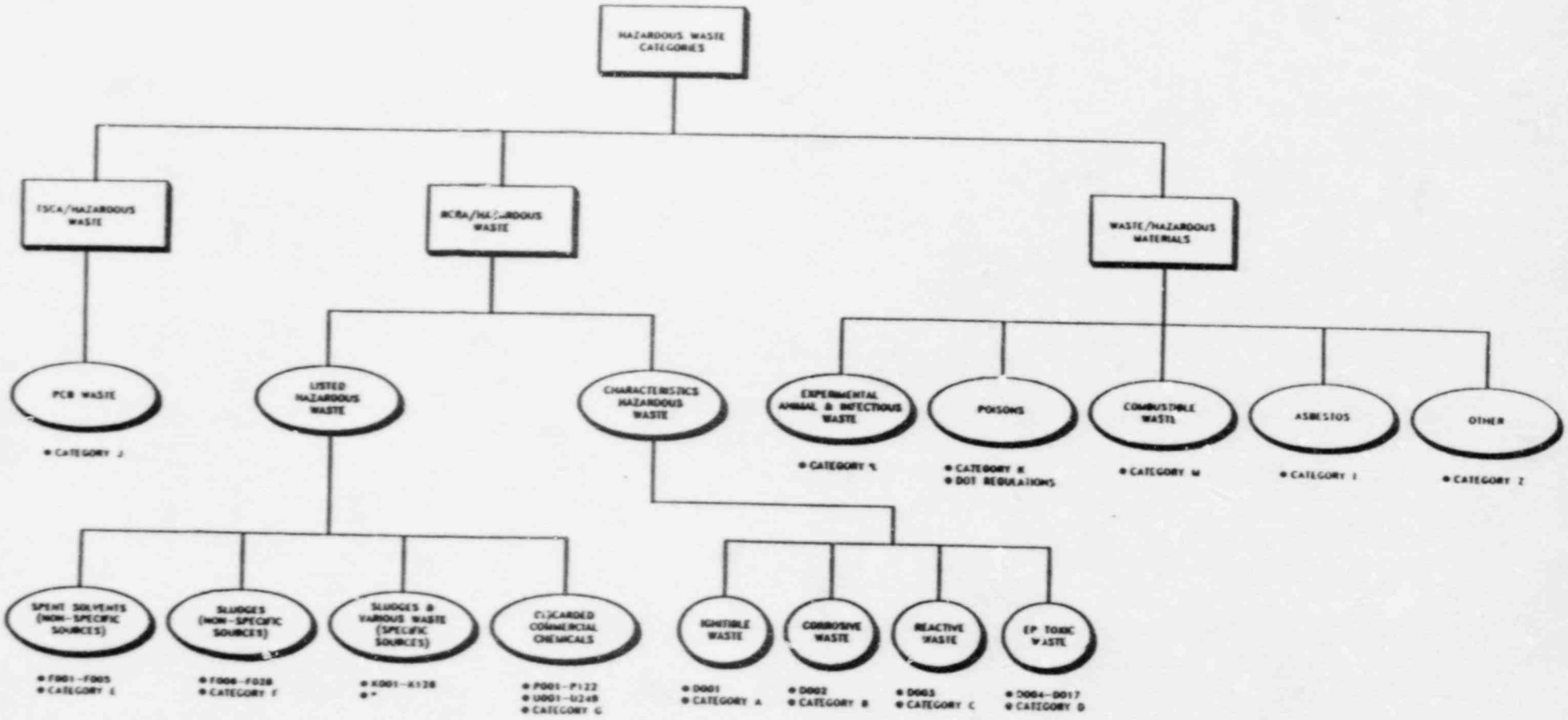
WASTES WERE GROUPED BY CATEGORIES

Cat.	EPA code(s)	Description
		Characteristically hazardous wastes
A	D001	Ignitible - a waste exhibits this characteristic if the waste has a flash point under 60°C, or as a solid, it is capable of causing fire through friction at standard temperature and pressure (see 40 CFR 261.21)
B	D002	Corrosive - a waste exhibits this characteristic if its pH is less than 2 or greater than 12.5, or if it corrodes steel at a given rate (see 40 CFR 261.22)
C	D003	Reactive - a waste exhibits reactivity if it is normally unstable, reacts violently with water, is capable of detonation, or generates toxic gases under certain conditions (see 40 CFR 261.23)
D	D004-D017	EP toxic - a waste exhibits toxicity if the leachate contains given toxic chemicals (such as arsenic, lead, mercury, silver) at concentrations equal or higher than those given in 40 CFR 261.24
		EPA/RCRA listed waste categories
E	F001-F005	Spent solvents - spent halogenated solvents such as TCE, chlorinated fluorocarbons; spent nonhalogenated solvents such as acetone, methanol and more; also mixtures/blends containing, before use, 10% or more (by volume) of these solvents (see 40 CFR 261.31)

WASTES WERE GROUPED BY CATEGORIES cont.

Cat.	EPA code(s)	Description
F	F006-F028	Sludges - waste-water treatment sludges from electroplating operations, spent solutions from certain electroplating operations and other nonspecific sources, wastes from the production of certain chemicals (see 40 CFR 261.31 for more details)
G	P001-P122 and U001-U249	Discarded commercial chemicals - discarded chemicals as listed in 40 CFR 261.33 such as cyanides, benzene, chlorophyll, etc.
		ISCA regulated hazardous wastes
J	(none)	PCB wastes - any form of PCB wastes (liquid, solid, etc.)
		Other hazardous wastes
I	(none)	Asbestos - any form of asbestos
K	(none)	Poisons, identified otherwise by DOT numbers
L	(none)	Experimental animal wastes and infectious wastes
M	(none)	Combustibles - materials that have a flash point above 60°C
U	(none)	Hazardous constituent not identified (unknown)
Z	(none)	Hazardous material other than any of the above mentioned

CATEGORIES FOLLOW EPA GROUPINGS



* = NOT CATEGORIZED FOR HAZWOOD BECAUSE NONE OF THESE LISTED WASTES ARE PRODUCED AT THE WMES SITES.

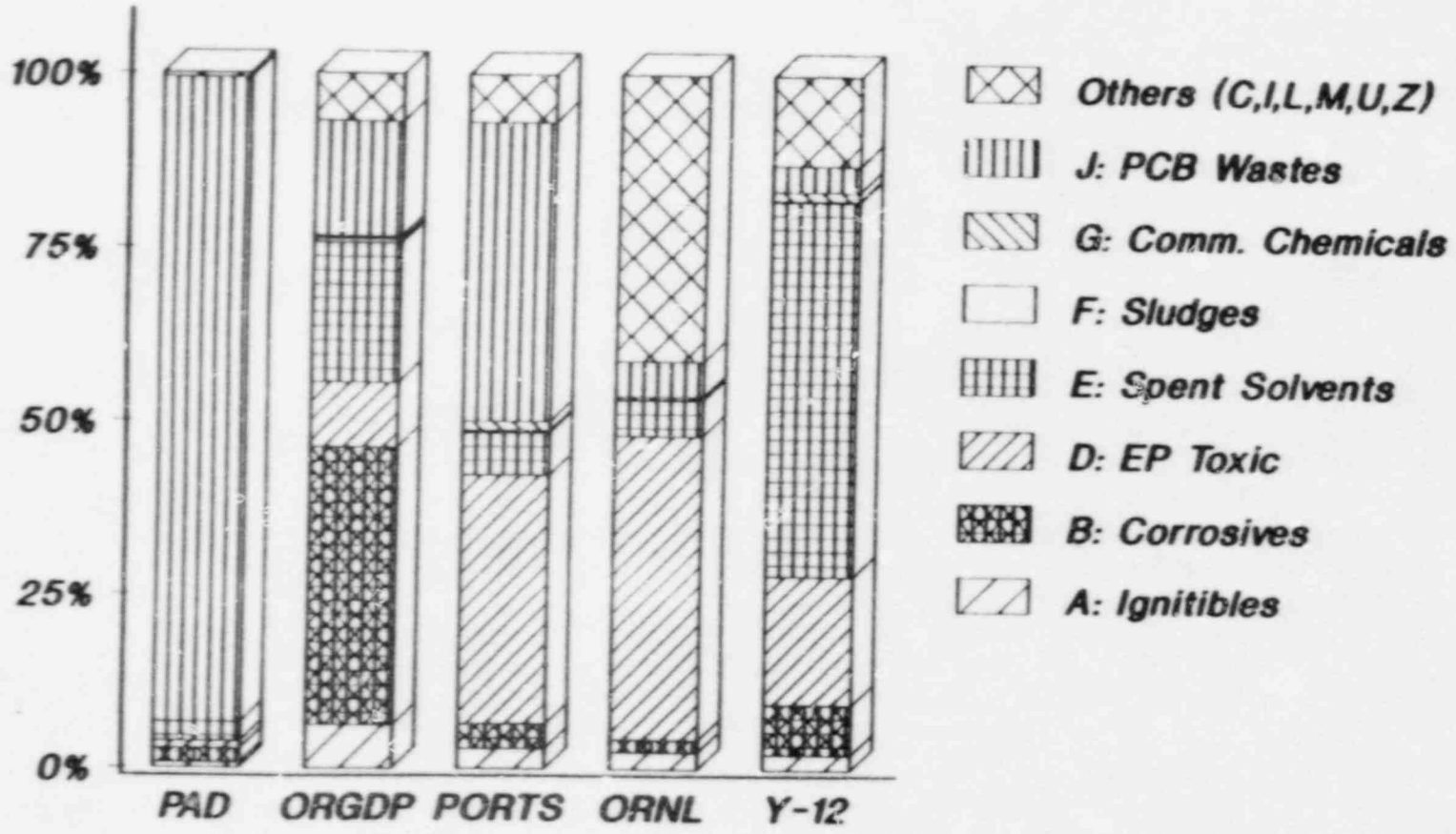
PRELIMINARY

ANNUAL GENERATION RATES GROUPED BY CATEGORY ALLOW COMPARISON

Waste category	Annual generation rates, kg/year					
	Paducah	ORGDP	Portsmouth	ORNL	Y-12	Total
A	2,591	7,550	3,440	9,865	59,395	82,841
B	6,817	48,160	4200	6,867	193,185	259,229
C		6		30	244	280
D	3,704	11,290	42,614	173,247	497,234	728,089
E	9,545	24,130	7,239	20,461	1,439,922	1,501,297
F		700	413		4,200	5,313
G	20	460	1,536	2,092	35,000	39,108
I	818	8,000	4,600	34,095	337,411	384,924
J	318,182	19,900	51,083	19,962	99,075	508,202
K				6,248		6,248
L		300	0	15,077		15,377
M			3,178	27,452	600	31,230
U	1,364		0	71,333	0	72,697
Z			420	8,912	5,502	14,834
Total	343,041	120,496	118,723	395,641	2,671,768	3,649,669

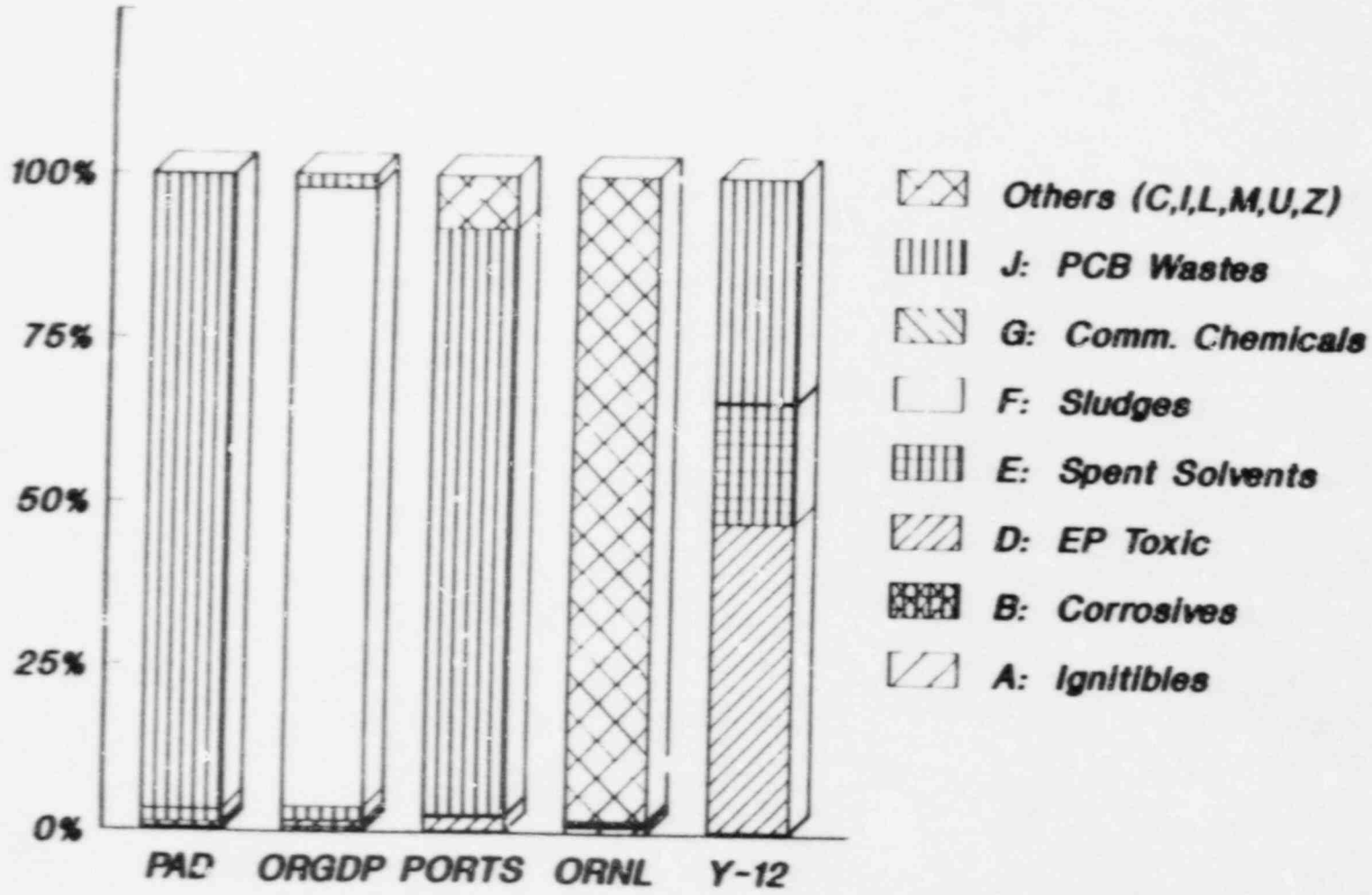
PRELIMINARY

EACH FACILITY HAS A UNIQUE WASTE MIX



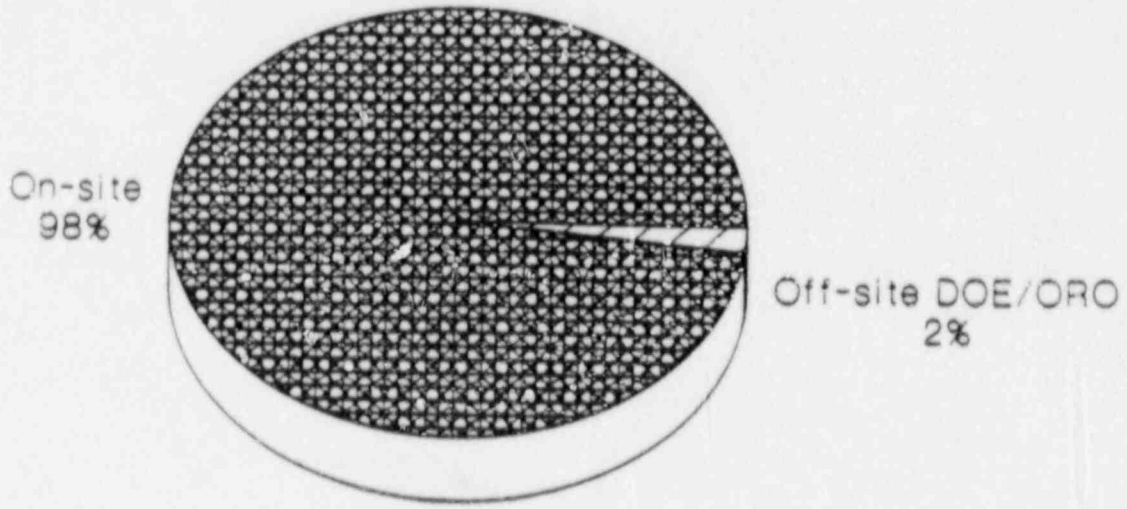
PRELIMINARY

CURRENT INVENTORIES

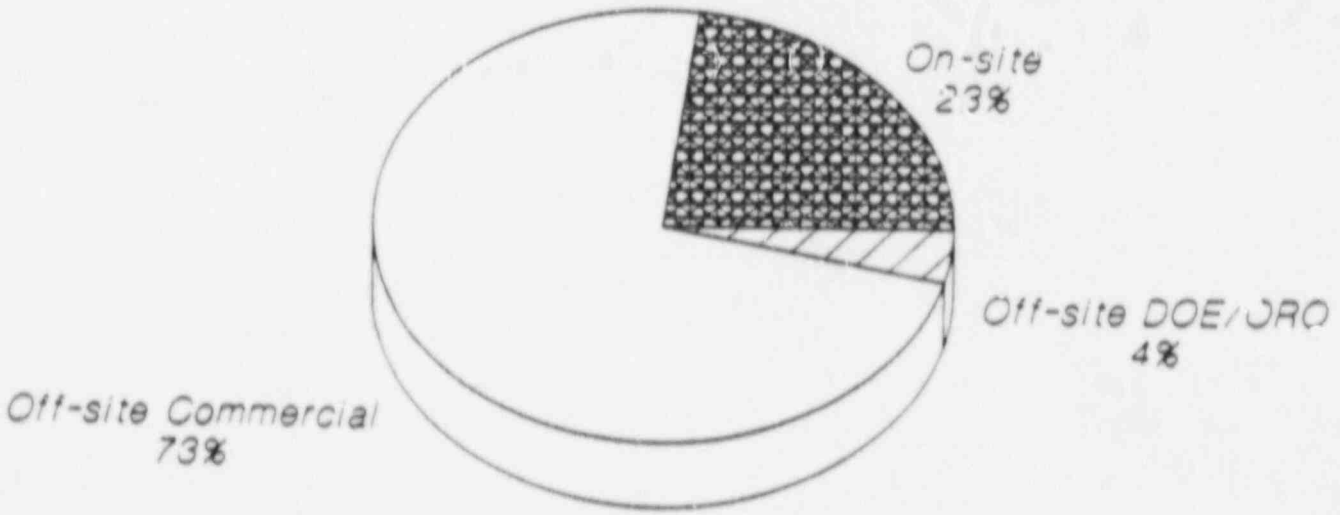


PRELIMINARY

WASTES ARE PRIMARILY HANDLED AT THE GENERATOR SITE



Mixed waste annual generation rates organized by destination.



Hazardous waste annual generation rates organized by destination.

PROBLEMS WERE IDENTIFIED AND RANKED AT HAZWDDD WORKSHOPS

HIGH PRIORITY:

- WASTE GENERATED AS A RESULT OF TREATING GROUNDWATER CONTAMINATION
- CONTAMINATED SOILS REMOVED FROM GROUND
- TSCA ASH
- SLUDGES
- SURFACE CONTAMINATION

MID-PRIORITY:

- CHROMIUM SLUDGES
- CONTAMINATED COOLING TWR MATERIAL
- SUBSTITUTION/RECOVERY FOR CHLORINATED SOLVENTS
- GAS CYLINDERS

ISSUES WERE IDENTIFIED

Section	Category	Issue
2.1	Waste Minimization	Avoidance
		Conversion to Nonhazardous Wastes
		Minimization of Secondary Wastes
		Delisting
		Below Regulatory Concern/ Health Based Standards
		Role of Risk Assessment
2.2	Consolidation	Common Concerns
		Shared Technology Development
		Shared Facilities
		Program Interfaces (LLWDDD, HAZWRAP)
		Transportation
2.3	Internalization	Commercial Treatment/Disposal
		DOE Liability
		Federal Regional Facilities
2.4	Disposal	Last Recourse
		Regional vs. On-site vs. Commercial

OBJECTIVE IS TO ENSURE CAPABILITY TO TREAT AND DISPOSE OF HAZARDOUS AND MIXED WASTES

QUESTIONS FROM THIS ANALYSIS ARE:

1. IS THE REQUIRED TREATMENT AND DISPOSAL CAPABILITY AVAILABLE?

2. IS THERE SUFFICIENT CAPACITY IN EACH AVAILABLE TREATMENT/DISPOSAL FACILITY TO HANDLE ALL OF THE POTENTIAL WASTE STREAMS TO BE ASSIGNED?

3. IS EACH WASTE STREAM BEING HANDLED IN A MANNER COMMENSURATE WITH REGULATORY REQUIREMENTS AND COMPANY POLICY?

NEEDED ACTIVITIES WERE IDENTIFIED FROM THE WORKSHOPS AND PREVIOUS SLIDES

Proposed Study Demonstration	Waste Concern	Installation
1. Position Papers/Protocol	All "Common" Concerns	All
1.1 Below Regulatory Concern (BRC)		
1.2 Statistically Valid Waste Characterization		
1.3 Delisting		
1.4 Risk Assessment		
1.5 Commercial Treatment/Disposal Cost Benefit Analysis		
2. Studies		
2.1 Evaluate Broadening TSCA Acceptance Criteria	Contaminated Wastes (Be, radionuclides)	All
2.2 Evaluate in situ Oxidation of Chromium Sludges	Chromium Sludges	C,K,P
2.3 Evaluate Private Cooling Tower Disposal Practices	Cooling Tower Materials	All
2.4 Evaluate Cylinder Transfer Equipment	Gas Cylinders	All
3. Technology Demonstrations		
3.1 Groundwater Treatment	Groundwater Contamination	All
3.2 In Situ Soil Treatment	Soil Contamination	All
3.3 Thermal Treatment	Soil and Surface Contamination	All
	Sludge (Hg, organics, PCB)	
3.4 Decontamination	Soil and Surface Contamination, TSCA Ash, Sludges	All
3.5 Fixation	Soil and Surface Contamination, TSCA Ash, Sludges, Chromium Sludges, Cooling Tower Materials	All
3.6 Volume Reduction	Surface Contamination, Sludges	All
4. Facilities		
4.1 Mixed Waste Disposal Facility	Soil and Surface Contamination, TSCA ash, Sludges	All
4.2 Decontamination Facility	Soil and Surface Contamination, TSCA ash, Sludges	All
4.3 Thermal Treatment Facility	Soil and Surface Contamination Sludges	All

IN CONCLUSION:

CORPORATE DOCUMENT IN DECEMBER PLANS FOR HAZARDOUS AND MIXED WASTE NEEDS

- Upper management agreement
- 10 year horizon
- Periodic updates
- Thought process employed and multiple reviews ensure quality plan

STATUS REPORT FOR THE Y-12 SLUDGE DETOXIFICATION DEMONSTRATION

PRESENTED AT THE
WASTE MANAGEMENT ADVISORY COMMITTEE MEETING

HAZARDOUS WASTE AND MIXED WASTE MANAGEMENT ACTIVITIES

SEPTEMBER 14, 1988
SHERATON INN SOUTH
CHATTANOOGA, TENNESSEE

BY
PAUL E. HOLLENBECK

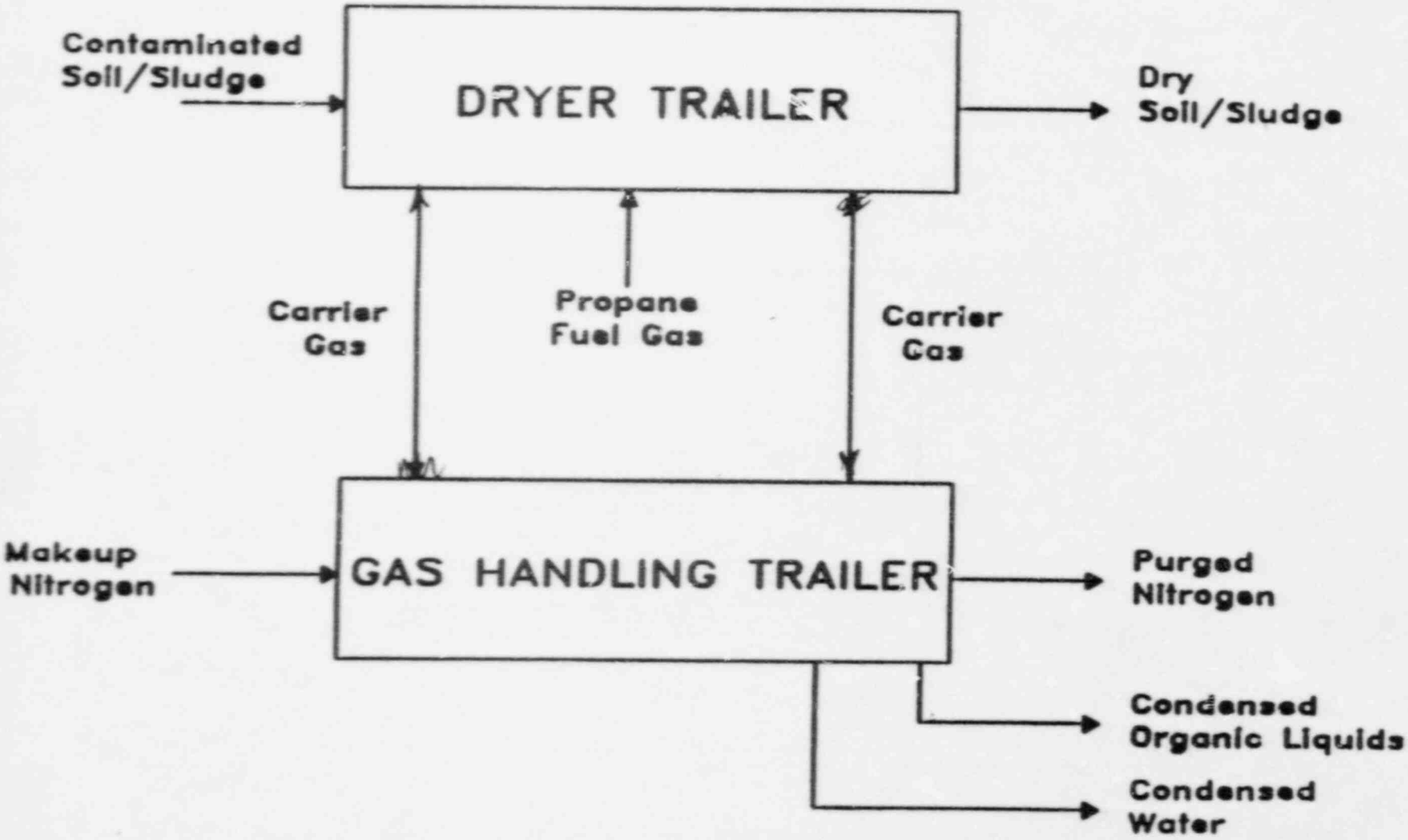
WASTE MANAGEMENT TECHNOLOGY CENTER
OAK RIDGE NATIONAL LABORATORY
OPERATED BY
MARTIN MARIETTA ENERGY SYSTEMS, INC.
FOR DOE/ORO

Y-12 SLUDGE DETOXIFICATION DEMONSTRATION PROJECT

LISTING OF EVENTS

o	CONTRACT PLACED	OCT. 1987
o	FEED PREPARATION AND CHARACTERIZATION	MARCH 1988
o	PERMITTING	
	RCRA	
	RD&D PERMIT NOT REQUIRED	AUGUST 1988
	MODIFICATION TO INTERIM STATUS	
	AIR	
	APPLICATION SUBMITTED	MAY 1988
	APPROVAL	AUGUST 1988
	NESHAP	
	NOT REQUIRED - DOE CONCURRENCE RECEIVED	JULY 1988
o	DELISTING	
	SAMPLING & ANALYSIS PLAN TO BE COMPLETED 2 MONTHS AFTER DEMO COMPLETE	
	PREPARATIONS ARE BEING MADE FOR INITIAL CONTACT WITH EPA	
o	PLANS AND PROCEDURES COMPLETED	JULY 1988
o	DEMONSTRATION	
	EQUIPMENT CHECKOUT IN MILWAUKEE	JULY 1988
	EQUIPMENT ARRIVES IN OAK RIDGE	AUGUST 1988
	DEMONSTRATION COMPLETE	OCT. 1988
o	FINAL REPORT TO BE COMPLETED BY	MID-DEC. 1988

BLOCK FLOW DIAGRAM
XTRAX SOIL/SLUDGE THERMAL SEPERATOR



PHOTOGRAPHS

Y-12 SLUDGE DETOXIFICATION DEMONSTRATION

1. K/P H88-2271, TRAILERS AND PROCESS SYSTEMS SET UP WITH VIEW OF CONDENSATE AND VENT SYSTEMS
2. K/P H88-2268, TRAILERS AND PROCESS SYSTEMS SET UP WITH VIEW OF TOTE BIN AND FEED SYSTEMS
3. K/P H88-1574, SLUDGE K-1232
4. K/P H88-1575, SLUDGE CPCF.
5. K/P H88-2292, VIEW OF PERSONNEL PROTECTION AT FEED STATION
6. K/P H88-2283, VIEW OF KILN AT FEED END.
7. K/P H88-2285, SCRUBBER AND WATER SYSTEM WITH COLLECTION TANKS AND VENT
8. K/P H88-2284, CONDENSATE COLLECTION TANKS WITH VIEW OF VENT SYSTEM
9. K/P H88-2277, CONDENSATE STORAGE DRUMS WITH VIEWS OF CHARCOAL FILTERS, VENT SYSTEM, AND GAS REHEATER
10. K/P H88-2279, VIEW OF KILN, DRY MATERIAL WITHDRAWAL AND COLLECTION SYSTEM

CURRENT DELISTING EFFORTS AT MARTIN MARIETTA ENERGY SYSTEMS INSTALLATIONS

Presented to the Waste Management Advisory Committee

on

September 14, 1988

Mike Eisenhower
Environmental and Safety Activities
Central Waste Management Office

Candidate Waste Streams for Delisting

- K-1407 B&C Pond Sludges
- K-1232 CPCF Wastewater Treatment Sludges
- Wastewater Treatment Sludges from WETF
- TSCA Incinerator Ash

K-1232/CPCF Wastewater Treatment Sludges

- F006 listed mixed sludges
- 48 drums (24 from each population) have been blended for the detoxification demonstration
- Delisting of treated sludges is part of planned demonstration
- Sampling and analysis plan scheduled for submittal Two months after completion of demo, i.e., December 1988

K-1407 B&C Pond Sludges

- F006 listed mixed sludges
- Sludges are being removed and stabilized in concrete
- Stabilized sludge stored in drums
- Sampling and analysis plan has been approved by EPA
- Delisting petition scheduled for submittal by November 1988

WETF Sludges

- F006 listed mixed sludges from the Y-12 CPCF and biodenitrification sludges from WETF
- Sludges currently stored in tanks at Y-12
- Delisting initiative identified as part of HAZWDDD efforts in FY '89 and '90

TSCA Ash

- Ash residues containing varying concentrations of heavy metals, uranium, and fission products.
- Current plans call for interim storage at ORGDP until can be delisted and returned to installations for further management.
- Delisting initiative identified as part of HAZWDDD efforts in FY '89 and '90.

Issues and Questions

General

- Are there any reasons why delisting of low-level mixed wastes cannot be accomplished to remove from RCRA regulations to allow management as solid low-level wastes?

- What model is used to determine delistability of wastes which are:

  1) stabilized;

  2) stored in steel containers;

  3) stored in steel containers in open air under roof?

- Are the health-based standards used for model comparison changing? Are any updated values available?

Specific

- What analytical information from the feed material to the incinerator should be included in the petition?

- What preparatory and extraction procedures are required for stabilized waste?

- Has the EPA adopted a hierarchy for incinerators similar to the POHC, or do we have to analyze the ash for all organics found in the feed material?

- If there is a hierarchy, how much data, in addition to the trial burn destruction efficiency data, will be required for the Appendix VIII organics?

EVALUATION OF ALTERNATIVES FOR MANAGING TSCA INCINERATOR ASH

Presented to the Waste Management Advisory Committee

on

September 14, 1988

Mike Eisenhower
Environmental and Safety Activities
Central Waste Management Office

What To Do With The Ash???

- Treatment of wastes via the TSCA incinerator will generate a mixed waste ash residue.

- Ash residues will be stored in drums and vaults. Storage capacity existing and/or planned through 1997.

- To complete the waste management cycle must evaluate alternatives for managing ash.

Analysis of the Problem

- A Kepner-Tregoe Analysis was conducted to identify our objectives and alternatives, compare the two, assess the risks, and select the preferred approach for managing the ash.

The Objectives

MUSTS

- Meet transportation, storage, treatment, and disposal regulatory requirements.
- Return ash to waste generating installation.

WANTS

- Ash be delistable
- Minimize transportation risks
- Alternative selected is compatible with current waste handling/storage plans
- Ash meets installation storage/disposal capabilities
- Minimize impact on operational flexibility
- Minimize overall costs for managing ash

The Alternatives

Three major elements consisting of several alternatives were considered.

- o Waste Stream Feed
  - No feed constraints
  - Installation specific feeds
  - Program feeds
  - ORNL vs. other 6
  - Individual state feeds
- o Storage & Delisting
  - ORGDP storage
  - ORGDP storage for ORR installations; others back
- o Disposal
  - ORR disposal for ORR installations; others back
  - ORR disposal

Combinations of the above produced 12 different alternatives + 1 base case*

*Base Case: No feed constraints
Storage at ORGDP
ORR Disposal

Results of Analysis

- With Base Case as MUST objective the 2 highest scoring alternatives were:
  - Alternative #1

    No feed constraints with ash storage at ORGDP and ultimate disposal at the waste generating installation.
  - Alternative #10

    ORNL vs. other 6 waste feed with ash storage at ORGDP and ultimate disposal at the waste generating installation
- With Base Case as WANT objective, the highest scoring alternatives included the two above + one additional one:
  - Alternative #8

    ORNL vs. other 6 waste feed with ash management on ORR.

Issues/Questions

- Is this ash a good candidate for delisting?
- Will ash be LLW or BRC?
- Will ash be hazardous by association with treatment process?
- Will unit require decon between runs?
- At what point must ash meet WAC, at TSCA or at receiving installation upon return?
- Analysis is RAD driven.

  U waste generators (6) vs. fission products generator (1)

THE ORNL EMERGENCY AVOIDANCE SOLIDIFICATION CAMPAIGN FOR LLLW – STATUS REPORT

T. E. Myrick
T. H. Monk
C. B. Scott
R. E. Helms

Environmental and Health Protection Division
Engineering Division

Oak Ridge National Laboratory

Presented To The Waste Management Advisory Committee

September 14, 1988

EASC STATUS REPORT TO COVER FOUR MAJOR PROGRAM PHASES

- o Solidification Subcontract Status
  - Waste Form Testing
  - Cold Checkout
- o Facilities Construction/Checkout
  - Solidification Facilities
  - Waste Storage Facilities
- o Operational Planning
  - Project Documentation
  - Readiness Review
- o Regulatory Interface
  - RCRA Permitting
  - Cold Checkout Site Visit

I. SOLIDIFICATION CONTRACT STATUS

Waste Form Testing

- Primary And Alternate Vendors (LN Technologies And Chem Nuclear, Respectively) Have Successfully Completed Waste Form Certification Against 10 CFR 61 Criteria

- ORNL Testing Of "Hot" Waste Form Is Nearing Completion
  - Leach Indices For Indicator Species Are Comparable To Surrogate
  - EP-Tox Results Confirm That Solidified Waste Form Is Non-RCRA
  - "False Set" Concerns Were Alleviated By Modification Of Solids Addition Sequence

I. SOLIDIFICATION CONTRACT STATUS (CONT)

Cold Checkout Activities

- LN Technologies Initiated The Month-Long Cold Checkout Phase On August 15

- Equipment Set-Up and Shake-Down Resulted In Only Minor Facility Modifications, Interface Improvements, and Procedure Changes In the EASC Facilities And Project Documentation

- Four Liners Have Been Processed During Checkout
  - Two Liners Of Water And Cement Mix To Initially Test The System
  - Two Liners Of Surrogate LLLW To Observe Solidification Process
  - Solidified Liners, Transport Cask And Storage Cask Have Been Utilized To Test Waste Transport And Storage Operations

- Surrogate Waste Forms Solidified As Expected, With Peak Temperatures And Waste Cool-Down Well Within Specified Limits

- Principle Operational Problems Have Been Associated With Solids Transfer Operations, As Usual For This Type Of Process

II. FACILITIES CONSTRUCTION

Solidification Facilities

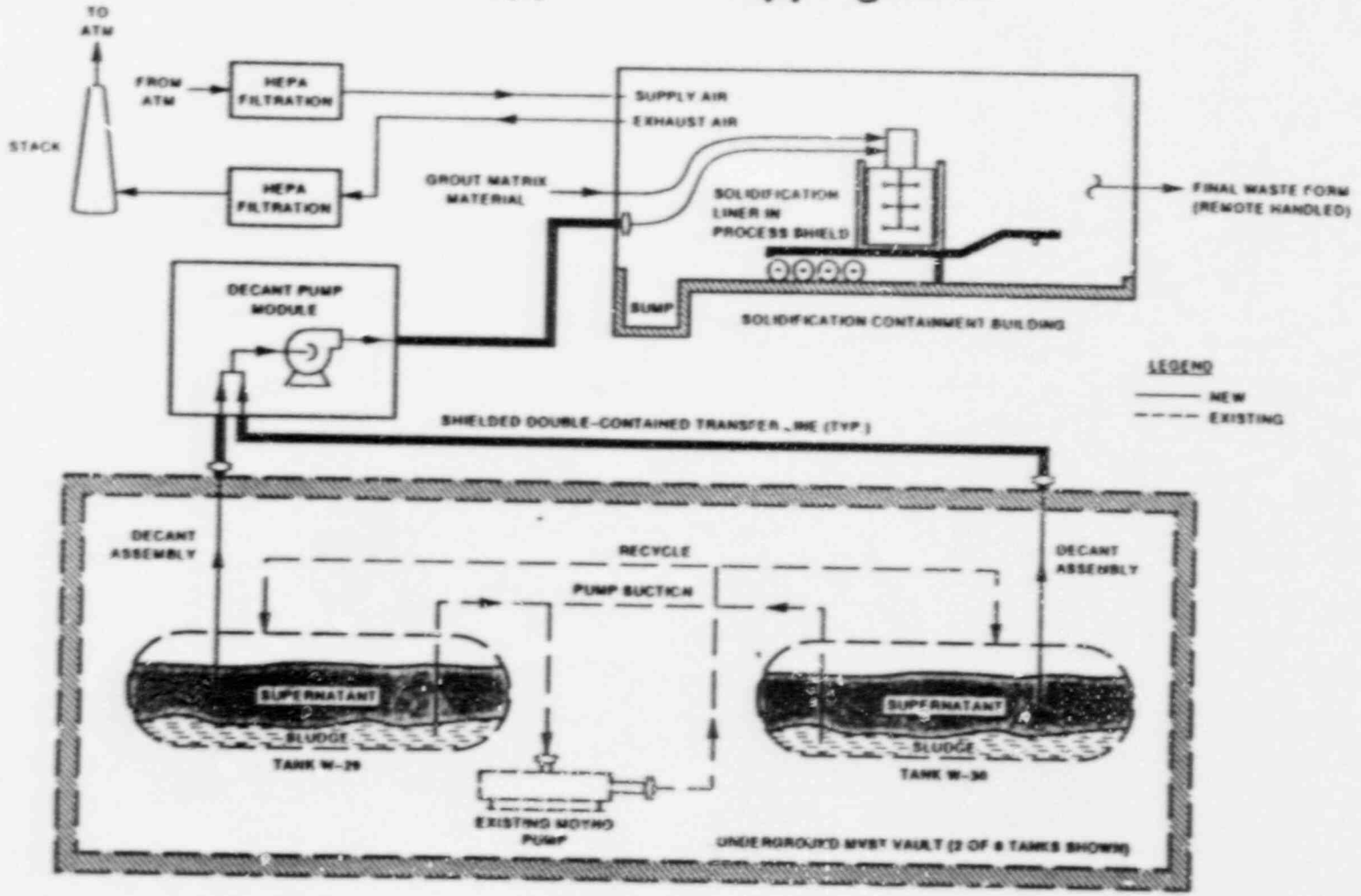
- Solidification Facilities Will Provide Utilities, Piping, Controls, and Containment Structure For Vendor's Solidification Equipment

- Major Facilities Construction Was Completed On Schedule In March And Integrated Systems Test Completed In April

- Support Equipment (Stack Monitor, Emergency Generator, Uninterruptible Power Supply), Procurement And Installation Are Proceeding On Schedule And Should Be In-Place And Tested By September 15

ORNL-DWG 88M-7830

Solidification will be Performed with the Solidification Liner Positioned Inside a DOT Approved Shipping Cask



II. FACILITIES CONSTRUCTION (CONT)

Waste Storage Facilities

- Construction Is Complete On The Interim Storage Site Adjacent to the EASC Facilities
  - Controlled Access Site In Security Area
  - Adequate Storage Capacity For Up To 80 Casks
  - Well Constructed Site Consists Of 12 Inches of Packed Gravel Over Filter Fabric; Best Management Practices On Drainage Control

- Interim Storage Casks Are In Full Production, With Approximately 50% Of the Required Casks Nearing Completion
  - First Batch Of Casks Are On-Site And Are Currently Being Positioned On The Storage Site And Instrumented For Monitoring

III. OPERATIONAL PLANNING

- All Required Project Planning Documentation Has Been Drafted, Reviewed, And Approved Or is Being Modified To Incorporate Cold Checkout Changes
  - Safety Studies
  - Action Description Memorandum (ADMs)
  - QA Plan
  - Interim Storage Monitoring Plan
  - Operating Procedures
  - Personnel Training Program

- Preoperational Readiness Review Is Currently Ongoing By Energy Systems Safety, Health, Compliance, And Operational Staff
  - Planning Documentation Has Been Reviewed
  - Team Observed Cold Checkout Phase
  - Recommendation For Startup of "Hot" Operations Has Been Received, Pending Completion Of Several Minor Facility Modifications and Procedure Changes

IV. REGULATORY INTERFACE

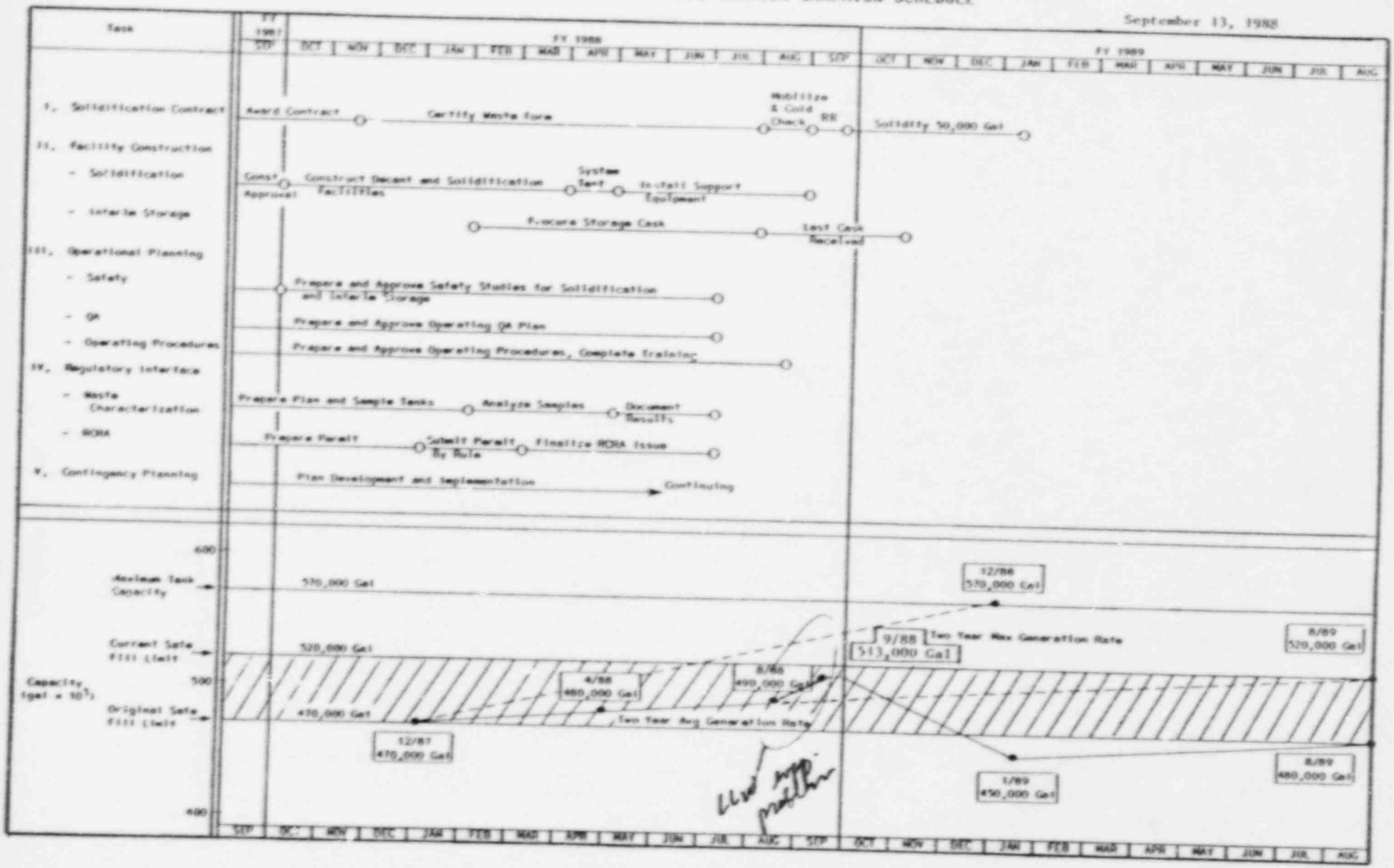
- Requested Project Documentation Has Been Provided To TDHE As Scheduled
  - No Negative Feedback Was Received On Project Plans

- Permit Actions
  - Air Permit Notification Completed
  - RCRA Permit By Rule Notification Completed
  - Based On Waste Form Testing Results, No Additional Permit Actions Are Planned

- Cold Checkout Site Visit
  - TDHE Staff Observed Surrogate Solidification Process And Toured Interim Storage Site On September 2

EMERGENCY AVOIDANCE SOLIDIFICATION CAMPAIGN SCHEDULE

September 13, 1988



INTERIM WASTE MANAGEMENT FACILITY (IWMF) DEVELOPMENT FOR CLASS II WASTES

T. E. Myrick
J. S. Baldwin
S. D. Van Hoesen

Environmental and Health Protection Division
Engineering Division

Oak Ridge National Laboratory

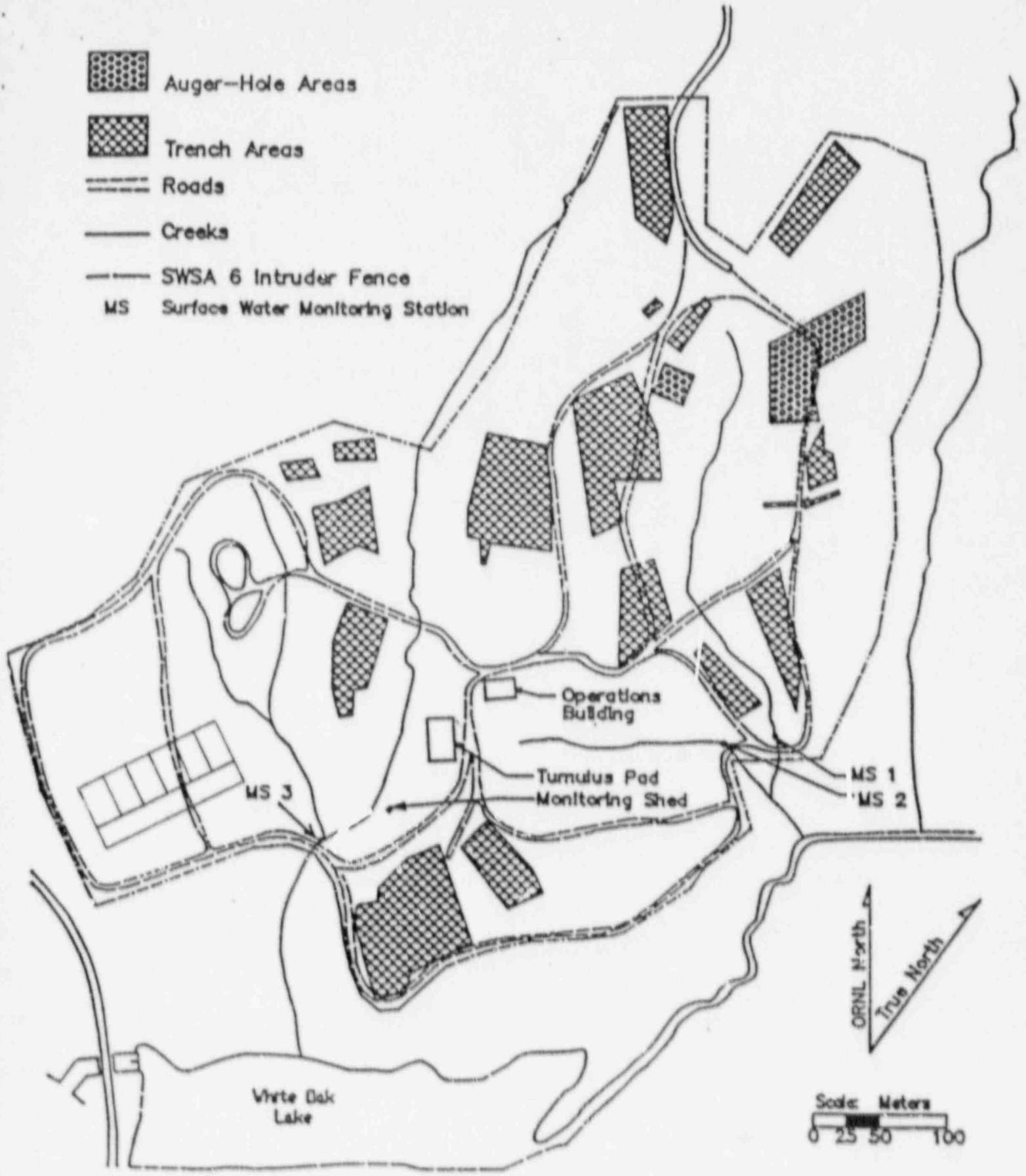
Presentation To The Waste Management Advisory Committee

September 14, 1988

IWMF PLANNING CONTINUES

- Class II IWMF Facility Development Continues, Based On Plans Presented At Last WMAC Meeting
  - ORNL Responsibility For Facility Construction And Operation
  - Greater Confinement Disposal Concepts To Be Used
  - SWSA 6 SW Site Being Evaluated For IWMF Construction

- SWSA 6 IWMF Appears To Be Most Feasible Option At Present
  - Approved Disposal Site For SLLW
  - Operational Support Facilities (Security, Equipment, Maintenance, Vault Loading, Contamination Control) Already Exist
  - Site Preparation Can Proceed In Parallel With EIS Development
  - Would Provide Earliest Possible Startup Of LLWDDD Waste Classification And Management Program

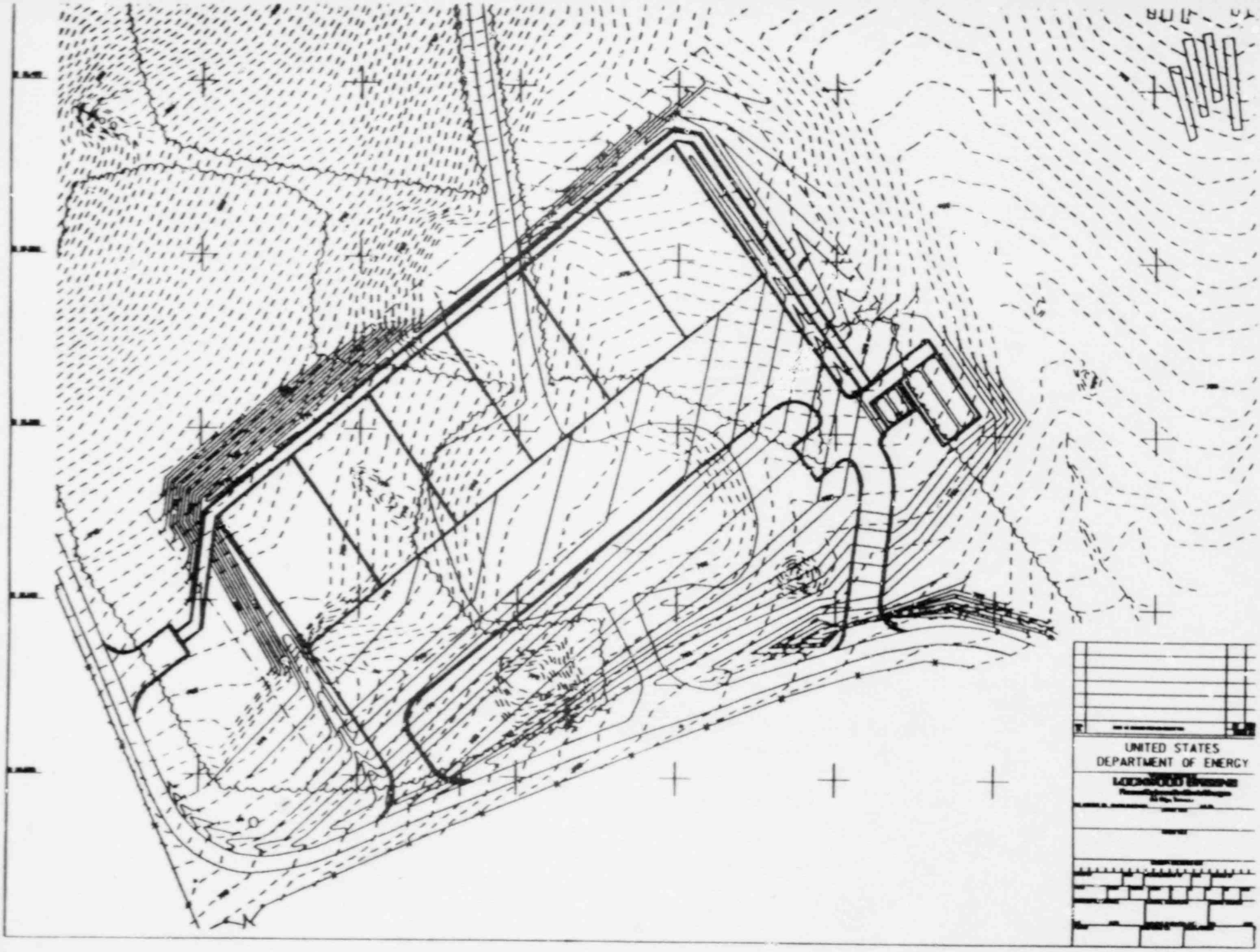

Auger-Hole Areas
Trench Areas
Roads
Creeks
SWSA 6 Intruder Fence
MS Surface Water Monitoring Station
Operations Building
Tumulus Pad
Monitoring Shed
MS 1
MS 2
MS 3
White Oak Lake
ORNL North
True North
Scale: Meters
0 25 50 100

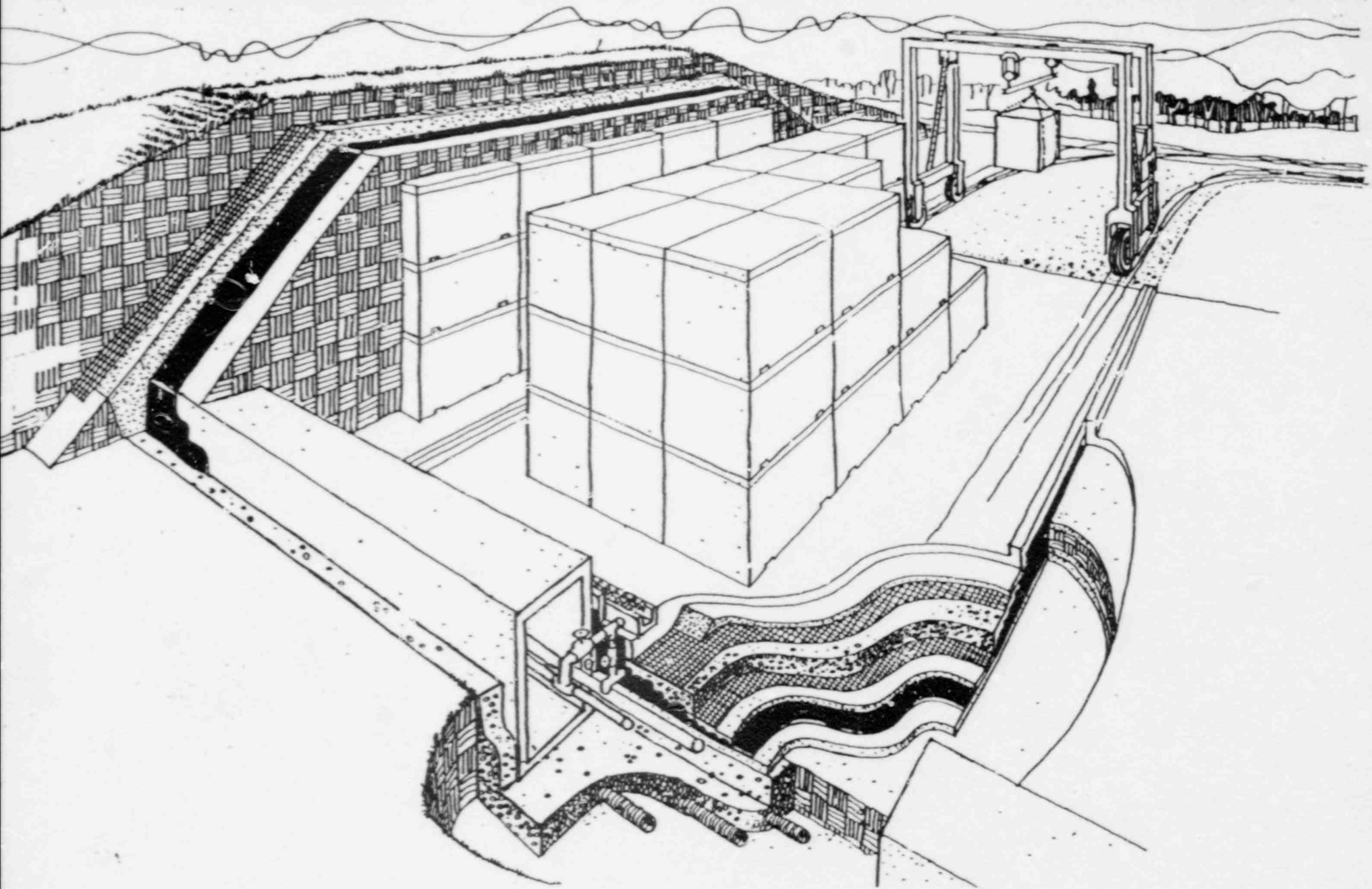
IWMF CONCEPTUAL MODEL

- Above-Grade Tumulus Design
  - 300 Year Performance Period
  - Zero-Release Performance Goal
  - Class II Wastes Only; 5 Year Capacity
- Minimal Use of GCD Silos
  - Difficult To Provide Equivalent Controls At Reasonable Cost
- Vault Recoverability (Not Easy Retrievability) To Be Design Basis
- Performance Monitoring To Be Provided For Both Pad and Underpad Drainage

IWMF CURRENT DESIGN ELEMENTS

- Modular Design With 5 To 6 Tumulus Pads Per Module
- Vertical Loading Of Disposal Vaults Via Straddle Crane System
- Performance Monitoring System For Each Module
  - Visual Inspection Capability Through Personnel Accessed Gallery
  - Containment And Monitoring Capability For Tumulus Pad Run Off
  - Containment And Monitoring Capability For Underpad Drainage
- Temporary And Final Covers Emplaced In Phased, Sequential Fashion
- Surface And Groundwater Management To Be Provided By Engineered Site Drainage Controls (Diversion Ditches, French Drain, Underpad Drainage Layers)


UNITED STATES
DEPARTMENT OF ENERGY



CURRENT IWMF SCHEDULE

- Preliminary Proposal For General Plant Project (GPP) To DOE By January 1989
- Facility Design Phase To Extend From March 1989 To February 1990, Allowing For Adequate Internal And Regulatory Reviews
- Construction Bid And Award Expected By May 1990, In Concert With EIS Schedule
- Facility Construction Scheduled For May 1990 Through December 1991, With Initial Disposal Unit To Be Completed To Support Operations Startup By September 1991

IWMF ISSUES

- Regulatory Agreement Needed On Interface With SWSA 6 Closure Activities
  - Do SWMU/WAG Boundaries Need To Be Formally Defined To Allow For Continued IWMF Operations During/After "SWSA 6 Proper" Closure?
  - Access To SWSA 6 Staging And Maintenance Facilities Will Need To Remain, As Will Basic Site Ingress/Egress
  - How Will IWMF Closure Planning Need To Be Handled During Site Planning And Development Phase?

- As In Most Disposal Facility Designs In the Humid East, Engineered Surface And Groundwater Controls Will Be Critical Components Of Facility Designs And Must Receive Adequate Assessment During Design Reviews

- IWMF-Related Recommendation Has Been Made To DOE Concerning First-Flush Tumulus Pad Run-Off Monitoring. Change To Be Implemented October 1988

LLWDDD IMPLEMENTATION ACTIVITIES

J. K. Bailey
S. C. Howard
L. S. Jones

Waste Transportation, Storage, and Disposal Department
Y-12 Plant
Oak Ridge, Tennessee

Presented To
Waste Management Advisory Committee
Chattanooga, Tennessee
September 14, 1988

MAJOR ELEMENTS OF THE Y-12 IMPLEMENTATION PLAN INCLUDE:

- Waste stream identification and characterization
  - Improved characterization of all waste streams
  - Uranium Lysimeter Demonstration Project
- Waste Minimization
- Establishment of a BRC limit
- Storage
  - Supercompaction
  - Facilities for wastes which can not be stored at ORGDP
- Monitoring/Certification
- Planning/development for a Class I disposal facility patterned after TDHE Solid Waste Disposal Regulations
- Investigating the feasibility of off-site shipments

URANIUM LYSIMETER DEMONSTRATION PROJECT

Action Item	Date/Status
Identify project scope and objectives	06/30/87 (C)
Advisory Committee update	12/15/87 (C)
Title II design	03/15/88 (C)
Project test plan	04/22/88 (C)
Advisory Committee update	06/15/88 (C)
Laboratory characterization phase	06/30/88 (C)
Receive bids for lysimeter construction	07/12/88 (C)
First meeting of peer review committee	08/22/88 (C)
Redesign and award construction bid for lysimeters	11/15/88
Complete construction	03/30/89
Begin loading lysimeter	04/15/89

IMPLEMENTATION ACTIVITIES

- Storage of Y-12 LLW at ORGDP
  - Approximately 400 B-25 boxes containing baled wastes, carbon, and contaminated filters
  - Approximately 400 drums of uranium oxide

- Funding has been allocated and work initiated to characterize an East Chestnut Ridge site for LLWDDD Class I disposal facility consideration

- A feasibility study has been initiated to examine treatment and disposal alternatives for a proposed FY 1994 low level waste disposal facility line item project

- Preparation of a modification to the TDHE permit for Y-12 Centralized Sanitary Landfill II which will address the disposal of compacted wastes and a BRC number has been initiated.

To implement a BRC standard for Sanitary Landfill disposals, improvements in waste monitoring and certification are required.

We are currently using the "elephant gun" with capability to detect 120 grams of depleted uranium in a 12 cubic yard dumpster of trash at a density of 0.1 gm/cc.

The following actions are underway:

- An FY-90 GPP has been proposed to supplement and provide a backup for the existing facility by allowing a larger number of dumpsters to be monitored. The second facility will have improved detection capabilities to differentiate depleted and enriched uranium wastes.

- We have received two bag/drum size detectors to enhance separation of uranium and non-uranium wastes at the source. These detectors also have capability for differentiating uranium isotopes.

- We are in the process of assembling and startup of the Crated Waste Assay Monitor (CWAM) to be used for monitoring materials and wastes removed from MAA' using the non-SNM doors.

- Two detector heads will be added to the existing equipment to improve detection capability and shorten count time.

TWO WASTE CURIE MONITORS (WCMS) WILL PROVIDE AN ENHANCEMENT OVER CURRENT METHODS FOR SEPARATING NON-RADIOACTIVE FROM RADIOACTIVE WASTES AT Y-12.

ACTION ITEM	DATE/STATUS
INITIATE PURCHASE REQUISITION FOR TWO WCMS	12-01-87 (C)
RECEIVE TWO WCMS	08-15-88 (C)
CALIBRATE, DETERMINE SENSITIVITY AND DETERMINE CORRELATION OF WCM AND TRASH MONITOR STATION (TMS)	10-15-88 (R)
DEVELOP PROCEDURES FOR USE OF WCMS	01-08-89 (R)
COMPLETE SIX MONTH PILOT STUDY	07-15-89 (R)
EVALUATE RESULTS AND RECOMMEND USAGE IN PLANT	09-15-89 (R)

THE CWAM WILL PROVIDE Y-12 WITH AN IMPROVED CHARACTERIZATION OF URANIUM CONTAMINATED WASTES TO SUPPORT PLANNED TREATMENT AND DISPOSAL DEVELOPMENT AND DEMONSTRATION.

ACTION ITEM	DATE/STATUS
RECEIPT OF CWAM AT Y-12	06-04-86 (C)
ENGINEERING DESIGN FOR MONITORING FACILITY COMPLETE	06-30-87 (C)
FACILITY CONSTRUCTION	12-15-87 (C)
CWAM SETUP	09-30-88
HSRR AND SECURITY REVIEW AND CALIBRATION	11-30-88
EQUIPMENT TESTING	02-28-89
PREPARATION OF OPERATING AND CALIBRATION PROCEDURES	03-30-89
PERSONNEL TRAINING	05-30-89
OPERATIONAL STARTUP	06-15-89

IMPLEMENTATION OF CONTRACT FOR SUPERCOMPACTION OF Y-12 LOW LEVEL WASTES

Action	Completion Date	Responsible Party
•Draft Specification Prepared	8/01/88	WTSD(C)
•Specification Issued To Purchasing	9/01/88	WTSD(C)
•Criteria Developed For Facility Audits	9/01/88	WTSD/A-E(C)
•Bid Advertised	9/30/88	Purchasing
•Bidder Facility Audits	9/30/88	WTSD/HP/IH/QA Safety/Traffic/ Audit Contractor
•Bids Received	10/30/88	Purchasing
•Bid Review & Award	11/21/88	WTSD/Purchasing
•Contract in Place	12/7/88	Purchasing
•Contractor/MMES Interface[1]	12/21/88	WTSD/Traffic/ Security
•First Shipment	12/28/88	WTSD

[1]Contractor/MMES interface shall include arrangements such as Contractor security clearances, site preparation, equipment transfer, orientation, etc.

SUMMARY OF

FRENCH LOW-LEVEL WASTE DISPOSAL TECHNOLOGY TRANSFER

ON-SITE TRAINING JUNE 5 - 24, 1988

PRESENTED TO THE LOW LEVEL WASTE ADVISORY COMMITTEE

SEPTEMBER 14, 1988

S. D. VAN HOESEN
W. N. LINGLE
J. M. KENNERLY
L. C. WILLIAMS

AS PART OF THE DOE/CEA LOW-LEVEL RADIOACTIVE WASTE TECHNOLOGY EXCHANGE PROGRAM AN INTENSIVE ON-SITE PROGRAM WAS ESTABLISHED TO PROVIDE TRAINING IN THE FRENCH

- LLW CHARACTERIZATION, ACCEPTANCE, AND CERTIFICATION PROCESS

- LLW DISPOSAL FACILITY DESIGN, CONSTRUCTION, AND OPERATION

THE LLW CHARACTERIZATION, ACCEPTANCE, AND CERTIFICATION PROCESS WILL BE DESCRIBED IN DETAIL IN A REPORT BEING PREPARED BY SGN. THE FOLLOWING HIGHLIGHTS WILL BE DISCUSSED TODAY

- GENERAL WASTE ACCEPTANCE CRITERIA
- WASTE STABILIZATION REQUIREMENTS
- WASTE ACTIVITY LIMITS
- EXAMPLES OF ACCEPTABLE WASTE CONTAINERS
- ORIENTATION OF WASTE CONTAINERS IN DISPOSAL FACILITY
- SUMMARY OF WASTE ACCEPTANCE PROCESS
- MOCK WASTE ACCEPTANCE EXERCISE

GENERAL WASTE ACCEPTANCE CRITERIA FOR NEAR-SURFACE DISPOSAL

- NO FREE-STANDING LIQUIDS
- NO ORGANIC LIQUIDS, INCLUDING ABSORBED LIQUIDS
- NO BIOLOGICALLY HAZARDOUS WASTE (STERILIZATION OFTEN REQUIRED)
- NO PYROPHORICS
- COMPATIBILITY OF WASTE FORMS WITH IMMOBILIZATION MATERIALS (Na, Al, Mg, ETC.)
- CRITICALITY

ALL WASTE FORMS MUST BE STABILIZED

- PURPOSE

  To produce a stable waste package in solid and non-dispersable form, containing as few voids as possible and providing long-term mechanical stability

- APPLICABILITY

  All waste packages

- PRINCIPAL TEST

  Resistance to load (0.35 MPa) with little or no deformation (<3%), and with little or no liquid release under compression

- MEANS

  Usually by cement grout; compaction is acceptable

WASTE ABOVE A SPECIFIC ACTIVITY LIMIT MUST BE IMMOBILIZED

- o PURPOSE - TO PRODUCE A STABLE WASTE FORM PROVIDING LONG-TERM CONTAINMENT OF RADIONUCLIDES
- o ACTIVITY LIMITS
  - LONG LIFE ALPHA (> 31 YRS), 5 MCI/TN AFTER 300 YEARS
  - SHORT-LIFE ALPHA (<31 YRS), 1 CI/TN AFTER 300 YEARS
  - TOTAL BETA/GAMMA, 1 CI/TN AT ACCEPTANCE
  - INDIVIDUAL BETA/GAMMA 0.1 CI/TN AT ACCEPTANCE ISOTOPES
- o PRINCIPAL TESTS
  - HOMOGENEOUS WASTES (RESINS, SLUDGES)

    LEACH RESISTANCE (ANNUAL FRACTION RELEASED)
  - HETEROGENEOUS WASTES

    DIFFUSION COEFFICIENT IN AQUEOUS MEDIA

RADIONUCLIDES	IMMOBILIZATION THRESHOLD		ACCEPTANCE LIMIT	
[redacted]	MBq/kg	Ci/t	MBq/kg	Ci/t
$^{226}_{88}Ra$	0.037	0.001	3.7	0.1
$^{232}_{90}Th$	0.037	0.001	1.1	0.03
TOTAL RADIONUCLIDES	0.19	0.005	3.7	0.1

Notes:

1. *All specific activities are calculated 300 years after the time of acceptance at the LLW disposal facility.*
2. *"t" is metric tonnes = 1,000 kg*
3. *1 Curies = 1 Ci = 3.7×10^{10} disintegrations per second*
4. *1 Becquerel = 1 Bq = 1 disintegration per second*
5. *Total Radionuclides means total long-lived alpha emitting radionuclides.*

Table 2.1: **Long-Lived Alpha Emitters (half-life > 31 years)**

RADIONUCLIDES	IMMOBILIZATION THRESHOLD		ACCEPTANCE LIMIT	
[redacted]	MBq/kg	Ci/t	MBq/kg	Ci/t
ANY INDIVIDUAL RADIONUCLIDE	3.7	0.1		
TOTAL RADIONUCLIDES	37.0	1.0		

Notes:

1. *All specific activities are calculated at the time of acceptance at the LLW disposal facility.*
2. *"t" is metric tonnes = 1,000 kg*
3. *1 Curies = 1 Ci = $3.7x10^{10}$ disintegrations per second*
4. *1 Becquerel = 1 Bq = 1 disintegration per second*
5. *Total Radionuclides means total short- and intermediate-lived alpha emitting radionuclides.*
6. *Any Individual Radionuclide means any short- or intermediatelived alpha emitting radionuclide.*

Table 2.2: Short- and Intermediate-Lived Alpha Emitters (half-life < 31 years)

INTERMEDIATE-LIVED BETA-GAMMA EMITTING RADIONUCLIDES	IMMOBILIZATION THRESHOLD		ACCEPTANCE LIMIT	
( ) Indicates Half-Life	MBq/kg	Ci/t	MBq/kg	Ci/t
$^{3}_{1}H$(12.3yr)	7.4	0.2	$7.4x10^{1}$	$2.0x10^{0}$
$^{22}_{11}Na$(2.58yr)	20.0	0.5	$2.0x10^{5}$	$5.4x10^{3}$
$^{49}_{23}V$(330 day)	37.0	1.0	$3.1x10^{7}$	$8.1x10^{5}$
$^{54}_{25}Mn$(310 day)	37.0	1.0	$7.0x10^{5}$	$1.9x10^{4}$
$^{55}_{26}Fe$(2.7 yr)	37.0	1.0	$3.6x10^{6}$	$8.1x10^{4}$
$^{57}_{27}Co$(270 day)	37.0	1.0	$2.0x10^{6}$	$5.4x10^{4}$
$^{60}_{27}Co$(5.27 yr)	3.7	0.1	$4.8x10^{4}$	$1.3x10^{3}$
$^{65}_{30}Zn$(245 day)	10.0	0.3	$1.0x10^{5}$	$2.7x10^{3}$
$^{68}_{32}Ge$(288 day)	37.0	1.0	$2.0x10^{6}$	$5.4x10^{4}$
$^{90}_{38}Sr$(28.2 yr)	3.7	0.1	$7.4x10^{2}$	$2.0x10^{1}$

Table 2.3: Intermediate-Lived Beta-Gamma Emitters
(0.5 years < half-life < 31 years)

INTERMEDIATE-LIVED BETA-GAMMA EMITTING RADIONUCLIDES	IMMOBILIZATION THRESHOLD		ACCEPTANCE LIMIT	
( ) Indicates Half-Life	MBq/kg	Ci/t	MBq/kg	Ci/t
$^{93m}_{41}$Nb(13.6 yr)	37.0	1.0	3.0×10^{5}	8.1×10^{3}
$^{106}_{44}$Ru(1.0 yr)	9.0	0.25	8.8×10^{4}	2.4×10^{3}
$^{101}_{45}$Rh(3.3 yr)	37.0	1.0	8.1×10^{5}	2.2×10^{4}
$^{102m}_{45}$Rh(207 day)	37.0	1.0	5.2×10^{5}	1.4×10^{4}
$^{102}_{45}$Rh(2.9 yr)	20.0	0.5	2.0×10^{5}	5.4×10^{3}
$^{110m}_{47}$Ag(253 day)	20.0	0.5	2.0×10^{5}	5.4×10^{3}
$^{109}_{48}$Cd(1.3 yr)	20.0	0.5	2.0×10^{5}	5.4×10^{3}
$^{113m}_{48}$Cd(14. yr)	3.7	0.1	1.0×10^{3}	2.7×10^{1}
$^{119m}_{50}$Sn(250 day)	37.0	1.0	2.0×10^{6}	5.4×10^{4}
$^{125}_{51}$Sb(2.7yr)	37.0	1.0	8.1×10^{5}	2.2×10^{4}

Table 2.3: Intermediate-Lived Beta-Gamma Emitters
(0.5 years < half-life < 31 years) (continued)

INTERMEDIATE-LIVED BETA-GAMMA EMITTING RADIONUCLIDES	IMMOBILIZATION THRESHOLD		ACCEPTANCE LIMIT	
( ) Indicates Half-Life	MBq/kg	Ci/t	MBq/kg	Ci/t
$^{134}_{55}Cs$(2.2 yr)	3.7	0.1	3.0×10^4	8.1×10^2
$^{137}_{55}Cs$(30.2 yr)	3.7	0.1	4.8×10^3	1.3×10^2
$^{133}_{56}Ba$(10.7 yr)	37.0	1.0	5.9×10^4	1.6×10^3
$^{144}_{58}Ce$(285 day)	9.0	0.25	8.8×10^4	2.4×10^3
$^{143}_{61}Pm$(265 day)	37.0	1.0	2.0×10^6	5.4×10^4
$^{144}_{61}Pm$(349 day)	37.0	1.0	5.2×10^5	1.4×10^4
$^{145}_{61}Pm$(18.0 yr)	37.0	1.0	4.5×10^5	1.1×10^4
$^{146}_{61}Pm$(5.5 yr)	37.0	1.0	5.9×10^4	1.6×10^3
$^{147}_{61}Pm$(2.6 yr)	37.0	1.0	5.9×10^5	1.6×10^4
$^{145}_{62}Sm$(1.0 yr)	37.0	1.0	2.0×10^6	5.4×10^4

Table 2.3: Intermediate-Lived Beta-Gamma Emitters (0.5 years < half-life < 31 years) (continued)

INTERMEDIATE-LIVED BETA-GAMMA EMITTING RADIONUCLIDES	IMMOBILIZATION THRESHOLD		ACCEPTANCE LIMIT	
( ) Indicates Half-Life	MBq/kg	Ci/t	MBq/kg	Ci/t
$^{152}_{63}$Eu(13.0 yr)	30.0	0.8	3.0×10^{4}	8.1×10^{2}
$^{154}_{63}$Eu(8.8 yr)	20.0	0.5	2.0×10^{4}	5.4×10^{2}
$^{155}_{63}$Eu(5.0 yr)	37.0	1.0	1.0×10^{5}	2.7×10^{3}
$^{153}_{64}$Gd(236 day)	37.0	1.0	2.0×10^{6}	5.4×10^{4}
$^{173}_{71}$Lu(1.4 yr)	37.0	1.0	2.0×10^{6}	5.4×10^{4}
$^{174}_{71}$Lu(3.3 yr)	37.0	1.0	2.0×10^{6}	5.4×10^{4}
$^{172}_{72}$Hf(1.9 yr)	37.0	1.0	5.2×10^{5}	1.4×10^{4}
$^{179}_{73}$Ta(1.6 yr)	37.0	1.0	8.1×10^{6}	2.2×10^{5}
$^{194}_{76}$Os(6.0 yr)	20.0	0.5	2.4×10^{4}	5.4×10^{2}
$^{195}_{79}$Au(183 day)	37.0	1.0	2.0×10^{6}	5.4×10^{4}

Table 2.3: Intermediate-Lived Beta-Gamma Emitters
(0.5 years < half-life < 31 years) (continued)

INTERMEDIATE-LIVED BETA-GAMMA EMITTING RADIONUCLIDES	IMMOBILIZATION THRESHOLD		ACCEPTANCE LIMIT	
( ) Indicates Half-Life	MBq/kg	Ci/t	MBq/kg	Ci/t
$^{204}_{81}Tl$(3.9 yr)	37.0	1.0	5.9×10^{5}	1.6×10^{4}
$^{210}_{82}Pb$(22.3 yr)	0.04	0.001	4.0×10^{1}	1.1×10^{0}
$^{228}_{88}Ra$(5.8 yr)	0.1	0.003	1.0×10^{2}	2.7×10^{0}
$^{227}_{89}Ac$(21.6 yr)	0.01	0.0003	1.0×10^{1}	3.0×10^{-1}
TOTAL OF ALL INTERMEDIATE-LIVED BETA-GAMMA EMITTERS	37.0	1.0	If, and only if, N is greater than 10 then the following limit applies: $\sum_{i}^{N} [\frac{a_i}{AL_i}] < 10.$ where: a_i = actual specific activity of isotope i; AL_i = acceptance limit of isotope i; i = 1,2,...N; N = total number of intermediate-lived beta-gamma radionuclides in the waste	

Table 2.3: Intermediate-Lived Beta-Gamma Emitters
(0.5 years < half-life < 31 years) (continued)

Examples of Homogeneous Waste Forms

- Ion Exchange Resins
- Evaporator Concentrates
- Co-Precipitation Sludges

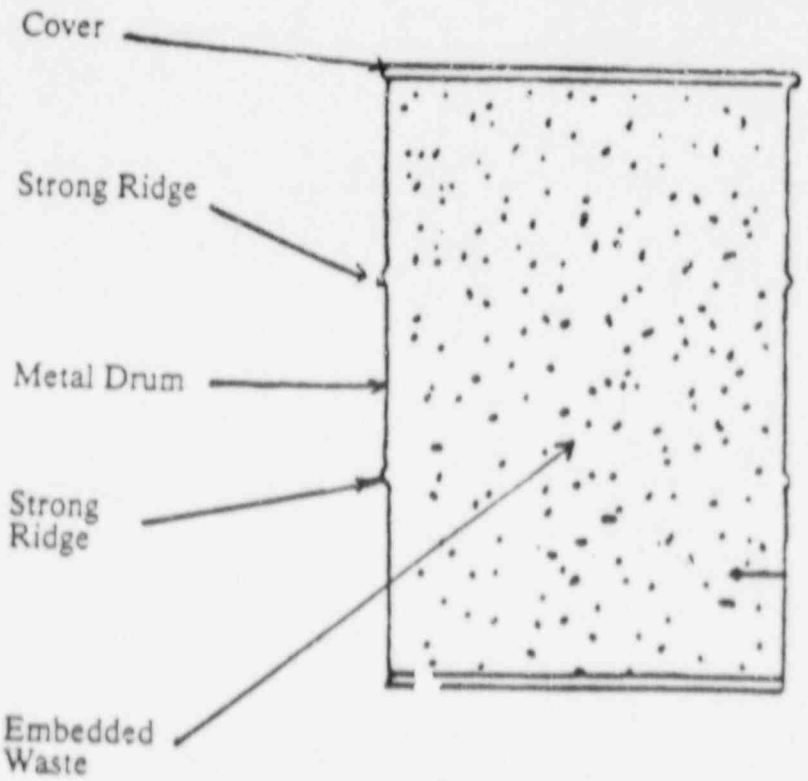


Figure 2.3 Homogeneous Waste Form in a Metal Drum

Examples of Heterogeneous Waste Forms

- Water Purification Filters
- Ventilation Filters
- Gloves
- Rags
- Other Dry Active Waste

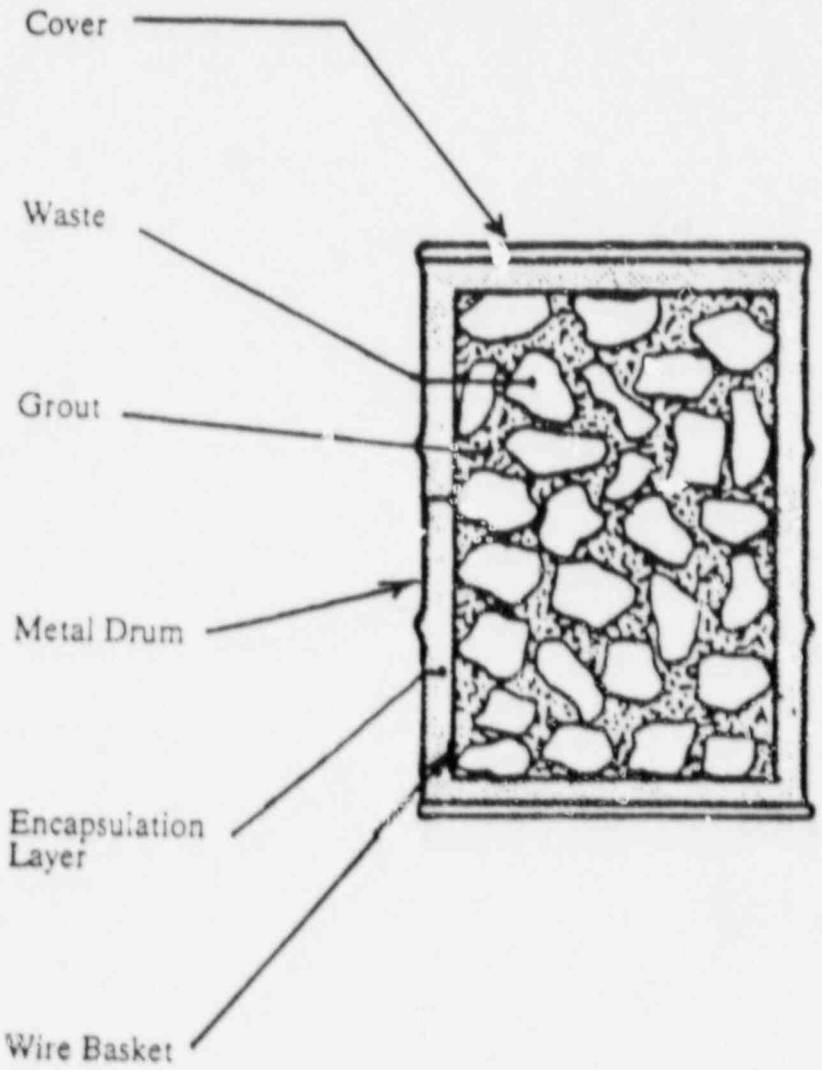


Figure 2.4 Heterogeneous Waste Form in a Metal Drum

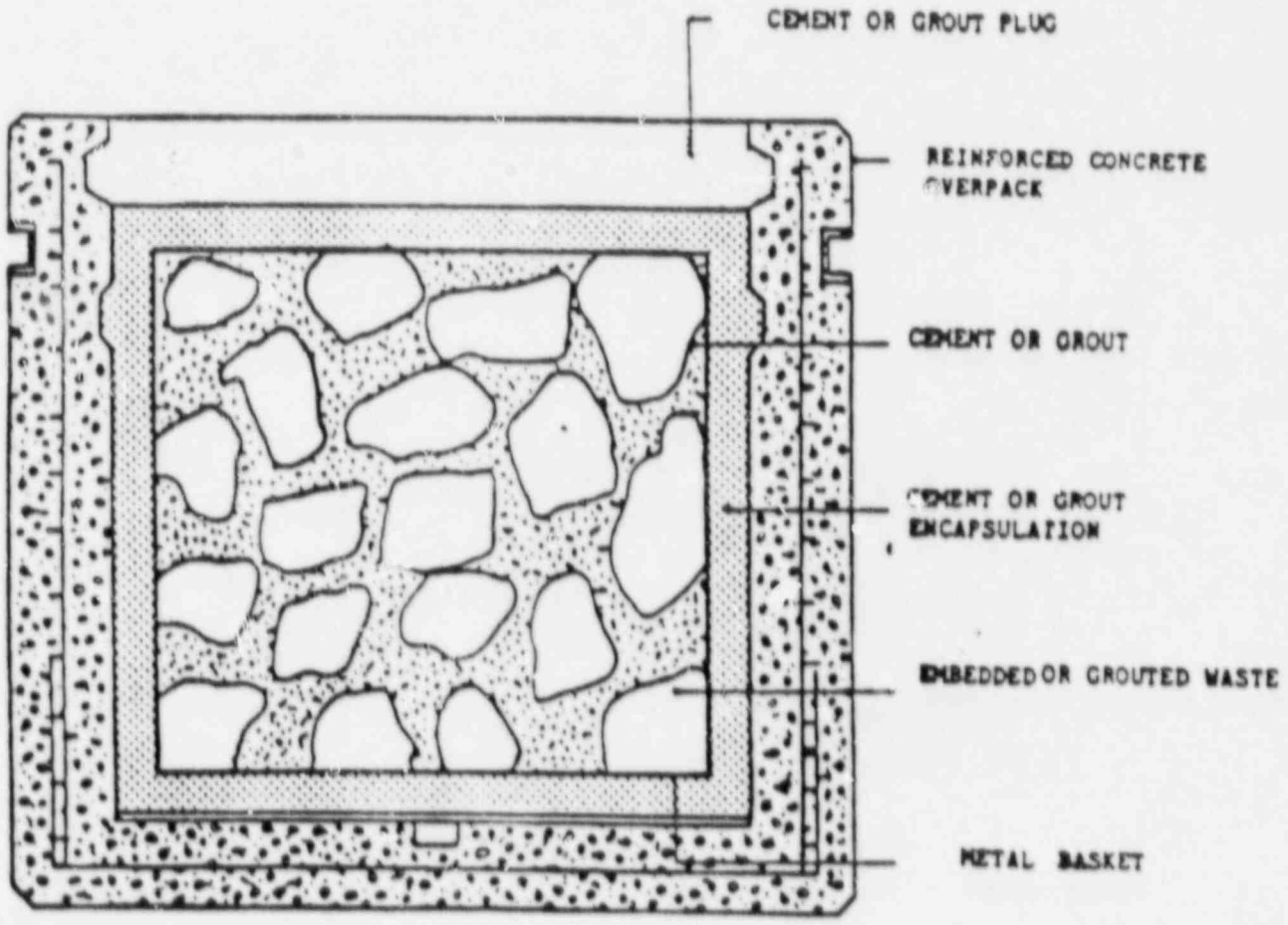


Figure 2.5 Heterogeneous Waste Form in a Concrete Overpack

	Contact Handled		Remote Handled
	Unimmobilized	Immobilized	
Durable Containers	Tumulus	Tumulus	
Perishable Containers	Tumulus	Monolith	Canyon

CONTENTS OF THE WASTE ACCEPTANCE FILE (DAC)

WASTE ACCEPTANCE FILE (DAC)

PROCESS BOOK — WRITTEN BY THE GENERATOR IN COMPLIANCE WITH A STANDARD REVIEW PLAN

CHARACTERIZATION FILE

- CHARACTERIZATION PROGRAM — ESTABLISHED IN COMPLIANCE WITH A STANDARD REVIEW PLAN
- DISCUSSED WITH AN ACCEPTED BY ANDRA
- TEST RESULTS FILE — COMPREHENSIVE FILE ESTABLISHED BY THE GENERATOR

QUALITY ASSURANCE PROGRAM

WASTE ACCEPTANCE PROCESS: THE THREE STAGES

PRELIMINARY STAGE	TEMPORARY APPROVAL
PROVISIONAL STAGE	PROVISIONAL APPROVAL
FINAL STAGE	FINAL APPROVAL

WASTE ACCEPTANCE PROESS: THE PRELIMINARY STAGE

WASTE ACCEPTANCE FILE

- o Preliminary Process Book
- o Quality Assurance Program
- o Characterization Program

MEASUREMENT ACCEPTANCE FILE

- o Brief presentation of activity measurement method

TEMPORARY APPROVAL

WASTE ACCEPTANCE PROCESS: THE PROVISIONAL STAGE

WASTE ACCEPTANCE FILE

- Draft Process Book
- Quality Assurance Evaluation
- Approved Characterization Program
- First Test Results

MEASUREMENT ACCEPTANCE FILE

- Technical Files by Generator
- Evaluation Report by ANDRA

PROVISIONAL ACCEPTANCE

WASTE ACCEPTANCE PROCESS: THE FINAL STAGE

WASTE ACCEPTANCE FILE

- Updated Process Book
- Quality Assurance Evaluation
- Comprehensive Test Results Report and Evaluation

MEASUREMENT ACCEPTANCE FILE

- Final Technical Files by Generator
- Technical Evaluation by ANDRA

FINAL APPROVAL

FOLLOWING ARE THE MAJOR CONCLUSIONS FROM THE WASTE ACCEPTANCE PORTION OF THE TRAINING PROGRAM

- THE MOCK WASTE ACCEPTANCE EXERCISE PROVIDED VALUABLE EXPERIENCE

- ACTIVITY CONTENT OF 70% OF FRENCH LLW IS BASED ON DOSE RATE/SPECTROGRAPHIC CORRELATIONS

- MAJOR EMPHASIS, INCLUDING EXTENSIVE TESTING, IS PLACED ON DEMONSTRATING WASTE STABILITY AND LEACH RESISTANCE

    - CREDIT FOR IMPROVED WASTE FORMS IS REFLECTED IN FACILITY PERFORMANCE ASSESSMENT

THE CURRENTLY OPERATING FRENCH LLW DISPOSAL FACILITY IS LE CENTRE DE STOCKAGE DE LA MANCHE. THE FOLLOWING ASPECTS OF THE LA MANCHE OPERATION WILL BE DISCUSSED TODAY

- LOCATION
- WASTE RECEIPT
- DRUMMED WASTE COMPACTION AND GROUTING
- GROUT INJECTION INTO BOXED WASTE
- DISPOSAL UNITS
  - MONOLITHS
  - HIGH ACTIVITY
  - TUMULUS
- STORAGE

IN ADDITION, LLW DISPOSAL ACTIVITIES AT TWO OTHER SITES WILL BE DISCUSSED

- COVER EXPERIMENT AT ST. SUAVERT

- NEW LLW DISPOSAL FACILITY - CENTRE DE STOCKAGE DE L'AUBE

Fig. 44
LOCATION OF THE FRENCH LLWD
CENTRE DE STOCKAGE DE LA MANCHE (CSM)

Fig. 65 - HIGH PRESSURE COMPACTION AND GROUTING AT THE CSM

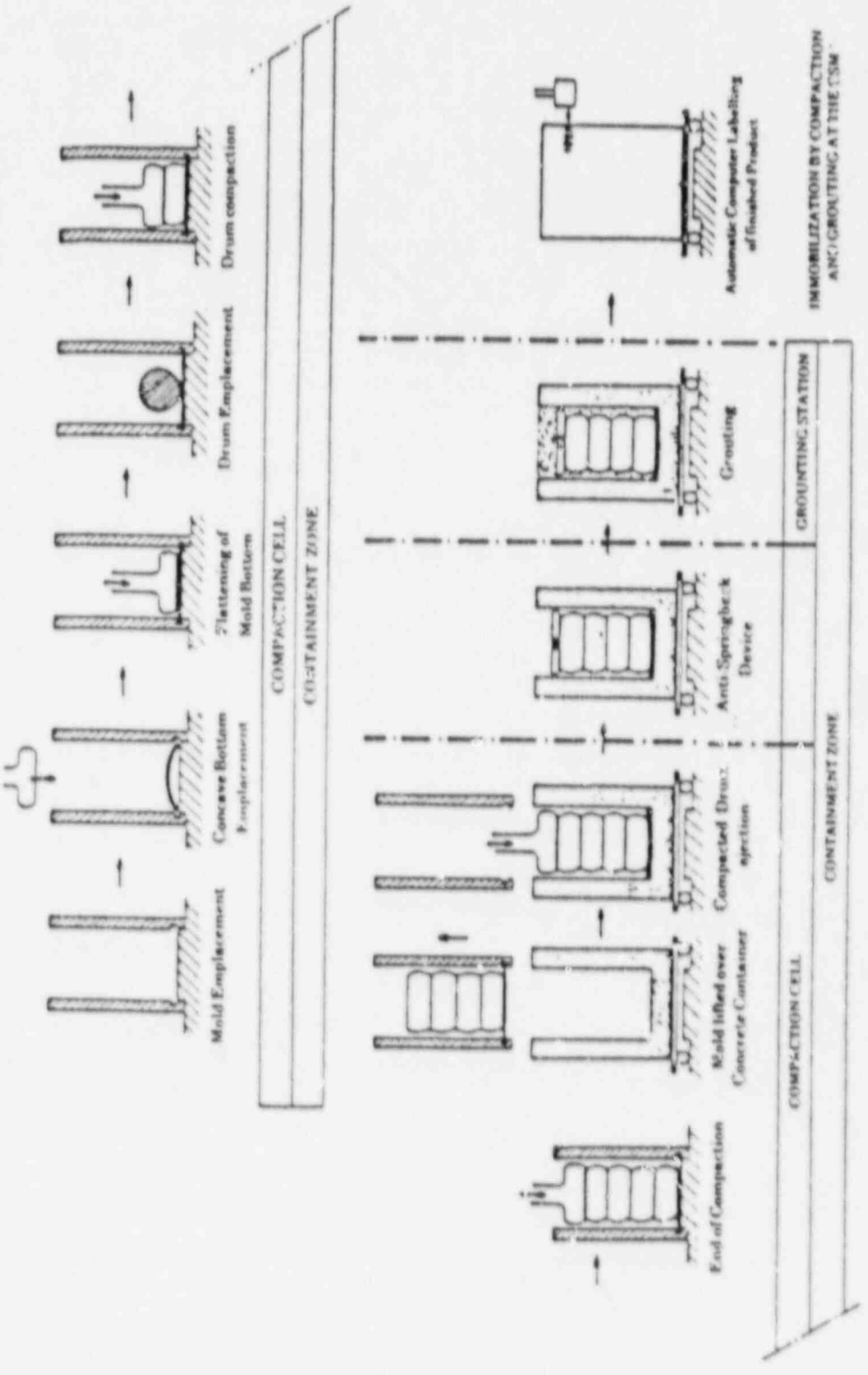


Fig. 64
COMPACTION AND GROUTING UNIT - GENERAL LAY-OUT

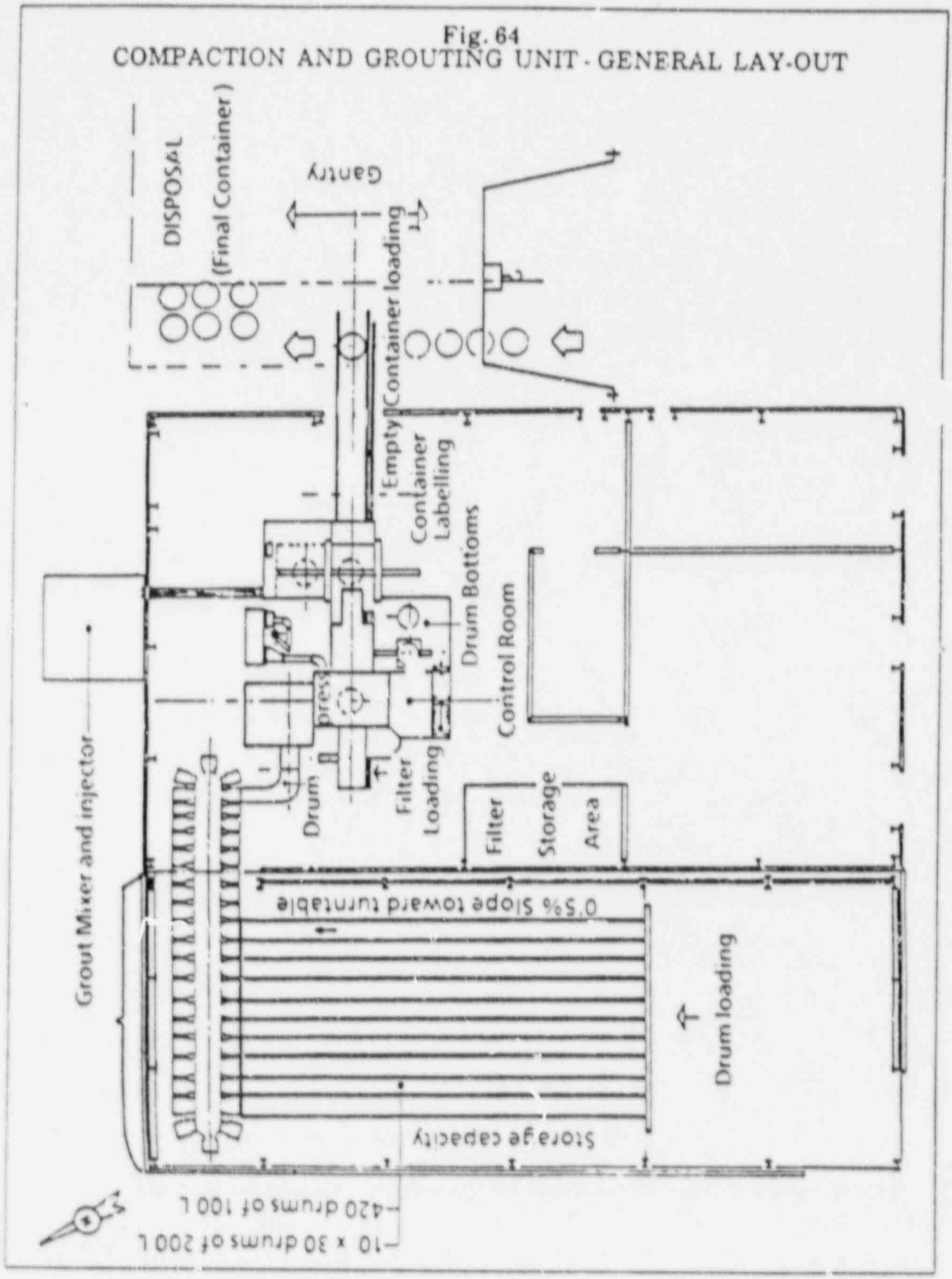


Fig 2

Fig. 66 - INJECTION OF GROUT IN METAL BOXES
PERSPECTIVE VIEW

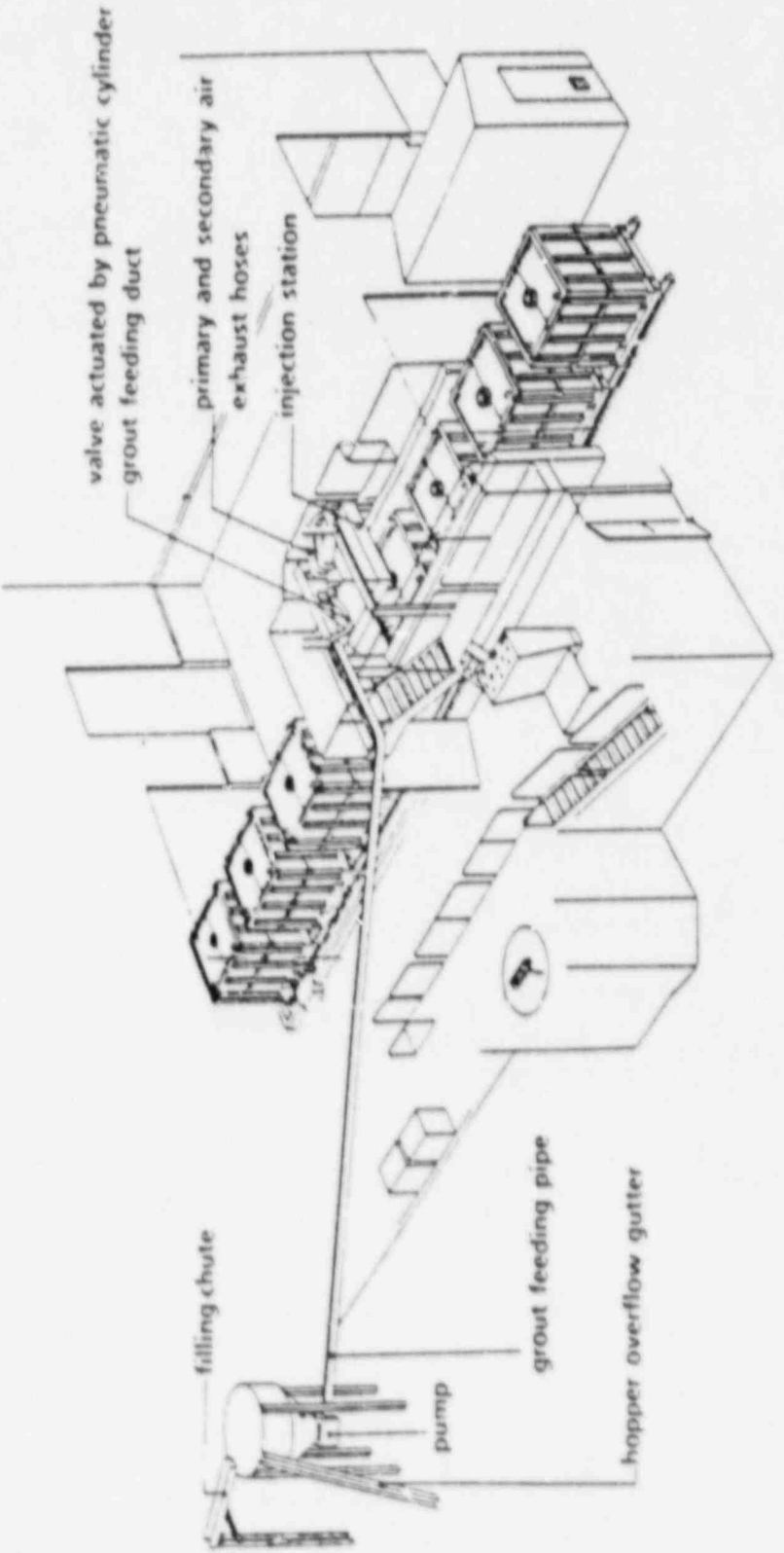


Fig. 55
EXPLODED VIEW OF CSM LLW DISPOSAL

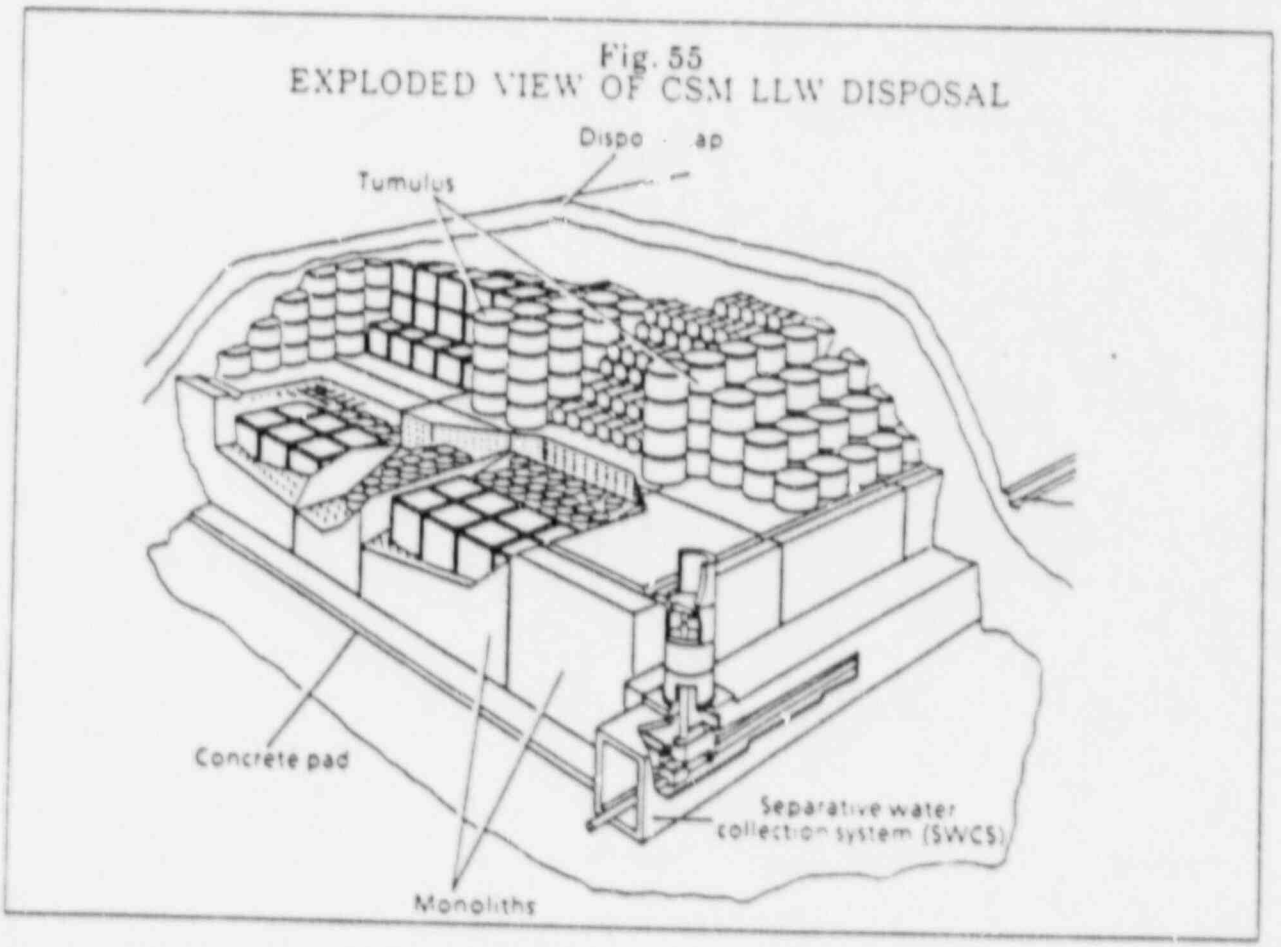


Fig. 59
REINFORCED CONCRETE MONOLITHS

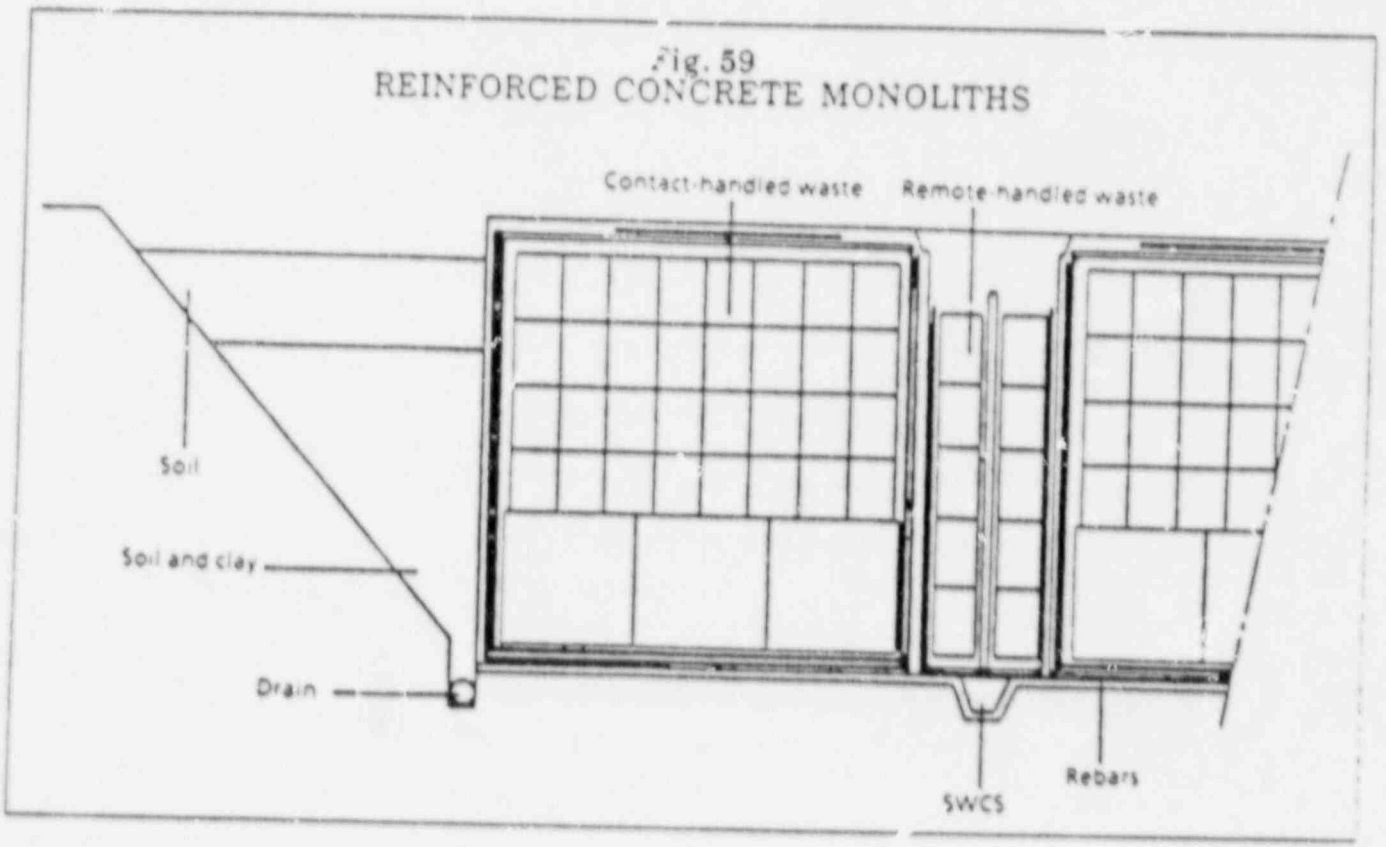


Fig. 60
PLACEMENT OF REMOTE-HANDLED PACKAGES IN MONOLITH STRUCTURE

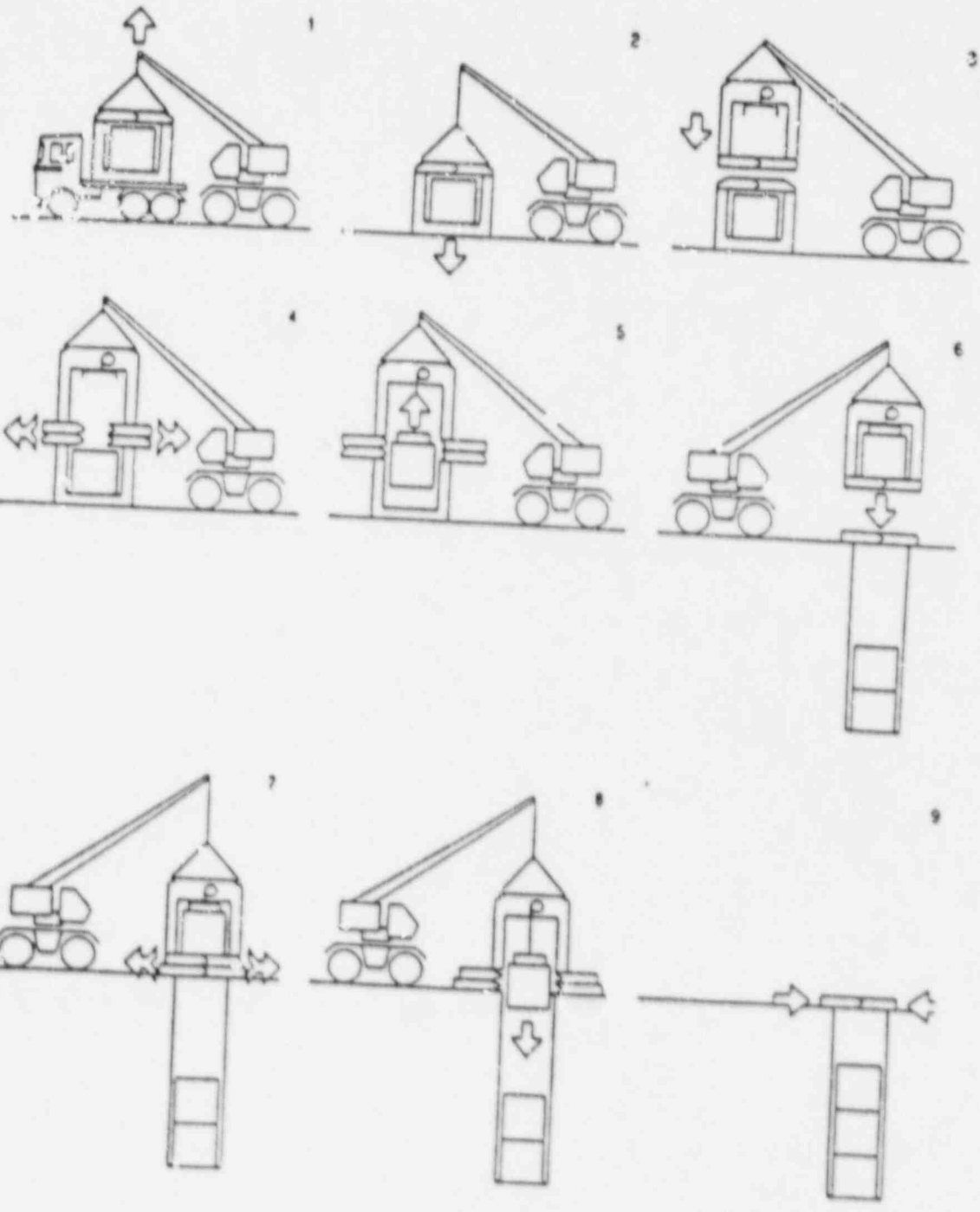


Fig. 61 - TUMULUS

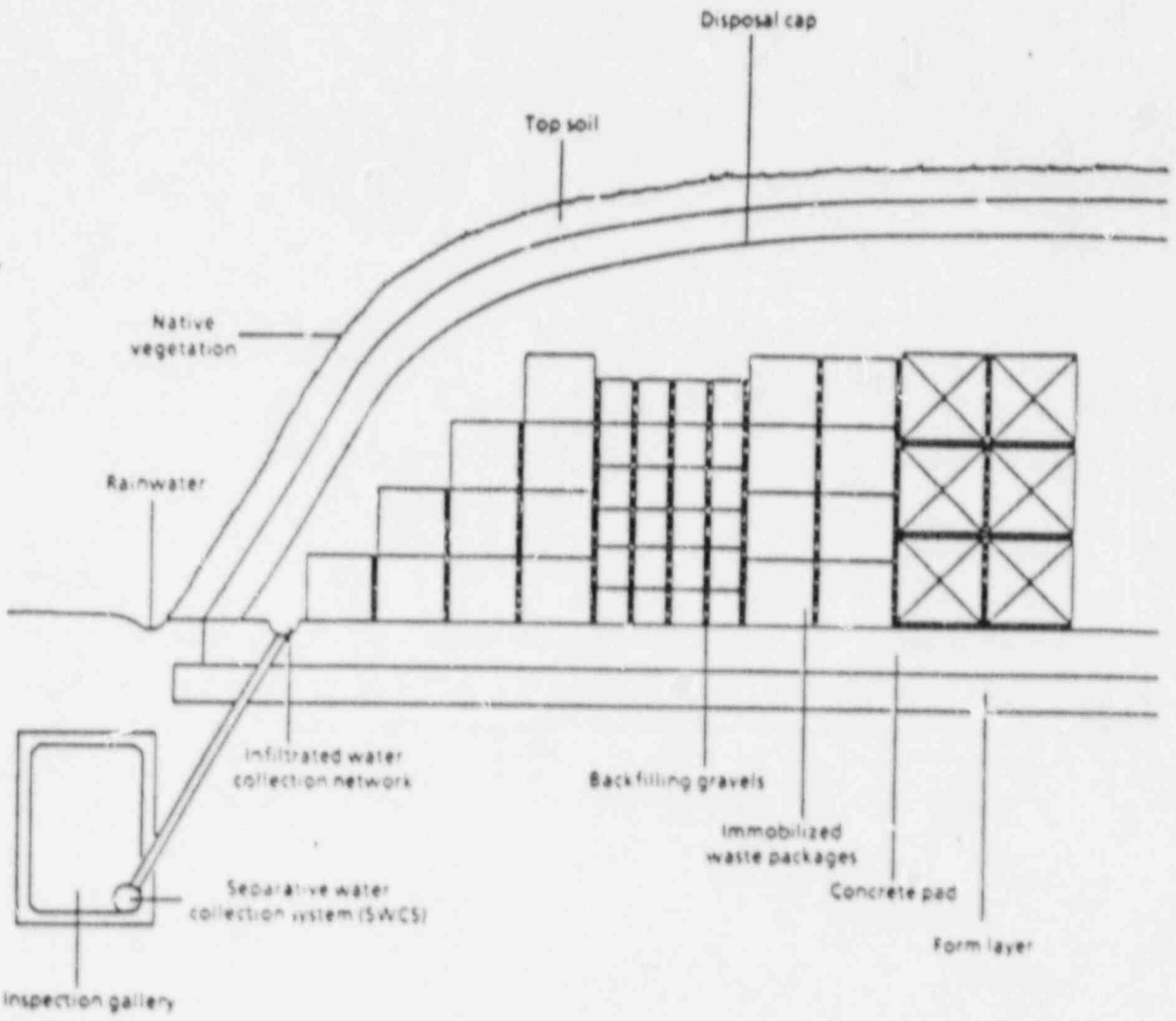


Fig. 62
CENTRE DE STOCKAGE DE LA MANCHE (CSM)
AREAS OF OPERATION

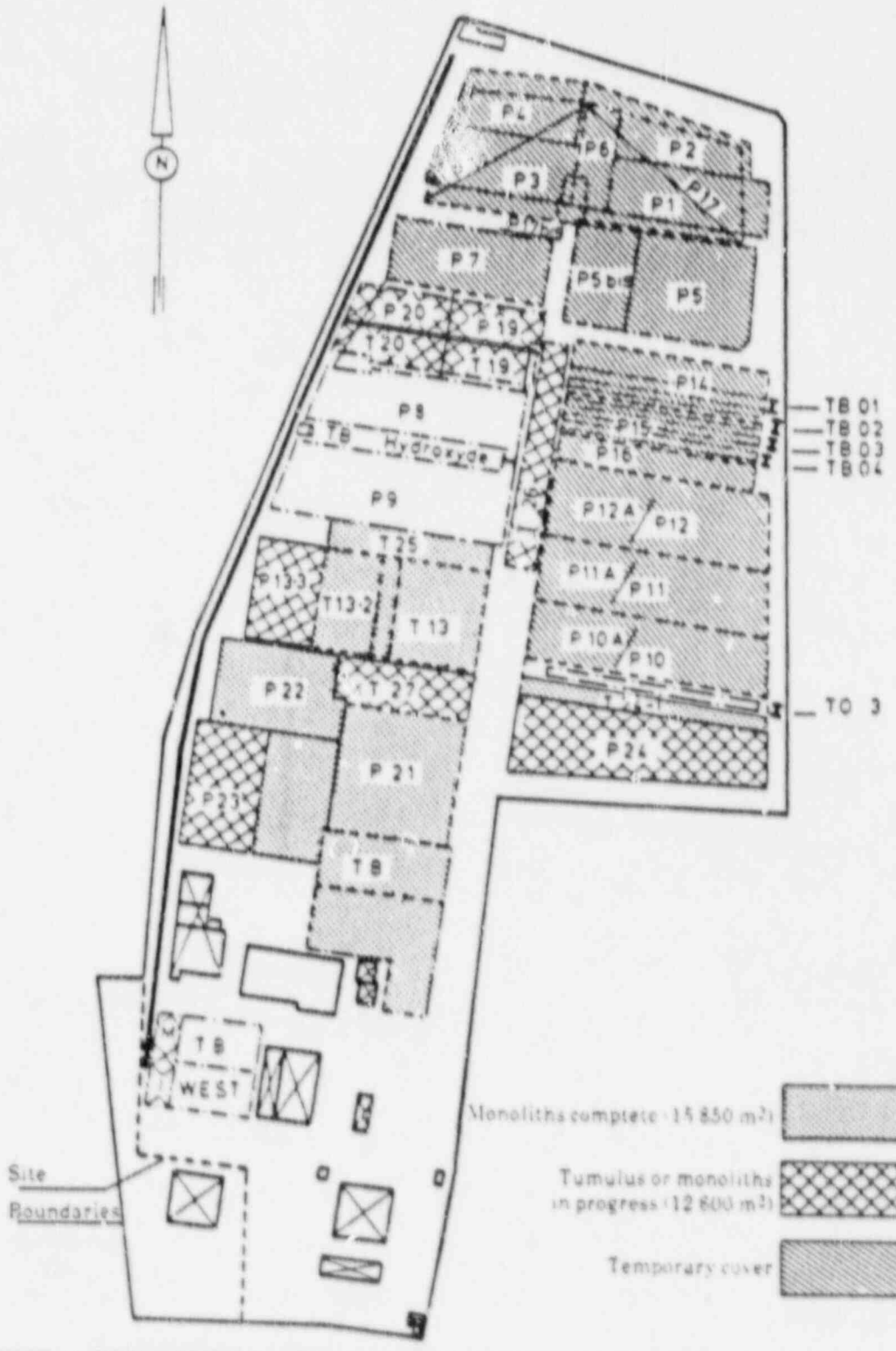


Fig. 15 - CONCEPTUAL MODEL OF A LLW DISPOSAL SITE