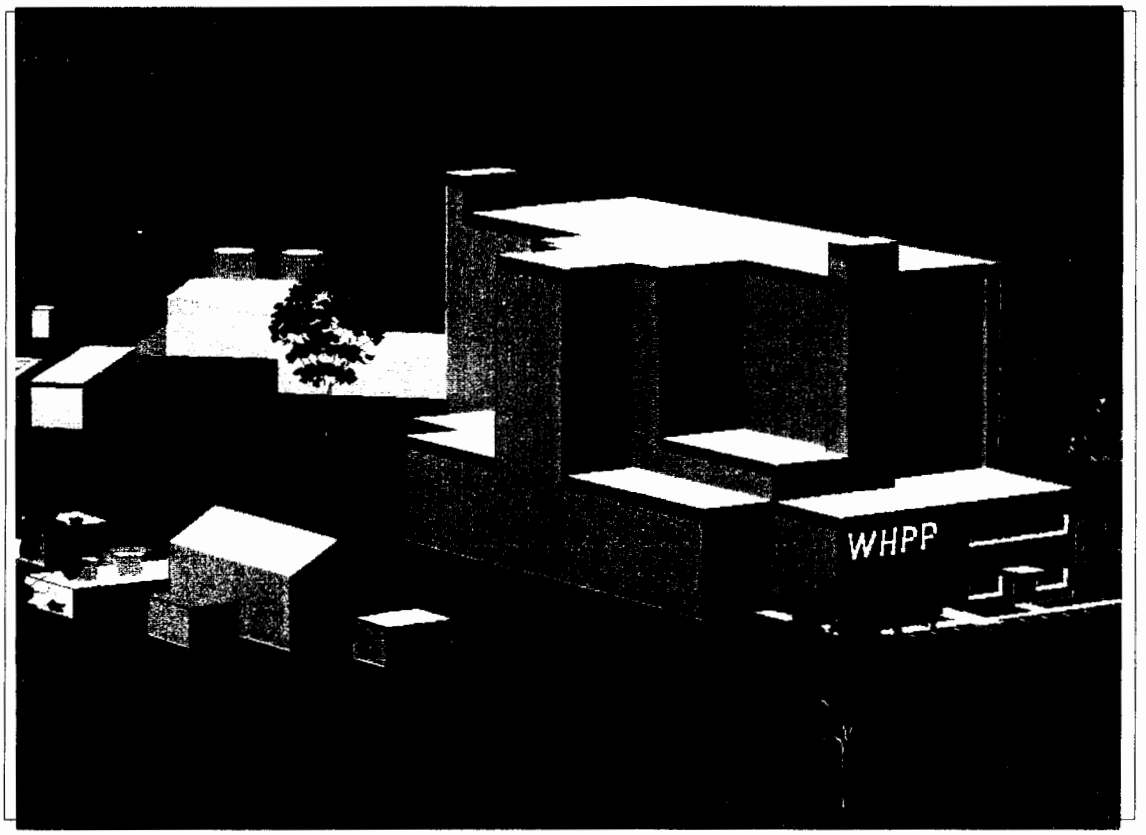
TRU WASTE UPDATE MEETING #19

DTWP

DEFENSE TRANSURANIC WASTE PROGRAM



Knoxville, Tennessee
January 9-10, 1991

910103

Room 217
FAX. Machine

19th TRU UPDATE MEETING
January 9-10, 1991
Knoxville, Tennessee

AGENDA

Tuesday, January 8

Tours of Oak Ridge National Laboratory and Scientific Ecology Group

Wednesday, January 9

LARRY ? Deputy ???

		Speaker
7:30 - 8:00	Continental Breakfast	
8:00 - 8:10	Welcome	Joe Lippis, DOE/WPO
8:10 - 8:30	Remarks-Oak Ridge Operations Office .	William Adams, DOE/ORO
8:30 - 9:15	Keynote Address	Jill Lytle, DOE/HQ
9:15 - 9:30	BREAK	
9:30 - 12:00	Waste Characterization/ Bin Preparation Task Force Update . . .	Joe Lippis, DOE/WPO Al Lappin, SNL Mark Duff, DOE/HQ Paul Drez, IT
12:00 - 1:00	LUNCH	
1:00 - 2:45	Sites' Updates: Waste Characterization/ Regulatory Status	Kevin Donovan, WID
	ANL-E.	Jim Thuot
	ANL-W.	Paul Bacca
	Hanford.	Dick Lipinski
	INEL	Jeff Riedesel
	LLNL	Kem Hainebach
	NTS.	Robert Dodge
	RFP.	Jerry O'Leary
	ORNL	Doug Turner
	SRS.	Pam Redd
2:45 - 3:00	BREAK	
3:00 - 5:00	Performance Assessment/ Engineered Alternatives Update.	Joe Lippis, DOE/WPO "Rip" Anderson, SNL Paul Drez, IT
6:30 - 8:30	HOSPITALITY HOUR	

Who ??

19th TRU UPDATE MEETING
January 9-10, 1991
Knoxville, Tennessee

AGENDA

Thursday, January 10

7:30 - 8:00	Continental Breakfast	
8:00 - 10:00	Sites' Updates:	
	TRU Waste Management Activities	Kevin Donovan, WID
	ANL-E.	Jim Thuot
	ANL-W.	Paul Bacca
	Hanford.	Dick Lipinski
	INEL	Jeff Riedesel
	LLNL	Kem Hainebach
	NTS.	Mike Noland
	RFP.	Jerry O'Leary
	ORNL	Bob Mason
	SRS.	Pam Redd
10:00 - 10:15	BREAK	
10:15 - 10:45	Transportation Program Status	Phil Gregory
10:45 - 11:15	WACCC Status	Dennis Morissette
11:15 - 12:00	Closeout Session.	Joe Lippis Larry Patrick Kevin Donovan
12:00 - 1:00	LUNCH	

Special Afternoon Meetings

1:00 - 3:00	WAC Status.	Hal Davis/ Dan Standiford
1:00 - 5:00	RH TRU Program Task Force	Closed Meeting
1:00 - 5:00	TRU Projects Meeting.	Closed Meeting

January 1991

UNITED STATES
DEPARTMENT OF ENERGY

Defense TRU Waste Update

MEETING # 19

Bin Preparation Activities

Presented By :

MARK DUFF

EM-342

M91-GT-0001-01

WIPP Projects Branch

- Bin Preparation Task Force
- No Migration Determination
- Generator Sites Responsibilities
- DOE Proposed RCRA Compliance Strategy

Bin Prep Task Force

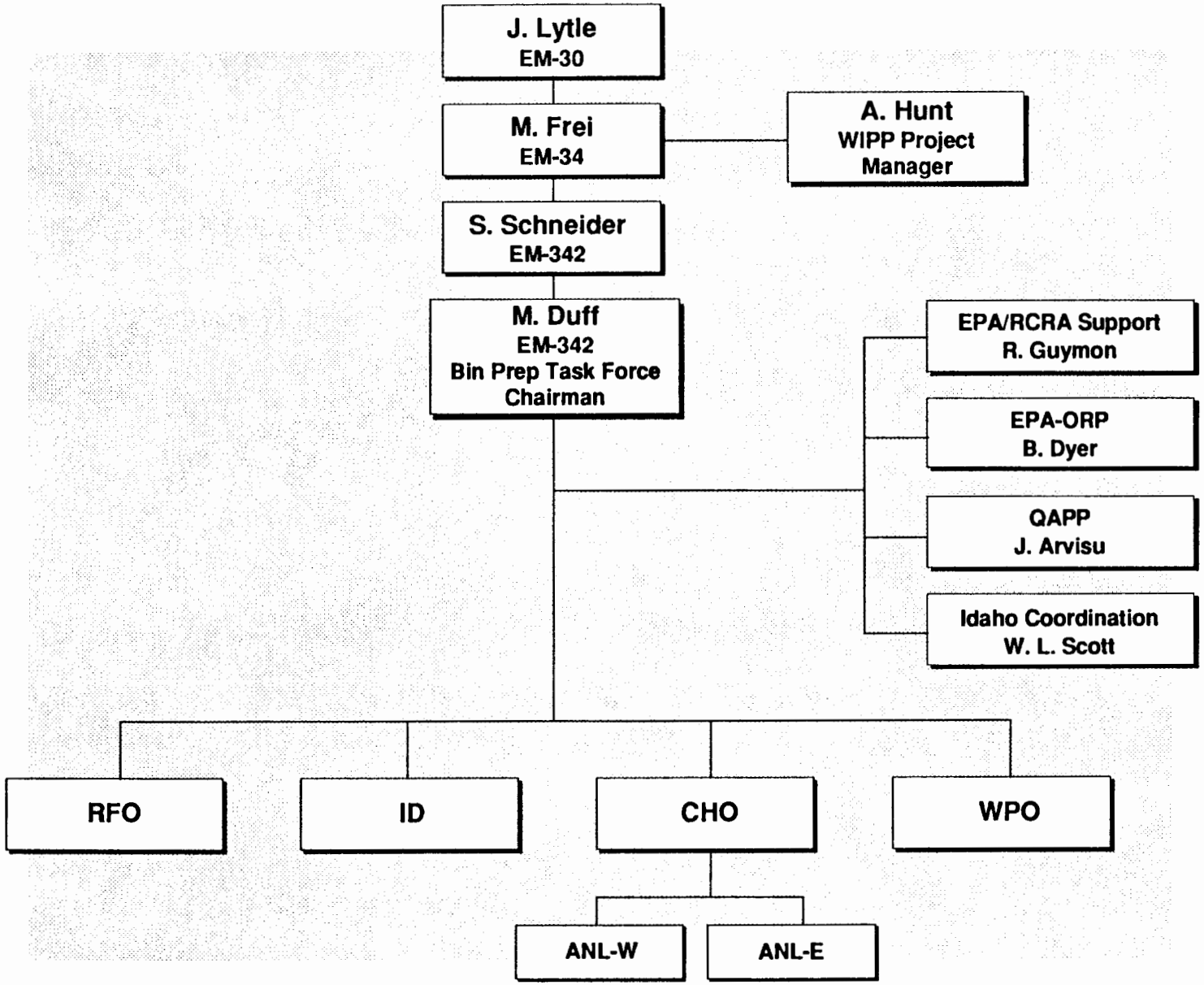
Mission: To Prepare TRU Mixed Waste at Rocky Flats and Idaho National Engineering Labs for Shipment to the Waste Isolation Pilot Plant.

WIPP Test Program

Phase O

- **65 "as received" bins**
- **Preparation at RFP and INEL**
- **Performance Assessment sampling and analysis conducted at WIPP only**

Bin Prep Organization



Bin Prep Task Force

Activities:

- **Documentation Development**
- **EPA Coordination**
- **Site Integration/Operations**

Documentation Development

Quality Assurance Program Plan (QAPP)

- **DOE/HQ Document**
  - Umbrella Document
  - Scope Includes Criteria for Shipments During Waste Operations
  - Addresses Current Regulatory Concerns Through October 1990
  - EM-1 Signature for Final

QAPP (continued)

- **Objective/Scope**
  - Identify requirements/needs for site-specific QA documentation (QAPjP)
  - Support QA for Waste Characterization Program Plan
  - Provide sampling requirements and standards

Documentation Development

- **QAPP Objectives (continued)**
  - **Establish minimum requirements for control of QA documentation**
  - **Establish Quality Control requirements**
  - **Establish data reduction, validation and reporting requirements**
  - **Site-specific project requirements**

Documentation Development

- **QAPP Objectives (continued)**
  - **Identify Routine Quality Assurance Report Management Requirements**
  - **Provide Corrective Actions Guidelines**
  - **Performance and System Audit Requirements Responsibilities and Frequencies**
  - **Provide Guidance on Internal Quality Control Checks and Frequencies**

Documentation Development

QAPP Status

- Several Meetings with EPA/OSW to Establish
  - Analyte Lists
  - Sampling Methods
  - Outline EPA concerns
- Draft QAPP distributed 11/30/90
- EPA conditions as published in the November 14, 1990 No Migration Variance Determination being evaluated
- Internal Comments complete 1/21/91
- External Review Final Draft 2/4/91

Documentation Development

Site-Specific Quality Assurance Project Plans (QAPjP)

- Each Generator Sending Waste to WIPP for the Test Phase Must Address QAPP
- Must be Applicable to EPA QAMS-005
- Must Meet DOE Order 5700.6B, May Cross Reference to Sections Pertaining to EPA Requirements

Documentation Development

QAPjPs (continued)

- Reference to Site-Specific SOPs which Detail Required Elements of the Program to be Performed
- Include Requirements for Participating Analytical Laboratory
- Must Reference Analytical QA Plans and Health and Safety Plans

Documentation Development

Rationale Document SAND 90-2481

- **Objectives:**

  (1)

  Provide statistical approach to Waste Characterization and Test Interpretation

  (2)

  Provide Test Matrices for:
  - **Level I (HO)**
  - **Level II (HO)**
  - **Low/Organic (LO)**
  - **Process Sludges (PS)**

  (3)

  Provide understanding of technical and regulatory framework of Bin tests

Documentation Development

Rationale Approach to Waste Characterization

- Characterization of RFP/INEL wastes in terms 11 (12) controlling matrix variables
- Interpret experiments with RFP/INEL wastes in terms of gas generation from same variables
- Characterization of wastes from other generators as required based on experiments

Documentation Development

Program Plan for the Pretest Characterization of WIPP Experimental Waste

- **Waste Characterization Program Plan (WCPP)**
- **In coordination with QAPP**
- **Will apply to all sites sending waste to WIPP**
  - **Representation of Inventory being used in experiments**

Documentation Development

Program Plan for the Pretest Characterization of WIPP Experimental Waste (continued)

Revision 6.1 incorporates EPA comments prior to No Migration Variance Determination

- **RTR**
- **Radioassay**
- **Visual Inspection**
- **Headspace Gas Sampling**
- **Sludge Analysis**

EPA Coordination

Interagency Agreement with Office of Radiation Programs signed September 17, 1990

- **Review and comment on sampling and analytical protocols**
- **Review and comment on QAPP**
- **Provide technical direction and assistance to DOE on EPA Method TO-14**
- **Evaluate DOE Operational Laboratory Readiness**

Performance Evaluation Program

Agreement (continued)

- Coordinate Inter-laboratory Performance Evaluation Program
  - INEL
  - ANLW
  - RFP
  - WIPP
  - ANL-E
  - EPA Region IV

EPA Coordination

Performance Evaluation Program

- **Individual labs develop analytical procedures**
- **Labs practice on equivalent standards**
- **Labs analyze PE samples and transmit to EPA/ORP**
- **EPA/ORP submits results to PE Administrator**
- **PE Administrator evaluates lab results and qualifies or disqualifies lab**

INEL

Radioactive Waste Management Complex

- Drum Selection
- RTR
- Radioassay
- Transportation to ANL-W in B-2/TRUPACT II
- Bin storage until shipment to WIPP
- EG&G Organic laboratory Analysis

Site Integration/Operations (continued)

Argonne National Labs - West

- Headspace gas sampling and analysis
- Inner bag sampling and analysis as required
- Bin Loading
  - -- Hot Fuel Examination Facility (HFEF)
  - -- Spray Chamber
  - -- Glove Box Facility
- TRUPACT II Loading Facility

Site Integration/Operations (continued)

Rocky Flats Plant

- **Visual/physical Inspection Studies**
- **Complete Waste Characterization for bin loading**
- **Advanced Size Reduction Vault**
- **Building 664 Inventory/Storage**
- **TRUPACT II Loading Facility**

Site Integration/Operations (continued)

Argonne National Labs - East

- **Sample Canister Calibration**
- **Back-up Laboratory**

WIPP Laboratory Integration

- **Sample and Analysis Methodology**

WIPP Lab Coordination

- QAPP includes analysis criteria for various gases
  - Excludes performance assessment ~~sampling~~ and analysis for site-specific gases at WIPP
- Quality Assurance Project Plan
  - Includes additional analytes for site-specific needs

No Migration Determination

- Published Notice of Intent April 1990
  - 9 conditions for proposed variance
- Public Hearings conducted May 1990
- Over 300 comments
  - Extensive waste characterization comments
- EPA provided comments on Pretest Waste Characterization Plan

No Migration Determination (continued)

- **No Migration Variance Determination published November 14, 1990**
  - **9 Conditions**
- **EPA/NMEID/Region VI meeting for interpretation and clarification of conditions is planned**

Generator Sites Responsibilities

- DOE approach demonstrates representative waste for Test Phase Bins
- Generator site required to show this analogy through representativeness
  - Statistical sample of WCP
- Non-inclusive waste streams
  - 3 Options

DOE Proposed RCRA Waste Characterization Strategy

- **Waste Stream by Waste Stream Basis**
  - Process Knowledge Assessment
- **Continue Visual Inspection Studies**
- **Conduct Diffusion Rate Studies for RCRA constituents within a drum**
- **Emphasis on Educating Regulators**
  - Tours
  - Observation of Bin Demos and related activities

DOE Proposed RCRA Waste Characterization Strategy

DOE Strategy Documentation for Compliance with EPA/NMEID

– Scope/Objectives

- **Decision Tree for Individual Waste Streams**
- **Determination of RCRA Constituents which are not Present Through Process Knowledge**
- **Present Systematic Approach for Extent of Characterization Required**

DOE Proposed RCRA Waste Characterization Strategy

- **Facilitate and Expedite Approval Process for Waste to be Accepted at WIPP**
- **To Develop Consistent Waste Characterization Data which will Assist in Overall Waste Management**

Conclusion:

- The mission of the Bin Prep Task Force is to prepare waste at RFP/INEL for initiation of the Test Phase at WIPP
- To provide consistent Waste Characterization at Generator Sites in full compliance with applicable RCRA regulations

UPDATE OF THE BIN PREPARATION TASK FORCE

PAUL DREZ, IT CORPORATION
JACK JOHNSON, WESTINGHOUSE-WIPP
HAL DAVIS, DOE-WIPP

TRU WASTE UPDATE MEETING #19
JANUARY 9, 1991
KNOXVILLE, TENNESSEE

WASTE CHARACTERIZATION REQUIREMENTS

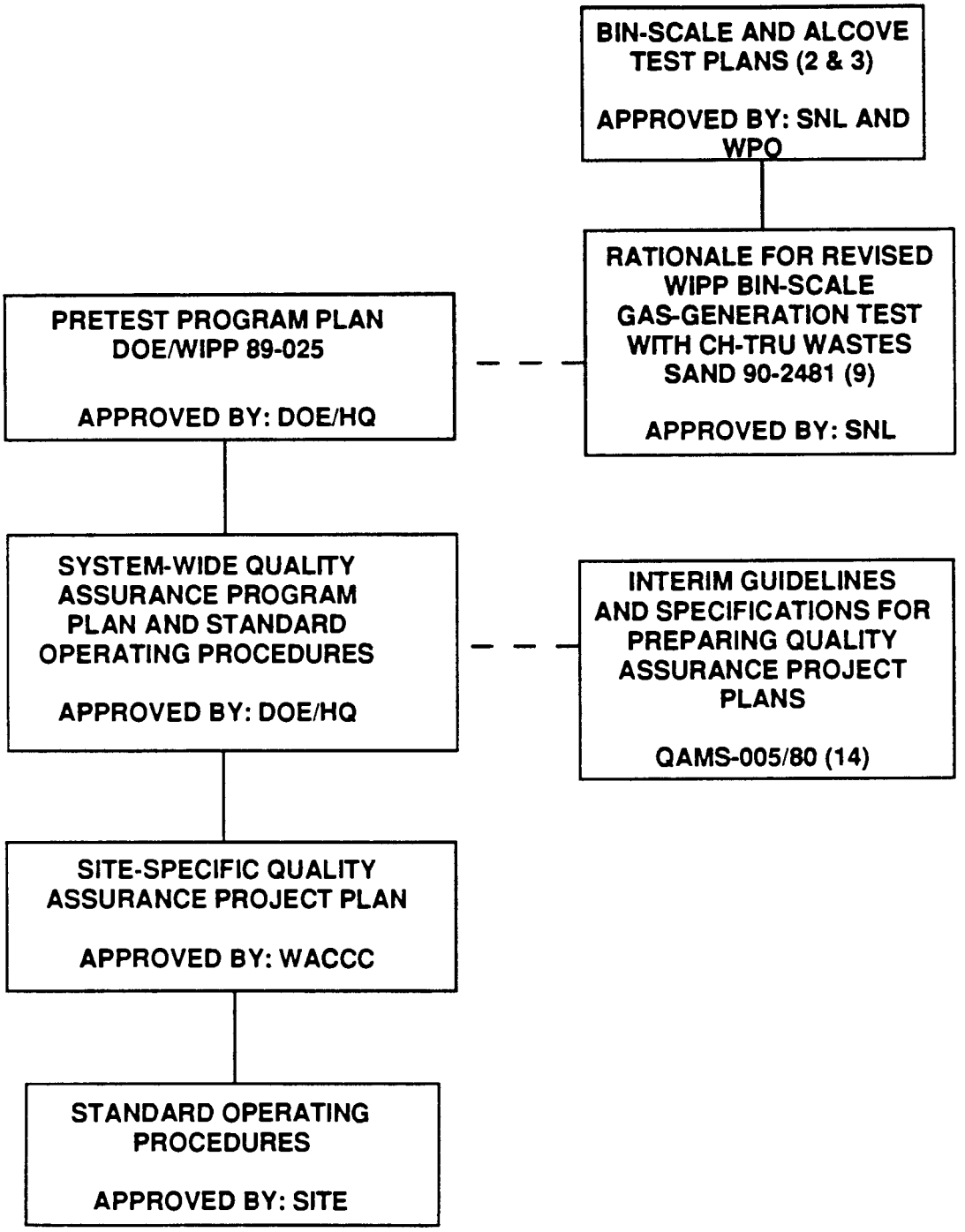
FOR TRU WASTE

OVERVIEW

- RELATIONSHIP BETWEEN THE 'PROGRAM PLAN FOR THE PRETEST CHARACTERIZATION OF WIPP EXPERIMENTAL WASTE" [PROGRAM PLAN] AND OTHER DOCUMENTS
- EXPLAIN WASTE CHARACTERIZATION REQUIREMENTS AS PRESENTLY KNOWN (REVISION 6.1 OF PROGRAM PLAN)
- INDICATE WASTE CHARACTERIZATION REQUIREMENTS FROM NO-MIGRATION DETERMINATION OF THE EPA (40 CFR 268)
- INDICATE RCRA REQUIREMENTS: DETAILS ARE UNCERTAIN AT PRESENT (STATE OF NEW MEXICO - 40 CFR 264 AND 40 CFR 270)
- DURATION OF WASTE CHARACTERIZATION REQUIREMENTS
- RATIONALE FOR WASTE CHARACTERIZATION REQUIREMENTS

HISTORY OF PRETEST WASTE CHARACTERIZATION REQUIREMENTS

- INITIATED IN SUPPORT OF WAC RECERTIFICATION AT RFP (SEPTEMBER 1989)
- BLUE RIBBON PANEL RECOMMENDED THAT 'PROGRAM PLAN' BE EXPANDED TO GENERAL WASTE CHARACTERIZATION ACTIVITIES (OCTOBER, 1989):
  - PERFORMANCE ASSESSMENT (PA)
  - RCRA
- EXPANDED TO ADDRESS REQUIREMENTS OF NO-MIGRATION VARIANCE PETITION (NMVP) (FEBRUARY, 1990)
- EXPANDED TO ADDRESS NEW REQUIREMENTS FOR NO-MIGRATION DETERMINATION BY THE EPA (NOVEMBER 1990)
- EXPANDED TO ADDRESS NEW REQUIREMENTS FOR RCRA FOR STATE OF NEW MEXICO (DISCUSSIONS IN PROGRESS)



DOCUMENTS GOVERNING PRETEST WASTE CHARACTERIZATION

PROGRAM PLAN FOR THE PRETEST CHARACTERIZATION OF WIPP EXPERIMENTAL WASTE

- CURRENT REVISION IS 6.1 (OUT FOR REVIEW BY SITES AND EXTERNAL AGENCIES)
  - INCLUDES CURRENT COMMITMENTS BY DOE FOR WASTE CHARACTERIZATION ACTIVITIES
- SUPPORTS THE FOLLOWING PROGRAMS AND ACTIVITIES:
  - NO-MIGRATION VARIANCE DETERMINATION (40 CFR PART 268.6)
    - LONG-TERM MIGRATION (GROUNDWATER/ AIR PATHWAY)
    - SHORT-TERM MIGRATION (AIR PATHWAY)
  - PERFORMANCE ASSESSMENT (40 CFR PART 191)
    - TEST PROGRAMS (BIN-SCALE AND ALCOVE)
    - LONG-TERM PERFORMANCE
  - RCRA CHARACTERIZATION REQUIREMENTS
- VERIFICATION OF "PROCESS KNOWLEDGE"

WASTE REQUIREMENTS FOR EXPERIMENTAL PERIOD

- ONLY WASTES THAT ARE PART OF NO-MIGRATION VARIANCE PETITION CAN BE USED IN TESTS (TABLE 2-1)

- WASTE SELECTION MUST HAVE STATISTICAL BASIS (SAND 90-2481)

- PRESENT PLANS ARE FOR ONLY RFP WASTE FROM RFP OR INEL FOR BIN TESTS

- WASTES USED IN EXPERIMENTS MUST BE "REPRESENTATIVE" OF WASTES TO BE DISPOSED AT WIPP FROM ALL DOE SITES

NO-MIGRATION DETERMINATION BY THE EPA

- RELEASED IN NOVEMBER, 1990
- IS LIMITED TO WIPP EXPERIMENTAL PHASE ONLY
  - DOES NOT ALLOW WASTE SHIPMENT TO WIPP FOR OPERATIONS DEMONSTRATION
- IMPOSES SEVERAL SPECIFIC WASTE CHARACTERIZATION RESTRICTIONS AND REQUIREMENTS ON WASTE TO BE SHIPPED TO WIPP FOR THE EXPERIMENTAL PHASE

REQUIREMENTS THAT RESULT FROM THE NO-MIGRATION DETERMINATION

- RESTRICTIONS AND SAMPLING REQUIREMENTS ON NONFLAMMABLE VOCs IN WASTE CONTAINERS
  - LIMITS ON MAXIMUM CONCENTRATIONS OF VOCs
  - LIMITS ON MEAN CONCENTRATIONS OF VOCs
  - SAMPLING FOR SPECIFIC LIST OF VOCs
  - WILL BE DISCUSSED IN DETAIL LATER

REQUIREMENTS THAT RESULT FROM THE NO-MIGRATION DETERMINATION

- BASIS FOR RESTRICTIONS ON NONFLAMMABLE VOCs IN WASTE CONTAINERS
  - CALCULATIONS USED IN NMVP TO DETERMINE COMPLIANCE WITH HAZARDOUS RELEASES FROM WIPP DURING TESTING AND OPERATIONAL PHASES
  - CALCULATIONS ARE BASED ON AVERAGE CONCENTRATIONS OF NONFLAMMABLE VOCs IN WASTE CONTAINER HEADSPACE GASES FROM TRU WASTE SAMPLING PROGRAM AT INEL
  - AMOUNT OF VOLATILE HAZARDOUS CONSTITUENTS RELEASED THROUGH CARBON COMPOSITE FILTER DEPENDENT ON ASSUMED CONCENTRATION OF HAZARDOUS CONSTITUENTS IN WASTE CONTAINER HEADSPACE AND DIFFUSION CONSTANT FOR FILTER

REQUIREMENTS THAT RESULT FROM THE NO-MIGRATION DETERMINATION

- RESTRICTIONS AND SAMPLING REQUIREMENTS ON POTENTIALLY FLAMMABLE CONCENTRATIONS OF GASES IN WASTE CONTAINERS
  - LIMITS ON FLAMMABLE GAS CONCENTRATIONS (H_2, CH_4, etc.)
  - LIMITS ON FLAMMABLE VOC CONCENTRATIONS
  - SPECIFIC FLAME TEST ON MIXTURE OF GASES IF FLAMMABLE VOC CONCENTRATIONS EXCEED SPECIFIED LIMITS
  - WILL BE DISCUSSED IN DETAIL LATER

REQUIREMENTS THAT RESULT FROM THE NO-MIGRATION DETERMINATION

- BASIS FOR RESTRICTIONS ON POTENTIALLY FLAMMABLE CONCENTRATIONS OF GASES IN WASTE CONTAINERS
  - EPA CONCERNED ABOUT POSSIBILITY FOR IGNITION OF POTENTIALLY FLAMMABLE MIXTURES OF INORGANIC GASES DURING PLACEMENT OF WASTE CONTAINERS INTO THE WIPP UNDERGROUND
  - THE POSSIBLE OCCURRENCE OF POTENTIALLY FLAMMABLE VOCs IN WASTE AND HOW DOE WILL INCLUDE THESE IN ANY FLAMMABILITY CALCULATIONS
  - RESTRICTIONS APPLY EVEN IN THE ABSENCE OF OXYGEN

REQUIREMENTS THAT RESULT FROM THE NO-MIGRATION DETERMINATION

- RESTRICTIONS ON GAS CONCENTRATIONS IN WASTE CONTAINERS TO DEMONSTRATE "REPRESENTATIVENESS"
  - IN ORDER TO USE DRUM HEADSPACE GAS SAMPLES FOR ASSESSING EITHER FLAMMABILITY, "COMPARABILITY", OR FOR DEMONSTRATING NO-MIGRATION, DOE MUST PROVE TO EPA'S SATISFACTION THAT A DRUM HEADSPACE GAS SAMPLE IS A "REPRESENTATIVE" SAMPLE
  - SAMPLING AND ANALYSIS OF HEADSPACE SAMPLES AND INNER LAYERS IS NECESSARY TO DEMONSTRATE:
    - EQUAL CONCENTRATIONS IN EVERY LAYER OF BAGGING (e.g., CHLORINATED SOLVENTS), OR
    - PREDICTION ALGORITHM FOR GASES WHERE CONCENTRATION GRADIENTS ARE EXPECTED IN A DRUM AT STEADY STATE (e.g, HYDROGEN, ALCOHOLS)

BASIS FOR "REPRESENTATIVENESS" RESTRICTIONS ON NONFLAMMABLE VOCs IN WASTE CONTAINERS

- PRELIMINARY DATA SHOWN TO EPA DEMONSTRATED THAT NONFLAMMABLE VOCs DIFFUSE RAPIDLY THROUGH BAGGING LAYERS AND HOMOGENIZE RAPIDLY (DAYS-WEEKS?) IN WASTE CONTAINERS

- DATA BASED ON:
  - DATA GENERATED DURING TRUPACT-II PROGRAM ON DIFFUSION OF VOCs THROUGH PLASTIC BAGGING MATERIALS
  - OPENING OF ONLY A FEW DRUMS AT RFP
  - HEADSPACE GASES WERE NOT ANALYZED BY EPA PROTOCOLS

BASIS FOR "REPRESENTATIVENESS" RESTRICTIONS ON NONFLAMMABLE VOCs IN WASTE CONTAINERS
(CONTINUED)

- EPA WANTS DOE TO GENERATE MORE DATA TO DEMONSTRATE THAT A HEADSPACE SAMPLE IN A WASTE CONTAINER WILL BE "REPRESENTATIVE" OF NONFLAMMABLE VOC CONCENTRATIONS IN ANY INNER BAGS
  - TO MAKE CORRELATION, NEED DATA FROM LAYERS OF WASTE CONTAINMENT INSIDE WASTE CONTAINERS
  - EPA WANTS SAMPLING OF ALL DRUM LAYERS INITIALLY THAT ARE OPENED FOR BIN-SCALE EXPERIMENTS UNTIL DOE HAS DEMONSTRATED A RELATIONSHIP BETWEEN HEADSPACE AND INNER BAG CONCENTRATIONS IN WASTE CONTAINERS
  - CAN USE COMBINATION OF LABORATORY TESTS AND SAMPLING OF WASTE CONTAINERS
  - LABORATORY TESTS ONLY ARE NOT ENOUGH
  - SUCCESSFUL DEMONSTRATION DURING BIN-SCALE TESTS WILL ALLOW ONLY HEADSPACE SAMPLING DURING ALCOVE TESTS

REQUIREMENTS THAT RESULT FROM THE NO-MIGRATION DETERMINATION

- DEMONSTRATE "COMPARABILITY"
  - DOE MUST DEMONSTRATE THAT THE HEADSPACE CONCENTRATION OF VOCs FOR CONTAINERS OF EXPERIMENTAL WASTE IS "COMPARABLE" TO CONCENTRATIONS OF HAZARDOUS CONSTITUENTS USED IN CALCULATIONS IN THE NMVP TO DEMONSTRATE NO-MIGRATION DURING THE TEST PHASE

REQUIREMENTS THAT RESULT FROM THE NO-MIGRATION DETERMINATION

- METHODOLOGY FOR DETERMINING "COMPARABILITY" IN A WASTE CONTAINER IF REPRESENTATIVENESS <u>HAS BEEN DEMONSTRATED</u>

  - ANALYZE THE DRUM HEADSPACE FOR THE HAZARDOUS CONSTITUENTS AND COMPARE THE CONCENTRATIONS, AS GIVEN BY THE ANALYSIS, TO VALUES LISTED IN TABLE 2

- CONCENTRATION IN ANY WASTE CONTAINER <u>PRIOR TO LOADING A BIN</u> CANNOT EXCEED 2 TIMES THE MAXIMUM CONCENTRATION OF HAZARDOUS CONSTITUENT LISTED IN TABLE 2 OF NO-MIGRATION DETERMINATION

TABLE 2
MAXIMUM HEADSPACE CONCENTRATIONS
(in volume percent)

CONSTITUENT	TYPE I	TYPE II	TYPE III	TYPE IV
Carbon tetrachloride	0.08	0.18	0.58	8.18
Methylene chloride	0.44	0.84	0.50	1.42
1,1,1-Trichloroethane	1.88	5.68	2.12	14.96
Trichloroethylene	0.08	0.34	0.28	0.28
1,1,2-Trichloro-1,2,2-trifluoroethane	0.05	1.62	5.74	20.80

NO-MIGRATION DEMONSTRATION RESTRICTIONS ON NONFLAMMABLE VOCs IN WASTE CONTAINERS

- ANY WASTE CONTAINER THAT WILL BE EMPLACED IN WIPP CANNOT HAVE THE CONCENTRATION OF NONFLAMMABLE VOCs EXCEED 10 TIMES THE AVERAGE CONCENTRATION IN TABLE 3 OF NO-MIGRATION DETERMINATION

- METHODS TO DEMONSTRATE COMPLIANCE
  - USE SIMILAR METHODOLOGY TO THAT FOR DEMONSTRATION OF COMPARABILITY (MEASURE CONCENTRATIONS IN ORIGINAL WASTE CONTAINER)
  - MEASURE CONCENTRATION IN BIN PRIOR TO SHIPMENT OR AT WIPP TO DETERMINE COMPLIANCE

TABLE 3
MEAN HEADSPACE CONCENTRATIONS
(in volume percent)

CONSTITUENT	TYPE I	TYPE II	TYPE III	TYPE IV
Carbon tetrachloride	0.24	0.26	0.30	6.90
Methylene chloride	0.39	0.42	0.33	0.93
Trichloroethylene	0.25	0.28	0.29	0.38

NO-MIGRATION DEMONSTRATION RESTRICTIONS ON NONFLAMMABLE VOCs IN WASTE CONTAINERS (Continued)

- SOURCE OF VALUES IN TABLES 2 AND 3 OF NO-MIGRATION DETERMINATION
  - CONCENTRATIONS QUOTED WERE THOSE FOUND IN DRUMS OF RFP WASTE AT RFP OR INEL (USED FOR CALCULATIONS IN NMVP)
  - CONCENTRATIONS ARE QUOTED BY WASTE TYPE (AS DEFINED IN TRUCON DOCUMENT)

POTENTIAL CONSEQUENCES ON FAILURE TO MEET COMPARABILITY CRITERIA

- ANY WASTE CONTAINERS, PRIOR TO LOADING IN BIN, THAT CANNOT COMPLY WITH 2 TIMES MAXIMUM RESTRICTION, SHOULD NOT BE LOADED INTO A BIN
- IF A WASTE CONTAINER WAS ALREADY LOADED INTO A BIN PRIOR TO ANALYSIS, AND EXCEEDED THE 2 TIMES MAXIMUM LIMIT, THE BIN CANNOT BE INCLUDED IN THE TEST PROGRAM UNDERGROUND AT WIPP
- POTENTIALLY, A DRUM COULD BE PURGED AND SAMPLED AGAIN AFTER REACHING STEADY STATE FOR "COMPARABILITY" CRITERIA
- IF DRUMS, BY WASTE TYPE, HAVE CONCENTRATIONS THAT CONSISTENTLY VIOLATE THE COMPARABILITY CRITERIA, DOE COULD RECALCULATE POTENTIAL RELEASES IN NMVP AND ASK FOR A MODIFICATION TO THE VARIANCE

POTENTIAL CONSEQUENCES ON FAILURE TO MEET NO-MIGRATION DEMONSTRATION CRITERIA

- IF MEASUREMENT IN BIN EXCEEDS VALUES IN TABLE 3 OF NO-MIGRATION DETERMINATION, BIN COULD BE PURGED TO LOWER VOC CONCENTRATIONS TO ACCEPTABLE LIMITS

- PURGING COULD BE DONE AT GENERATOR SITE TO BRING BIN INTO COMPLIANCE

- IF BINS CONSISTENTLY HAVE VALUES ABOVE 10 TIMES THE AVERAGE VALUE, DOE COULD RECALCULATE POTENTIAL RELEASES IN NMVP AND ASK FOR A MODIFICATION TO THE VARIANCE

ADDED REQUIREMENTS THAT RESULT FROM THE NO-MIGRATION DETERMINATION

- METHODOLOGY FOR DETERMINING "COMPARABILITY" IN A WASTE CONTAINER (IF REPRESENTATIVENESS HAS NOT BEEN DEMONSTRATED)
  - ANALYZE INNER BAGS FOR HAZARDOUS CONSTITUENTS IN TABLE 2, AND FOR EACH HAZARDOUS CONSTITUENT
    - SUM THE MASS OF EACH CONSTITUENT FROM EACH INNER BAG
    - DIVIDE BY THE TOTAL VOLUME OF THE DRUM TO OBTAIN AN AVERAGE DRUM CONCENTRATION FOR THAT CONSTITUENT
    - THE AVERAGE VALUE IS THEN COMPARED TO THE VALUES IN TABLE 2.
  - AN ESTIMATE OF THE INNER BAG VOID VOLUMES MUST BE MADE IN THIS CASE.

ADDED REQUIREMENTS THAT RESULT FROM THE NO-MIGRATION DETERMINATION

FLAMMABILITY CRITERIA

- IF FLAMMABLE VOCs DO NOT EXCEED 500 PPMV IN A REPRESENTATIVE SAMPLE FROM A WASTE CONTAINER:
  - USE THE VALUES OF THE CONCENTRATIONS OF H_2 AND CH_4 TO CALCULATE A THEORETICAL LOWER EXPLOSIVE LIMIT (LEL) USING THE Le CHATELIER'S RULE
  - IF THE CONCENTRATIONS OF H_2 AND CH_4 EXCEED 50% OF THE CALCULATED LEL, THE REPRESENTATIVE SAMPLE IS FLAMMABLE
  - IF THE CONCENTRATIONS OF H_2 AND CH_4 DO NOT EXCEED 50% OF THE CALCULATED LEL, THE REPRESENTATIVE SAMPLE IN NOT FLAMMABLE
  - THE FLAME TEST REQUIREMENTS DO NOT APPLY

ADDED REQUIREMENTS THAT RESULT FROM THE NO-MIGRATION DETERMINATION

FLAMMABILITY CRITERIA (CONTINUED)

- IF FLAMMABLE VOCs DO EXCEED 500 PPMV IN A REPRESENTATIVE SAMPLE FROM A WASTE CONTAINER:
  - TEST THE REPRESENTATIVE SAMPLE USING A YES/NO FLAME TEST (MODIFIED ASTM E681-85)
  - IF THE REPRESENTATIVE SAMPLE 'PRODUCES A FLAME FRONT THAT SPREADS FROM THE IGNITION SOURCE AND REACHES THE VESSEL WALLS", THE REPRESENTATIVE SAMPLE IS FLAMMABLE
  - IF THE REPRESENTATIVE SAMPLE DOES NOT 'PRODUCE ... VESSEL WALLS", THE REPRESENTATIVE SAMPLE IS NOT FLAMMABLE
  - THE 'BELOW 50% OF THE CALCULATED LEL" REQUIREMENT DOES NOT APPLY

ADDED REQUIREMENTS THAT RESULT FROM THE NO-MIGRATION DETERMINATION

FLAMMABILITY CRITERIA (CONTINUED)

- DOE MAY PETITION EPA EITHER:
  - TO RESCIND THE FLAME TEST REQUIREMENT IF THE THEORETICAL CALCULATION OF LELs IS SHOWN TO BE EQUIVALENT TO EXPERIMENTAL VALUES (FOR COMPLEX MIXTURES WITH GREATER THAN 500 PPMV OF FLAMMABLE VOCs)
  - TO USE THE FLAME TEST AS THE SOLE CRITERION FOR FLAMMABILITY TESTING
- TO ENSURE THAT NO WASTE CONTAINER IS EMPLACED AT WIPP WITH FLAMMABLE MIXTURES OF GASES, DOE MAY
  - PURGE BINS PRIOR TO THEIR EMPLACEMENT AT WIPP

SUMMARY

- NO-MIGRATION DETERMINATION OF THE EPA REQUIRES SPECIFIC CHARACTERIZATION OF WIPP EXPERIMENTAL WASTE

- ADDITIONAL CHARACTERIZATION MAY BE NECESSARY TO MEET REQUIREMENTS OF STATE RCRA REGULATIONS

- PROGRAM PLAN IS BEING REVISED TO INCORPORATE ALL WASTE CHARACTERIZATION REQUIREMENTS

- IMPLEMENTATION OF THESE WASTE CHARACTERIZATION REQUIREMENTS, AND REVISION OF THE PROGRAM PLAN, IS BEING COORDINATED BY THE BIN PREP TASK FORCE

TRU WASTE UPDATE MEETING #19

EG&G ROCKY FLATS PLANT

JERRY O'LEARY

JANUARY 10, 1991

(NOT APPROVED FOR PUBLICATION)

TRU MIXED WASTE STORAGE

- Maximum Permitted Storage Limit at Rocky Flats Plant is 1601 Cubic Yards
- Limiting Condition of Operation (LCO) is 1491 Cubic Yards
- Current TRU Mixed Waste Inventory is 1,046 Cubic Yards as of January 6, 1991
- Generation Rate (Shutdown) 21 Cubic Yards/Month (Includes TRU Mixed/Residue)
- Generation Rate After Resumption 83.7 Cubic Yards (Includes TRU Mixed/Residue)

TRU MIXED WASTE STORAGE CONT'

- Reclassification of 75 Cubic Yards of TRU Mixed Waste Completed November 1990
- Current Plans for Waste Retrieval/Certification will be to Randomly Select and Prepare Waste for the WIPP Bin Scale Test Program
- Waste and Environmental Management System (WEMS)

TRU MIXED WASTE STORAGE ISSUES

- Without Supercompactor, No Shipments to WIPP, and Phased Resumption *(June 1991-Building 559, Sept 1991-Building 707)*
  - LCO will be Reached February 1992
  - Storage Capacity Reached June 1992
  - Based on 87 Cubic Yard/Month Generation Rate

- With Supercompactor (April 1991), No Shipments to WIPP, and Phased Resumption *(June 1991-Building 559, Sept 1991-Building 707)*
  - LCO will be Reached September 1993
  - Storage Capacity Reached January 1994
  - Based on 87 Cubic Yard/Month Generation Rate

- With Supercompactor (April 1991), Shipments to WIPP (Aug 1991), and Phased Resumption *(June 1991-Building 559, Sept 1991 Building-707)*
  - LCO will be Reached February 1994
  - Storage Capacity Reached June 1994
  - Based on 87 Cubic Yard/Month Generation Rate

UNCERTIFIED TRU/TRU MIXED WASTE IN STORAGE

- Majority of Uncertified Waste Currently in Storage is Certifiable but Additional Processing Required

- Current Inventory of Uncertified Waste in Storage at Rocky Flats Plant

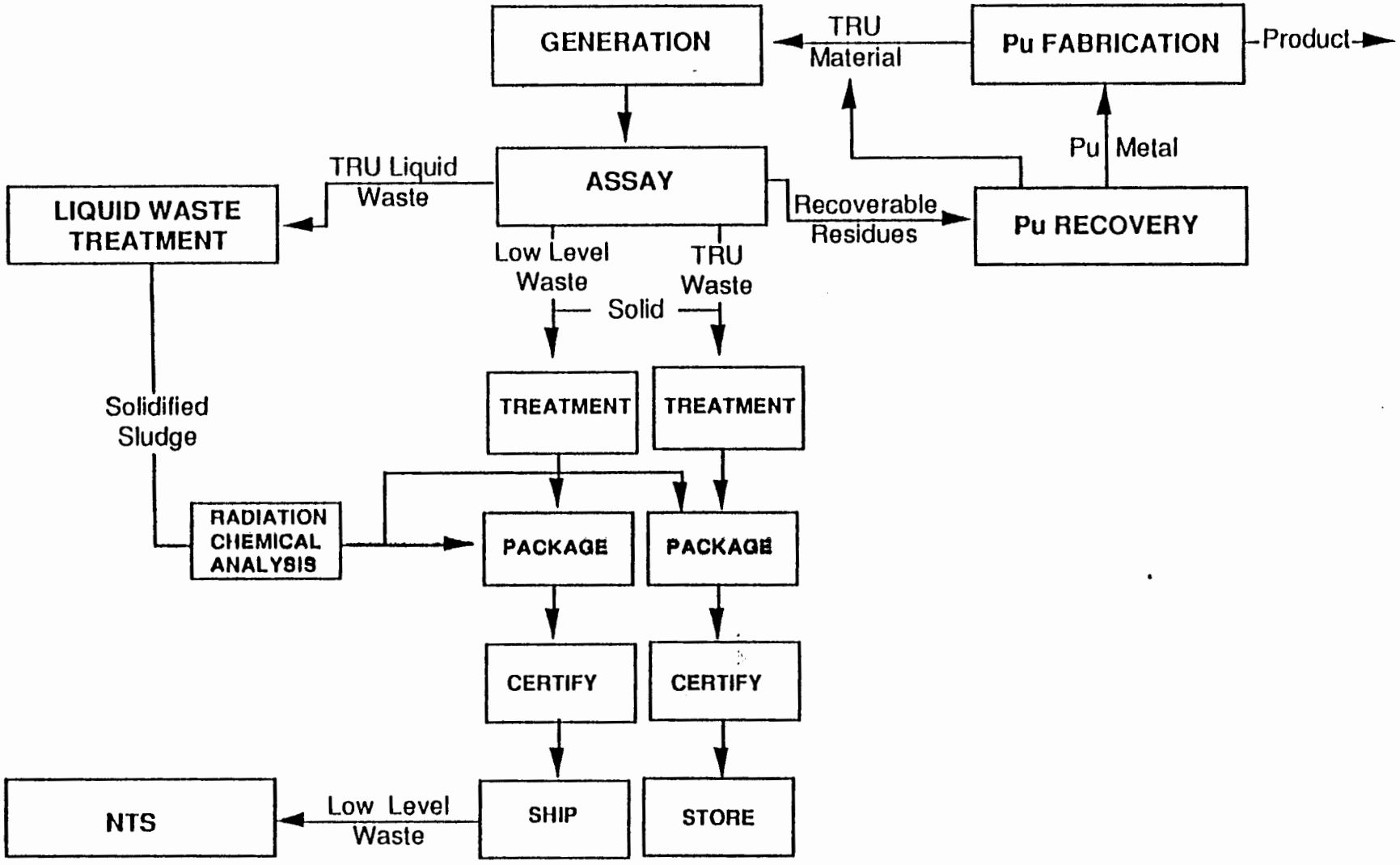
  124 Cubic Yards

- Solidified Organics in Storage do not meet TRAMPAC Requirements 131 Cubic Yards

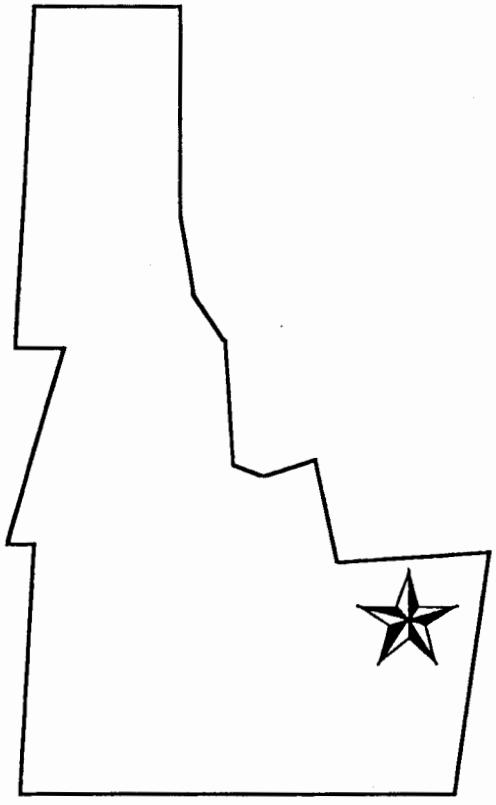
- No Drum Rigid Liners Aspirated

- Any Package not Meeting the Waste Acceptance Requirements is Returned to the Generator for Corrective Action
  - Repack and/or Remove Nonconforming Items
  - Accomplished in Size Reduction Vault and Repackaging Facility

Radioactive Waste Flow Sheet



EG&G ROCKY FLATS



Idaho
National
Engineering
Laboratory

19th TRU UPDATE MEETING

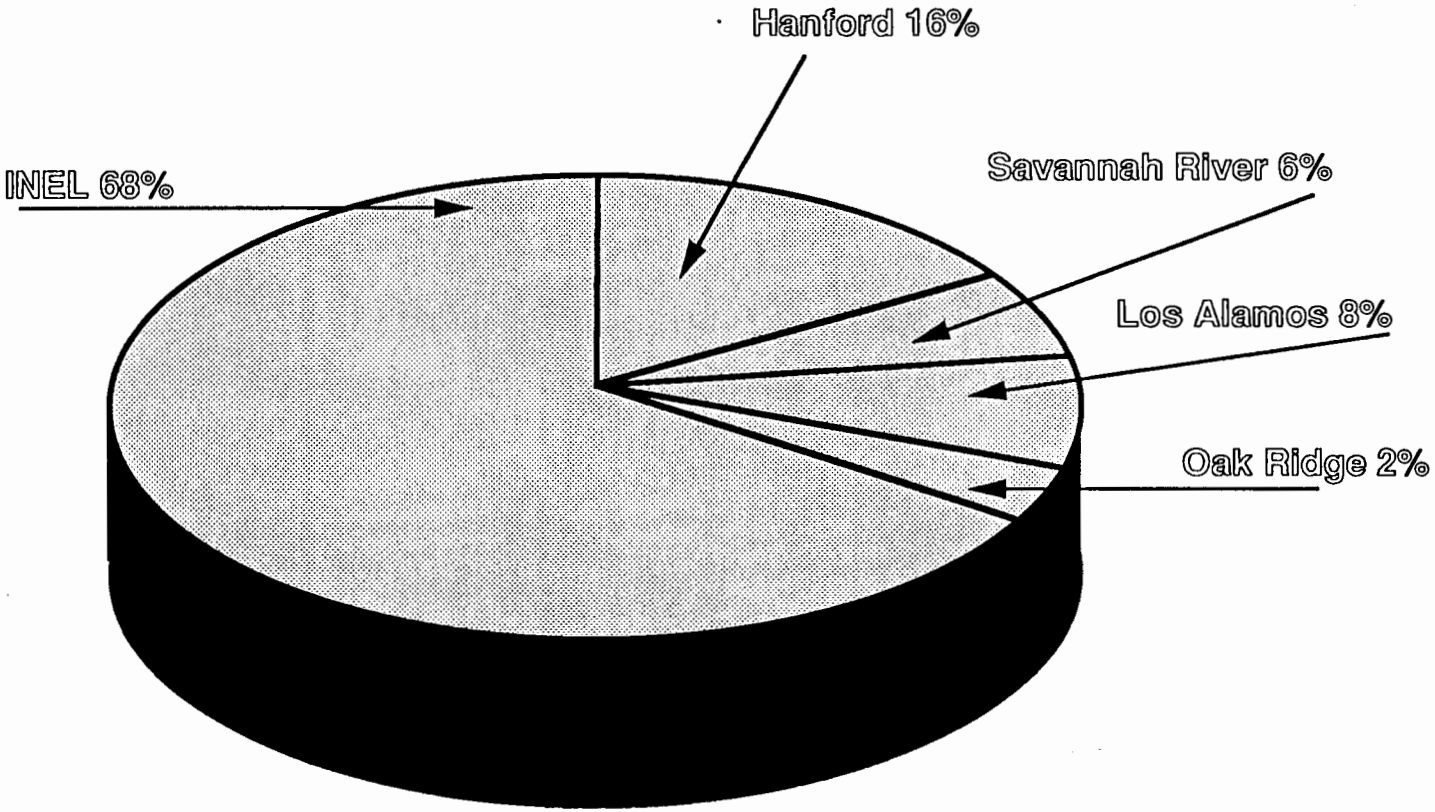
INEL TRU Waste Management Status

J. J. Riedesel
January 10, 1991

The RWMC Was Established In 1952 For The Disposal Of Solid Waste

- Since 1954, TRU waste has been received from other DOE facilities.
- Since 1970, TRU waste has been placed in above ground retrievable storage.
- TRU waste is stored pending shipment to the Waste Isolation Pilot Plant (WIPP) for disposal.
- RWMC TRU waste storage areas are operating under Part A, Resource Conservation and Recovery Act (RCRA) interim status permit.

Contact Handled Stored TRU Waste Inventory



P.2.JJR.1.7.91.2

Total Stored Waste Inventory at RWMC is 65,000 cubic meters

- Waste is stored in air support building, on a tarpaulin covered asphalt pad, and on earth covered asphalt pads.

- It is estimated that over 95% of the waste contains hazardous constituents.

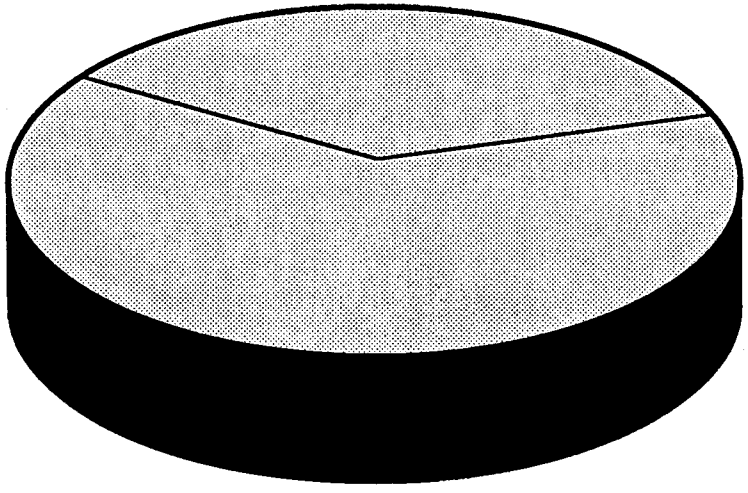
- It is estimated that ~40% of the waste will assay at less than 100NCi/gm (reclassified low-level waste).

Insert photo

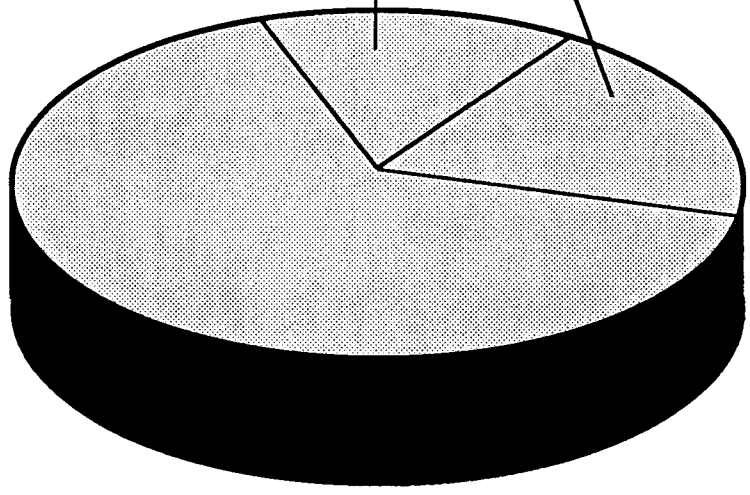
Insert photo

Stored Waste Inventory

Total = 65,021 cubic meters

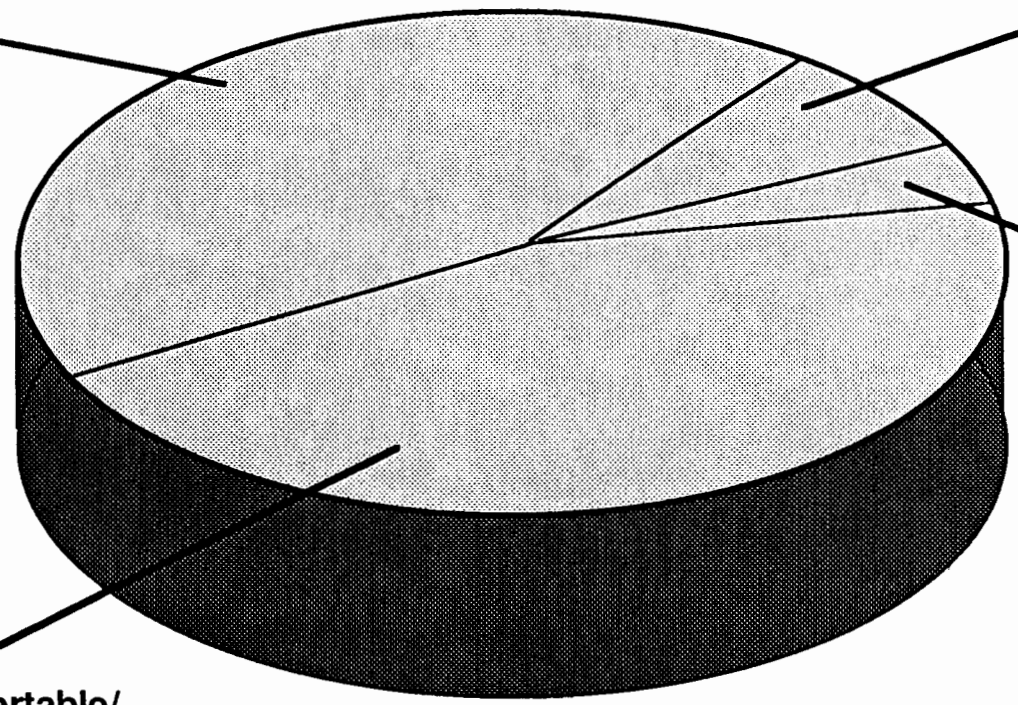


By Container



By Location

Stored Waste Categories
(Estimated volumes)



P.2.JJR.1.7.91.7

The Objectives of the Stored TRU Program are:

1) All waste operations will be conducted in accordance with Applicable DOE, State, and Federal regulations.

2) Waste will be certified to meet applicable transportation and disposal waste acceptance criteria.

3) All stored TRU waste will b e removed from Idaho.

Stored TRU Waste Strategy Will Focus on Both Near-Term and Long-Term Issues

Near-Term Strategies -

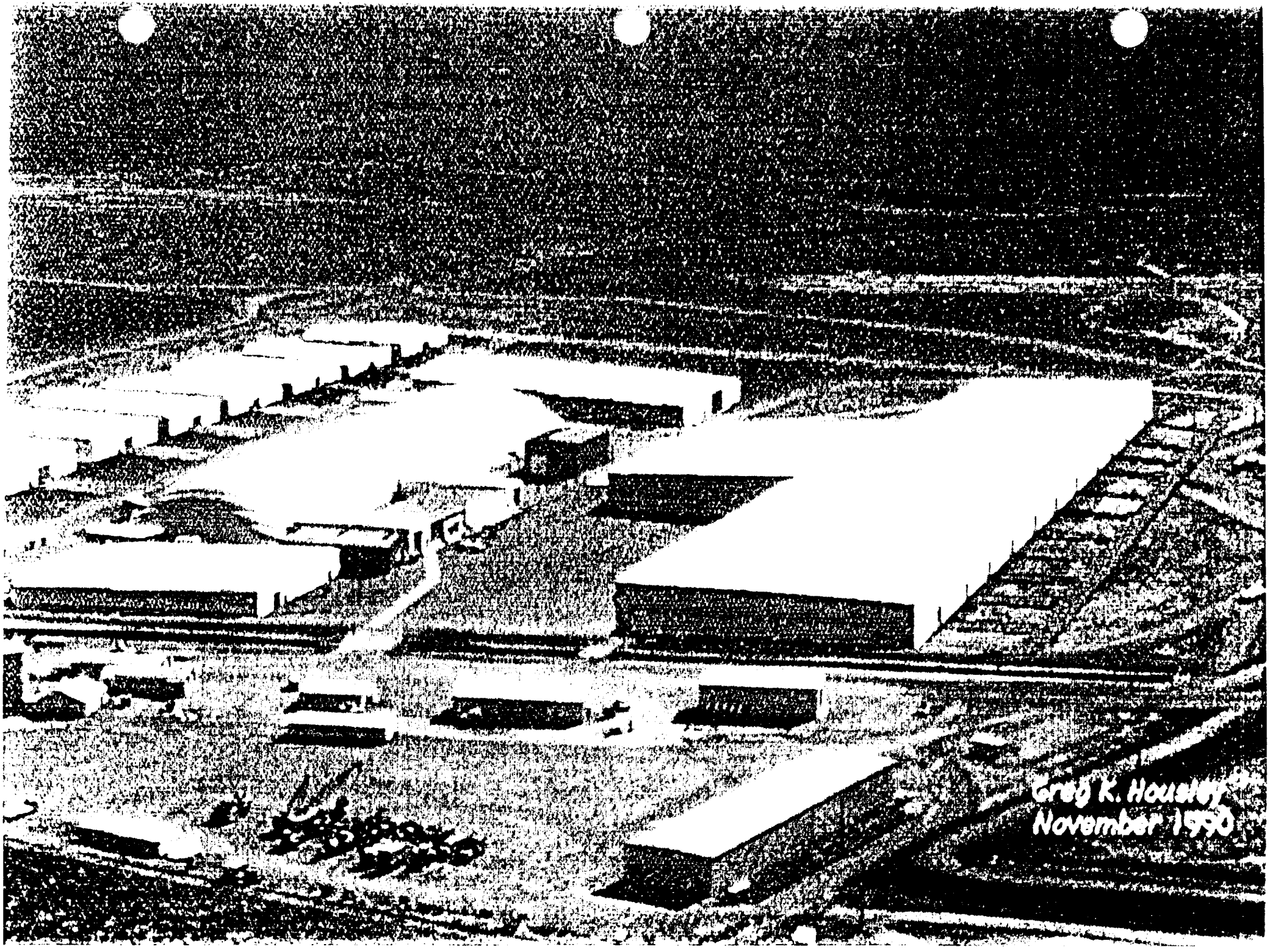
- Stabilization of earth covered waste containers
- Compliance to regulatory requirements
- Development of technical baseline for the retrieval and treatment of waste.
- Support WIPP Experimental Test Program

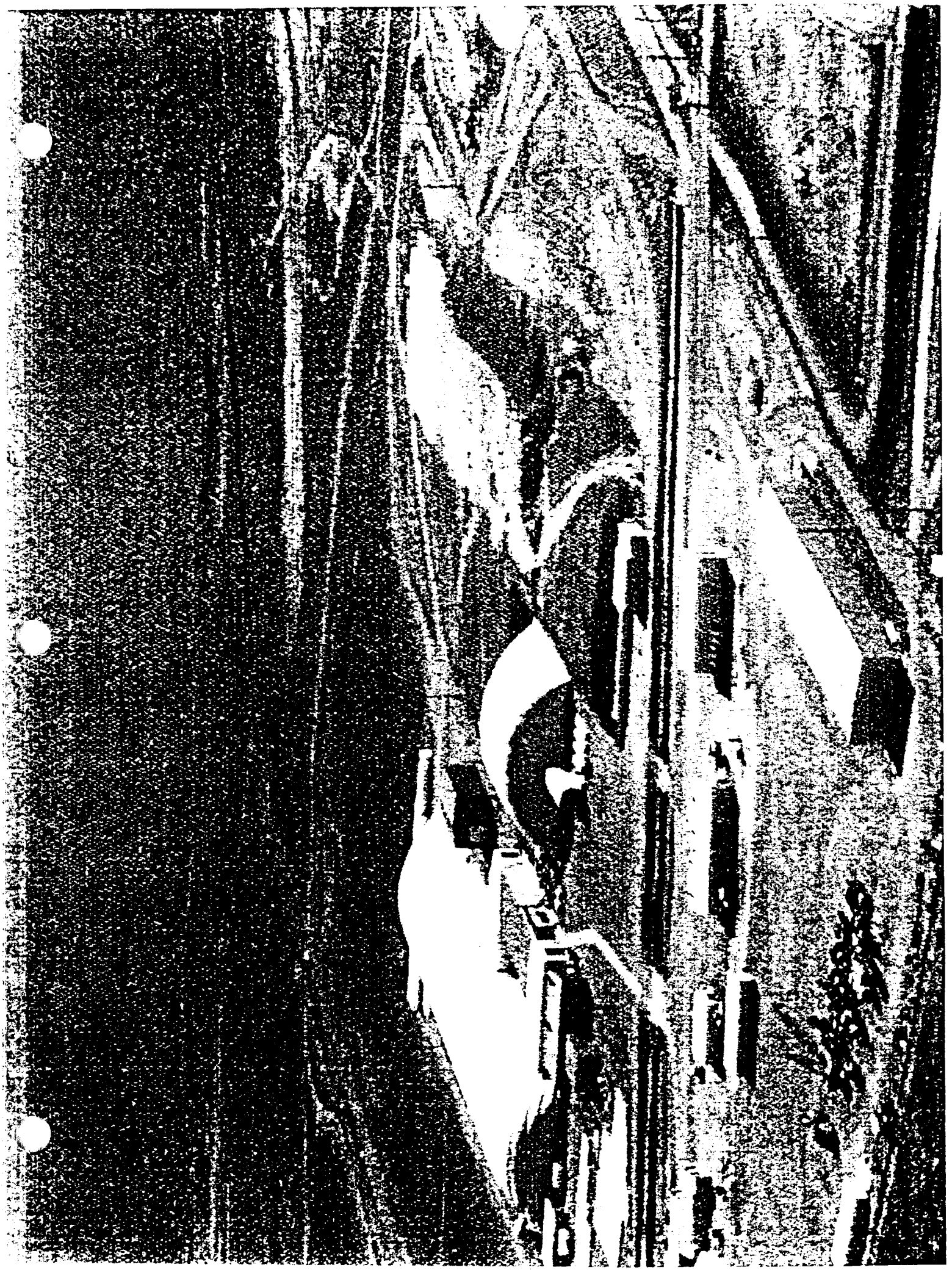
Long-Term Strategy

- Remove all stored TRU waste from Idaho

Three New Facilities Are Required to Meet Stored TRU Waste Objectives

- TSA Retrieval Enclosure (1990 LICP)
- TRU waste characterization and storage facility (1990 LICP)
- Idaho Waste Processing Facility (1996 LICP)


Greg K. Housing
November 1990



REGULATORY ACTIVITIES

AT ANL-WEST

PERTAINING TO WIPP TRU-WASTE CHARACTERIZATION PROJECT

(January 1991)

J. Paul Bacca

WIPP TRU-WASTE CHARACTERIZATION PROJECT AT ANL-WEST

Environmental Aspects

NEPA (National Environmental Policy Act)

- A "C-2" Document (52 FR47662, Section C, Part 2) has been prepared to show that Project activities are bounded by existing NEPA documentation; namely, the WIPP Final Supplemental Environmental Impact Statement (FSEIS).

- Chapters addressed in the "C-2" Document are:

  1) ANL-West/HFEF Activities
  2) INEL-RWMC Activities
  3) Transportation Activities (RWMC to ANL-West)

WIPP TRU-WASTE CHARACTERIZATION PROJECT AT ANL-WEST

Environmental Aspects (Continued)

- DOE Field Offices and Headquarters review and approval cycle process is underway.

NESHAP (National Emissions Standards for Hazardous Air Pollution, 40CFR61)

- Has been determined that normal doses for radionuclides for maximally exposed off-site individuals is less than 0.1 mRem/hr. Therefore, no permit is required.

State of Idaho Air-Quality Board (AQB)

- ANL-West interprets regulations as not requiring a specific permit. Concurrence of Idaho AQB is being sought.

WIPP TRU-WASTE CHARACTERIZATION PROJECT AT ANL-WEST

Environmental Aspects (Continued)

- ANL-West interpretation is based on no increases in emissions.

RCRA (Resources Conservation and Recovery Act)

- ANL-West has submitted and has State of Idaho approval of a Part A application for storage of WIPP-TRU Waste (76 drum equivalent, maximum).

- Part B submission is planned for approximately September, 1991.

- TSD (Treatment, Storage and Disposal) Part A permit was obtained (even though minimal storage periods of less than 90 days are anticipated) since RWMC is a TSD-permitted facility.

HANFORD SITE
TRU WASTE PROGRAM

Rudy Guercia
Dick Lipinski

NEPA

- NEPA documentation needed for TRU waste retrieval
- Supplemental EIS may be required for WRAP
- Programmatic EIS and Hanford EIS on Environmental Restoration & Waste Management could cause delays

COMPLIANCE AGREEMENT

o Complete WRAP I	9/96
o Complete WRAP II	9/99
o Issue Part B Permits	
- Burial Grounds	3/91
- WRAP	9/92
- CWC	12/92
- TRUSAF	9/93

RCRA REGULATORY CLIMATE

- State Agency Delegate - Department of Ecology
- TRU Facilities have interim status permits (Part A)
  (TRUSAF, Burial Grounds & CWC)
- No special permit conditions for TRU waste at present for the Part B
- Major issues
  - Knowledge vs. Analysis
  - Beyond 2 yr. Nation Capacity Variance

OTHER REGULATORY ISSUES

- Long Term Storage vs. Continuing RCRA Changes
- Waste Characterization for Storage
- Impacts of Clean Air/Clean Water
- Relationship with Regulators

Lawrence Livermore National Laboratory

TRU Waste Management

Regulatory Issues

January 9, 1991

RCRA regulatory climate

- LLNL mixed waste regulated by EPA
- LLNL operating under interim status
- Current Part B permit application under EPA consideration, decision not expected until CY92

NEPA Documentation

- LLNL is embarking on a site-wide EIR/EIS update to be completed by mid - 1992

- An Environmental Impact Report (EIR) for Hazardous Waste Facilities will be completed earlier to satisfy State of California requirements for permitting

WIPP WAC Compliance Status

- WIPP WAC audit in June 1990
  - There were 3 findings and 9 observations
  - Closure: LLNL responded and comments were accepted by the WIPP WACCC, Dec. 1990
- Internal audit in Sept. 1990 of TRU records and data collection
  - There were 2 findings and 2 observations and they have been addressed

Waste Characterization

- LLNL has included mixed waste issues in its permit application
- Ongoing effort to characterize waste using process knowledge and segmented gamma scanner assay
- LLNL is evaluating waste certification strategy to comply with NVO-325, which is more stringent than WIPP DOE 069
  - Working with the generators to produce certifiable waste
  - Suggest unified NTS and WIPP WAC

Other certification issues

- Previous TRU waste shipments sent to NTS for interim storage may have to be recertified or will be considered mixed waste based on new NVO-325 acceptance criteria

REGULATORY ISSUES

Characterization:

Waste receipt began in 1974

Characterization not required until 1985

Poor generator records of what is in waste

Characterization to comply with WIPP does not comply with RCRA

REGULATORY ISSUES

Current Storage:

Stored in lined drums or boxes
72 drums per cargo container(4 rows, 2 high)
No labels, no drip pans, no locks
No weekly inspections
Liquids and aerosols stored separately

REGULATORY ISSUES

Storage Permit:

October, 1987	-	1985 Part A Permit submitted to State, TRU storage not included
June, 1987	-	Revised Part A, TRU included, Pad not specified
September, 1987	-	Revised Part A, TRU included, Pad not specified
December, 1987	-	Revised Part A, TRU included, Pad not specified
April, 1988	-	TRU storage pad constructed
August, 1988	-	Revised Part A submitted describing TRU pad

REGULATORY ISSUES

Potential Violations 11-19-1990

40 CFR 265.35	No aisle space is provided between drums stored in the metal carriers located on the TRU pad.
Resolution:	Store 18 per containers single row, stack 2 high Requires an additional 72 cargo containers
40 CFR 265.174 40 265.15(a)	The drums stored on the TRU mixed waste storage pad are not inspected weekly.
Resolution:	Requires 1.5 FTE's

REGULATORY ISSUES

Potential Violations 11-19-1990

40 CFR 262.31 40 CFR 262.32	Each drum of mixed waste should have been labeled prior to receipt by the NTS. Labels should be placed on each drum.
Resolution:	Label drums in storage Generators label drums before shipment

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REGULATORY ISSUES

Potential Violations 11-19-1990

40 CFR 268.7(c)(2)	The facility does not test the waste or an extract of the waste to assure that the wastes are in compliance with the applicable treatment standards set forth in Subpart D of 268. Nor is the testing frequency specified in the facility's waste analysis plan.
Resolution:	Use onsite auditing and sampling

REGULATORY ISSUES

Potential Violations 11-19-1990

40 CFR 270.72(a)(3)	The TRU mixed waste pad was constructed prior to submitting a Part A and receiving approval of the Administrator of the Division of Environmental Protection.
Resolution:	Now a Finding of Alleged Violation and reason for Administrative Order

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REGULATORY ISSUES

Administrative Order 11-1-90

The Department of Energy shall:

1. By November 30, 1990 prepare and submit to the Division a plan and schedule for determining which containers of TRU waste presently in storage are TRU waste only and which are TRU mixed waste.

2. Upon completion of the above determination, remove all TRU mixed waste to a properly permitted treatment, storage or disposal facility and cease operation of the pad as a hazardous waste unit.

REGULATORY ISSUES

Letter From State 11-26-90

1. State withdrew approval to receive radioactive mixed wastes for storage or disposal.

2. DOE must submit and receive approval for a waste analysis plan incorporating sampling and testing of waste.

3. The required NEPA documentation must be completed.

ORNL REGULATORY STATUS

D. W. Turner

January 9, 1991

ORNL NEPA DOCUMENT STATUS

- **Environmental Assessment for ORNL CH TRU**
  - Submitted to DOE-HQ May 1990
  - Includes on-site handling, certification, storage
- **NEPA Document for ORNL RH TRU**
  - Will be prepared for the Waste Handling & Packaging Plant (WHPP)
  - Planned for 1992
  - Will include retrieval, transport, repackaging, and certification

ORNL RCRA REGULATORY CLIMATE

- **State of Tennessee authorized for**
  - Base RCRA Program and for mixed waste (Not for 1984 HSWA)
  - Air pollution control regulations
  - NPDES
- **ORNL is under interim status until November 1992**
- **Federal Facilities Compliance Agreement**
  - Most issues resolved
  - Compliance actions have been initiated
  - Time for signing indefinite

OTHER ORNL REGULATORY ISSUES

- **Waste Characterization for RCRA Storage**
  - Generator knowledge of TRU waste
  - Certification system requires generator signatures
- **General Relationships with Regulators**
  - Positive relationship and communications
  - Regular interface meetings
  - State opposition to out-of-state waste
- **Other Regulatory Issues**
  - Sampling vs. ALARA

UPDATE OF THE ENGINEERED ALTERNATIVES TASK FORCE

PAUL DREZ, IT CORPORATION
ARTHA PETERMANN, WESTINGHOUSE-WIPP
RAVI BATRA, DOE-WPO

TRU WASTE UPDATE MEETING #19

JANUARY 9, 1991

KNOXVILLE, TENNESSEE

ENGINEERED ALTERNATIVES TASK FORCE

BACKGROUND

- ESTABLISHED BY DOE IN SEPTEMBER, 1989, IN RESPONSE TO RECOMMENDATIONS OF THE NATIONAL ACADEMY OF SCIENCES AND FEDERAL AND STATE REGULATORY AGENCIES

- FUNCTION IS TO EVALUATE EXISTING WASTE FORMS AND CURRENT DESIGN OF THE WIPP FACILITY, AND MAKE RECOMMENDATIONS ON MODIFICATIONS THAT COULD IMPROVE PERFORMANCE (COMPLIANCE WITH 40 CFR PART 191 AND 40 CFR PART 268)

THU UPM TO VU

ENGINEERED ALTERNATIVES TASK FORCE

SCOPE OF WORK

- IDENTIFY ENGINEERED ALTERNATIVES THAT MIGHT IMPROVE PERFORMANCE OF THE REPOSITORY (e.g., SHRED AND CEMENT WASTE, VITRIFICATION OF WASTE, ETC.)
- RANK THE ALTERNATIVES WITH RESPECT TO THEIR EFFECTIVENESS AND FEASIBILITY
- ANALYZE THE EFFECTIVENESS OF THE ALTERNATIVES QUANTITATIVELY USING COMPUTER SIMULATIONS
- ESTABLISH BEST ALTERNATIVES FOR RECOMMENDATIONS
- INPUT RECOMMENDED ALTERNATIVES INTO PERFORMANCE ASSESSMENT CALCULATIONS AND EXPERIMENTAL PROGRAMS (SANDIA NATIONAL LABORATORIES)

TRU UNITU VU

POTENTIAL ISSUES IN DEMONSTRATING COMPLIANCE

- GAS GENERATION (UNDISTURBED SCENARIO)
- POTENTIAL HUMAN INTRUSION EVENTS
- RCRA CONSTITUENTS AND GOVERNING REGULATIONS

POTENTIAL PROBLEMS CAUSED BY GAS GENERATION

- SOURCES:

  - MICROBIAL DEGRADATION - CO_2, CH_4 (WASTE)
  - ANOXIC CORROSION - H_2 (CONTAINERS, WASTE)
  - RADIOLYSIS - H_2, CO_2, CH_4 (WASTE, H_2O)

- CONCERNS:

  - IF GENERATION RATE EXCEEDS ADVECTION RATE, THEN ROOM PRESSURE MAY EXCEED LITHOSTATIC PRESSURE.

POTENTIAL SOLUTIONS TO GAS GENERATION CONCERNS

LEVEL 1 NON-WASTE FORM MODIFICATIONS

- GROUT BACKFILL
- CHANGE CONTAINER MATERIAL

LEVEL 2 MODIFICATIONS TO REDUCE GAS GENERATION RATES BUT NOT ELIMINATE POTENTIAL

- SHRED AND CEMENT
- ADD pH BUFFER
- MELT METALS TO FORM INGOTS

LEVEL 3 MODIFICATIONS TO ELIMINATE GAS GENERATION

- INCINERATE AND CEMENT
- DECONTAMINATE METALS
- VITRIFY

POTENTIAL PROBLEMS CAUSED BY HUMAN INTRUSION EVENTS

- POTENTIAL NON-COMPLIANCE WITH 40 CFR PART 191 (PRELIMINARY EVALUATIONS BY SANDIA NATIONAL LABORATORIES)

- CRITICAL PERFORMANCE PARAMETERS:

  - PERMEABILITY OF WASTE/BACKFILL
  - SOLUBILITY OF RADIONUCLIDES IN BRINE
  - SHEAR STRENGTH OF WASTE

TRU UPNTU VU

POTENTIAL SOLUTIONS TO HUMAN INTRUSION CONCERNS

- REDUCE PERMEABILITY OF WASTE/BACKFILL
  - USE LOW PERMEABILITY WASTE FORMS
    - SUPERCOMPACT
    - SHRED AND CEMENT
    - VITRIFY
  - USE GROUT BACKFILL
- RAISE pH OF REPOSITORY BRINE (REDUCE RADIONUCLIDE SOLUBILITY)
  - ADD pH BUFFER TO WASTE
  - SHRED AND CEMENT
  - ADD pH BUFFER TO BACKFILL

ENGINEERED ALTERNATIVES TASK FORCE

OVERALL APPROACH

- DUAL APPROACH
  - IDENTIFY POTENTIAL ENGINEERED ALTERNATIVES AND EVALUATE THE FEASIBILITY OF IMPLEMENTATION
  - DEVELOP OR MODIFY EXISTING DESIGN ANALYSIS MODELS TO EVALUATE THE POTENTIAL EFFECTS OF ENGINEERED ALTERNATIVES ON WASTE FORMS AND REPOSITORY PERFORMANCE
    - USE DETERMINISTIC MODELS
    - EATF IS NOT DEMONSTRATING PERFORMANCE ASSESSMENT (PA)
    - NEED FOR ENGINEERED ALTERNATIVES, IF ANY, WILL BE IDENTIFIED BY PA STUDIES

IDENTIFICATION OF ENGINEERED ALTERNATIVES

- EXPERT MULTIDISCIPLINARY PANEL ASSEMBLED TO IDENTIFY AND QUALITATIVELY ASSESS THE FEASIBILITY AND EFFECTIVENESS OF ENGINEERED ALTERNATIVES
  - FEASIBILITY IS A FUNCTION OF REGULATORY AND TECHNICAL ISSUES; EFFECTIVENESS CRITERIA INCLUDED MITIGATION OF GAS GENERATION, PERMEABILITY, ETC.

DESIGN ANALYSIS OF ENGINEERED ALTERNATIVES USING DESIGN ANALYSIS MODELS

- EFFECTIVENESS OF ALTERNATIVES IS EVALUATED WITH RESPECT TO:
  - PEAK INDEX PRESSURE
  - CONSEQUENCES OF HUMAN INTRUSION RELATIVE TO BASELINE DESIGN

ALTERNATIVE COMBINATIONS ANALYZED

DESIGN	SLUDGES	SOLID ORGANICS	SOLID INORGANICS	BACKFILL
Baseline	As Received	As Received	As Received	Salt
Alternative 1	As Received	Shred/Cement	Shred/Cement	Salt
Alternative 2	Cement	Shred/Cement	Shred/Cement	Salt
Alternative 3	Cement	Shred/Cement	Shred/Cement	Grout
Alternative 4	Cement	Incinerate/Cement	Shred/Cement	Salt
Alternative 5	Cement	Incinerate/Cement	Shred/Cement	Grout
Alternative 6	Vitrify	Incinerate/Vitrify	Melt Metals*	Salt
Alternative 7	Vitrify	Incinerate/Vitrify	Melt Metals*	Grout
Alternative 8	Vitrify	Incinerate/Vitrify	Melt Metals**	Salt
Alternative 9	Vitrify	Incinerate/Vitrify	Melt Metals**	Grout

* Metals are melted into transuranic (TRU) waste ingots.

** Metals are melted with glass/glass frit; radionuclides partition into the slag and metals are eliminated from the WIPP inventory, including metal containers that may produce gas by corrosion.

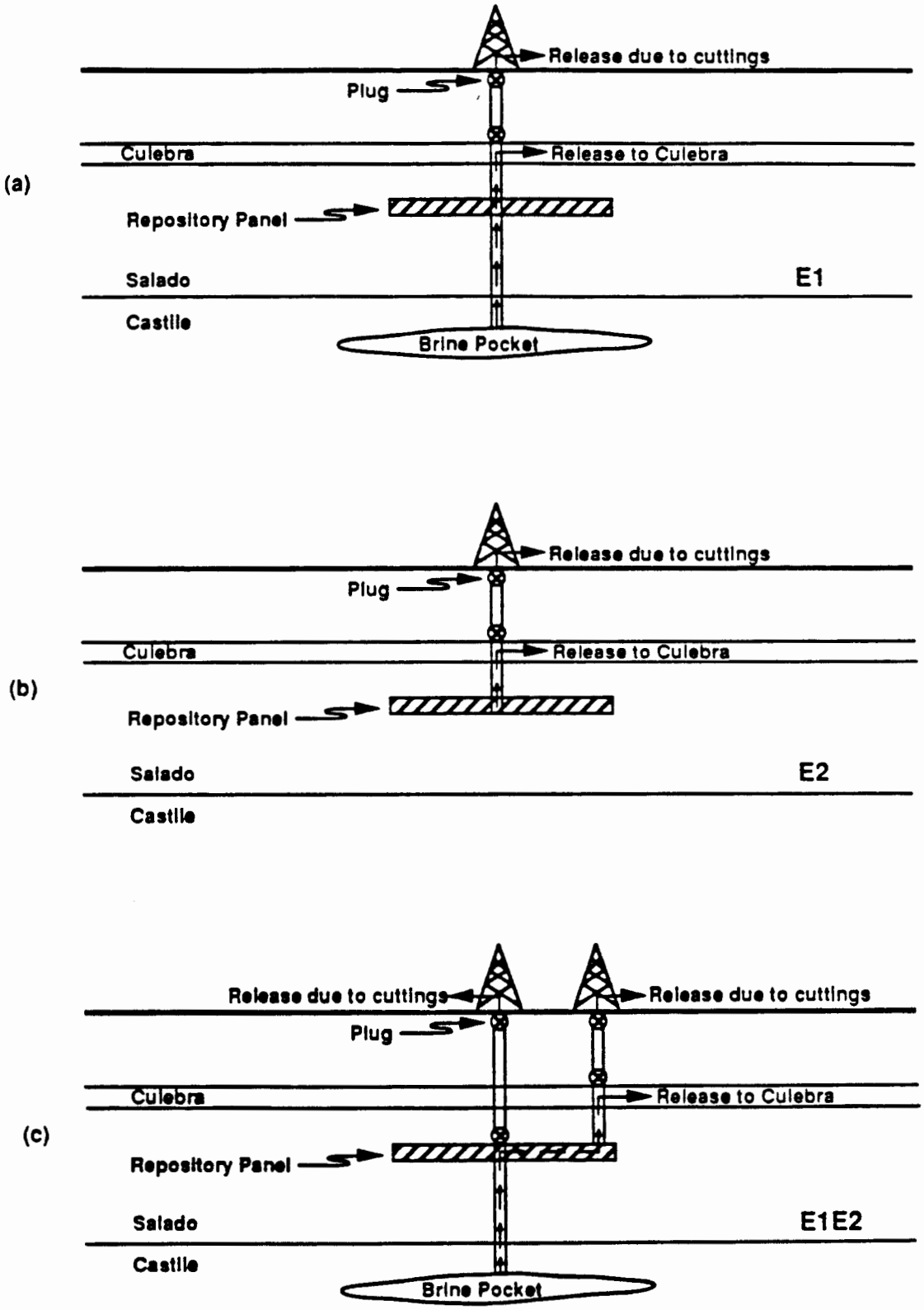
SUMMARY OF THE EFFECTS OF ALTERNATIVE WASTE FORMS ON PEAK INDEX PRESSURES

- KEY FACTORS ARE THE MASS OF ORGANIC MATERIALS PRESENT IN THE ROOM AND THE VOID VOLUME AVAILABLE FOR PRESSURIZATION

- ALTERNATIVES THAT INVOLVE THERMAL TREATMENT DO NOT EXCEED LITHOSTATIC PRESSURE EVEN THOUGH METALS ARE PRESENT

HUMAN INTRUSION SCENARIOS ANALYZED

E1	CONNECTION OF ROOM WITH CASTILE BRINE RESERVOIR
E2	PENETRATION OF ROOM WITH BOREHOLE
E1E2	DUAL BOREHOLE



HUMAN INTRUSION SCENORIOS ANALYZED

RESULTS OF HUMAN INTRUSION ANALYSES

E1 RELATIVE IMPROVEMENTS OF ONE ORDER OF MAGNITUDE ARE PREDICTED FOR SHREDDED AND CEMENTED WASTE FORMS AND TWO ORDERS OF MAGNITUDE FOR INCINERATED OR VITRIFIED WASTE FORMS.

CRITICAL PARAMETERS ARE WASTE/BACKFILL PERMEABILITY, BOREHOLE RADIUS AND PERMEABILITY, AND WASTE ELEMENT SOLUBILITIES.

E2 RELATIVE IMPROVEMENTS OF ONE ORDER OF MAGNITUDE ARE PREDICTED FOR SHREDDED AND CEMENTED WASTE FORMS.

CRITICAL PARAMETERS ARE WASTE/BACKFILL PERMEABILITY, VOLUME OF CONTAMINATED BRINE TRAPPED IN THE REPOSITORY AFTER REPRESSURIZATION, AND WASTE ELEMENT SOLUBILITIES.

E1E2 RELATIVE IMPROVEMENTS OF THREE ORDERS OF MAGNITUDE ARE PREDICTED USING INCINERATED, VITRIFIED, OR MELTED WASTE FORMS. CRITICAL PARAMETERS ARE WASTE/BACKFILL PERMEABILITY AND WASTE ELEMENT SOLUBILITIES.

SUMMARY OF EATF RECOMMENDATIONS
ALTERNATIVE WASTE FORMS FOR INCLUSION IN WIPP TESTING PROGRAM

WASTE FORM	SLUDGES	COMBUSTIBLES	GLASS/METAL
Vitrified*	Thermal Treatment	Thermal Treatment	N/A
Cement**	Mix to form a monolith	Shred and Cement OR Incinerate and Cement	Shred and Cement
Compacted**	N/A	Compact Only OR Shred/Add Salt and Compact	Shred and Compact OR Shred/Add Salt and Compact
Shred/Bentonite**	N/A	Fill Voids	Fill Voids
Metal Ingot*	N/A	N/A	Melt Metals
pH Buffered**	Add Lime, Alumina, Cement, etc. to As Received Waste		

* Laboratory Studies Only
**Bin-Scale Testing Needed

FACTORS DETERMINING FEASIBILITY OF ALTERNATIVES

- STATUS OF TECHNOLOGY DEVELOPMENT
- REGULATORY CONSTRAINTS
- INSTITUTIONAL CONSTRAINTS
- IMPLEMENTATION COSTS
- SCHEDULE
- WORKER, PUBLIC, AND ENVIRONMENTAL SAFETY
- OPTIMAL LOCATION(S) FOR WASTE TREATMENT

INSTITUTIONAL CONSTRAINTS

- STATE AND LOCAL WASTE PROCESSING REGULATIONS
- UNIQUE WASTE CHARACTERISTICS
- INSTITUTIONAL CONTROLS

TRU UPMTG VU

STATUS OF WORKER, GENERAL PUBLIC, AND ENVIRONMENTAL SAFETY

- RISK ASSESSMENT UNDERWAY
- COMPARE DIFFERENT COMPONENTS OF ENGINEERED ALTERNATIVE RISKS:
  - NEAR-TERM RISKS OF TREATMENT
  - LONG-TERM RISKS OF TREATMENT

OTHER EATF RELATED ACTIVITIES

- CONTAINER MATERIAL EXPERT PANEL
- CEMENTITIOUS MATERIALS EXPERT PANEL
  - NEED FOR THESE ALTERNATIVES, IF ANY, WILL BE IDENTIFIED BY PA STUDIES
- SANDIA NATIONAL LABORATORIES: PASSIVE INSTITUTIONAL CONTROL EXPERT PANELS

MISSION OF WASTE CONTAINER PANEL

- IDENTIFY FEASIBLE CONTAINER MATERIALS THAT WILL NOT GENERATE GAS IN THE WIPP REPOSITORY ENVIRONMENT, AND THAT CAN BE FABRICATED TO THE REQUIREMENTS FOR CONTAINMENT, HANDLING, AND TRANSPORTATION OF TRU WASTE.

CONTAINER MATERIAL DESIGN CRITERIA

- MINIMIZE OR ELIMINATE GAS GENERATION
- DOT TYPE 7A COMPLIANT
- 25 YEAR CONTAINMENT INTEGRITY
- COMPATIBLE WITH TRUPACT-II

EVALUATION CRITERIA

- FABRICABILITY
- MATERIAL AVAILABILITY
- FABRICATION CAPACITY
- STATUS OF TECHNOLOGY
- COST
- MECHANICAL PROPERTIES
- GAS GENERATION POTENTIAL
- GAS GENERATION RATE

THU UPMTO VU

MATERIALS EVALUATED

METALS	COPPER AND ALLOYS
	TITANIUM AND ALLOYS
	HIGH NICKEL ALLOYS
	ZIRCONIUM AND ALLOYS
	STAINLESS STEEL
CERAMICS	FIRED
	CHEMICALLY BONDED
	GLASS
CEMENTS	NON-REINFORCED
	DISCONTINUOUS REINFORCEMENT
	CONTINUOUS REINFORCEMENT
COATINGS	RETARD CORROSION
	COAT MONOLITHIC WASTE FORMS
POLYMERS	POLYETHYLENE

THU UPMTO VU

CONCLUSIONS

- Cu AND Ti ALLOYS ARE THE BEST CANDIDATE METALS. Cu IS LESS EXPENSIVE BUT HAS MORE UNCERTAINTIES

- CERAMICS, GLASS, AND CEMENT WILL PERFORM WELL, BUT SEVERAL YEARS WILL BE REQUIRED TO ESTABLISH FULL-SCALE PRODUCTION OF CONTAINERS

- ORGANIC MATERIALS WILL ADD ADDITIONAL UNCERTAINTY IN LONG-TERM PERFORMANCE, AND ARE NOT RECOMMENDED

EXPERT PANEL ON CEMENTITIOUS MATERIALS

MISSION:

- DETERMINE WHETHER CEMENTITIOUS MATERIALS SHOULD BE CONSIDERED FURTHER FOR USE AT WIPP TO IMPROVE LONG-TERM PERFORMANCE AND REDUCE UNCERTAINTIES IN KEY PERFORMANCE PARAMETERS.

SPECIFIC APPLICATIONS CONSIDERED:

- BACKFILL
- WASTE FORMS
- CONTAINER MATERIAL

TRU DPMTO VU

EXPERT PANEL ON CEMENTITIOUS MATERIALS
(Continued)

PANEL CONCLUSIONS:

- THE PANEL IS CONFIDENT THAT METHODOLOGY CAN BE DEVELOPED TO EVALUATE LONG-TERM PERFORMANCE OF CEMENTITIOUS MATERIAL FORMULATIONS FOR USE AT WIPP.

- PANEL AGREES THAT PROPERLY FORMULATED CEMENT-BASED MATERIALS ARE LIKELY TO MEET LONG-TERM PERFORMANCE CRITERIA INCLUDING PERMEABILITY AND SHEAR STRENGTH.

- PANEL AGREES THAT SPECIFIC FORMULATIONS WILL DEPEND ON THE SPECIFIC ENVIRONMENT AND MUST TAKE INTO ACCOUNT WASTE AND REPOSITORY CHARACTERISTICS.

STATUS OF EATF

DELIVERABLES:

- RECOMMEND INITIAL WASTE FORMS FOR WIPP EXPERIMENTAL TEST PROGRAM
  - COMPLETED MARCH 15, 1990 (DOE/WIPP 90-009)

- DEVELOP DESIGN ANALYSIS MODEL
  - COMPLETED JUNE 30, 1990

- DRAFT TECHNICAL STATUS REPORT ON EFFECTIVENESS OF ENGINEERED ALTERNATIVES
  - ISSUED FOR EXTERNAL DISTRIBUTION ON SEPTEMBER 14, 1990 (DOE/WIPP 90-018)

STATUS OF EATF (Continued)

- DRAFT TECHNICAL STATUS REPORT ON FEASIBILITY OF ENGINEERED ALTERNATIVES
  - ISSUED FOR EXTERNAL DISTRIBUTION ON SEPTEMBER 14, 1990 (DOE/WIPP 90-017)
- DRAFT FINAL REPORT ON EFFECTIVENESS AND FEASIBILITY OF ENGINEERED ALTERNATIVES
  - DUE JANUARY 31, 1991 (FOR INTERNAL REVIEW)
- DRAFT FINAL REPORT ON EFFECTIVENESS AND FEASIBILITY OF ENGINEERED ALTERNATIVES
  - DUE APRIL 1, 1991 (FOR EXTERNAL REVIEW - BRP, NAS, EEG, EID, EPA, SITES)
- FINAL REPORT ON EFFECTIVENESS AND FEASIBILITY OF ENGINEERED ALTERNATIVES
  - DUE MAY 17, 1991 (FOR EXTERNAL DISTRIBUTION)

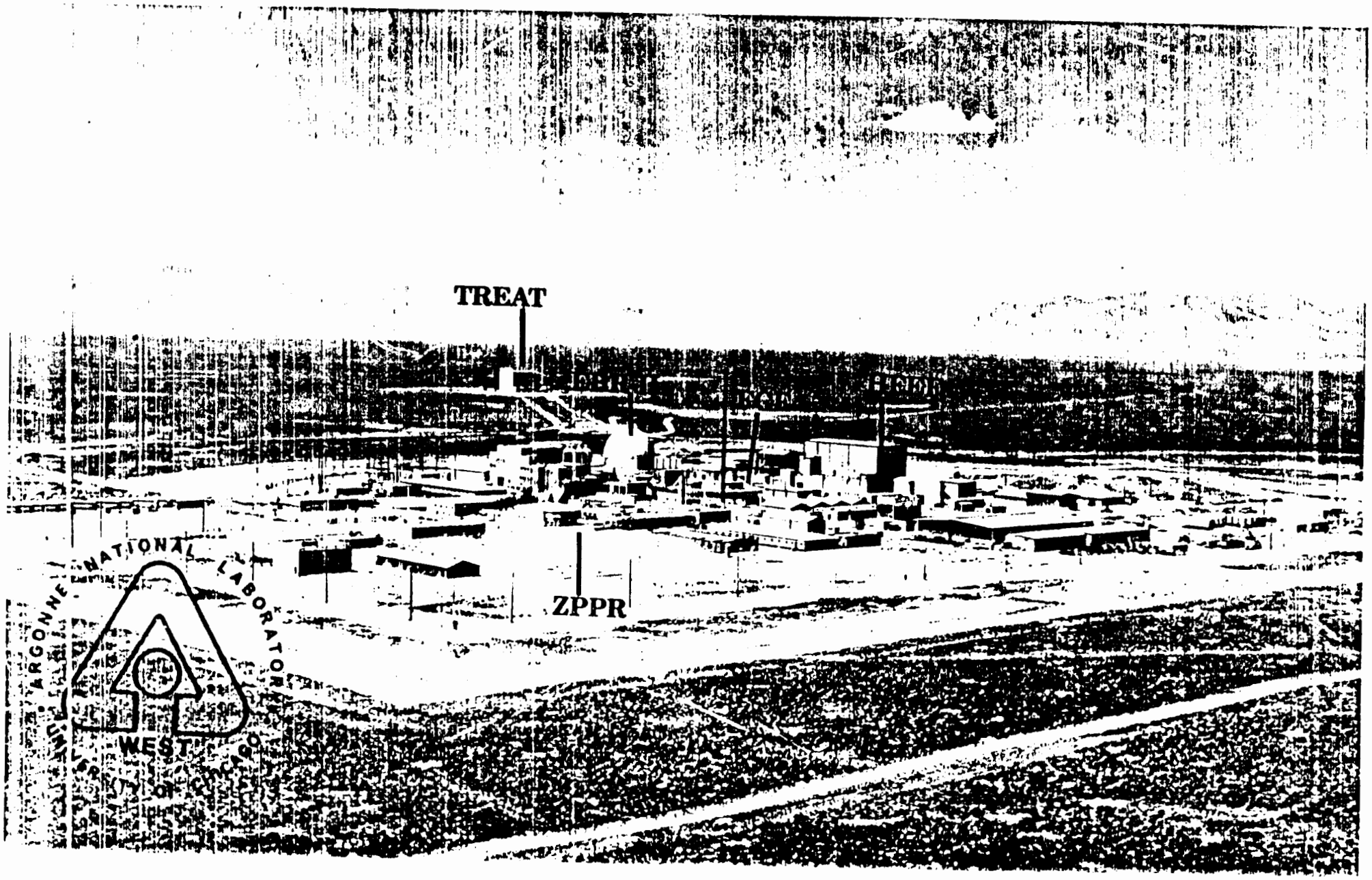
ANTICIPATED RESULTS OF EATF

- RESULTS ARE A MATRIX OF ENGINEERED ALTERNATIVES
  - UNDISTURBED SCENARIO
    - LEVEL I - NON-WASTE FORM MODIFICATIONS
    - LEVEL II - PROCESSED TO REDUCE GAS GENERATION RATES BUT NOT ELIMINATE POTENTIAL
    - LEVEL III - PROCESSED TO ELIMINATE GAS GENERATION
  - HUMAN INTRUSION SCENARIO
  - NO-MIGRATION VARIANCE PETITION - RCRA
- THESE RESULTS ARE ONLY AN ANTICIPATED SOLUTION
- NEED FOR ENGINEERED ALTERNATIVES, IF ANY, WILL BE IDENTIFIED BY PA STUDIES

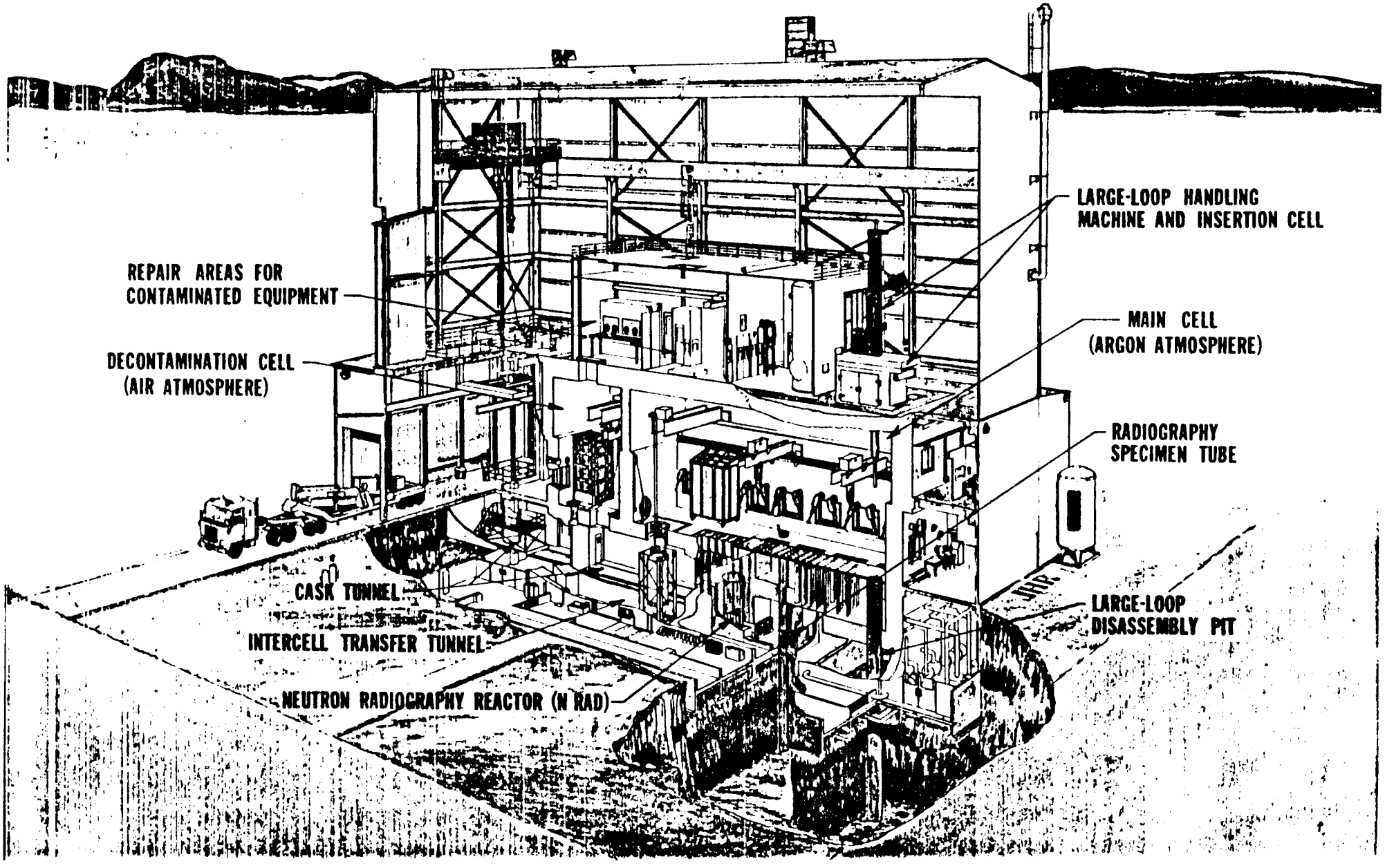
ANL-WEST UPDATE

(January 1991)

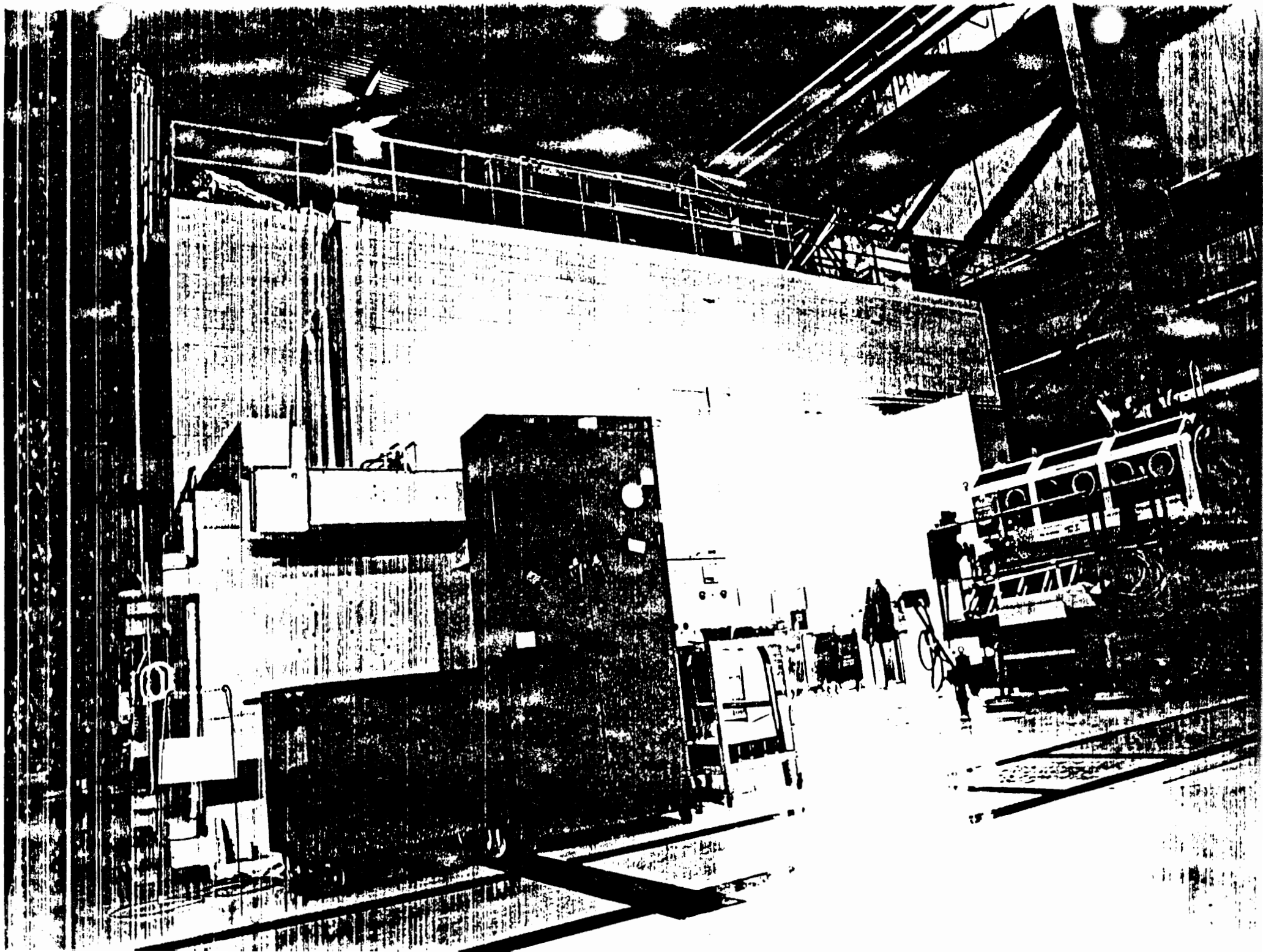
J. Paul Bacca

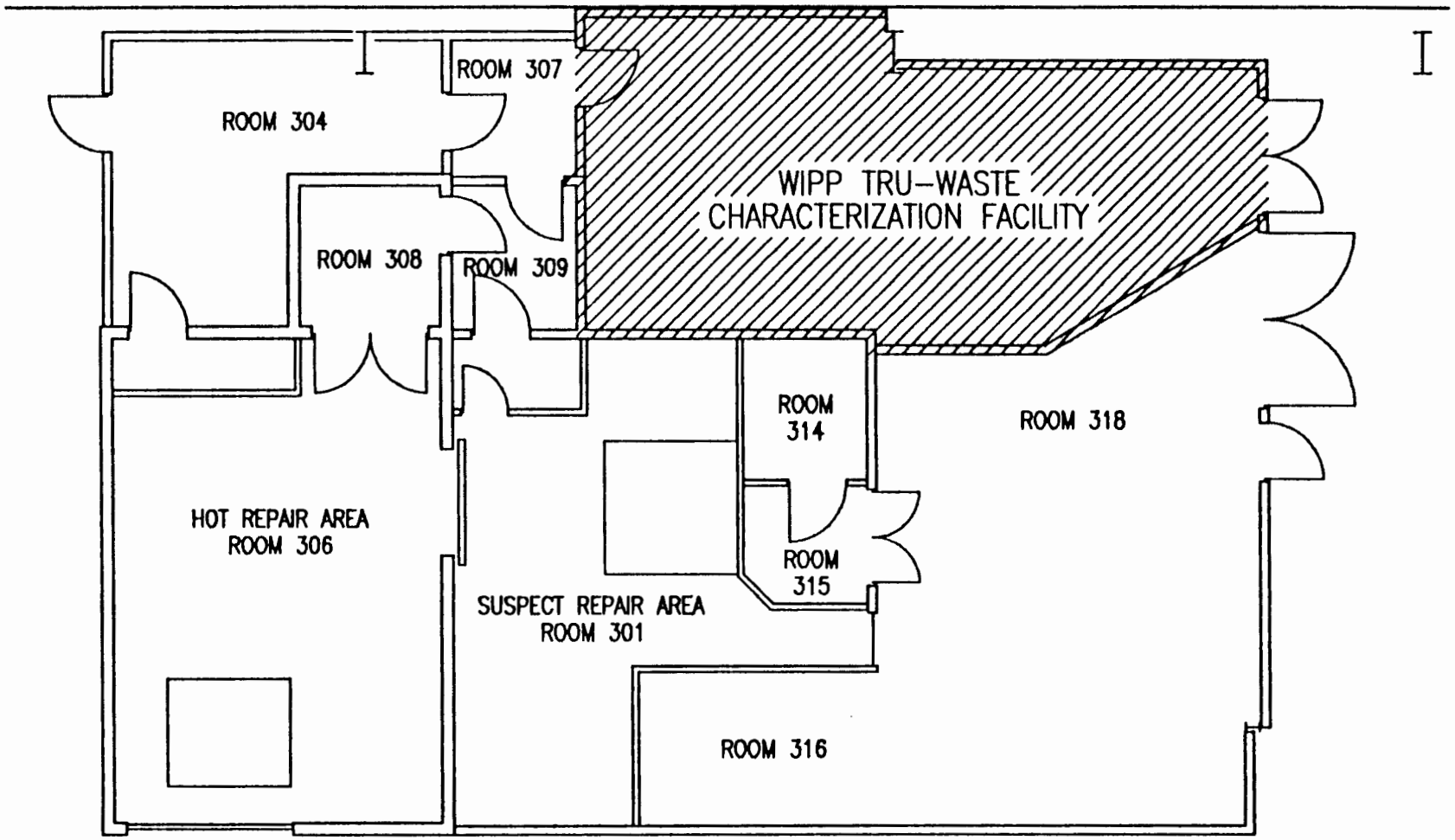


ARGONNE-WEST SITE



HOT FUEL EXAMINATION FACILITY





HFEF HIGH-BAY AREA
WIPP TRU-WASTE CHARACTERIZATION FACILITY
IN HOT REPAIR FACILITY
(PLAN VIEW)

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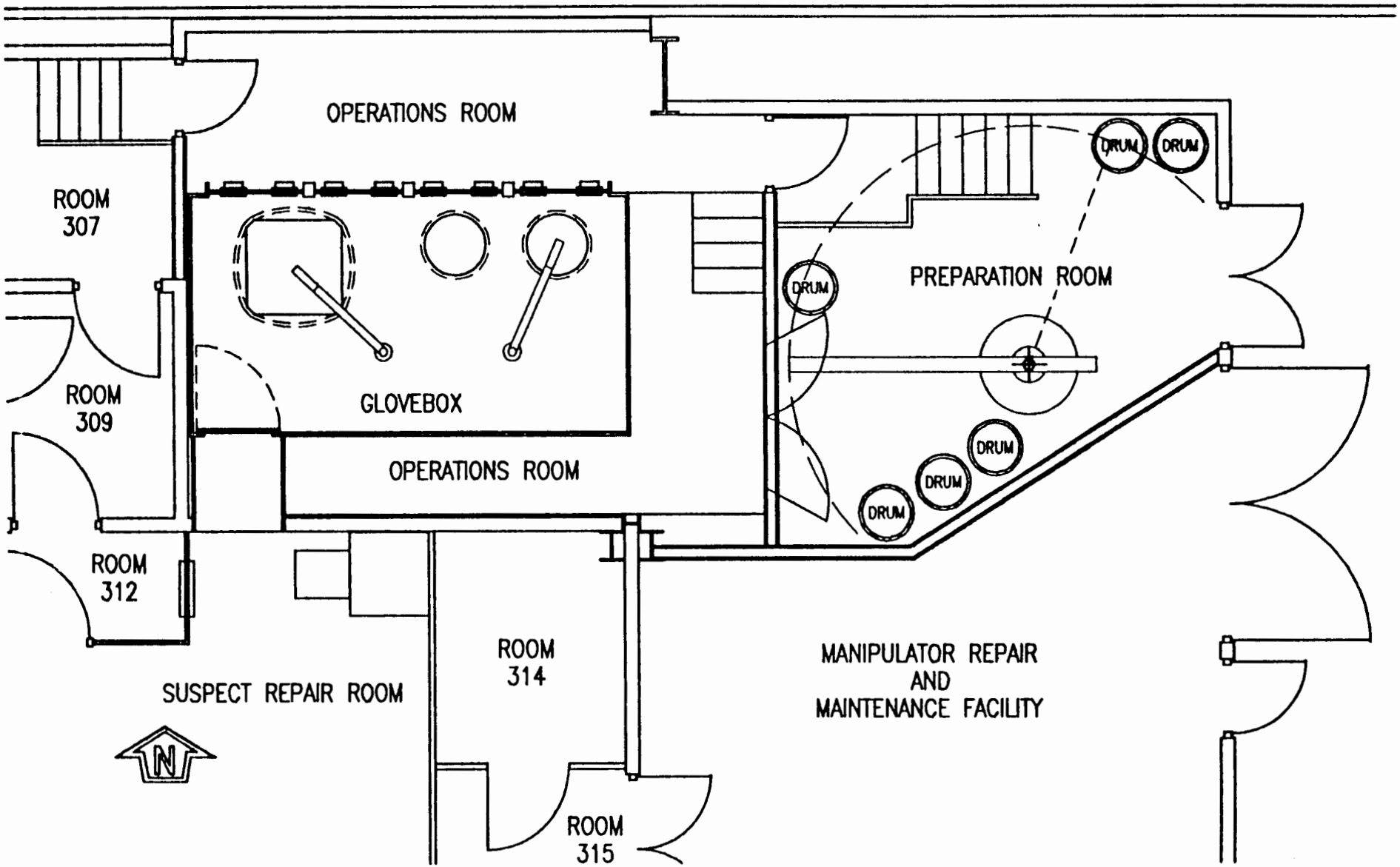
DECEMBER 1990



HFEF HIGH-BAY AREA
WIPP TRU-WASTE CHARACTERIZATION FACILITY
(PLAN VIEW)

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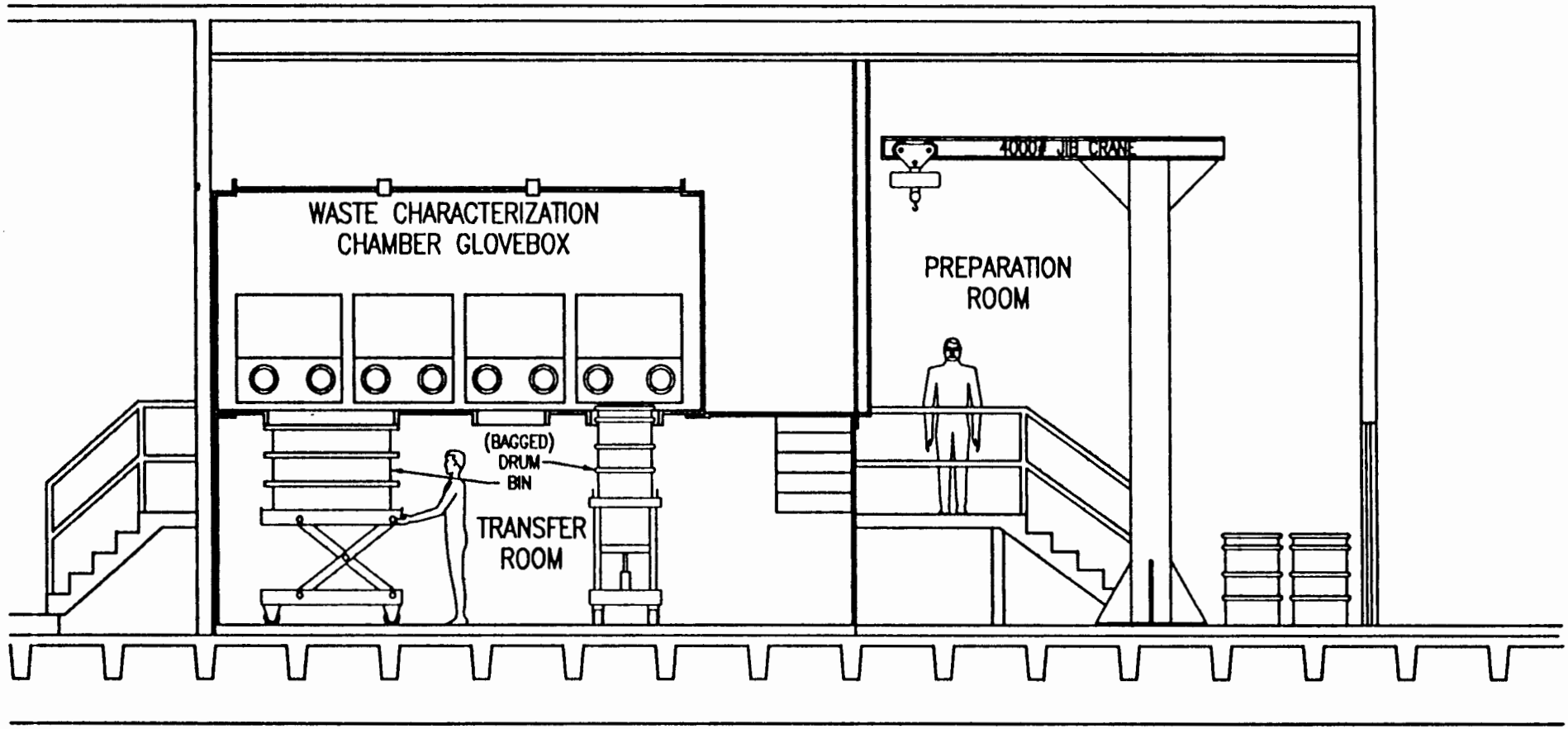
DECEMBER 1990



HFEF HIGH-BAY AREA
WIPP TRU-WASTE CHARACTERIZATION FACILITY
(VERTICAL SECTION, FACING NORTH)

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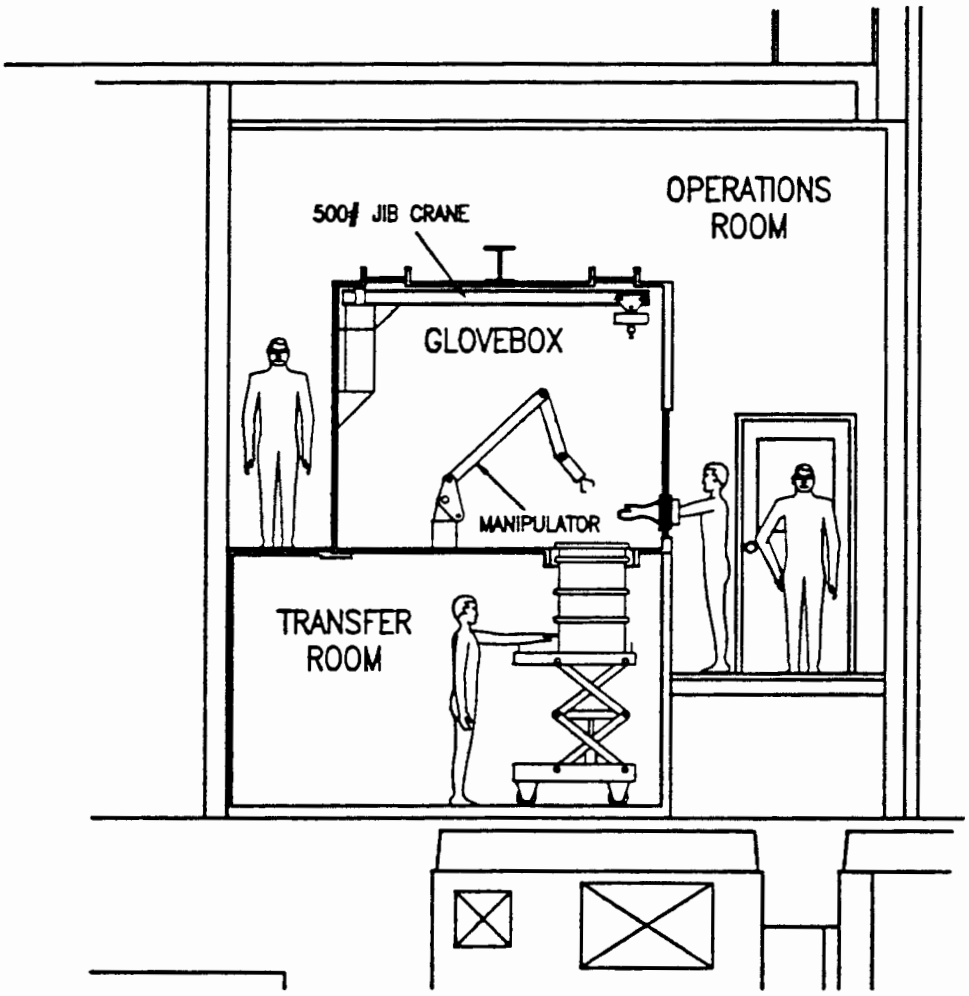


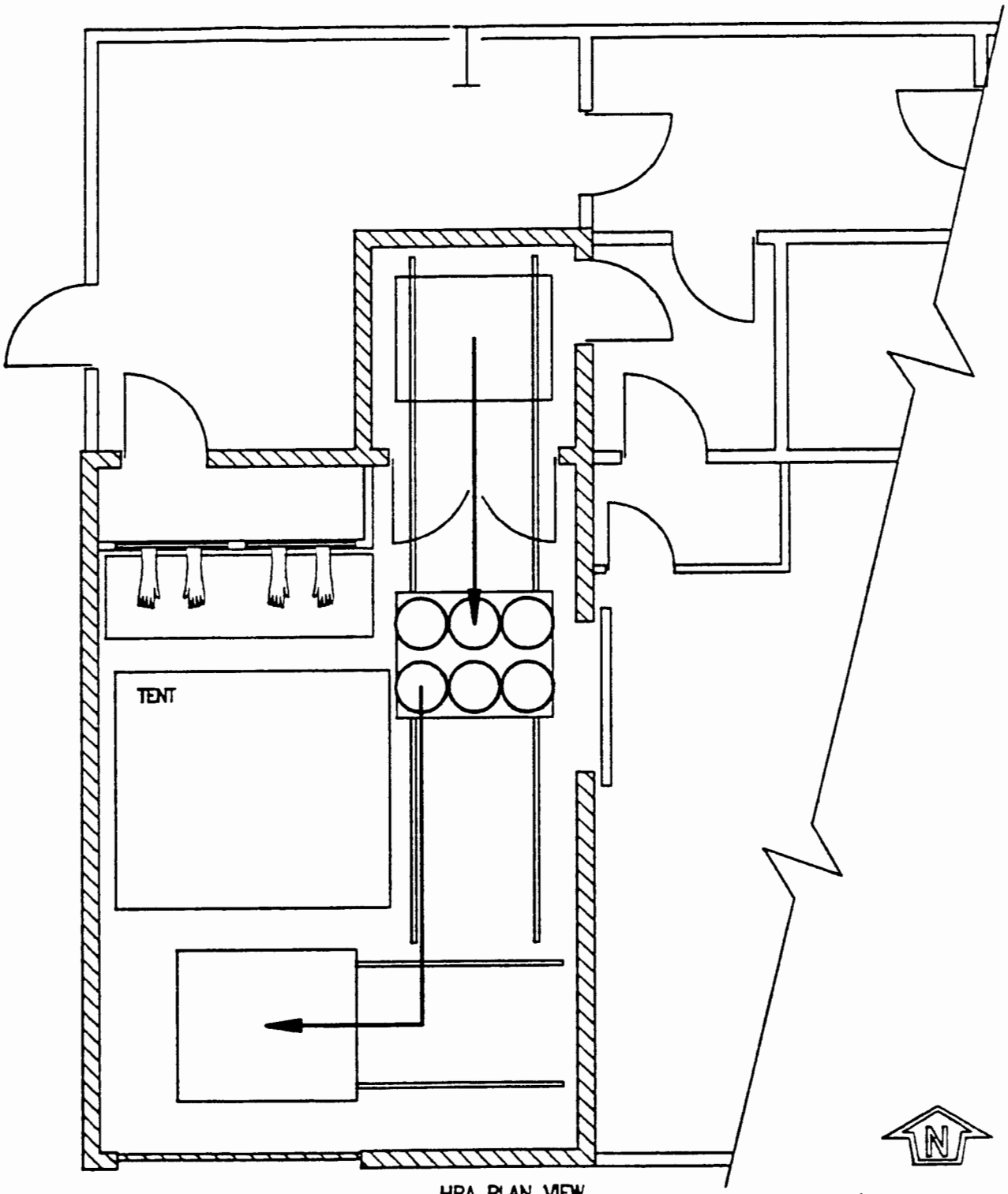
HFEF HIGH-BAY AREA
WIPP TRU-WASTE CHARACTERIZATION FACILITY
(VERTICAL SECTION, FACING WEST)

ACAD:\FCD\HFEF\PLANS\WIPP-6.DWG
DECEMBER 1990

HFEF HIGH-BAY AREA

WIPP TRU-WASTE CHARACTERIZATION FACILITY GLOVE AND MANIPULATOR BOX

(FACING SOUTH)



HRA PLAN VIEW

ANL/W HFEF
WIPP TRU-WASTE CHARACTERIZATION FACILITY
DECON CELL AND HIGH-BAY AREA

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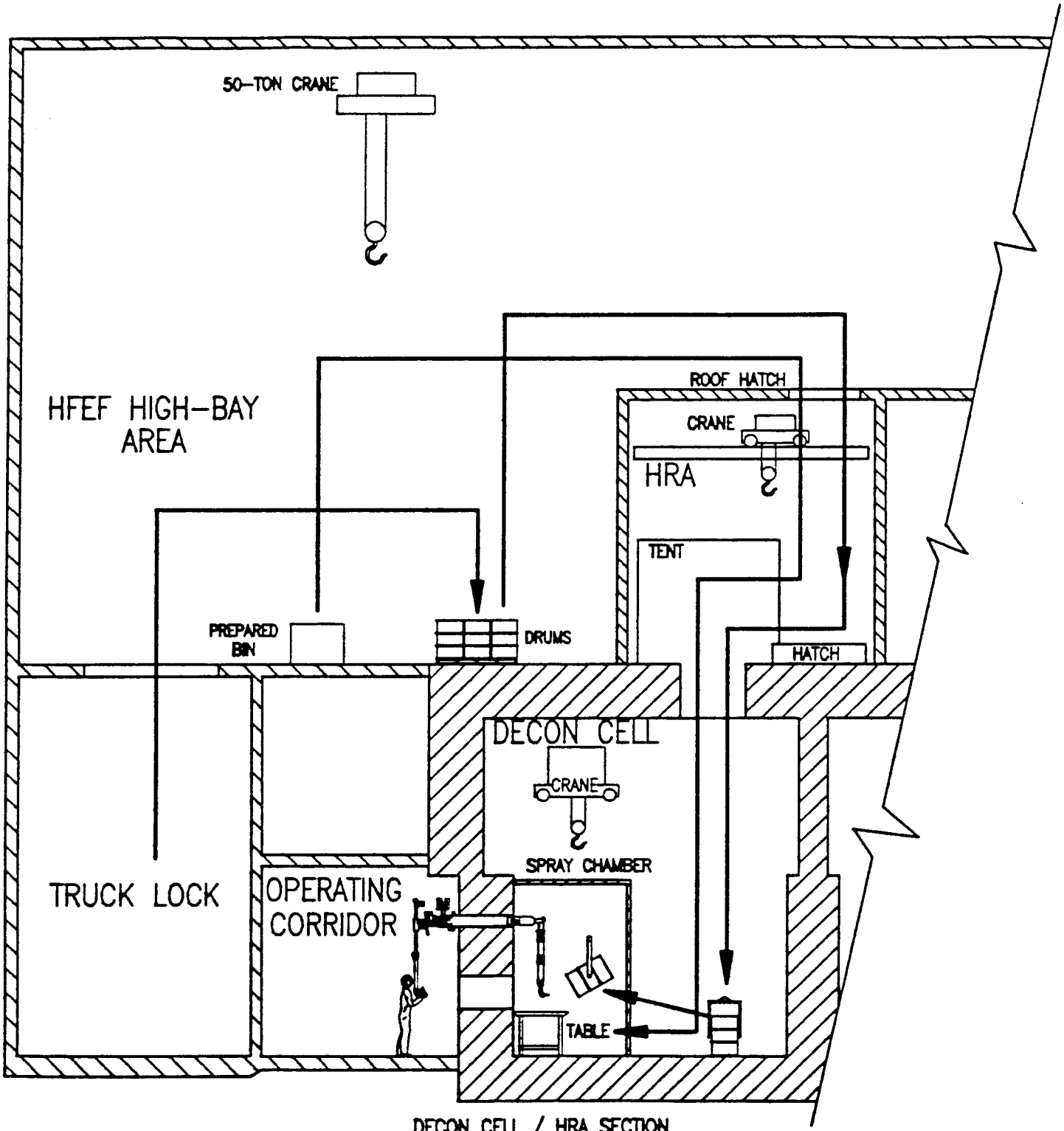
DECEMBER 1



DECON CELL / HRA SECTION

ANL/W HFEF
WIPP TRU-WASTE CHARACTERIZATION FACILITY
DECON CELL AND HIGH-BAY AREA

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DECEMBER 19

HANFORD SITE
TRU WASTE PROGRAM

Rudy Guercia
Dick Lipinski

TRU GENERATION/INVENTORY

Inventory (in storage)

Contact Handled -	Drums -	4333
	Boxes -	4225
Remote Handled -	Canisters -	202

Newly Generated

Contact Handled -	Drums -	1633
	Boxes -	339
Remote Handled -	Canisters -	4352

RH TRU WASTE

WRAP-II:	Build to produce WIPP certified waste	'99
HWVP:	Vitrofied tank waste	'99
OFFSITE:	Process as required - charactierized by the generator	
ONSITE:	Process as required - to be characterized	

TRU WASTE RETRIEVAL
(CH ONLY)

PHASE I - RECORD STUDY

COMPLETE

PHASE II - SAMPLE

STARTED: '89-'90 PROJECT
NOW: '91-'92 PROJECT

- Look at 19 Locations
- Remove 200 drums and 5 boxes from 7 locations
- NDA and RTR Containers

PHASE III - WASTE MATERIAL CHARACTERIZATION

AFTER PHASE II

- Lab Analysis

FULL SCALE RETRIEVAL - SUPPORT OF WRAP 1

~ '97

HANFORD TRANSPORTATION

SWB - NOT APPROVED FOR ONSITE

RL 5820.2A - MEET DOT/NRC REQUIREMENTS

NO TRUPACT-II LOADING FACILITY UNTIL WRAP I

Lawrence Livermore National Laboratory

TRU Waste Management

Site Update

January 10, 1991

TRU waste generation rates

- Approximately 60 drums and 10 Standard Waste Boxes (SWBs) for an estimated $50m^3$ per annum

Inventory

- Approximately 110 drums and 30 oversize boxes of suspect TRU mixed waste are currently being stored pending certification efforts

- Based on projected generation rates, LLNL will reach storage capacity in 18 months unless Nevada shipments resume

Processing uncertified waste

- Alternatives being considered for oversized TRU Boxes
  - Size reduction in Pu facility with LLNL staff
  - Size reduction in Pu facility with contract staff
- Stored, uncertified drum inventory
  - Generator interviews that enable certification as TRU only based on process knowledge

NTS TRU STATUS

M.B. NOLAND

1) The Nevada Test Site TRU Waste storage cell (pad) is located at the Area 5 RWMS.

2) The TRU Storage Pad is a 92,800 sq. ft. asphalt surface with 8" containment curbs.

3) The NTS TRU is stored in metal sea-land cargo containers:
   - Under the current storage configurations, each container is packed with approx. 70 drums ea. or 2 to 4 TRU waste boxes.
   - At the present there are 1640 TRU drums stored in 32 cargo containers and 58 TRU waste boxes stored in 17 cargo containers.

4) All TRU stored on the NTS TRU pad was received from LLNL which consists of approx. 600 cubic meters. TRU waste is not generated at the NTS and the NTS does not have RH TRU in storage.

5) NTS TRU current disposition status:

NO. BOXES IN STORAGE	NO. BOXES UNCERTIFIABLE	DISPOSITION
58	1	Contains aerosols & needs overpacked.

NO. DRUMS IN STORAGE	NO. DRUMS UNCERTIFIABLE	DISPOSITION
1640	209	57-Fluids. 63-Aerosols. 27-Fluids & aerosols. 62-Need NDA & NDE.

* There are 165 drums with irregularities, some of which are WIPP certifiable if overpacked, or further testing proves them not to be " suspect " of containing prohibited materials.

6) The following picture illustrates the current facilities at NTS for the handling of the TRUPACT-II and waste examination, venting, etc.

7) Facilities for the loading and unloading of the TRUPACT-II are not available to date at the NTS.
   -Several options are being studied at the present including the use of the WIPP portable system if available.

8) Discussions continue on a facility to breech, vent, and NDE all TRU waste packages.

- Such a facility is needed before the TRU at NTS can be shipped to the WIPP.
- Possible options and buildings are under evaluation at the present time.

9) With the optimistic hopes of shipping the NTS TRU to the WIPP at the end of the next 5 years, many of the required documents for TRU waste certification and certification to use the TRUPACT-II must still be developed.

- The NTS TRU Waste Certification & Quality Assurance Implementation document is in the review and comment stages at present.
- Some of the documents NTS must still develop and submit prior to the movement of any TRU waste currently on site are as follows:
  - Site specific QA plan for payload control per WIPP-89-007.
  - Site specific " TRAMPAC " for payload control parameters.
  - Site specific QA plan for TRUPACT-II use and minor maintenance.
  - Develop documented & controlled training procedures for waste characterization, payload control activities and minor maintenance.
  - Venting and headspace sampling procedures.

* Many of these documents are contingent upon final decisions on needed facilities, procedures, methods, and regulatory concerns.

10) With the current atmosphere between the State of Nevada and the NTS a major amount of time and effort has been and will be consumed in addressing the States alleged findings and until such time as agreements are finalized, the approach to many of these items, documents, and procedures are unclear.

11) Since August, 1990, all of the TRU records and inventory, dating back to 1974, are being researched and updated in preparation of a new TRU data base and to assist in the accurate taking of future inventories as well as assuring confidence in the certification of the NTS, TRU to the WIPP.

ORNL

TRU WASTE UPDATE

R. C. Mason

January 10, 1991

ORNL TRU WASTE

- VOLUME TO BE SHIPPED TO WIPP
  - CH - 1122 yd^3
  - RH - 444 yd^3 - SOLID
  - RH - 1500 yd^3 - SLUDGE (PROCESSED)
- GENERATION RATES
  - CH - 1.5 yd^3/mo
  - RH - 0.5 yd^3/mo (SOLID)
- DATE STORAGE CAPACITY EXCEEDED
  - CH TRU - NOVEMBER 1995
  - RH TRU (SOLID) - JUNE 2004
  - RH TRU (SLUDGE) - DECEMBER 1999

ORNL HAS LIMITED STORAGE CAPABILITY

Waste Type	Generation Rate (m^3/y)	1990 Inventory (m^3)	Storage Capacity (m^3)
CH TRU Solid [1]	18	500 [2]	315
RH TRU Solid	6	300	500
RH TRU Liquid [3]	55	1,800	2,100

[1] Construction of new storage facility planned ($600m^3$)

[2] 800 drums are wet and deteriorating.

[3] Solidification campaigns will be necessary.

ORNL CH TRU FACILITIES

Facility	Year	Cost ($x1000)	Status	Operational
STORAGE				
Building 7834, 7825			Current Storage	RCRA Closure 1992
Building 7823			Current Staging	RCRA Closure 1992
TRU/SLLW 7879	1989	$ 425	Construction Complete	Beneficial Occupancy January 1991
CH TRU Storage	1990	$1050	Design Criteria	1992

ORNL CH TRU FACILITIES

(continued)

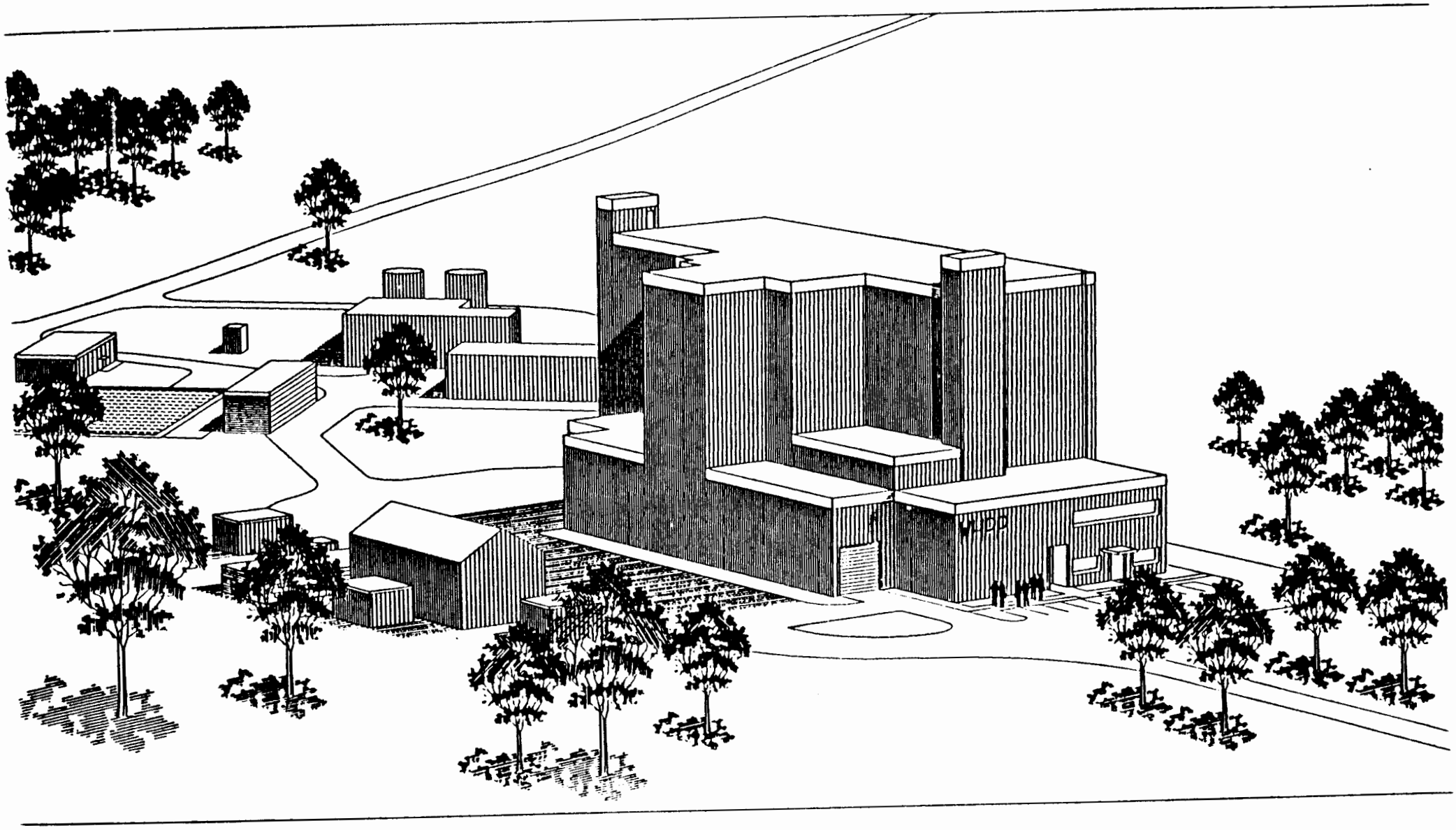
Facility	Year	Cost ($x1000)	Status	Operational
TREATMENT/CHARACTERIZATION				
WEAF Upgrade	1990	1,100	Design on Hold for NEPA	1992
CH TRU Repackage	1993	1,100	Planning	1995
WCCF (Line Item)	1994	16,000	Feasibility Study Complete	1998
DISPOSAL (Long-Term Storage)				
NFS Storage	1991	1,100	Draft Design/Proposal	1992

ORNL RH TRU FACILITIES

Facility	Year	Cost ($x1000)	Status	Operational
STORAGE				
Bunker 7855			Current Storage	RCRA Closure 1992
SWSA 5N. Trenches			Current Storage	RCRA Closure 1992
RH TRU Bunker	1989	904	Construct Hold for NEPA	1992
RH TRU Bunker II	1991	1,090	Preliminary Proposal Complete	1993
DISPOSAL				
SWSA 5S. Trenches			Buried RH TRU Casks	
DISPOSAL				
WHPP (Line Item)	1994	240M	CDR Hold for Funds	2002

PROCESSING PLANS

- **CH TRU Repackaging (Contract) FY1991**
  - Gain storage space - FY2002
  - Certify waste WIPP to WAC
- **CH TRU Repackaging Facility**
  - Depends on FY1991 Results
  - 800 Wet Drums - Scheduled for WHPP
    - Evaluating WHPP/WIPP delays
    - May have to process
- **WHPP**
  - ORNL SLLW/LLLW Future Processing Facility
  - TRU sludge and solid waste
  - CH TRU noncertifiable and high rad level

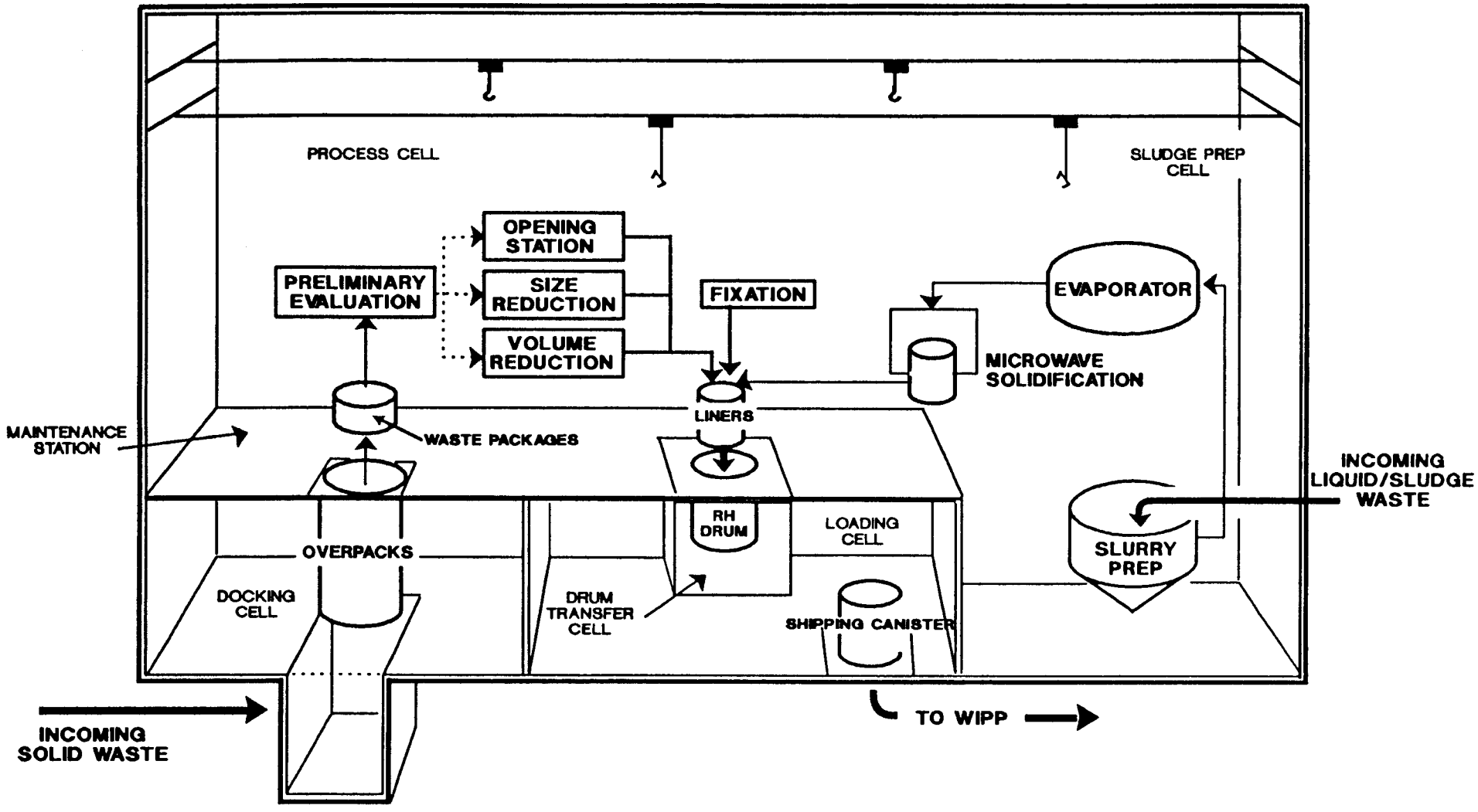


Waste Handling & Packaging Plant

ORNL WASTE HANDLING & PACKAGING PLANT (WHPP)

THE WHPP AT ORNL WILL RETRIEVE/RECEIVE, PROCESS, PACKAGE AND CERTIFY REMOTE-HANDLED AND SPECIAL CASE TRU WASTES FOR SHIPMENT TO WIPP.

- FY 1994 capital line item project
- Project total estimated cost of $240M
- Projected Operational date in 2002
- Process and ship stored and NG RH TRU
- Process High Rad (>50 mR/hr) and Noncertifiable CH TRU



CONCEPTUAL WHPP CUTAWAY

TRU UPDATE MEETING #19
TRANSPORTATION SYSTEM

PHIL GREGORY - WID

TRANSPORTATION STATUS

- TRUPACT-II container
- TRUPACT-II trailer
- Amendments to the TRUPACT-II Certificate of Compliance
- TRUPACT-II recovery
- TRANSAX '90
- TRANSCOM
- RH Cask Program

191R:4910a

TRUPACT-II

Background

- All WIPP waste will be transported in NRC-certified containers
- NRC Certificate of Compliance for TRUPACT-II design received in 10/89
  - Rigorous testing program preceded NRC certification
- Nuclear Packaging, Inc., (NuPac) designed, certified and is fabricating containers

1090R:4824f

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Status

- Manufacturing difficulties resulted in production of several nonconforming containers
- Liquidity problems of subcontractor jeopardized the production of certifiable TRUPACT-IIs on a schedule that would support the WIPP Test Phase
- Westinghouse and NuPac reached agreement on future TRUPACT-II production

1090R:4824g

MEMORANDUM OF UNDERSTANDING

- Design, test and certification process proved value of TRUPACT-II to WIPP safety
- NuPac and Pacific Nuclear financial conditions threatened TRUPACT-II program and Secretary's Decision Plan
- MOU preserved the investment and was in the best interest of the government

1090H:4813b

PRODUCTION STATUS

Enhanced Processes Implemented

- Revised material specifications
- Revised inspection and measurement requirements
- Full-time QA management at TAF
- Full-time QA engineering oversight
- Enhanced radiography process
- Dedicated task force and management
- Utilize outside expertise

1090H:4813d

PRODUCTION STATUS

Accomplishments

- MOU signed 7/30/90
- NRC review August 1990
  - No adverse findings
- First certified TRUPACT-II complete 8/30/90
- First certified TRUPACT-II accepted 9/28/90
- Present status
  - Six TRUPACT-IIs completed
  - Three TRUPACT-IIs accepted
  - Seventeen trailers accepted

191R:4910b

PRODUCTION STATUS

Future Plans

- Fabrication of one unit per month
- Two trailers-worth available by January 1991

1090H:4813f

TRUPACT-II TRAILERS

- Fleet trailers are air-ride, spread axle
  - Air bag suspension is smoother than spring suspension
  - Spread axle is more stable than tandem axle
- Seventeen trailers have been delivered to date
- Fleet trailers will soon be used for road shows and training
- Trailers are inspected before, during, and after each shipment
- Drivers will be trained as certified Commercial Vehicle Safety Alliance (CVSA) inspectors
- Drivers have driven the state-designated alternate route with no problem

191R:4910c

TRUPACT-II TRAILERS
Cracks

- No problems related to load bearing members or the suspension
- One problem related to crossmember welds
  - Caused by lack of weld penetration

    Repaired by welding
  - No further problems

1190H:4813h

TRUPACT-II TRAILERS
Cracks
(cont.)

- Cracks at the crossmember flange
  - Caused by torsion and/or vibration
  - Corrected by redesign and replacement of crossmember
  - No further problems
- Three cracks in the fenders and/or supports
  - Tandem axle trailers only
  - Design was changed for fleet trailers
  - Will monitor this area on the fleet trailers

TRUPACT-II CERTIFICATE OF COMPLIANCE

Amendment to Support Bin Preparation

- Will permit loading test bins into TRUPACT-II
- Allows the use of kevlar filters on bins
- Describes additional experimental bin content codes
- Submitted to the NRC 12/90
- NRC approval anticipated 2/91

191R:4910j

TRUPACT-II CERTIFICATE OF COMPLIANCE

Amendment for Retrieval of Dry Test Waste

- Retrieval of dry waste (bins, drums, etc.) from WIPP
  - If required
- WIPP becomes a shipper
- Transportation requirements satisfied by process knowledge and administrative controls
- Scheduled to be submitted to the NRC 2/91
- Not required for WIPP facility baseline readiness

191R:4910k

TRUPACT-II CERTIFICATE OF COMPLIANCE

Amendment for Retrieval Wet Bins

- Retrieval of wet bins form WIPP
  - If required
- Allows use of Drum OverPack (DOP) to overpack a Standard Waste Box with contaminated exterior
  - Type A package
  - Subcontract with Container Products
  - Prototype failed test
  - Design modifications underway
- Current transportation requirements require brine stabilization and verification
- Submittal date to support wet bin tests TBD

191R:49101

TRUPACT-II CERTIFICATE OF COMPLIANCE

Future Amendments

- Establish lower G-values by testing waste
  - Test procedure is described in the SARP
  - Test data is required from these programs
  - Potential for increasing decay heat limits
- Use of filtered bags for waste packaging
  - The issue is five percent hydrogen
  - Increased wattage potential
- Mixing of shipping categories for more efficiency

191R:4910m

TRUPACT-II RECOVERY

- Recovery guide will be on the tractor
- Lifting lugs and welding rod on the tractor
- Utilizes commercial crane and tractor trailer
  - Horizontal transport
- Has been demonstrated at WIPP
- Will be demonstrated to Western Governors' Association early 1991

191R:4910f

TRANSAX '90

- Simulated transportation accident on interstate ramp
- November 8, 1990 - Colorado Springs, Colorado
- Emergency operations centers activated
  - State of Colorado
  - RFP
  - WIPP
  - DOE/AL
  - DOE/HQ

191R:4910g

TRANSCOM STATUS

- System upgraded form LORAN-C to satellite tracking
- Accuracy improved to approximately 1/4 mile
- Location not confused by weather conditions
- Antenna moved from trailer to tractor
- "System saver" bill of lading allows tracking empty shipment on tractor only

191R:4910h

RH CASK PROGRAM

Design Status

- Recommended enhancements from design review
  - Change "model" cask to "certified" cask
  - Add a third O-ring to the ICV
  - Add a device to maintain ICV/OCV radial location
  - Use the same pintle socket on the ICV and OCV
  - Add handling and storage capability to the trailer
- Alternate canister designs are under development

191R:4910n

RH CASK PROGRAM

Contract Status

- DOE contract with Nuclear Packaging
- SARP payload (contents) data sent to NuPac 9/90
  - Initial submittal only
  - Payloads will utilize a phased approach
- DOE issued a stop work order 9/90 (open issues)
- Stop work order was extended through 1/91
- NuPac is preparing a proposal to revise contract

191R:4910o

RH CASK PROGRAM

Issues

- When is the RH cask needed
  - RH waste is not in the initial WIPP test plan
  - Scheduled for first emplacement of RH waste
- How many RH casks will be required
  - Quantity of waste to be shipped
  - Length of RH waste shipping campaign
- DOE review of SARP prior to submittal to the NRC

191R:4910p

WASTE ACCEPTANCE CRITERIA (WAC)

DAN STANDIFORD (FACILITATOR), WIPP

KNOXVILLE, TENNESSEE

JANUARY 9 -10, 1991

INTRODUCTION

- WACCC members and disciplines represented
- Presentation by each WACCC member on their discipline
- Short question and answer session after each presentation - five minutes

191L:4920a

WAC REVISION

- Draft 1 of the WAC revision is currently under review by the WAC
- Dan Racki, the team leader, (under contract) for the WAC revision will present an overview of Draft 1
  - Dan Racki is from the Westinghouse Advanced Energy Systems (AES)

191L:4920b

TRU UPDATE MEETING #19
TRANSPORTATION SYSTEM

PHIL GREGORY - WID

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1090R:4824f

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1090H:4813b

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- Enhanced radiography process
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- Utilize outside expertise

1090H:4813d

PRODUCTION STATUS

Accomplishments

- MOU signed 7/30/90
- NRC review August 1990
  - No adverse findings
- First certified TRUPACT-II complete 8/30/90
- First certified TRUPACT-II accepted 9/28/90
- Present status
  - Six TRUPACT-IIs completed
  - Three TRUPACT-IIs accepted
  - Seventeen trailers accepted

191R:4910b

PRODUCTION STATUS

Future Plans

- Fabrication of one unit per month
- Two trailers-worth available by January 1991

1090H:4813f

TRUPACT-II TRAILERS

- Fleet trailers are air-ride, spread axle
  - Air bag suspension is smoother than spring suspension
  - Spread axle is more stable than tandem axle
- Seventeen trailers have been delivered to date
- Fleet trailers will soon be used for road shows and training
- Trailers are inspected before, during, and after each shipment
- Drivers will be trained as certified Commercial Vehicle Safety Alliance (CVSA) inspectors
- Drivers have driven the state-designated alternate route with no problem

191R:4910c

TRUPACT-II TRAILERS
Cracks

- No problems related to load bearing members or the suspension
- One problem related to crossmember welds
  - Caused by lack of weld penetration

    Repaired by welding
  - No further problems

1190H:4813h

TRUPACT-II TRAILERS
Cracks
(cont.)

- Cracks at the crossmember flange
  - Caused by torsion and/or vibration
  - Corrected by redesign and replacement of crossmember
  - No further problems
- Three cracks in the fenders and/or supports
  - Tandem axle trailers only
  - Design was changed for fleet trailers
  - Will monitor this area on the fleet trailers

1190H:48131

TRUPACT-II CERTIFICATE OF COMPLIANCE

Amendment to Support Bin Preparation

- Will permit loading test bins into TRUPACT-II
- Allows the use of kevlar filters on bins
- Describes additional experimental bin content codes
- Submitted to the NRC 12/90
- NRC approval anticipated 2/91

191R:4910j

TRUPACT-II CERTIFICATE OF COMPLIANCE

Amendment for Retrieval of Dry Test Waste

- Retrieval of dry waste (bins, drums, etc.) from WIPP
  - If required
- WIPP becomes a shipper
- Transportation requirements satisfied by process knowledge and administrative controls
- Scheduled to be submitted to the NRC 2/91
- Not required for WIPP facility baseline readiness

191R:4910k

TRUPACT-II CERTIFICATE OF COMPLIANCE

Amendment for Retrieval Wet Bins

- Retrieval of wet bins form WIPP
  - If required
- Allows use of Drum OverPack (DOP) to overpack a Standard Waste Box with contaminated exterior
  - Type A package
  - Subcontract with Container Products
  - Prototype failed test
  - Design modifications underway
- Current transportation requirements require brine stabilization and verification
- Submittal date to support wet bin tests TBD

191R:49101

TRUPACT-II CERTIFICATE OF COMPLIANCE

Future Amendments

- Establish lower G-values by testing waste
  - Test procedure is described in the SARP
  - Test data is required from these programs
  - Potential for increasing decay heat limits
- Use of filtered bags for waste packaging
  - The issue is five percent hydrogen
  - Increased wattage potential
- Mixing of shipping categories for more efficiency

191R:4910m

TRUPACT-II RECOVERY

- Recovery guide will be on the tractor
- Lifting lugs and welding rod on the tractor
- Utilizes commercial crane and tractor trailer
  - Horizontal transport
- Has been demonstrated at WIPP
- Will be demonstrated to Western Governors' Association early 1991

191R:4910f

TRANSAX '90

- Simulated transportation accident on interstate ramp
- November 8, 1990 - Colorado Springs, Colorado
- Emergency operations centers activated
  - State of Colorado
  - RFP
  - WIPP
  - DOE/AL
  - DOE/HQ

191R:4910g

TRANSCOM STATUS

- System upgraded form LORAN-C to satellite tracking
- Accuracy improved to approximately 1/4 mile
- Location not confused by weather conditions
- Antenna moved from trailer to tractor
- "System saver" bill of lading allows tracking empty shipment on tractor only

191R:4910h

RH CASK PROGRAM

Design Status

- Recommended enhancements from design review
  - Change "model" cask to "certified" cask
  - Add a third O-ring to the ICV
  - Add a device to maintain ICV/OCV radial location
  - Use the same pintle socket on the ICV and OCV
  - Add handling and storage capability to the trailer
- Alternate canister designs are under development

191R:4910n

RH CASK PROGRAM

Contract Status

- DOE contract with Nuclear Packaging
- SARP payload (contents) data sent to NuPac 9/90
  - Initial submittal only
  - Payloads will utilize a phased approach
- DOE issued a stop work order 9/90 (open issues)
- Stop work order was extended through 1/91
- NuPac is preparing a proposal to revise contract

191R:4910o

RH CASK PROGRAM

Issues

- When is the RH cask needed
  - RH waste is not in the initial WIPP test plan
  - Scheduled for first emplacement of RH waste
- How many RH casks will be required
  - Quantity of waste to be shipped
  - Length of RH waste shipping campaign
- DOE review of SARP prior to submittal to the NRC

191R:4910p

WACCC STATUS
TRU UPDATE MEETING
KNOXVILLE, TENNESSEE

DENNIS MORISSETTE
MANAGER - WASTE TECHNOLOGY

JANUARY 10, 1991

DISCUSSION TOPICS

- WACCC reorganization
- Frequency of WACCC meetings
- WACCC program development
- WACCC 1990 oversight activities

191L:4906aa

WACCC REORGANIZATION

- Dedicated WACCC chairperson — December 1989
- Dedicated Waste Technology manager — July 1990

191L:4906a

WACCC ORGANIZATIONAL STRUCTURE

Project Manager (DOE/WPO)
A.E. Hunt

Assistant Manager System Integration (DOE/WPO)
M.H. McFadden

WACCC Chairperson (DOE/WPO)
H.J. Davis

Waste Technology Group Manager (MOC)
C.D. Morissette

D.L. Standiford, Engineer

C.B. Shoemake, Technician

Audit Surveillance Group

Audit/Surveillance Group Cadre of Auditors

(Knowledgeable of the National TRU Waste System)

191L:4906b

WACCC/WTG

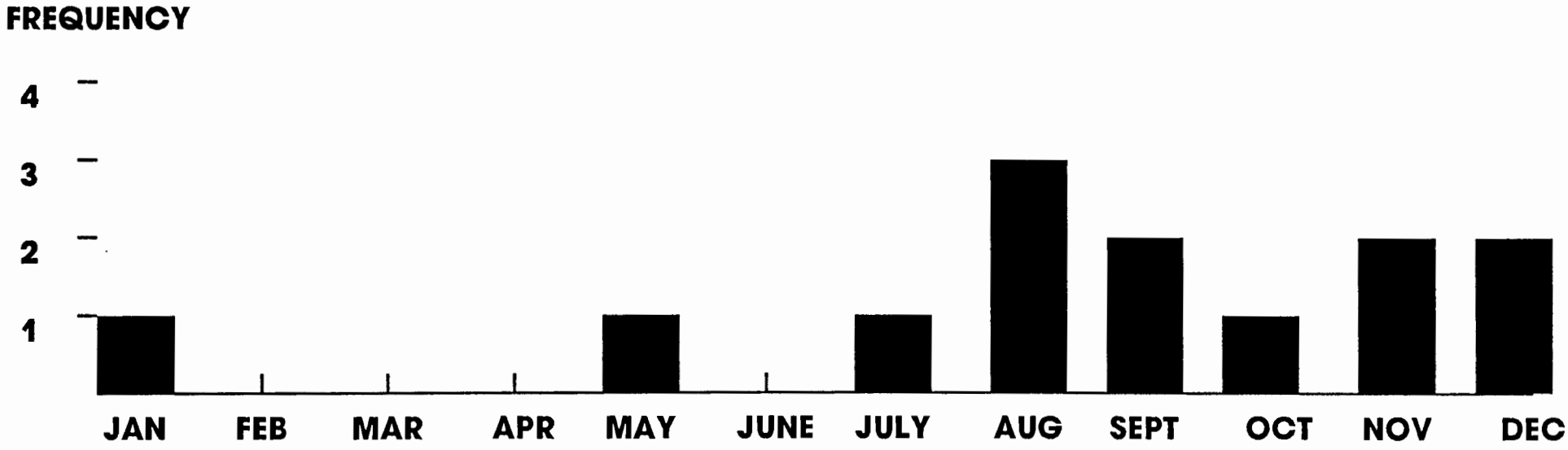
DISCIPLINES	PRIMARY	ALTERNATE
Quality Assurance	J.E. Atchenson *	J.F. Allen *
Waste Operations	J.M. Lott	H.M. Batchelder *
Health Physics	R.D. Boyer *	D.R. Kump *
Data bases	K.R. Mikus *	M.F. Sharif *
NDA/NDE	K.R. Mikus *	J.F. Allen *
RCRA	B.K. Nielsen *	S.C. Cooper *
Performance Assessment	L.S. Gomez **	A.C. Peterson **
Transportation and Packaging	T.D. Stroud *	T.R. Ward *

(*) Matrixed to Waste Technology

(**) Sandia National Laboratories personnel

191L:4906c

1991 WACCC MEETINGS



191L:4906d

1990 WACCC AUDIT HISTORY

Four audits and one surviellance

June LLNL 6/26 - 6/28

July ANL-E 7/17 - 7/20

Aug None scheduled

Sept RFP audit postponed until 1/21/91

Reason - WACCC auditors were required to have training to OSHA 29 CFR 1910.120 requirements

Oct INEL audit 10/15 - 10/18

ANL-W surveillance - 10/18

Nov ORNL audit postponed

Reason - ORNL audit by DOE Tiger Team at the same time as the WACCC audit

Dec None scheduled

191L:4906e

PROGRAM DEVELOPMENT

- DOE/WIPP 90-004 Waste Acceptance Criteria Certification Committee Management Program, September 1990

DOE Management directives:

- 9.6.1 WACCC Audits, approved 10/10/90
- 9.7.1 WACCC Surveillance, approved 11/7/90
- 9.8.1 WACCC Document Control, approved 11/7/90
- 9.9.1 WACCC Audit and Surveillance Trend Analysis, approved 11/7/90

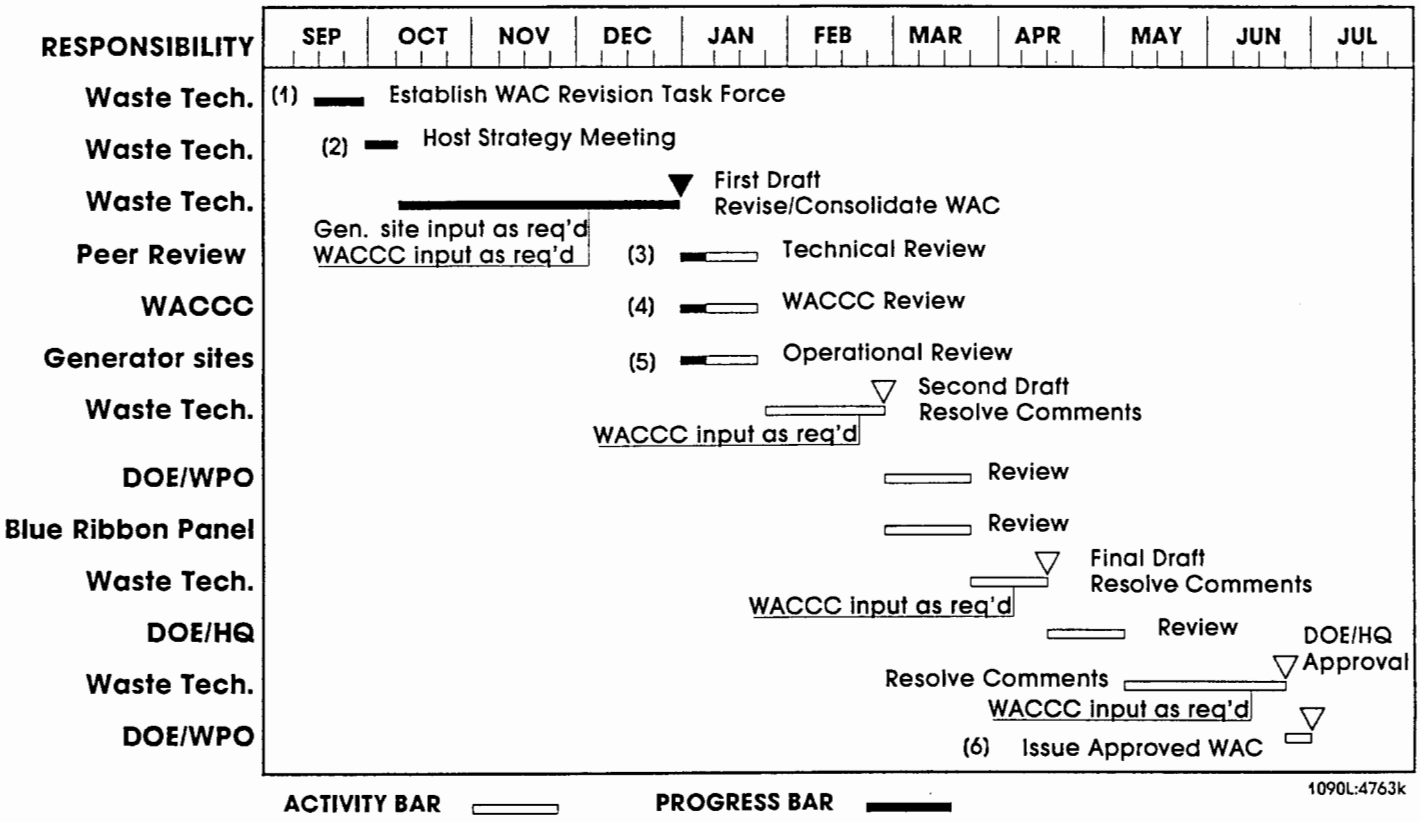
191L:4906f

PROGRAM DEVELOPMENT
(cont.)

- 9.10.1 WACCC Audit and Surveillance Tracking, approved 11/7/90
- Monthly WACCC status reports
  - Issued 10/31/90, 11/30/90, 12/31/90
- Annual WACCC Status Report issued 10/25/90
- WACCC auditor training
  - WACCC Audit Program - 10/11/90
  - OSHA 29 CFR 1910.120 requirements - 11/26-30/90 and 12/3-7/90

191L:4906g

SCHEDULE FOR WASTE ACCEPTANCE CRITERIA (WAC) REVISION



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(2) Two day meeting to determine full scope of work and establish revised WAC format. Attended by Waste Technology, Generator sites, DOE/HQ, IT, Sandia, and lead individual of task force

(3) An independent contractor that has knowledge of the WAC, but is not responsible for implementation of the WAC

(4) This review will also include a Westinghouse Corporation legal review

(5) This review include DOE and contractor

(6) Issue approved revised WAC for compliance and provide to oversight groups (EID, EEG, etc.) for information

APPROVAL: _____ _____

WACCC CHAIRPERSON DATE

191:4763K1

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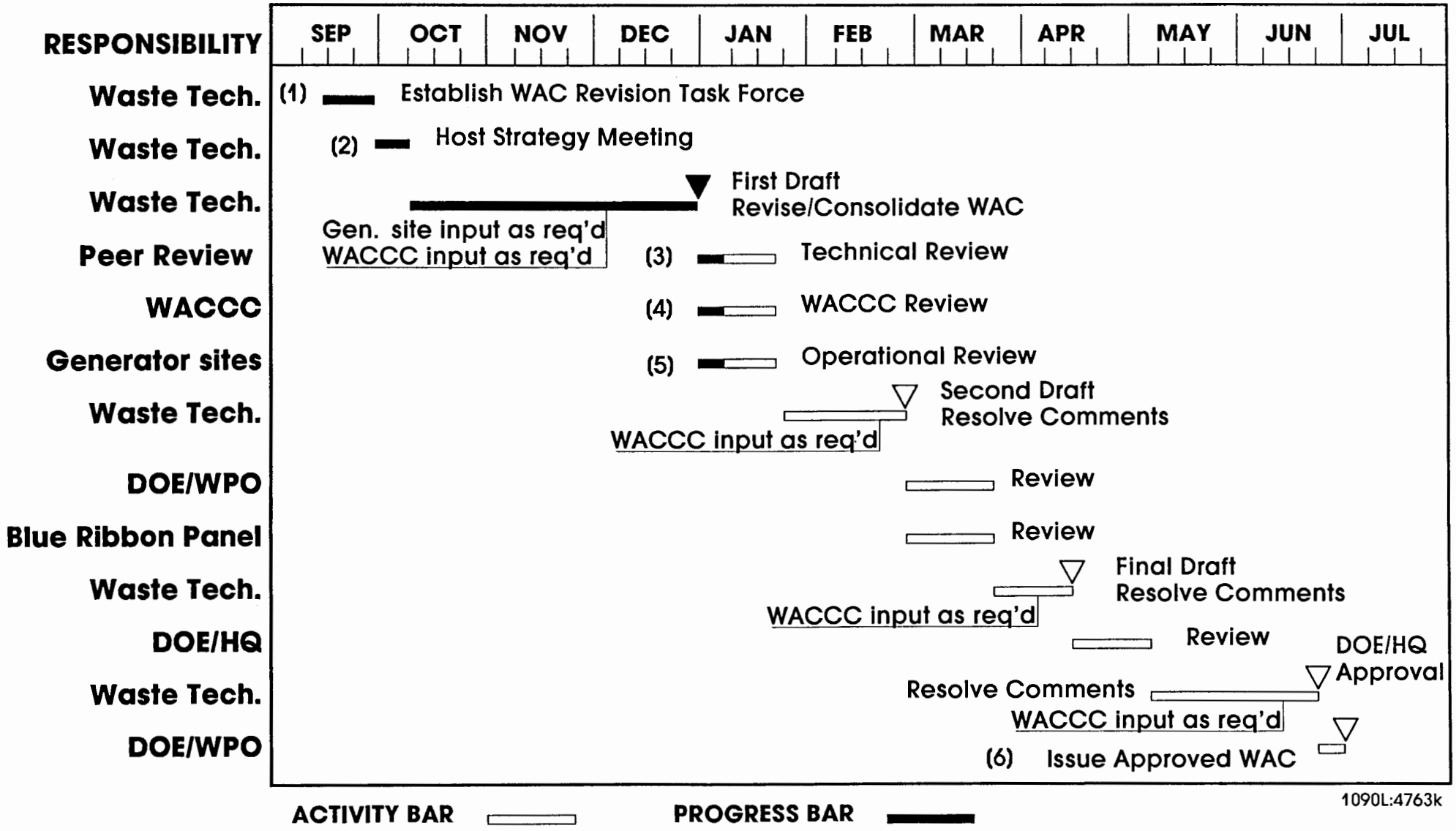

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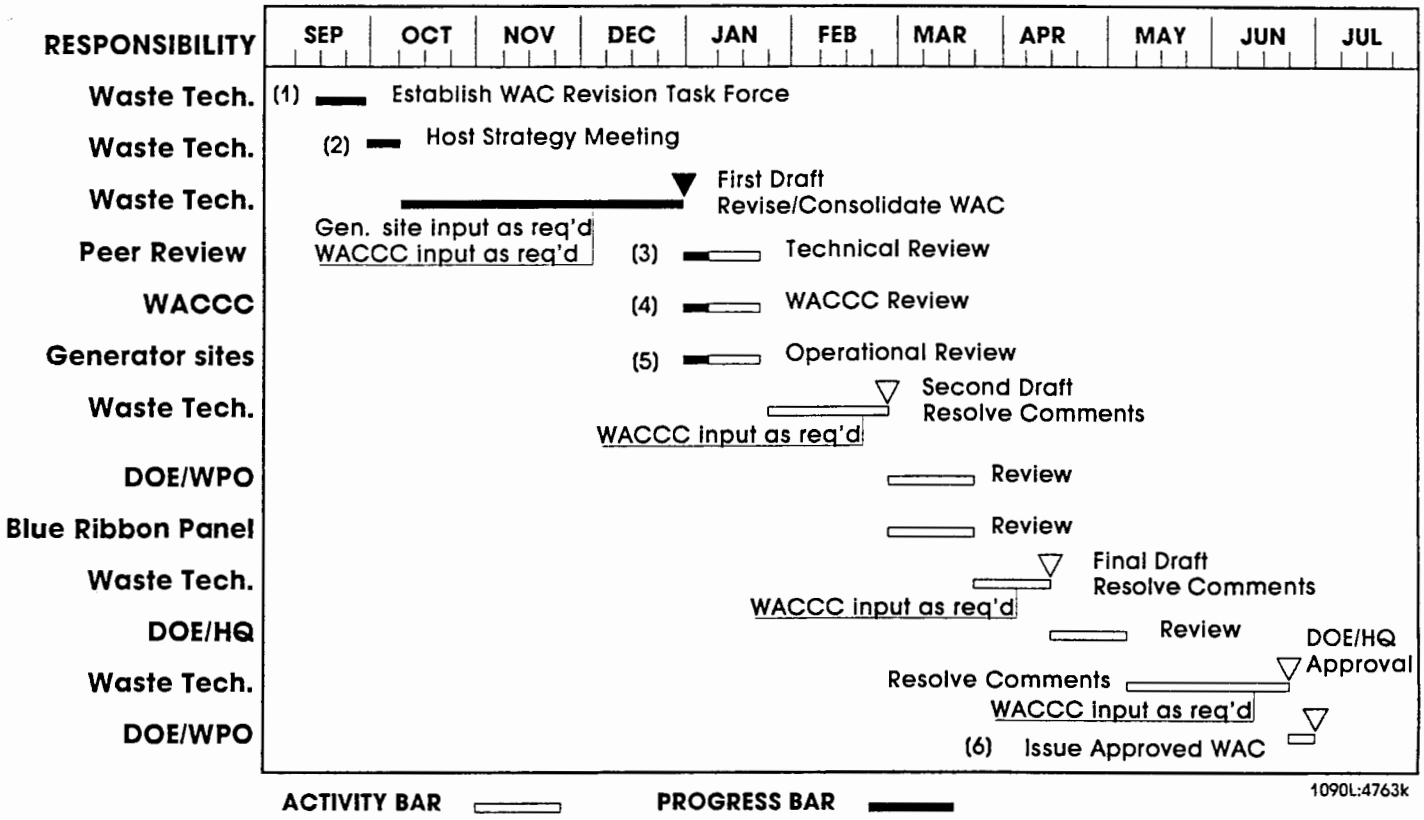

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APPROVAL: _____ _____

WACCC CHAIRPERSON DATE

191:4763K1

Generator Sites Responsibilities (continued)

- **Previous Waste Characterization Data may be acceptable**
  - **Proper QA provided**
- **Original Manifest Documentation on Process Knowledge must be available prior to shipment**
- **Quality Assurance Project Plans required before shipment**

Visual Validation Testing Provides:

- Real Time Radiography
- Gas Sampling From Outer Bag
- Visually Inspecting and Weighing of Each Bag
- Physically Segregating and Weighing Contents of Each Bag
- Videotaping and Recording of All Relevant Data

12 Drums Selected for Visual Validation Testing

- 6 TRUCON Code 116 (3 Wet Combustibles, 2 Dry Combustibles, 1 Plastic)
- 3 TRUCON Code 117 (Metals)
- 1 TRUCON Code 123 (Rubber Gloves)
- 1 TRUCON Code 118 (Glass)
- 1 TRUCON 122 (Insulation)

TRU WASTE UPDATE MEETING #19

EG&G ROCKY FLATS PLANT

SCOTT ANDERSON

JANUARY 9, 1991

(NOT APPROVED FOR PUBLICATION)

ROCKY FLATS PLANT
NEPA DOCUMENTATION

- New Rocky Flats Plant Site Wide EIS Currently Being Planned
- Supplement Analysis of Waste Preparation Activities for WIPP Bin/Alcove Tests Submitted to DOE-HQ
- MTF for TRUPACT-II Loading Facility Approved by DOE-HQ September 1990
- EA for Supercompactor Approved by DOE-HQ August 1990
- Supercompactor Mitigation Action Plan Under Preparation

Regulatory Status

- RCRA Regulated by the Colorado Department of Health (CDH)
- Relationship with CDH is Relatively Open and Good
- RCRA Part A Filed - November 1980
- RCRA Parts A & B Filed - November 1985
  - Included Certain Mixed Wastes
- Compliance Agreement - July 1986
  - Compliance with RCRA
  - Excluded Residues and TRU-Mixed Waste
- RCRA Parts A & B for TRU-Mixed Wastes - June 1988
  - Residues Still Excluded

REGULATORY STATUS CONT'

- CDH Issued Notice of Violation - August 1989
- Residue Settlement Agreement and Compliance Order on Consent - November 1989
- RCRA Permit for TRU-Mixed Waste is Anticipated to be Issued in Late 1991
- Land Disposal Restriction (LDR) Federal Facility Compliance Agreement (FFCA) Issued September 1989
- LDR FFCA Expired September 19, 1990
  - Request for 120 Day Extension Approved by EPA/DOE
  - "New" Agreement Drafted and Submitted to EPA/CDH - January 7, 1991

WASTE CHARACTERIZATION

- Sampling Strategies
- Analytical Methodologies
- Analytical Capabilities
  - On-site
  - Off-site
- Process Knowledge
  - 1989-90 Waste Stream and Residue Identification and Characterization Document
  - Traveller

WACC 6-1

ENTERED

ENVIRONMENTAL EVALUATION GROUP

AN EQUAL OPPORTUNITY / AFFIRMATIVE ACTION EMPLOYER

7007 WYOMING BOULEVARD, N.E.
SUITE F-2
ALBUQUERQUE, NEW MEXICO 87109
(505) 828-1003

RECEIVED
JAN 18 1991
EID DIRECTOR'S OFFICE

January 11, 1991

Mr. Arlen Hunt
Project Manager
U.S. Department of Energy
WIPP Project Office
P.O. Box 3090
Carlsbad, NM 88220

Dear Mr. Hunt:

EEG has reviewed your 11/22/90 responses to our 6/15/90 comments on the Program Plan for the Pretest Characterization of WIPP Experimental Waste and Revision 6.1 of this document (DOE/WIPP 89-025).

We found that you have accepted most of our suggestions in your modification of the document. Where clarifications were sought by us, we are also generally satisfied by your responses. It is recognized, however, that you will have to make more changes to the Plan in order to incorporate the requirements imposed by EPA's conditional approval of the No Migration Petition. Additional requirements may also be imposed by N.M. EID. Even without these additional requirements, a great deal of work remains to be completed.

Your responses to our comments have confirmed the following aspects of the waste experimental program.

1. No decision has yet been made on the location of the wet bin tests and the plan of characterization of waste for these tests has not yet been developed. A discussion of the radiological safety implications to the workers from these tests will not be included in the first addendum to the Final Safety Analysis Report (FSAR).

2. The original plans for waste experiements at WIPP required different kinds of waste from different generator sites in order to obtain meaningful data since the TRU inventory waste forms varied so widely. This position has now been abandoned.

3. Due to "resource limitation," DOE currently has no plans to test for gas generation from waste at waste generation sites other than Rocky Flats Plant (RFP waste is scheduled to arrive to WIPP for testing).

4. Efforts to characterize the waste for alcove tests, and development of justification for the required sample size (to avoid sampling all alcove waste drums), are currently on the back-burner. This, coupled with the slow pace of the alcove seal testing effort, indicates a reduced interest in pursuing the alcove testing program.

Your responses to additional EEG comments (McFarland) are satisfactory. Detailed comments on your responses are enclosed.

Sincerely,

Robert H. Neill
Director

RHN/LC/MKS/mm

Enclosure

cc: Mr. James Bickel, DOE - ALO
Ms. Jill Lytle, Deputy Assistant Secretary for Nuclear Materials, U.S. DOE
Mr. Mark Frei, Chairman, WIPP Task Force
Mr. Leo Duffy, Assistant Secretary, U.S. DOE
Mr. Richard Mitzelfeldt, Director, EID

Response 3.2

Your response indicates that DOE has clearly abandoned a major justification to perform the gas generation tests at WIPP, i.e. that because representative waste from each of the sites have to be assembled at one place.

Response 4

Rev 6.1 defers to the yet to be issued QA Project Plan and still does not specify the applicable DOE orders and other regulations relating to health and safety for the generators.

Response 5

EEG Comment 5 is still valid. It is not clear how the various WAC criteria listed in our comment will be confirmed.

Response 6

This response suggests that the laboratories are apparently not yet equipped for the analytical effort. Furthermore, procedures remain to be written and approved and the analytical operations validated before waste can be opened and repackaged into the bins. Even if some of these activities are pursued in parallel, it is clear that it will take several months before the headspace gas in the first bin is analyzed and ready for shipment to WIPP. Table 6 identifies detection limits components in the headspace gas. For some components the Program Plan requires an order of magnitude better resolution than the results reported in "Waste Drum Gas Generation Sampling Program at Rocky Flats During FY 1988." Furthermore, Table 7 requires quantitative analysis of many volatile organic compounds to as low as 1 part per million by volume. Given the stringent requirements, the Program Plan should cite or contain a detailed discussion of the columns used to perform the analysis and the analytical techniques. That discussion should also contain a detailed description of the statistical methods used to estimate the uncertainty in the composition measurements.

Response 7

Contrary to DOE's assertion in your response, EPA's approval contains stringent conditions for Waste Characterization.