DOE/NMED/EEG
JANUARY 24, 1995 WIPP QUARTERLY REVIEW

49k

TIME	TOPIC	PRESENTER
9:00 AM	OPENING REMARKS REVIEW OF ACTION ITEMS	J. PARKER - NMED
9:20	PROJECT STATUS & OVERVIEW	G. DIALS - DOE
9:45	EEG ACTIVITIES UPDATE REVIEW OF CURRENT ISSUES	R. NEILL - EEG
10:10	STATE WIPP PROGRAM ACTIVITES UPDATE	C. WENTZ - EMNRD J. PARKER - NMED
10:35	BREAK	
10:45	STATUS OF SPM WHITE PAPERS	M. MCFADDEN - DOE
11:10	DRAFT COMPLIANCE CERTIFICATION UPDATE	J. MEWHINNEY - DOE
11:45 - 1:15 PM	LUNCH	
1:15 PM	ENGINEERED ALTERNATIVES STUDY UPDATE	J. MEWHINNEY - DOE
1:45	SOURCE TERM TESTING PROGRAM AT LANL	M. MCFADDEN - DOE
2:15	BIENNIAL COMPLIANCE REPORT	J. MEWHINNEY - DOE
2:45	CONCLUDING REMARKS	J. PARKER NMED
3:00 PM	ADJOURN	

?

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WIPP Quarterly Review
January 24, 1995

Activities Update for NMED's RCRA Permits Program

1. Hazardous Waste Permit Fee

   - Assessed fee to review revised Part B Application required by NMED Secretary's order of 9/2/94.
   - Calculated to reflect anticipated expenses associated with activities over a 40-month period (9/94 - 12/97).
   - DOE will pay fee in phases throughout FY 95 and 96.

2. Permit Application Review Process

   - Stakeholders review informally during draft submittal phase.
   - Review for administrative adequacy revision delivered 5/31/95.
   - Review for technical adequacy after determination of administrative completeness.

3. SPM Stakeholder Meetings

   - Attend all meetings as regulatory observer.

4. EPA Technical Exchange Meetings

   - Attend meetings in-state.
   - Monitor meetings out-of-state via cooperative arrangement.

5. Waste Characterization Issues

   - Attended information exchange meeting with DOE in Albuquerque 11/9/94.
   - Submitted comments on Quality Assurance Program Plan (QAPP) to DOE 12/12/94.

DOE/NMED/EEG

JANUARY 24, 1995 WIPP QUARTERLY REVIEW

NAME	ORGANIZATION	PHONE
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NEW MEXICO
RADIOACTIVE WASTE CONSULTATION TASK FORCE

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Mr. Darren White, Cabinet Secretary (Acting)
N.M. Department of Public ~~Safety~~
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Advisory Members:

Senator Tom Rutherford, Chairman
Representative Robert S. Light, Vice-Chairman
Radioactive and Hazardous Materials Committee
c/o Legislative Council Service
State Capitol Building, Room 311
Santa Fe, NM 87503
986-4600

NEW MEXICO
RADIOACTIVE WASTE CONSULTATION TASK FORCE

The N.M. Radioactive Waste Consultation Task Force, sometimes known as the Governor's WIPP Task Force, is authorized by the *Radioactive and Hazardous Materials Act* [Section 74-4A-2 through 74-4A-14 NMSA 1978]. The membership is comprised of the Secretaries of the Energy, Minerals and Natural Resources Department, Taxation and Revenue Department, Department of Health, Environment Department, Department of Public Safety, and the State Highway and Transportation Department, or their designees. In addition, the Chairman and Vice-Chairman of the joint interim legislative Radioactive and Hazardous Materials Committee, or their representatives, participate as advisory members. The Governor appoints the Chairman of the Task Force.

The primary duties of the Task Force include negotiating on behalf of the State of New Mexico with the federal government in all areas relating to the siting, licensing, and operation of new federal disposal facilities for high-level, transuranic, and low-level radioactive wastes (*e.g.*, WIPP); conducting technical and policy analyses of related issues; recommending legislation to implement the State's policies with respect to new federal disposal facilities; identifying and disseminating information on impacts associated with those disposal facilities; and coordinating any related investigations or studies undertaken by State agencies. The Task Force is also required to meet with the Radioactive and Hazardous Materials Committee of the New Mexico State Legislature and keep them apprised of all actions taken by the Task Force.

SELECTED STAKEHOLDER ISSUES RAISED TO DOE DURING SYSTEMS PRIORITIZATION PROCESS

Issue	Response
1. No chemical adsorption or dual porosity	Agree (until data support otherwise)
* 2. Use independent elicitation	Using UNM experts
3. Assume climate change	Effect of wetter climate being modeled -- water table raised
4. Consider gas solubility in brine	Assuming no solubility -- means higher gas pressures; therefore, bigger impact
5. Consider effect of vertical fractures in Salado	When pressure reaches lithostatic, assuming instantaneous transport
6. Use VOC degradation	Not in model (no data to date; therefore, higher release)
7. Consider criticality after transport to surface?	Assessing potential
8. Consider flooding due to poor seals	Assessing potential of seal cracks
9. Assume borehole plugs degrade	Plugs allowed to degrade in model
10. Assume drill holes near repository	Assuming drill holes near repository
11. Assume subsidence due to mining	Analyzing subsidence due to current mining
12. Increase number of boreholes	Will be considered per EPA guidance
13. Address suitability of site	Performance Assessment directly does this
14. Study impact of brine aquifer	Included in Performance Assessment scenarios
15. Assess impacts of karst channels above site (use tracer)	WIPP has investigated and will document findings
16. Consider seals demonstration	Being considered
17. Consider human intrusion	Being considered in PAs
18. Generator/storage sites' buried waste threatens environment	HQ-EM will address

11/9/94

SYSTEM PRIORITIZATION METHOD
and
PERFORMANCE ASSESSMENT

Optimizing Elicited Data

Concerns relating to methodologies proposed for elicitation of data from expert resources have been raised by stakeholder participants in the Carlsbad Area Office (CAO) review of the Waste Isolation Pilot Plant (WIPP) System Prioritization Method (SPM) and the WIPP performance assessment (PA).

Prior to initiating disposal operations at WIPP, the U.S. Department of Energy (DOE) must comply with U.S. Environmental Protection Agency (EPA) regulations (40 CFR Part 191) which require DOE to assemble a performance assessment model to project the probability of release beyond the repository boundary for several regulated materials slated for disposal at WIPP. A reasonable expectation of repository behavior must be forecast for a 10,000 year period.

The SPM is a decision support system which, when applied to the performance assessment model, isolates discrete components from the PA and yields information related to cost and contribution to regulatory compliance for each component. DOE is employing the SPM in order to determine the most efficient program of experimentation which can support a successful compliance application to the EPA within assumed funding constraints and its own planning milestones.

This document is intended to provide constructive thought on improved mechanisms for data elicitation to the New Mexico Institute for Public Policy for use by Sandia National Laboratories staff engaged in performance assessment modeling and in preparation of the System Prioritization Method for DOE.

OVERVIEW

Mathematical models, including performance assessments, can be characterized by their degree of *representativeness*, a quality which describes how closely a model represents the behavior of the system it mimics. The most representative models are those which receive precisely the same data as their real-world counterparts, behave in precisely the same manner as their counterparts and, consequently, deliver the identical result (albeit with a numeric value). This is an ideal state for most complex models and is an even more elusive goal for predictive models like performance assessments. However, considerable opportunity exists in design of these two modeling programs (System Prioritization and Performance Assessment) to maximize their representativeness.

The result produced by any model is only as reliable as the most uncertain value included in the model. The representativeness of a model cannot exceed the uncertainty embodied in its most speculative input.

SYSTEM PRIORITIZATION METHOD

The system prioritization method isolates discrete components from the PA and yields information related to cost and contribution to regulatory compliance for each component. Some empirical data which is intended for use by the PA is not yet mature, and estimates of likely experimental outcomes must be gathered in order to attempt to round out as complete a PA as can be assembled at this time.

OBJECTIVE

Current efforts to elicit these data from principal investigators are undocumented as of this writing and therefore do not present a concise form which can be commented upon.

The objective of this exercise is to ensure practices chosen to guide the elicitation of experimentalists for the estimation of likely experimental outcomes for use in the SPM are uniform and provide quantities which are generated in a similar manner. *This activity should yield a standardized method for eliciting probability values from experimentalists and standardized treatment of those elicited values when they are presented to the SPM.*

PERFORMANCE ASSESSMENT

The WIPP performance assessment includes two types of probabilistic values: probabilities generated by empirical sources, such as experimentation; and probabilities which are opined by individuals with specialized knowledge of processes to be modeled. In a predictive model, empirical data is generally more representative of real-world circumstances, as it is actually rendered by a visible, measurable action which can be reproduced.

Because it is a mathematical model, the WIPP performance assessment processes these distinct classes of numeric values in the same fashion, and accordingly, its results are likely to exhibit the (higher) uncertainty of the elicited data. This bias effect comes from the fact that opined data cannot be known in the same sense that experimentally derived data is known.

40 CFR Part 191 circumscribes the methodology employed in the WIPP performance assessment and acknowledges that as a predictive model, it must only provide a reasonable expectation of the probability of future releases of regulated materials from the repository. It is conceivable that results produced by the model would retain uncertainty which exceeds the degree of accuracy

requested by the regulation. That is, while the model may yield values indicating compliance, the statistical likelihood that the WIPP repository will actually behave in the predicted manner may be minimal, due to the inherent uncertainty of the elicited input values. Conscientious structure of probability elicitation and scrupulous attention to elicitation practice should ensure these values are as similar and, therefore, as useful to the model as possible.

OBJECTIVE

Numerous SNL documents (Hora *et al., 1991*; Trauth *et al.*, 1993) relate a conscientious effort to empanel and manage qualified resources for elicitation of appropriate values. These processes make strong strides toward configuring processes which are capable of yielding critical outcomes, but largely neglect homogeneous generation and treatment of probabilities produced by empaneled resources.

For example, the SNL group convened to consider future human intrusion into the WIPP divided a universe of 16 panelists into 4 teams. Values were not elicited from the teams in the same manner, and probabilities reported are virtually impossible to compare to one another in a consistent manner. (See pgs. IV3 and V5-8, SAND903063/UC-721)

The SNL expert panel convened to provide expert judgement on markers to deter intrusion into the WIPP gathered 13 individuals and divided them into teams of 6 and 7 members each. Results were reported by individual members of one team and as a group for the other team. (See pgs. 5-1 to 5-10, SAND92-1382/UC-72)

While these elicitations were organized and conducted in what can only be described as an excellent and scientifically sound manner, they were not intended to provide guidance to a determination of regulatory compliance in the context of current understanding.

The objective of this exercise is to identify standardized practice for elicitation by any expert resources which may be requested to supply opined values for use in subsequent performance assessment iterations.

Sandia National Laboratories is requested to examine expert elicitation practices employed to date for the PA and to assess opportunities to standardize those practices in order to assure no inconsistency in elicitation structure or interview methodology which can conscientiously be removed is employed in future elicitations. *This undertaking should yield a standardized approach to the empanelment of experts and standardized methods for eliciting probability values from expert panels.*

SOURCE: James T. Firkins, Co-Coordinator, N.M. Radioactive Waste Consultation Task Force, October 1994.

Jan 24, 1995

46th WIPP Quarterly Mtng

George Dials Project Status

BECR, Baseline for PBWAC on schedule

Upcoming - NEPA Draft Compliance Package 3/95

Inventory Definition to DOE 3/95

Remote Handled Strat. (Draft to EEG 2/17/95)

NMVP (undisturbed, operational phase) 5/95

RCRA Pt B 5/95

Remote Handled Study 10/95

→ Purpose is to engage EPA early in discussions. DOE initiative. SPM will identify activities to produce data for PA. Trying to account for recently issued Proposed 194 Compliance regs.

Reiterate - SPM is not PA, nor does it replace it.

SPM - white papers being issued, future meetings considered. Results due March 95.

Paul Brewer (new) Pgm Mgr from Sandia for WIPP is now in Carlsbad. More staff changes. Les Shepherd will be Tech Prog Mgr starting 2/95 (Coming from Yucca Mtn)

Budget - 1% cut (FY96 $172.7M, FY95 $174.3M)

Already negotiated budgets with SNL/WID, anticipated staff reduct

Uncertain what will happen in Congressional budget deliberations

Budget for 5 years, uncertain beyond FY97

Will Review DDP after SPM-2. Questions about SPM personnel directed to Bob Bills or Paul Brewer

Bob Neill SPM Position Papers - didn't really state positions. EEG comments on papers at next week.

Source Term Testing - no usable data for 2 years.

RH issue - glad it's being confronted, but much to be done. When will shipping cask design be submitted to NRC. Where will it be emplaced.

How are decisions made & documented? Backfill, retrievability, ~~etc~~ etc.

Opportunities to comment on draft Compliance Criteria 19,

Lokesh Revisit recommendations made last Jan 12, 1994

DOE letter last week abandoning 5 year retrievability, or at least the intention of retrieving waste. Gen. said due to operational shift from test + storage to final disposal. Will be subject to public scrutiny during RCRA/NMD process. SEIS will be updated to reflect change to disposal.

Chris Task Force Stats - with new gov, all cab secr. have changed. Jennifer A. Salisbury. No chair yet. Next meeting May or June (after legislature session) Activities - 2 yr funding agreement. Monies distributed throughout the state based on need, to maintain transp. issues. Suggested workshops prior to public hearings for draft compli.

* George stressed importance of ORA mtg Feb 14-16 in DC. Concerns about stakeholder meetings - left out yesterday, Late receipt of NTPO Program Plan + Charter. No action on RH TRU study, which should be done in consultation with state Gov - nothing done yet anyway.

Jim Firkins - concern over standardized elicitation

→ DOE promised report at next meeting on process

McFadden Status of SPM Position Papers.

Committed to using most conservative. Viewgraphs list # of comments received for each paper. Expect revisions & presentation by March 95. Request clear, uniform summary for each paper, outlining positions & conclusions

Jim M. Draft Compliance Application

92 PA was never meant as part of compliance document or demonstration. Promise to EPA - no surprises in application

(1) CSR

(2) White Papers → PTB → DCCA - FCCA

March application will not include disturbed conditions (updated summer 95). (2) QA on data/software for PA (3) Engineered alternatives, (4) PBWAC

No committment from EPA for review schedule. DOE thinks ~~they~~ EPA responds best under pressure, since LWA requires EPA to finalize rule within 1 yr of FCCA

Bob Neill - need to ensure all aspects of what EPA requires (or expects) in application is spelled out somewhere - promulgated, etc.

Jim M. Engineered Altern. Cost/Benefits Study - additional EA's beyond, say, shaft seals. DOE def EA = modification to waste form or a man-made structure, barrier, device, system, or process that substantially improves performance of a disposal system

EA's will only appear in Project Tech Baseline after approval or selection.

Process or mechanism for evaluation probably won't be based on informal expert judgment. DOE decides which EA's to implement, may use SPM to determine which to use. Only then will they be incorporated in PA. Public involvement throughout process.

McFadden Actinide STTP

*Action item - George to determine when results will be released to public. Some data expected from equilibrium conditions within 6 months, others not ready for over 2 years. Argument over timing of test & availability of data w/respect to submission of final Compliance Act.

Open House in late March / April

Beth Bennington BECR

Deadline April 30, 1995 for comments from EPA, State

Draft Compliance Certification Application

EEG/NMED Quarterly Meeting
January 24, 1995

Jim Mewhinney
Carlsbad Area Office

Topics

- Draft Compliance Certification Application

  - Purpose and Scope
  - Format and Content
  - Schedule

Purpose

- Provide the EPA with a "head start" on the review process
- Begin technical discussions now

Scope of Document

- 40 CFR 191- Disposal Standards for Transuranic Wastes
  - Provide compliance discussion relative to undisturbed repository conditions
- Proposed 40 CFR 194-Criteria for Certification of WIPP with 40 CFR 191
  - Until promulgated, DCCA will address primarily the general content requirements

Augmented / updated as needed

Format

- Defined by DOE-CAO Format and Content Guide (DOE/CAO-94-2004)

may be amended to reflect

- Final certification package will follow 40 CFR 194 guidance

General Content

- Site Description
- Facility Description
- Operational Environmental Monitoring Programs
- Quality Assurance/Quality Control Programs
- Active and Passive Institutional Controls
- Performance Assessment Methodology
- Scenario Selection and Screening Processes
- Waste Characterization
- Compliance with Other Environmental Laws

Some chapters to be detailed, near final.
others will initially be sketchy

Content- Site Description

- Rock Chemistry
- Site Geology
- Natural Resources
- Surface-water and Groundwater Hydrology
- Soil Characteristics
- Seismology

Content- Facility Description

- Emergency Response
- General Facility Design
- Hoist Systems
- Underground Facilities
- Waste Management Support Systems
- Seals and Closure Systems
- Closure Plans

Content- Environmental Monitoring

- Radiological Program

- Non-Radiological Program

Content- QA/QC Programs

- Evolution of QA Program
- QA Requirements
- Implementing Documents

- QA Activities Related to:
  - Site Characterization
  - Experimental Programs
  - Numerical Codes
  - Waste Characterization and Acceptance
  - Repository Design and Construction
  - Repository Operation
  - Monitoring Programs
  - Repository Closure

Content- Institutional Controls

- Active Controls
  - Requirements and Objectives
  - Design Criteria
  - Monitoring
- Passive Controls
  - Requirements and Objectives
  - Design Concept
  - Records Management

Content- PA Methodology

- Characterization of Uncertainties
- Monte Carlo Analysis Techniques

Content- Scenario Selection Process

- Scenario Development History

- Development of Features, Events, and Processes

- Screening Criteria and Processes

Content- Waste Characterization

- Details Knowledge of Waste Forms

  - Baseline Inventory Report

    starting with all assumed waste,
    not "phased" inventory

Content- Other Environmental Laws

- Status of Compliance with Environmental Safety Regulations (other than "disposal" regulations)

  - Clean Air Act
  - Safe Drinking Water Act
  - Toxic Substances Control Act
  - Endangered Species Act
  - CERCLA
  - NEPA
  - RCRA
  - Atomic Energy Act
  - *(Note: This is not an all-inclusive list of "other laws")*

Items Not Included

- Disturbed repository performance calculations
  - Provided by SPM-2 in late- March 1995
  - Will be added in the Summer 1995 timeframe
- Detailed description of data and software quality validation efforts currently in-progress
- Engineered alternatives benefit/detriment study
- Performance-Based Waste Acceptance Criteria
  - Output of SPM-2

Schedule

Activity	Milestone
Draft to EPA	March 31, 1995
EA Benefit/Detriment Scoping Report Complete	March 31, 1995
SPM-2 Information Available (Decisions by Dials)	May 31, 1995
Additions to March Submittal	Summer 1995
EA Benefit/Detriment Report Complete	September 30, 1995
Additional SPM Results Available (if necessary)	December 31, 1995
Quality Assurance Information Relative to Data Quality	December 31, 1995
Final Submittal to EPA	December 31, 1996

STATUS OF WIPP SPM POSITION PAPERS

Michael H. McFadden
Experimental Programs Branch Chief

EEG/NMED QUARTERLY MEETING

Santa Fe, New Mexico
January 24, 1995

195L:6666

DRAFT OF DETAILED PROJECT POSITION PAPERS HAVE BEEN COMPLETED IN TEN AREAS

Title	Stakeholder Meeting
• Performance Assessment Methodology	August, 94
• Repository Scenario Development	August, 94
• Salado Formation Fluid Flow and Transport Containment	September, 94
• Disposal Room Modeling	October, 94
• Repository Sealing	October, 94

195L:6666a

DRAFT OF DETAILED PROJECT POSITION PAPERS HAVE BEEN COMPLETED IN TEN AREAS

(cont.)

Title	Stakeholder Meeting
• Rock Mechanics	October, 94
• Actinide Source Term	December, 94
• Gas Generation Source Term	December, 94
• Hazardous Constituent Source Term	December, 94
• Non-Salado Flow and Transport	January, 95

195L:6666b

POSITION PAPERS AND COMMENT RESOLUTION WILL BE COMPLETED IN MARCH 1995

Comments Received (cont.)

- Position paper: Disposal Room and Cuttings Model
  - Project internal 140
  - New Mexico Attorney General 50
- Position paper: Non-Salado Hydrology
  - Project internal 675

195R:6667c

POSITION PAPERS AND COMMENT RESOLUTION WILL BE COMPLETED IN MARCH 1995

Comments Received (cont.)

- Position paper: Scenario Screening
  - EPA 4
  - EEG 7
  - New Mexico Attorney General 42
- Position papers: PA Methodology/Actinide Source Term/Gas Generation/Hazardous Component Source Term
  - Combined comments over 300

195R:6667d

ACTINIDE SOURCE-TERM TEST PROGRAM

NMED/EEG Quarterly

Mike McFadden

Experimental Programs Branch Chief

January 25, 1995

SOURCE TERM TEST PROGRAM

Purpose:

- Confirm the predictive capability of Actinide Source Term Model using actual TRU waste
- Confirm the actinide bearing colloids model

195R:6661a

THE ACTINIDE SOURCE-TERM WASTE TEST PROGRAM (STTP)

The STTP consists of:

- 15 Drum-scale tests with heterogeneous wastes (combustibles, lab wastes, metals, etc.)
- 33 Liter-scale tests with homogeneous wastes (sludges, cemented or solidified wastes, pyrochemical salts, etc.)
- 6 Pressurized liter-scale tests at 60 bar with homogeneous wastes

195R:6661b

PROJECTED STTP START-UP SCHEDULE

FONSI and EA Finally Approved
January ~~20~~ 24, 1995

Finding of No Significant Impact

Shipment of Waste to WCRRF

From TA-54 Inventory	1/25/95
From TA-55 Inventory (Pyrochemical Salt)	1/25/95
From CMR Building (Solidified Organic Sludge)	1/27/95

1/30/95	Commence Core Drilling of Homogeneous Waste	Commence Characterization of Heterogeneous Waste	3/6/95
2/28/95	Complete Loading of Liter-Scale Test Containers (39 each)	Complete Loading of Drum-Scale Test Containers (15 each)	4/8/95
3/3/95	Add Brine to Liter-Scale Test Containers	Add Brine to Drum-Scale Test Containers	4/12/95
3/6/95	Transfer Liter-Scale Test Containers to CMR	Transfer Drum-Scale Test Containers to CMR	4/14/95
3/9/95	Add Inoculum to Liter-Scale Test Containers	Add Inoculum to Drum-Scale Test Containers	4/17/95
3/10/95	Configure Liter-Scale Test Containers in Environmental Enclosure	Configure Drum-Scale Test Containers in Environmental Enclosure	4/19/95
3/13/95	Commence Liter-Scale Tests at 30 degrees Celsius	Commence Drum-Scale Tests at 30 degrees Celsius	4/24/95
3/20/95	Commence Sampling Liter-Scale Test Containers	Commence Sampling Drum-Scale Test Containers	5/8/95
3/31/95	Develop First Preliminary Data Package for Liter-Scale Tests	Develop First Preliminary Data Package for Drum-Scale Tests	5/19/95
4/28/95	Complete First Approved Liter-Scale Data Package	Complete First Approved Drum-Scale Data Package	6/19/95

195R:6661d

STTP FUTURE ACTIVITIES

- Data packages will be completed every four months
- Open house will be held in April

Experiment will continue for 5 years

(1/00)

195R:6658e

Engineered Alternatives Cost/Benefit Study

Program Overview

EEG/NMED Quarterly Meeting
January 24, 1995

Jim Mewhinney
Carlsbad Area Office

PROGRAM OVERVIEW

ENGINEERED ALTERNATIVES
Cost/Benefit Study

January, 1995

ENGINEERED ALTERNATIVES
Cost/Benefit Study

- **Driver**

  - Understanding between the DOE and EPA - Based on issues raised by NACEPT and discussions between Jill Lytle of DOE and Margo Oge of EPA-ORIA

  - Selection of additional Engineered Alternatives for assurance, beyond the quantitative requirements, will be made with full knowledge of system wide impacts including

Benefits,		Costs,
Detriments,	and	Schedule

ENGINEERED ALTERNATIVES
Cost/Benefit Study

Regulatory Comparison
Global

COMPLIANCE	**ASSURANCE**
A QUANTITATIVE REQUIREMENT	A QUALITATIVE REQUIREMENT

ENGINEERED ALTERNATIVES
Cost/Benefit Study

Regulatory Comparison
Objectives

COMPLIANCE	**ASSURANCE**
A QUANTITATIVE REQUIREMENT	A QUALITATIVE REQUIREMENT
Assessing Compliance with Containment Requirements	Improving Performance Reducing Uncertainty
Binary Compliance/Non-Compliance	Help Assure that the Desired Level of Protection is Achieved

ENGINEERED ALTERNATIVES
Cost/Benefit Study

Regulatory Comparison
Features/Aspects

COMPLIANCE	ASSURANCE
A QUANTITATIVE REQUIREMENT	A QUALITATIVE REQUIREMENT
Performance Assessment	Active Institutional Controls Long-Term Monitoring Passive Institutional Controls ✷ Engineered Barriers Consideration of the Presence of Resources Removal of Waste

ENGINEERED ALTERNATIVES
Cost/Benefit Study

Regulatory Comparison
General Approach

COMPLIANCE	**ASSURANCE**
A QUANTITATIVE REQUIREMENT	A QUALITATIVE REQUIREMENT
Performance Assessment	✷ Engineered Barriers
	Engineered Alternatives Cost/Benefit Study

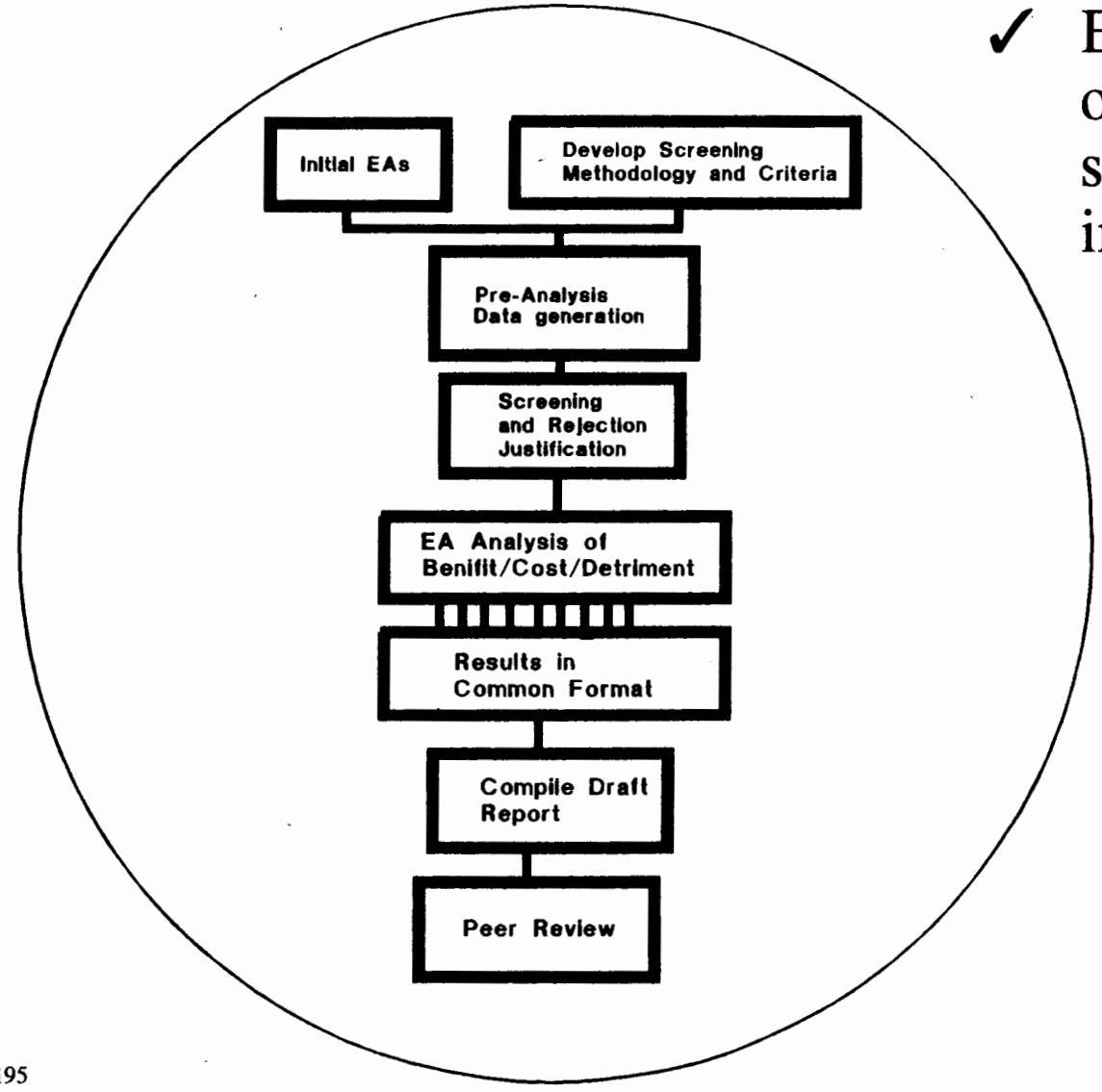
ENGINEERED ALTERNATIVES
Cost/Benefit Study

- Definition (original from DOE)

  - Engineered Alternative

    A modification to waste form or a man-made structure, barrier, device, system, or process that substantially improves the performance of a disposal system

ENGINEERED ALTERNATIVES
Cost/Benefit Study
Process Overview



✓ Entire process open to stakeholder input

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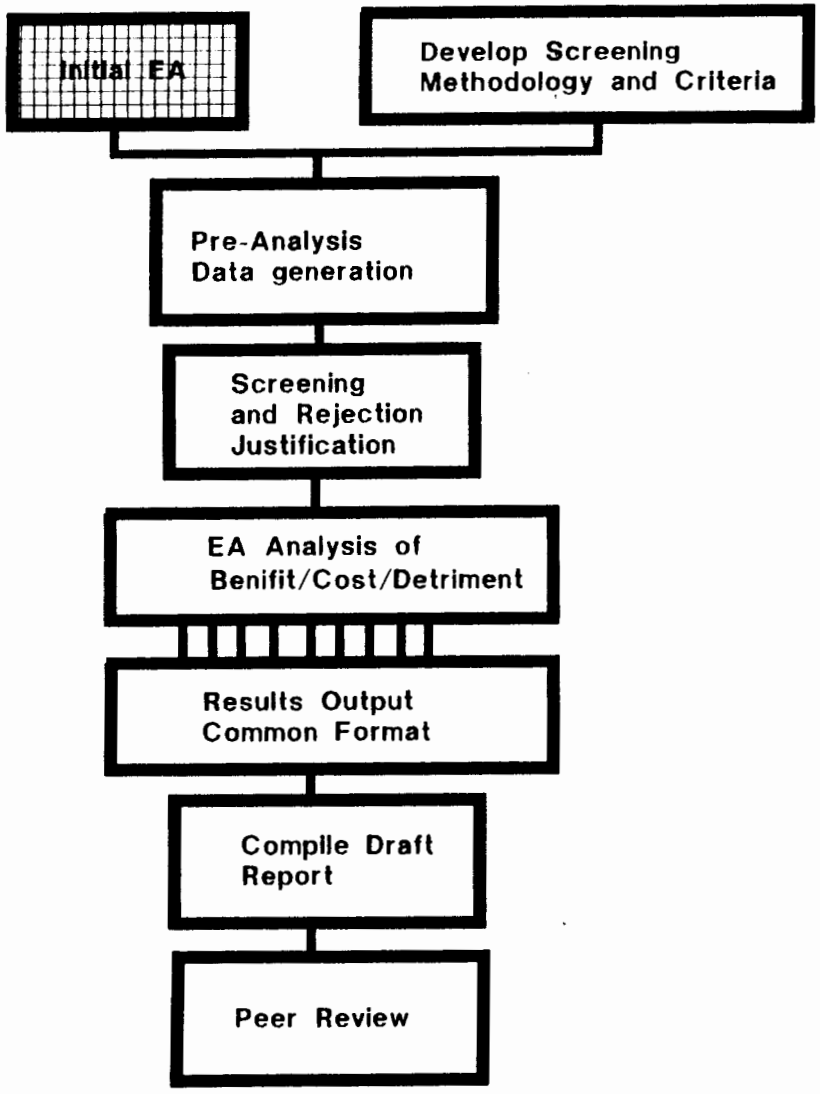
ENGINEERED ALTERNATIVES
Cost/Benefit Study
Description of Technical Approach

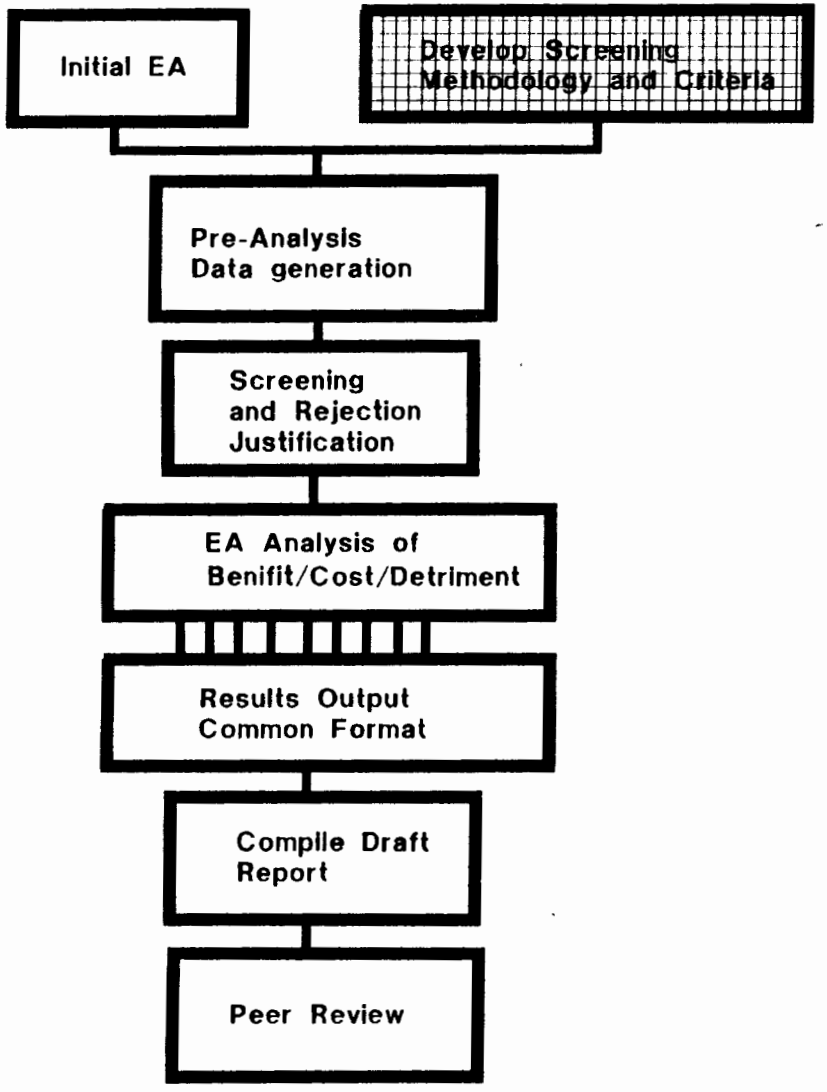


- **Determine candidate Engineered Alternatives**

Sources for initial candidate EAs:

- Those under consideration in SPM2
- 1991 Engineered Alternatives Task Force - Final Report (EATF)
- Expected input from the EPA and stakeholder exchanges

ENGINEERED ALTERNATIVES
Cost/Benefit Study
Description of Technical Approach (contd.)



- **Develop screening methodology and criteria**

1. Develop methodology

- Approach based on 1991 EATF
- Develop EA Rejection Methodology

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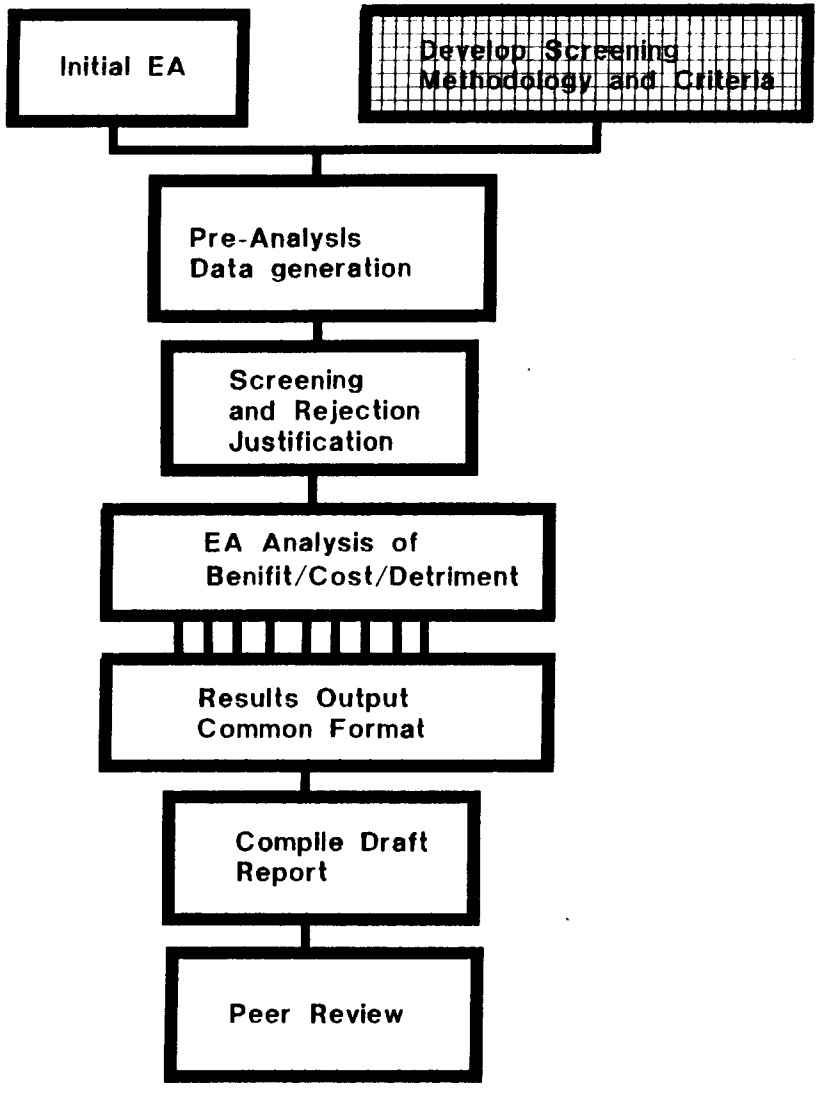
ENGINEERED ALTERNATIVES
Cost/Benefit Study
Description of Technical Approach (contd.)



- **Develop screening methodology and criteria (contd)**

2. Determine screening factors

For example:

- Cost/Benefit.
- Status of Technology.
- Knowledge of critical/sensitive performance parameters.
- Contrary to the Agency's objective of protecting human health and the environment ?
- Other.

Or likely a combination of the above

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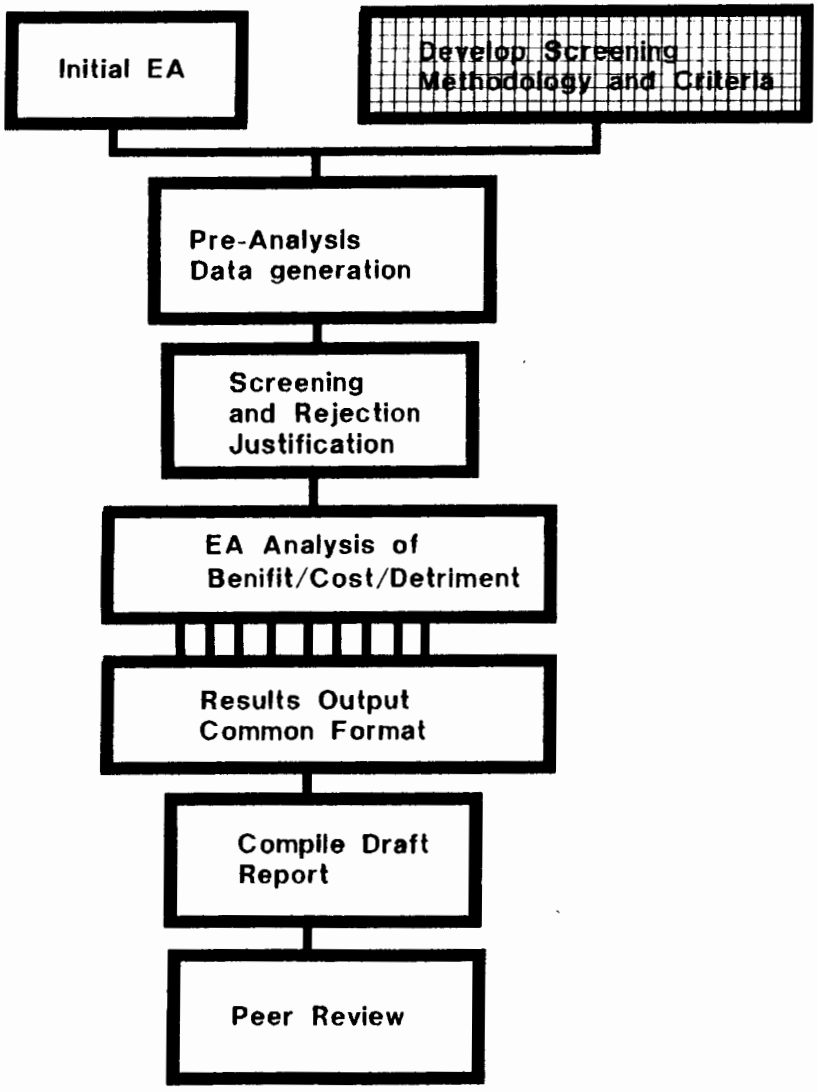
ENGINEERED ALTERNATIVES
Cost/Benefit Study
Description of Technical Approach (contd.)



- **Develop screening methodology and criteria (contd.)**

3. Determine screening limits of developed criteria

- Approach similar to 1991 EATF
- Modifications that will accommodate new or different criteria

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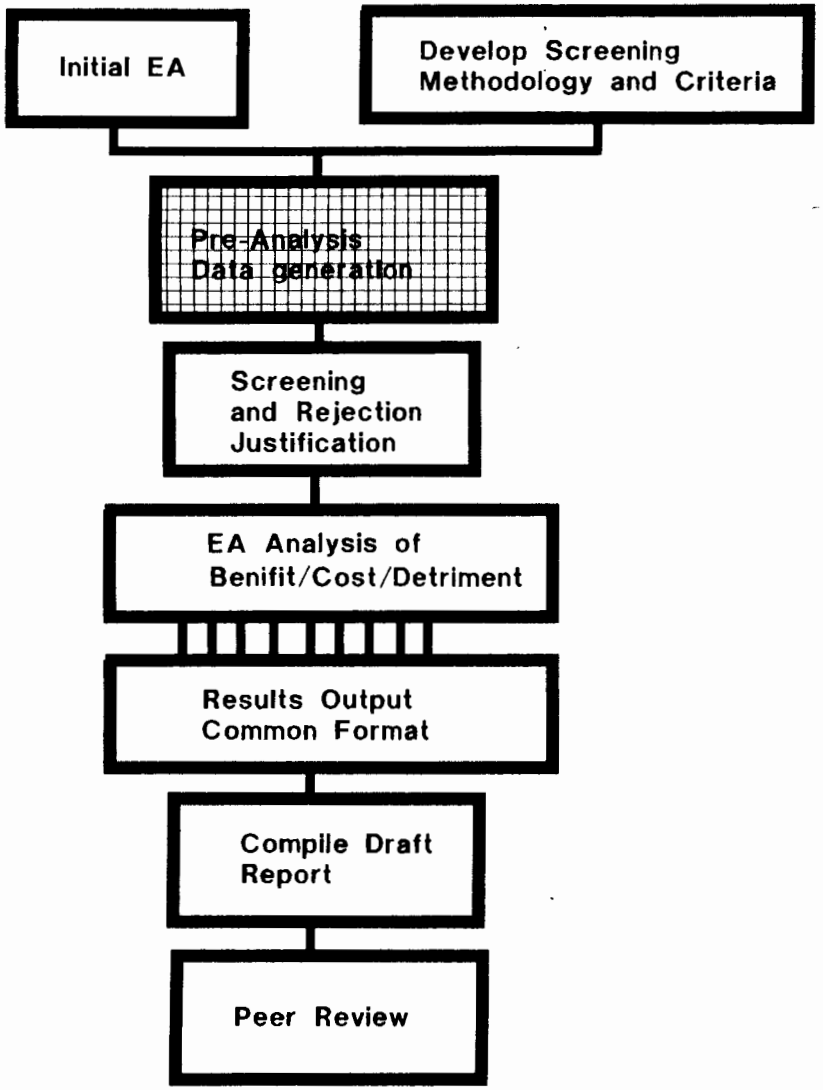
ENGINEERED ALTERNATIVES
Cost/Benefit Study
Description of Technical Approach (contd.)



- **Pre-analysis Data Generation**
  - Governed by criteria under consideration.
  - Used to screen selected EAs.

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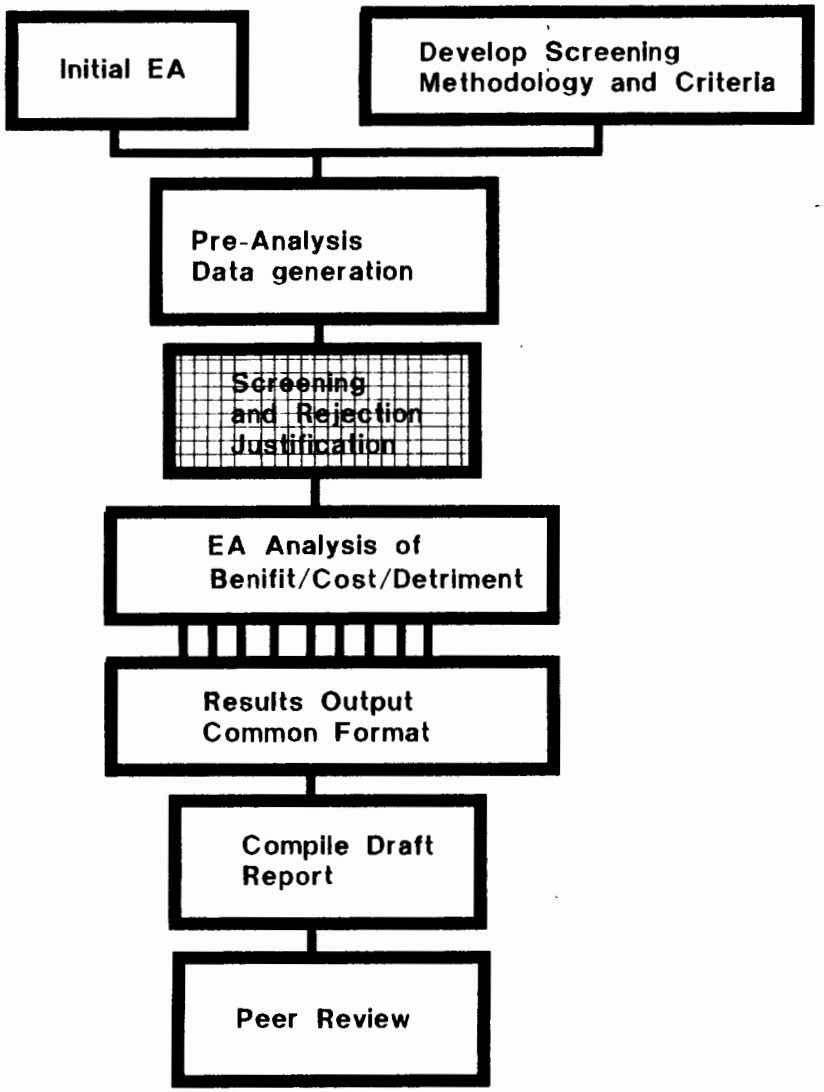
ENGINEERED ALTERNATIVES
Cost/Benefit Study
Description of Technical Approach (contd.)



- **Perform Screen and document justification**

  - Apply criteria to information for candidate EAs.
  - Document justification for exclusion of EAs for further consideration and analysis.

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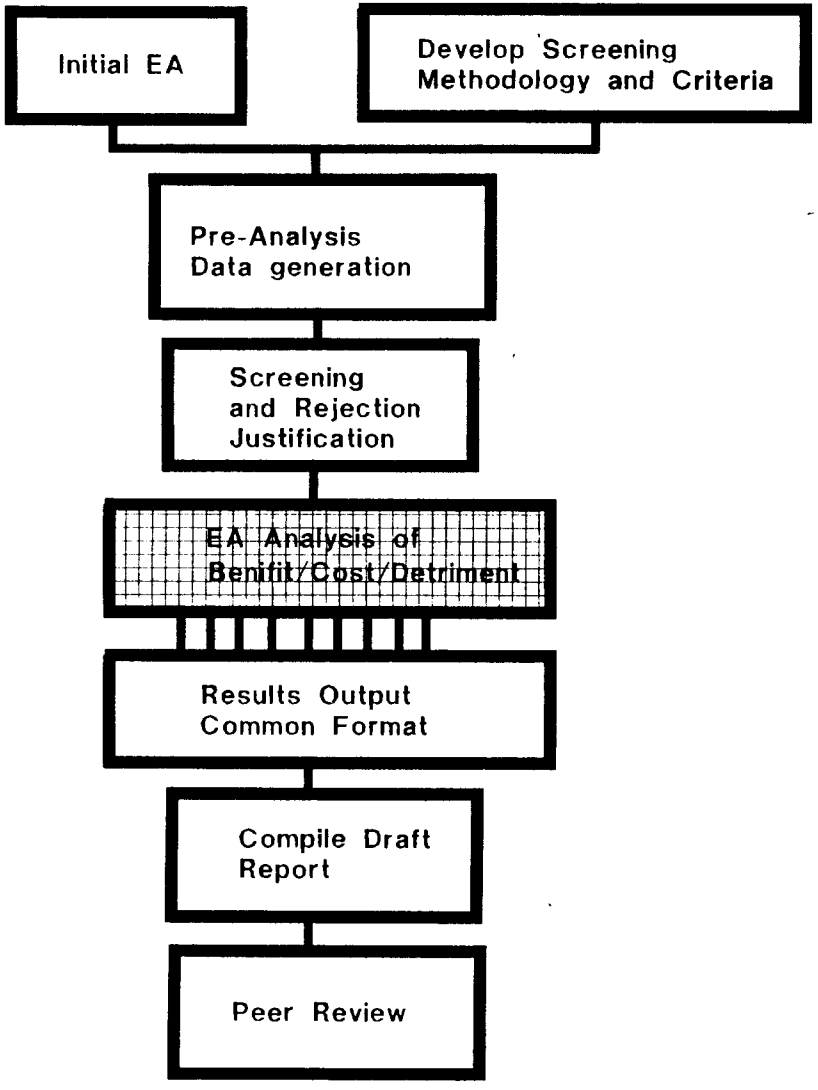
ENGINEERED ALTERNATIVES
Cost/Benefit Study
Description of Technical Approach (contd.)

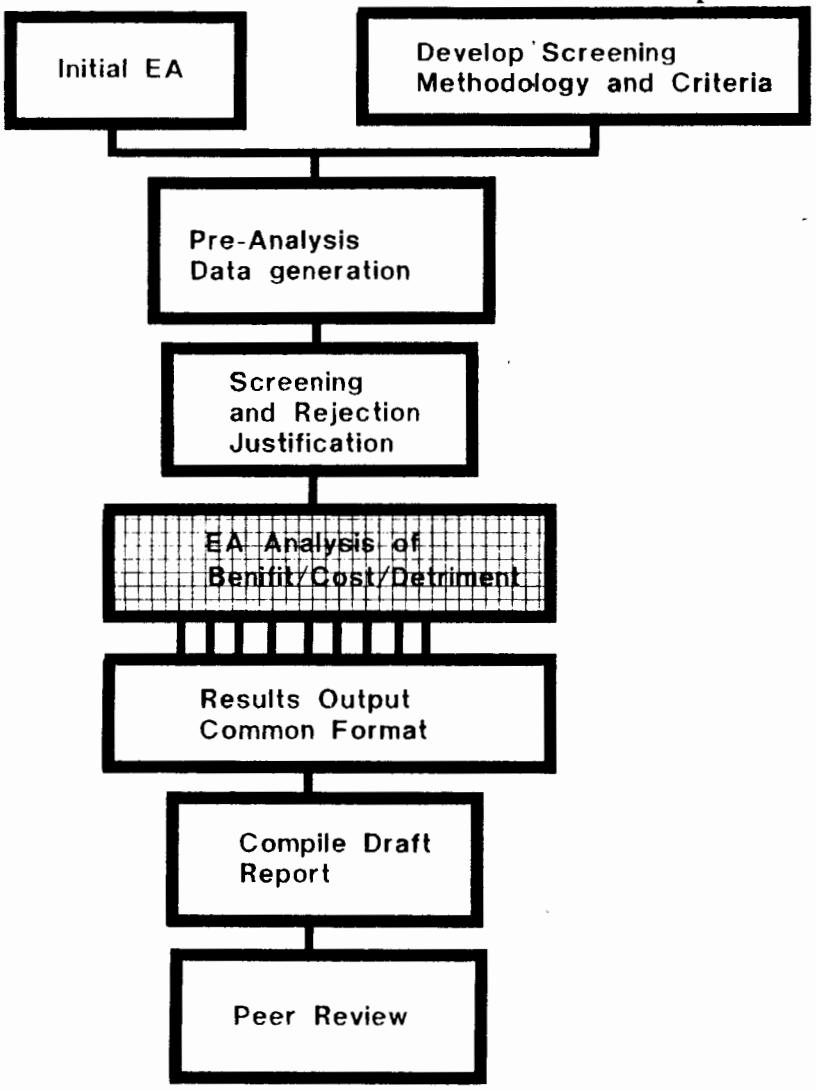


- **Analysis for each EA will estimate impact of that EA on these factors**

  - Water/waste movement toward accessible environment
  - Occupational exposure
  - Removing waste from disposal system
  - Transportation risk
  - Compliance assessment uncertainty
  - Public confidence in disposal system performance
  - Total system costs
  - Other waste disposal programs
  - Consequences of human initiated processes and events.

☆ In the analysis of EAs, publicly held meetings are the vehicle for assessment of the increased or reduced public confidence in the performance of the repository

ENGINEERED ALTERNATIVES
Cost/Benefit Study
Description of Technical Approach (contd.)



- **Analysis will consider each of these conditions**

  - Existing waste already packaged
  - Existing waste not yet packaged
  - Existing waste in need of re-packaging
  - To-be-generated waste

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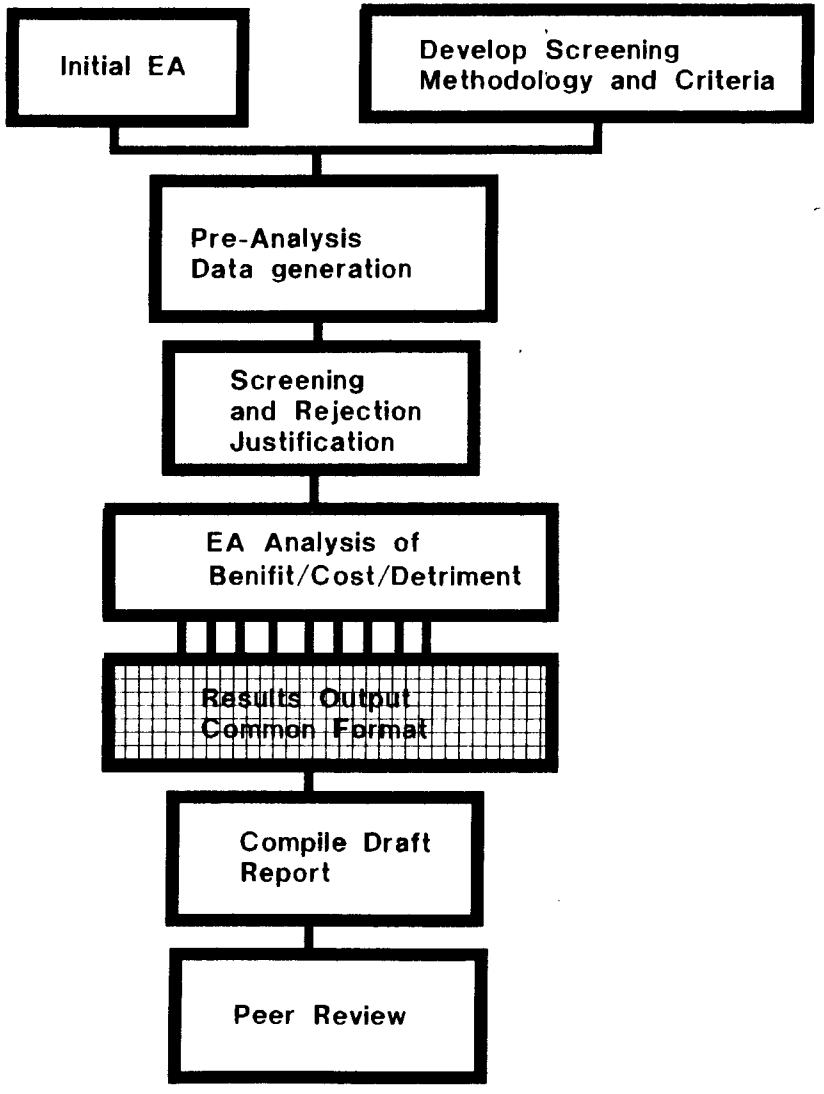
ENGINEERED ALTERNATIVES
Cost/Benefit Study
Description of Technical Approach (contd.)



- **Formatted Output**

- A common format of the output will be defined for each of the EA factors

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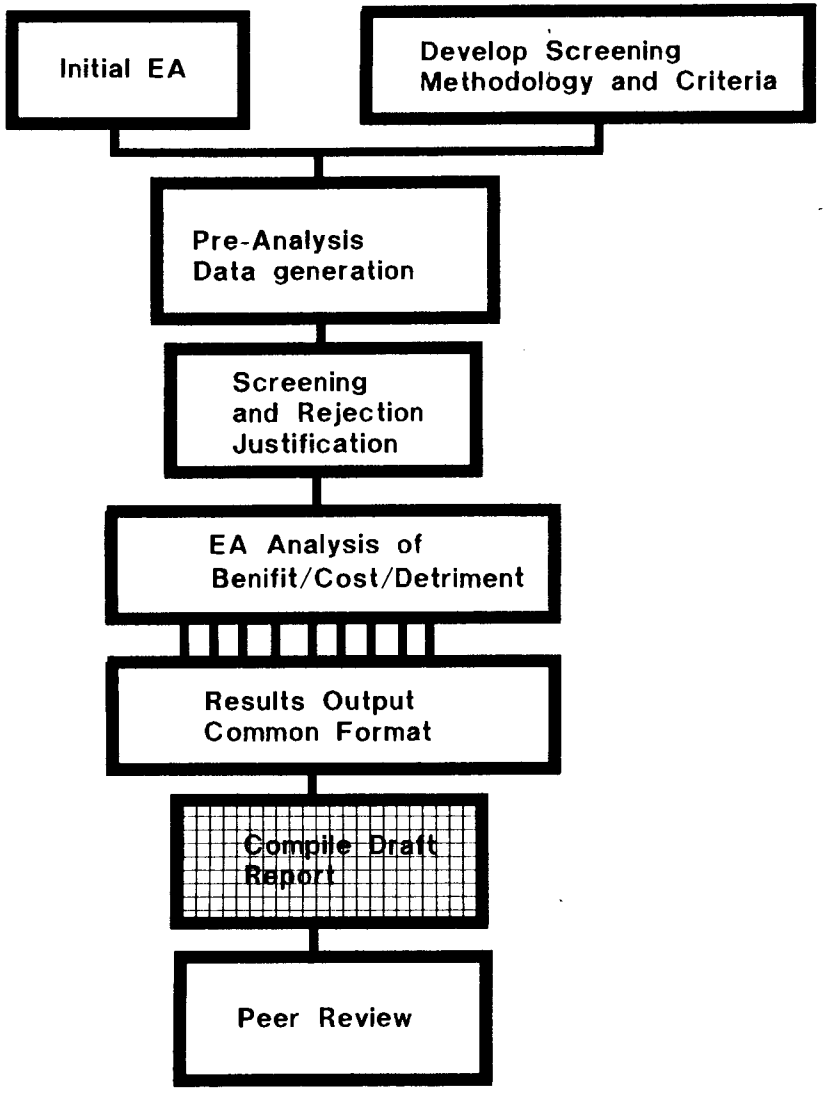
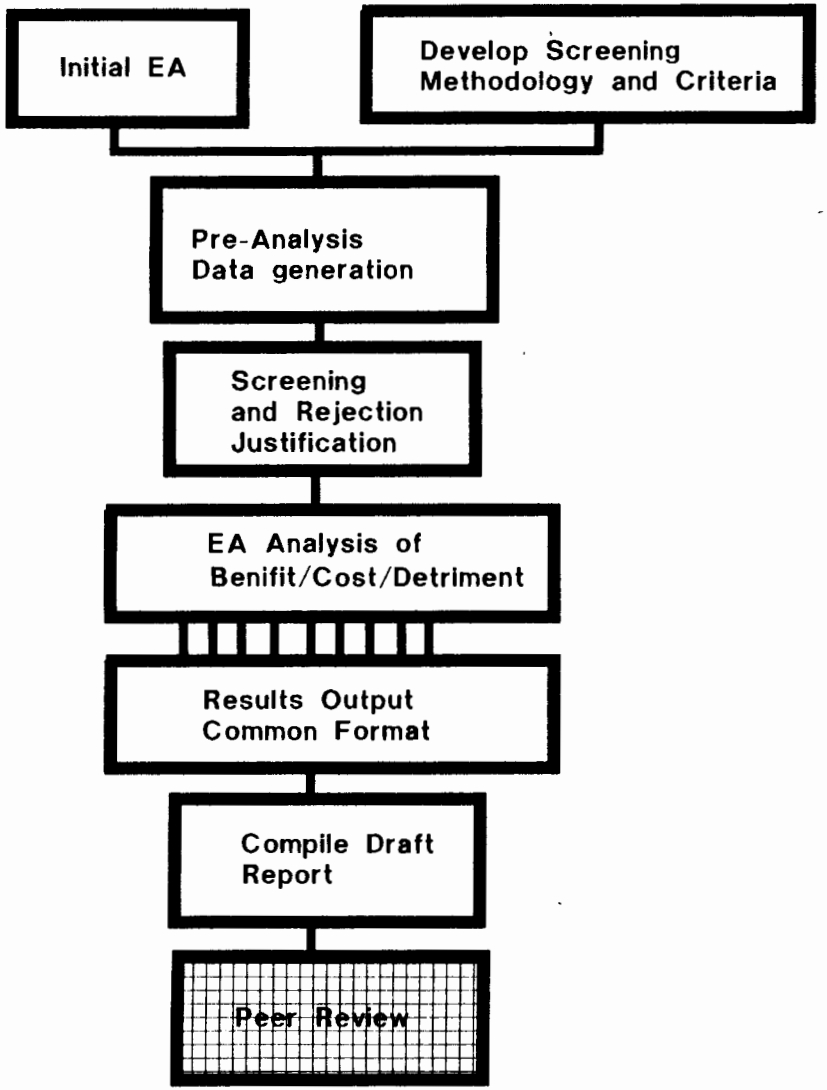
ENGINEERED ALTERNATIVES
Cost/Benefit Study
Description of Technical Approach (contd.)



- **Compile draft report**
  - Results of analysis for all EAs analyzed
  - Information will be amenble to comparison

ENGINEERED ALTERNATIVES
Cost/Benefit Study
Description of Technical Approach (contd.)



- **Peer review**
  - An appropriate panel will be identified and retained for review
  - Draft report will be submitted for peer review.
  - ☆ The DOE uses the National Academy of Science for most peer reviews

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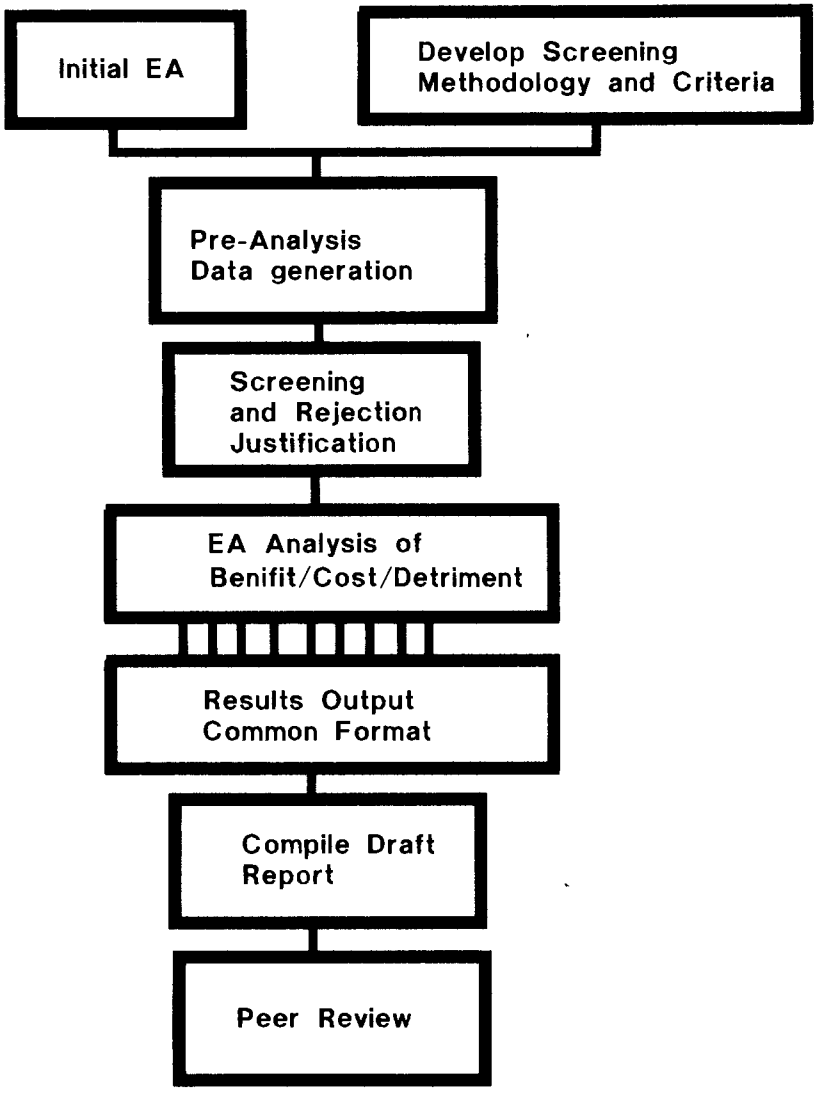
ENGINEERED ALTERNATIVES
Cost/Benefit Study
Milestones & Schedule



- Program Overview to EPA Jan 1995
- Stakeholder Meeting - Mid March
- Scoping Report - Mar 31, 1995
- Stakeholder/EPA input to EA program and candidate EAs - May 1, 1995
- Screen EAs May 1 - 15, 1995
- EA Analysis Complete - Aug 1995
- Draft Report Complete - Sep 29, 1995
- DOE Review Complete - Jan 1996
- Peer Review Complete - May 1996

ENGINEERED ALTERNATIVES
Cost/Benefit Study

- **Summary**

  - System Prioritization Methodology (SPM) will indicate the potential usefulness of engineered alternatives to meet **quantitative requirements**

  - Selection of an engineered alternative for **assurance beyond the quantitative requirements** will be made with full knowledge of system wide impacts including

    Benefits, Costs,
    Detriments, and Schedule

  - This study provides the technical basis for making this decision for assurance

EEG/NMED/NMEMNRD

49th Quarterly Meeting

George Dials, Manager
Carlsbad Area Office

January 24, 1995

THE CARLSBAD AREA OFFICE

- On schedule and focused
  - DDP milestones
  - Draft compliance application
  - SPM
  - RCRA Part B
- On budget

195R:6665a

ON SCHEDULE

DDP Milestones Completed

- Biennial Environmental Compliance Report
  - Completed: 10/27/94
- Preliminary Baseline Assumptions for Performance-Based Waste Acceptance Criteria
  - Completed: 10/31/94

195R:6665b

ON SCHEDULE

Upcoming Milestones

• Draft Compliance Package to EPA	3/95
• Inventory Definition to Draft Compliance Package	3/95
• Remote-Handled Strategy	3/95
• No Migration Variance Petition to EPA	5/95
• Revised RCRA Part B to NMED	5/95
• Remote-Handled Study	10/95

195R:6665c

RH STRATEGY

March 1995

- Provides CAO's approach to RH waste management
- Describes linkages between generator sites, packaging/transportation, and WIPP disposal
- Documents process to ensure RH wastes are effectively and efficiently disposed
- Will be provided to EEG for review, February 17, 1995

195R:6665I

RH STRATEGY COMPONENTS

- Strategy for near-term RH waste disposal
  - Defines mechanics to ensure RH waste is available for disposal in June 1999
- Strategy for long-term comprehensive RH waste disposal
  - Defines process to develop optimal long-term, sustainable, efficient RH waste disposal system

195R:6665m

DRAFT COMPLIANCE PACKAGE

March 1995

- Purpose: to develop overall approach, identify gaps, obtain regulator perspective
- Draft application is CAO's initiative
- Draft application will be provided to regulators, oversight groups, stakeholders
- SPM will identify activities to cost-effectively produce data for final PA

195R:6665e

SYSTEM PRIORITIZATION METHOD

(SPM)

- Initial stakeholder meetings on position papers completed
- Position papers are being revised
- Future meetings being considered
- Results of SPM-2 due in March 1995 to CAO
- SPM results will be used to decide what activities to pursue

195R:6665f

SYSTEM PRIORITIZATION METHOD

(cont.)

- SPM procedures have not changed
- SPM schedule has not changed
- SPM management has not changed
- SPM staff assignments have changed

195R:6665n

NO-MIGRATION VARIANCE PETITION

• Disposal Operations submittal	5/95
• Long-term containment submittal	6/96
• Final submittal	12/96
• Expected EPA decision	12/97

195R:6665g

RCRA PART B APPLICATION

- Order issued by NMED Secretary, 9/2/94
- Revised Part B Application chapters submitted to NMED
  - B -- Facility Description
  - D -- Facility and Process Description
  - E -- Groundwater Monitoring
  - F -- Procedures to Prevent Hazards
  - G -- Contingency Plan
  - H -- Personnel Training
  - I -- Closure and Post-closure Plans
  - J -- Corrective Actions for SWMUs
  - K -- Other Federal Laws

1194L:L6629b

RCRA PART B APPLICATION

(cont.)

- Remaining sections to be submitted in draft
  - A -- Part A Permit Application, 3/2/95
  - C -- Waste Analysis Plan, 3/2/95
  - L -- No-Migration Determination, 3/2/95
  - M -- Certification, 3/2/95
- Chapters will be revised to respond to public comment
- Final application to be submitted to NMED on 5/31/95

1194L:L6629c

REMOTE-HANDLED WASTE STUDY

October 1995

- Study will include:
  - Analysis of the impact of RH TRU waste on the WIPP PA
  - Comparison of RH TRU and CH TRU wastes
- RH TRU Study Implementation Plan is being sent to affected states, the EPA, and other interested parties for comment

195R:6665i

ON BUDGET

FY96 President's Budget

- 1 percent cut from FY95 to FY96
- CAO FY96 budget: $172.7M
- CAO FY95 budget: $174.3M
- Scope/tasks maintained to achieve DDP

195R:6665|2

THE CARLSBAD AREA OFFICE

- We are focused and on schedule
- We are moving toward a Disposal Decision in January 1998

195R:6665k

ENVIRONMENTAL EVALUATION GROUP

AN EQUAL OPPORTUNITY / AFFIRMATIVE ACTION EMPLOYER

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(505) 828-1003
FAX (505) 828-1062

IL QUARTERLY MEETING

Department of Energy

Environmental Evaluation Group

Environment Department

Energy, Minerals and Natural Resources Department

Attorney General

January 24, 1995
Santa Fe

Providing an independent technical analysis of the Waste Isolation Pilot Plant (WIPP), a federal transuranic nuclear waste repository.

STATUS OF 1/12/1994 RECOMMENDATIONS FOR THE WIPP PROJECT

January 24, 1995

compare with other document

1. Inventory and Characteristics of Waste

- Waste Characteristics: No change since last year. DOE apparently plans to handle the issue through phased application. Lynsey has written letter stating not legal.

- Radionuclide Solubility: Tests to start in January, 1995

- LWA Constraints: No change

3. Performance Assessment

- No new iteration of the Performance Assessment published since 1992. The Systems Prioritization Method (SPM) has not replaced P.A.

- Definite progress has been made on the availability of the computer codes.

- Commitments for the Assurance Requirements not yet available.

4. Operational Readiness Issues

- Continuous Air Monitor (CAM) issues: Status not changed. Concern over operating in dusty, salty conditions

- Waste Hoist Safety: EEG preparing another report. Progress made.

- Potentially explosive waste: FSAR Hazard Study planned.

- Maintanance of existing excavations: DOE/EEG dialog in progress.

- Sequencing and scheduling of new excavations: DOE/EEG dialog in progress.

- Waste emplacement and backfilling: Backfilling being deleted from the design?
  DOE - not operationally require, but still considered as engineered alternatives.

- Ventilation during operations: Significant progress.

- Analysis of realistic accident scenarios: FSAR Hazard Study planned.

- Radiation Protection: Will revisit during Operational Readiness Review (ORR).

5. Decisions to be Made by DOE

- Design and Testing of Panel and Shaft Seals: No change in status.

- Basic Engineered Barriers: No change in status.

- Engineered Barriers: No change in status.

- Release Limits into the DRZ: Recommendation not considered.

- Post-disposal monitoring plans and design of Markers: No change in status.

DOE has decided to abandon the 5 year retrievability.

ENVIRONMENTAL EVALUATION GROUP

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GENERAL RECOMMENDATIONS FOR THE WIPP PROJECT

Lokesh Chaturvedi

XLV WIPP Quarterly Meeting

January 12, 1994
Santa Fe, N.M.

Providing an independent technical analysis of the Waste Isolation Pilot Plant (WIPP), a federal transuranic nuclear waste repository.

Purpose of this presentation:

- **To outline what needs to be done.**
- **To make specific suggestions of how to proceed.**

Major Categories of Work to be Completed to Obtain Certification for Disposal

1. Inventory and characteristics of waste

   - Data and decisions are needed for the existing and yet to be generated waste and container characteristics.

   - Experimental data on radionuclide solubilities and gas generation characteristics under the anticipated environment are needed.

   - Constraints on the type and amount are provided by the Land Withdrawal Act and the Consultation and Cooperation Agreement.

Major Categories of Work to be Completed (cont.)

2. Completion and resolution of site characterization issues.

- Regional hydrology - recharge, discharge, water table, flow across stratigraphic units, etc.

- Rustler hydrology - flow and transport mechanisms and extent of radionuclide retardation.

- Salado hydrology - mechanism of brine flow, far-field and near-field.

- Effect of human activities on hydrology. Effect of oil and gas exploratory and production wells and injection wells on hydrology of Rustler and Salado Formations.

- Rock mechanics - physical effect of gas pressurization on repository strata, threshold pressure, effect on brine inflow, etc.

- Natural resources - an update of the 1983 report is needed.

Major Categories of Work to be Completed (cont.)

3. Performance Assessment

- New calculations with realistic scenarios and realistic input parameters are needed. e.g. "undisturbed" releases after gas pressurization and degraded shaft seals; direct release of brine to the surface with dissolved and suspended waste; with no physical and chemical retardation in the Rustler, etc.

- Realistic probabilities, frequency and timing of human intrusion.

- Release of codes to enable reviewers to verify calculations.

- Commitments for the Assurance Requirements need to be made.

- Strategy for RCRA compliance needs to be developed.

Major Categories of Work to be Completed (cont.)

4. Operational Readiness Issues

- Safety Analysis Report for Disposal Operations will require resolution of issues such as:

  - Continuous air monitors
  - Waste hoist safety
  - Potentially explosive waste
  - Maintenance of existing excavations
  - Sequencing and scheduling of new excavations
  - Waste emplacement and backfilling
  - Ventilation during operations
  - Analysis of realistic accident scenarios
  - Radiation protection

- A report to assess and plan for compliance with 40 CFR 191, Subpart A, may be a good additional vehicle to focus on the operational readiness issues.

Major Categories of Work to be Completed (cont.)

5. Decisions to be made by DOE

Much research has been performed on the following issues. It is time to make some decisions now.

- Design of panel and shaft seals so that final prototype testing may begin.

- Basic Engineered Barriers: salt, or salt and bentonite for backfill; container for waste yet to be generated; processing and/or additives for waste yet to be generated, etc.

- Initiation of decision-making process for more robust engineered barriers, such as treatment and repackaging of existing waste.

- Consider establishing release limits into the damaged rock zone.

- Post-disposal monitoring and Active/Passive markers design, as required by 40 CFR 191.13.

Schedule

The target schedule presented at the previous Quarterly Meeting and to the NAS WIPP Committee is unrealistic. We suggest completion of the activities outlined above before submitting the final compliance reports to EPA. We support an early submittal of a draft compliance document to EPA to initiate the DOE/EPA dialogue.

Most of these activities can proceed in parallel. However, Site Characterization and Performance Assessment should continue to be mutually iterative. Similarly, decision on treatment and repackaging of existing waste should be guided by performance assessment.

WASTE ISOLATION PILOT PLANT
BIENNIAL ENVIRONMENTAL COMPLIANCE REPORT

United States Department of Energy
Carlsbad Area Office
Carlsbad, New Mexico

Beth Bennington

BIENNIAL ENVIRONMENTAL COMPLIANCE REPORT

- **Authority**

  Public Law 102-579, Waste Isolation Pilot Plant Land Withdrawal Act

- **Purpose**

  To provide documentation of compliance with all applicable laws, regulations and permit requirements pertaining to public health and safety or the environment as they pertain to the WIPP

BECR REQUIRED BY 1992 LAND WITHDRAWAL ACT

- The Secretary shall, not later than 2 years after the date of the enactment of this Act, and biennially thereafter, submit documentation of continued compliance with the laws, regulations and permit requirements described in paragraph (1) to the Administrator, and with the law described in paragraph (1)(C) to the State

- Reporting Period

  - 1st year October 30, 1992 through March 31, 1994 (18 months)

  - Subsequent years April 1, xxxx through March 31, xxxx +2 (even numbered years) (24 months)

ENVIRONMENTAL LAWS AND REGULATIONS

(1) Applicability. Beginning on the date of the enactment of this Act, the Secretary shall comply with respect to WIPP, with --

(A) the regulations issued by the Administrator establishing the generally applicable environmental standards for the management and storage of spent nuclear fuel, high-level radioactive waste, and transuranic radioactive waste and contained in subpart A of part 191 of title 40, Code of Federal Regulations;
(B) the Clean Air Act (40 U.S.C. 7401 et seq.);
(C) the Solid Waste Disposal Act (42 U.S.C. 6901 et seq.);
(D) title XIV of the Public Health Service Act (42 U.S.C. 300f et seq.; commonly referred to as the "Safe Drinking Water Act");
(E) the Toxic Substances Control Act (15 U.S.C. 2601 et seq.);
(F) the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (42 U.S.C. 9601 et seq.);
(G) all other applicable Federal laws pertaining to public health and safety or the environment; and
(H) all regulations promulgated, and all permit requirements under the laws described in subparagraphs (B) through (G).

ORGANIZATION OF REPORT

- 14 parts
  - 8 Federal Programs
  - 6 State Programs
- Each part corresponds to a Federal or State agency that is authorized to administer regulatory programs that are applicable to the WIPP.

ORGANIZATION OF REPORT (continued)

- 38 Chapters (1 Introduction chapter)
  - 23 pertaining to Federal Programs
  - 14 pertaining to State Programs
- Each chapter summarizes a law and its implementing regulations and describes their applicability to the WIPP.
- Each chapter also provides Summary tables that provide:
  - Specific regulatory citation
  - Citation requirement
  - Compliance status
  - Cross-reference to the more detailed discussion in the supporting text

ORGANIZATION OF REPORT (continued)

- 2 Appendices
  - Appendix A - list of specific requirements by Agency
  - Appendix B - list of specific requirements by technical subject area

FEDERAL PROGRAMS

- U. S. Environmental Protection Agency
- Council on Environmental Quality
- U. S. Department of Energy
- U. S. Nuclear Regulatory Commission
- U. S. Department of Transportation
- U. S. Department of the Interior
  - Bureau of Land Management
- U. S. Department of the Interior
  - Fish and Wildlife Service
- Advisory Council on Historic Preservation

STATE PROGRAMS

- New Mexico Environment Department
- New Mexico Department of Public Safety
- New Mexico Department of Finance and Administration
- New Mexico Commissioner of Public Lands
- New Mexico Department of Game and Fish
- New Mexico Department of Agriculture

COMPLIANCE DETERMINATION

- The Administrator or the State, as appropriate, shall determine not later than 6 months after receiving a submission under paragraph (2) whether the Secretary is in compliance with the laws, regulations, and permit requirement described in paragraph (1) with respect to the WIPP.

BECR STATUS

- The CAO delivered the BECR to the EPA, NMED and Stakeholders on October 27, 1994
- Review currently underway by Federal and State agencies
- Compliance determination due April 30, 1995
- BECR documents the WIPP is in compliance with all applicable requirements