

WP No. 12412-86
Rev. B
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MODIFIED WORK PLAN TO SUPPORT
QUALITY ASSURANCE LEVEL ASSIGNMENTS
for
Sandia National Laboratories
NNWSI WBS ELEMENT 1.2.4.1.2.S
DESIGN BASIS

Approvals (signature and date):

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List of Activities and Tasks

II

A. Subsystem Design Requirements

II

B. Change Control Studies

TBD

C. Engineering Design Data Studies

WBS 1.2.4.1.2.S DESIGN BASIS

1. Objective and Issues Addressed

A. Objectives

Activities to be accomplished under this WBS element are the preparation, collection, derivation, and review of site-specific design bases information and documentation; and the performance of engineering studies which directly support design of more than one "Repository" WBS activity element.

B. Issues Addressed

The Issues and Information Needs addressed are based on the Issues Hierarchy dated 4/15/86.

1. This WBS element will both address and contribute to the resolution of the following Issues and Information Needs:

Issue 3.6 Have the characteristics of the mined geologic disposal system and its operating procedures and activities been established adequately to assess environmental impacts and risks to the public health and safety?

Issue 3.7 Have the characteristics of the mined geologic disposal system and its operating procedures and activities been established adequately to determine if such characteristics, procedures, and activities could induce social and economic impacts in communities and surrounding regions?

Issue 3.8 Have the characteristics of the transportation system and its operating procedures and activities been established adequately to assess impacts and risks to public health and safety in the affected area?

Issue 4.3 Are the repository design and operating procedures that ensure worker nonradiological health and safety adequately established to support resolution of the performance issues?

Issue 4.4 Are the waste package production technologies adequately established to support resolution of the performance issues?

Issue 4.5 Are the repository construction, operating, closure and decommissioning technologies adequately established to support resolution of the performance issues?

Issue 4.6 Are the waste package and repository costs adequately established to support resolution of the performance issues?

2. Principal Investigator

R. R. Hill, Sandia National Laboratories (SNL), Albuquerque, NM

3. Statement of Work

The following project management and integration activities have been assigned to this WBS element.

A. Subsystem Design Requirements (SDR)

Activities to be accomplished under this element are the preparation, collection, derivation, and review of site-specific information to be used as design criteria for the advanced conceptual design of the repository facilities. The SDR document will consolidate legal and functional requirements, site information, definitions of project scope design parameters, and applicable codes, standards, and regulations to govern the efforts of the repository designers.

- a. Purpose: The purpose of the SDR is to provide criteria for design of the repository. The SDR will act as the technical base for any further design after the criteria are developed.
- b. Information Needs: 3.6.1, 3.6.2, 3.6.3, 3.6.4, 3.6.5, 3.6.6, 3.6.7, 3.6.8, 3.6.9, 3.6.10, 3.6.11, 3.6.12, 3.7.1, 3.7.2, 3.8.1, 3.8.3, 3.8.4, 3.8.5, 4.3.1, 4.3.2, 4.3.3, 4.4.1, 4.5.1, 4.5.2, 4.5.3, 4.5.4, 4.5.5, 4.5.6, 4.5.7, 4.5.8, 4.5.9, 4.5.10, 4.5.11, 4.5.12
- c. Methods, techniques, and equipment design process and design criteria development will proceed as discussed in DOE Orders 6410.1 and 6430.1
- d. Technical Procedures:
 - Available Procedures - None
 - Needed Procedures - None
- e. Computer Codes:
 - Available Computer Codes - N/A
 - Needed Computer Codes - N/A
- f. Documentation of Results: SAND85-0260, Subsystem Design Requirements to Support the Advanced Conceptual Design Studies for the Yucca Mountain Mined Geologic Disposal System, 2/24/86. This report will be updated, revised, and reissued on 3/15/87, 11/30/87, and 6/30/88.
- g. Quality Assurance Level: II
- h. Remarks: Initial report written, Interface Control Drawings will be added to the SDR at the start of the ACD. The SDR will be updated periodically to maintain currency to the design and will be put under change control (see item B below). QA Level II is assigned because the SDR will provide guidance for Advanced Conceptual Design activities which involves comparative technical analyses.

B. Change Control Studies

Activities to be accomplished under this element are those necessary to implement changes to the SDR and other approved baselined documents including the preparation, justification, review and evaluation, authorization, and distribution of the change.

- a. Purpose: The purpose of the change control studies is to provide the means to effect changes to baselined documents. These baselined documents provide a control point from which all future changes require a deliberate evaluation prior to implementation.
- b. Information needs: Self defined per topic under proposed change
- c. Methods, Techniques, and Equipment: N/A
- d. Technical Procedures:
Available Procedures - None
Needed Procedures - None
- e. Computer codes:
Available Computer Codes - N/A
Needed Computer Codes - N/A
- f. Documentation of Results: Engineering change directives will be issued in accordance with approved Quality Assurance Procedures
- g. Quality Assurance Level: II
- h. Remarks: QA Level II is assigned because change control studies involves comparative technical analyses and will be used to modify the SDR throughout the ACD.

C. Engineering Design Data Studies

Activities to be accomplished under this element are the preparation, collection, derivation, and review of site-specific geological, geotechnical, natural conditions, topography, weather conditions/climate, and seismic activity data. These studies may directly support design and cross different WBS elements.

- a. Purpose: The purpose of Engineering Design Data Studies is to fully analyze specific aspects of the design and related information needs in order to provide the data necessary with which to proceed with in design.
- b. Information Needs: 4.5.6 and other information needs as they are identified by future design data studies.
- c. Methods, techniques, and equipment: Unknown until studies are identified and determined
- d. Technical procedures:
Available Procedures - None
Needed Procedures - None

- e. Computer Codes:
 - Available Computer Codes: N/A.
 - Needed Computer Codes: Unknown until studies are determined.
- f. Documentation of Results: SAND Reports and/or criteria changes.
- g. Quality Assurance Level: TBD.
- h. Remarks: The QA Level is to be determined before tasks begins.

4. Data and Materials Needed

Activity A. Subsystem Design Requirements

Data Needed: The type of information required consists of technical and design requirements traceable to DOE Orders, Federal regulations and laws, national and state codes and standards and the Yucca Mountain Mined Geologic Disposal System Requirements (SAND84-1882). In addition, requirements and/or special considerations based on subjective engineering judgment may be included in the SDR.

Source of Data: As stated above.

Quality of the Data: N/A.

Materials Needed: N/A.

Source of Materials: N/A.

Quality of Materials: N/A.

Activity B. Change Control Studies

Data Needed: Only that data necessary to justify the proposed change.

Source of Data: TBD.

Quality of the Data: TBD.

Materials Needed: N/A.

Source of Materials: N/A.

Quality of Materials: N/A.

Activity C. Engineering Design Data Studies

Data Needed: TBD.

Source of Data: TBD.

Quality of the Data: TBD.

Materials Needed: TBD.

Source of Materials: TBD.

Quality of Materials: TBD.

5. Non-Standard Methods or Techniques

None.

6. Location of Work Performance

Sandia National Laboratories, Albuquerque, NM

Contractors: Bechtel National, Inc.
San Francisco, CA

Parsons Brinckerhoff Quade & Douglas, Inc.
San Francisco, CA

7. Quality Assurance Requirements

Quality Level II has been assigned to the Activities A and B of this WBS element. Quality level for C to be determined.

8. Application of Results

The information developed by this subtask will be utilized in the management and by the designs of the following WBS elements.

1.2.4.2 Development and Testing

1.2.4.3 Facilities

1.2.4.4 Operations and Maintenance

1.2.4.5 Decommissioning

1.2.4.6 Performance Assessment

9. Schedule

Starting Date: 1987

Activities for "Design Basis" will continue through ACD.

10. Past and Expected Achievements

A. Past Achievements

Milestone N433 Preparation of the Initial Draft of the Subsystem Design Requirements

Milestone N446 Preparation of Seismic Design Basis

Milestone R059 Preparation of prediction equations developed using test data from Underground Nuclear Events at the Nevada Test Site

B. Expected Achievements

FY86

Complete preparation of initial Subsystem Design Requirements (SDR) document.

Perform change control studies as necessary to update the SDR.

Perform engineering design data studies as necessary to provide Basis of Design information including prediction equations developed using test data from Underground Nuclear Events at NTS and preparation of Seismic Design Basis.

FY87

Update Subsystem Design Requirements.

Perform change control studies as necessary to update the SDR.

Perform engineering design data studies as necessary to provide Basis-of-Design information.

FY88

Update SDR and complete License Application Design criteria.

Perform change control studies as necessary to update the SDR.

Perform engineering design data studies as necessary to provide Base-of-Design information.

FY89

Perform change control studies as necessary to update the SDR.

11. Milestones and Deliverables

<u>Milestone Number</u>	<u>Description and Criteria</u>	<u>Completion Date</u>
Level 1 N433	Initial Subsystem Design Requirements A copy of the SDR will be submitted Deliverable: SAND Report	02/24/86
M456	Complete Final Subsystem Design Requirements for ACD A copy of the SDR will be submitted Deliverable: SAND Report	11/30/87
M042	Update SDR with Initial ACD Changes A copy of the SDR will be submitted Deliverable: SAND Report	06/30/88
Level 2 R059	Prepare SAND Report containing prediction equations developed using the test data from UNEs at NTS	12/17/85
N491	Update Subsystems Design Requirements A copy of the SDR will be submitted Deliverable: SAND Report	

12. Costs

Costs are in thousands of expenditure-year dollars.

FY86

SNL Labor Costs: \$309 Other Costs: \$544

FY87

SNL Labor Costs: \$ 87 Other Costs: \$483

FY88

SNL Labor Costs: \$243 Other Costs: \$717

FY89

SNL Labor Costs: \$199 Other Costs: \$561

13. Performance Measurement

Level of Effort

QUALITY LEVEL ASSIGNMENT CRITERIA SHEET

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QALAS No. 058
Rev. B

Activity: A. Subsystem Design Requirements (SDR)

Task: A. Same as Activity PI R. E. Stinebaugh

QA Criterion	Applies	Does Not Apply	Comments
1. OA Organization	X		
2. OA Program	X		
3. Design & Scientific Investigation Control	X		Design control and verification require- ments apply.
4. Procurement Document Control	X		
5. Instructions Procedures & Drawings	X		
6. Document Control	X		
7. Control of Purchased Material, Equipment, and Services	X		
8. ID and Control of Materials, Parts, Components and Samples		X	No manufacturing or samples involved.
9. Control of Processes		X	No special processes.
10. Inspection		X	No inspection or Surveillance involved.
11. Test and Experiment/ Research Control		X	No tests/experiments.
12. Control of Measuring and Test Equipment		X	No manufacturing or tests involved.
13. Handling, Shipping, and Storage		X	No instruments, hard- ware or samples involved.
14. Inspection, Test, and Operating Status		X	No inspection or tests involved.
15. Control of Nonconformances	X		
16. Corrective Action	X		
17. QA Records	X		
18. QA Audits	X		

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QALAS No. 118
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Activity: B. Change Control Studies

Task: B. Same as Activity

PI R. E. Stinebaugh

QA Criterion	Applies	Does Not Apply	Comments
1. QA Organization	X		
2. QA Program	X		
3. Design & Scientific Investigation Control	X		Design control and verification require- ments apply.
4. Procurement Document Control	X		
5. Instructions Procedures & Drawings	X		
6. Document Control	X		
7. Control of Purchased Material, Equipment, and Services	X		
8. ID and Control of Materials, Parts, Components and Samples		X	No manufacturing or samples involved.
9. Control of Processes		X	No special processes.
10. Inspection		X	No inspection or surveillance involved.
11. Test and Experiment/ Research Control		X	No tests/experiments.
12. Control of Measuring and Test Equipment		X	No manufacturing or tests involved.
13. Handling, Shipping, and Storage		X	No instruments, hard- ware or samples involved.
14. Inspection, Test, and Operating Status		X	No inspection or tests involved.
15. Control of Nonconformances	X		
16. Corrective Action	X		
17. QA Records	X		
18. QA Audits	X		

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Activity: C. Engineering Design Data Studies

Task: C. Same as Activity

PI R. E. Stinebaugh

QA Criterion	Applies	Does Not Apply	Comments
1. OA Organization	X		
2. OA Program	X		
3. Design & Scientific Investigation Control	X		Design control and verification requirements apply.
4. Procurement Document Control	X		
5. Instructions Procedures & Drawings	X		
6. Document Control	X		
7. Control of Purchased Material, Equipment, and Services	X		
8. ID and Control of Materials, Parts, Components and Samples		X	No manufacturing or samples involved.
9. Control of Processes		X	No special processes.
10. Inspection		X	No inspection or Surveillance involved.
11. Test and Experiment/Research Control		X	No tests/experiments.
12. Control of Measuring and Test Equipment		X	No manufacturing or tests involved.
13. Handling, Shipping, and Storage		X	No instruments, hardware or samples involved.
14. Inspection, Test, and Operating Status		X	No inspection or tests involved.
15. Control of Nonconformances	X		
16. Corrective Action	X		
17. OA Records	X		
18. OA Audits	X		