

DRAFT

PROPOSED EBS (TASK 4) OPERATIONS PLAN ACTIVITIES AND COSTS

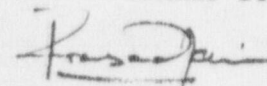
FOR

A STUDY TO DEVELOP THE TECHNICAL BACKGROUND FOR  
INTERPRETING THE REGULATORY REQUIREMENT OF  
SUBSTANTIALLY COMPLETE CONTAINMENT IN 10CFR60.113

CENTER FOR NUCLEAR WASTE REGULATORY ANALYSES

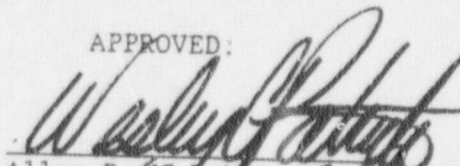
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PREPARED BY:

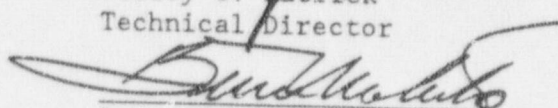


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## 1.0 TECHNICAL OBJECTIVES

10CFR60.113(a)(1)(i)(A) requires the waste package to provide substantially complete containment (SCC) of radionuclides for a period of 300 to 1000 years. The words "substantially complete containment" have been interpreted with a varying set of assumptions by DOE and other interested parties. While there is a general sense of what the words mean, ambiguity continues to exist in how a designer of waste packages will comply with the regulation. The description of the uncertainty in the rule and a potential strategy for the resolution of the uncertainty are described in the documents cited below.

1) Bunting, J. O., "Technical Policy Options to Minimize the Regulatory Uncertainty Regarding Substantially Complete Containment", Draft Report, March 20, 1989.

2) Bunting, J. O., Weller, R. A., Peterson, C., and Interrante, C., "Scoping Paper for Proposed Rulemaking to Minimize Uncertainty Regarding the Requirement for Substantially Complete Containment", Rev. 1, March 28, 1989

3) CNWRA 10CFR60 Subpart E Regulatory Requirement Topic: E-4, "Containment Performance of the Engineered Barrier System to be Substantially Complete after Permanent Closure".

In developing a viable uncertainty reduction method, an understanding of the technical feasibility of the various options is required. The proposal presented here attempts to develop the necessary technical background as a precursor to the selection and exercise of any uncertainty reduction option. The objectives of this Operations Plan are:

- \* To develop a report that outlines the technical Elements of Proof required for demonstrating long term waste package performance under anticipated conditions at the selected repository site,

- \* To develop a reference report that classifies the type and nature of uncertainties and provides guidance for quantifying the uncertainties and estimating confidence limits for the various parameters affecting waste package performance, and

- \* To develop a recommendation regarding a potential rulemaking on SSC to include a regulatory uncertainty reduction method and strategy based on the information generated in the technical reports described above.

## 2.0 TECHNICAL PROGRAM DESCRIPTION

### 2.1 Technical Approach

The activities described in this proposed plan are part of Task 4 in the EBS Program Element Operations Plan. The approach presented in this section will, when implemented, be consistent with the intent of the Commission to provide for independent barriers for the isolation of radionuclides in a repository. In this respect, NUREG-0804 and other NRC documents and Memoranda of Understandings will provide guidance to the process of determining uncertainty reduction methods.

The proposed work effort will consist of three subtasks. The first two subtasks will provide the technical basis for establishing the nature of considerations that are required in defining "substantially complete containment". These two subtasks will be performed by teams of technical experts. It is the intent to use the special talents from the CNWRA, NRC, and NIST staff in conducting these subtasks. The major effort and responsibility for the completion of the subtasks, as outlined, will be that of the CNWRA. The third subtask will identify a method for reducing the uncertainty on Substantially Complete Containment, based on information developed in the first two subtasks. The CNWRA will maintain overall coordination for all subtasks.

### 2.2 Task Description

The various activities are described under EBS Task 4, Substantially Complete Containment Evaluation.

#### 2.2.1 Subtask 4.1 Technical Basis for the Elements of Proof for Evaluating Substantially Complete Containment

In this subtask a report will be prepared to include Elements of Proof (EOP) and associated technical review components. This report will detail the technical considerations required for evaluating waste package performance under anticipated conditions at the repository. Information on service environments, mechanisms of field degradation of canister materials, controlling processes with time, available data, prediction models, and design and fabrication related parameters will be reviewed and assessed for identifying their relative importance to long-term performance.

A preliminary draft of the EOP report will be completed in three months. The draft report will be reviewed for adequacy and completeness by a minimum of five technical peers in the relevant areas. The peer review will take place at the Center. These reviews will take place during the fourth and fifth month after the start of this subtask. Based on the review, the EOP report will be updated and made ready for a workshop session to be held at the end of the sixth month. The workshop participants will include technical experts in the various disciplines identified by the report. The purpose of the workshop will be to provide a peer consensus of the content and hierarchy of the elements of proof and technical review components presented in the report. A draft final



report will be prepared and submitted to the NRC by the end of the seventh month.

#### 2.2.2 Subtask 4.2 Develop Guidelines for Uncertainty Evaluations

The state-of-information on the technology required to demonstrate compliance with the containment regulatory requirement will have varying degrees of uncertainty. Evaluation of these uncertainties on a qualitative basis will be difficult both for a designer and for a regulator. In support of a rational approach for assessing the various technical uncertainties, guidelines based on quantitative methods will be developed. A guideline report will be prepared and will include statistical techniques and probabilistic methods.

The draft report is expected to be completed in a period of four months after the start of this Subtask. A peer review will be conducted. At least three technical experts with appropriate backgrounds will participate in the peer review. A draft report will be updated and presented at the workshop associated with the workshop in Task 4.1. A draft final report will be submitted to NRC at the end of seven months. It is expected that staff from CNWRA and NRC and a potential consultant will participate in this subtask.

#### 2.2.3 Subtask 4.3 Develop Recommendations for Substantially Complete Containment Uncertainty Resolution

Historic background on the rule in 10CFR60.113, its intent, the comments on the rule from the interested parties, and Memoranda of Understandings between NRC and DOE will be collected and evaluated. Based on the evaluation and preliminary information from Subtasks 4.1 and 4.2, an analysis of the nature and the impact of the Substantially Complete Containment uncertainty will be presented.

Based on the assessment, recommended wording for a proposed rule or other alternatives will be prepared. Recommendations will be developed for identifying a Substantially Complete Containment uncertainty reduction method. The feasibility of implementing the method will be evaluated. The uncertainty reduction method will include statements of a potential regulatory position with accompanying technical specifications on the expected performance of waste packages. Appropriate recommendation will be presented in a letter report and submitted to NRC for review.

This subtask will be initiated one month after the start of the project and is expected to be completed in an eight month period. Both the NRC and the CNWRA staff are expected to participate in this subtask.

### 2.3 Schedules, Milestones, and Deliverables

Figure 1 presents the planned schedule for the Substantially Complete Containment project. For the purpose of developing a schedule it is assumed that the project will be initiated on or about June 22, 1989. The milestones and deliverables are outlined below.

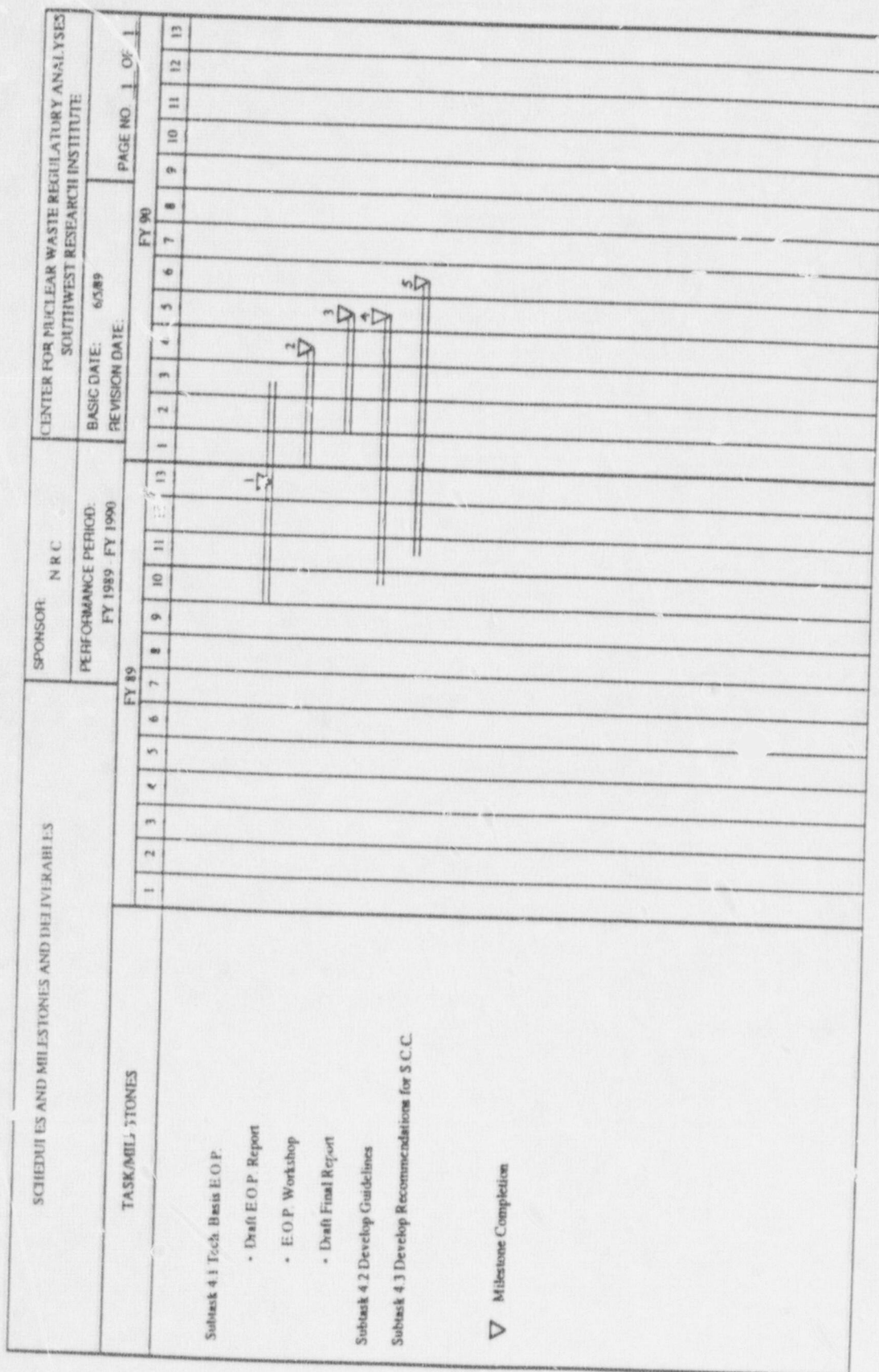


Figure 1. Schedule/Milestones for E.B.S. Task 4

<u>Milestone/ Deliverable</u>	<u>Description</u>	<u>Date</u>
1	Draft Preliminary EOP Report	9/20/89
2	EOP Workshop	12/12/89
3	Draft Final EOP Report	1/20/90
4	Draft Final Uncertainty Evaluation Methodology Report	1/20/90
5	Substantially Complete Containment Recommendations Letter Report	2/20/90

#### 2.4 Required Interface with Other Organizations

Subtask 4.1 will involve CNWRA and NIST staff. Subtask 4.2 will be accomplished by CNWRA, NRC, and a Consultant (TBD). Subtask 4.3 participants will primarily include CNWRA and NRC staff.



### 3.0 PROGRAM MANAGEMENT

The Substantially Complete Containment project will be conducted under the Task 4 activity of the Centers' EBS Program Element Operations Plan. The Quality Assurance requirements for this project will be conducted according to the approved CNWRA QA Program. Dr. Prasad Nair will be the Project Manager for the overall Substantially Complete Containment effort at the Center. Figure 2 identifies the project organization with the assigned Subtask Leaders for each subtask. General resources needed are mainly library facilities to conduct literature searches and to obtain specific technical and regulatory documents.

This project will involve travel. Following is breakdown of the potential travel requirements for the Center staff.

<u>Destination</u>	<u>Subtask 4.1</u>	<u>Subtask 4.2</u>	<u>Subtask 4.3</u>
	<u>Trips/Staff</u>	<u>Trips/Staff</u>	<u>Trips/Staff</u>
	<u>Days</u>	<u>Days</u>	<u>Days</u>
Washington DC	4 / 12	2 / 6	6 / 18
Totals	4 / 12	2 / 6	6 / 18

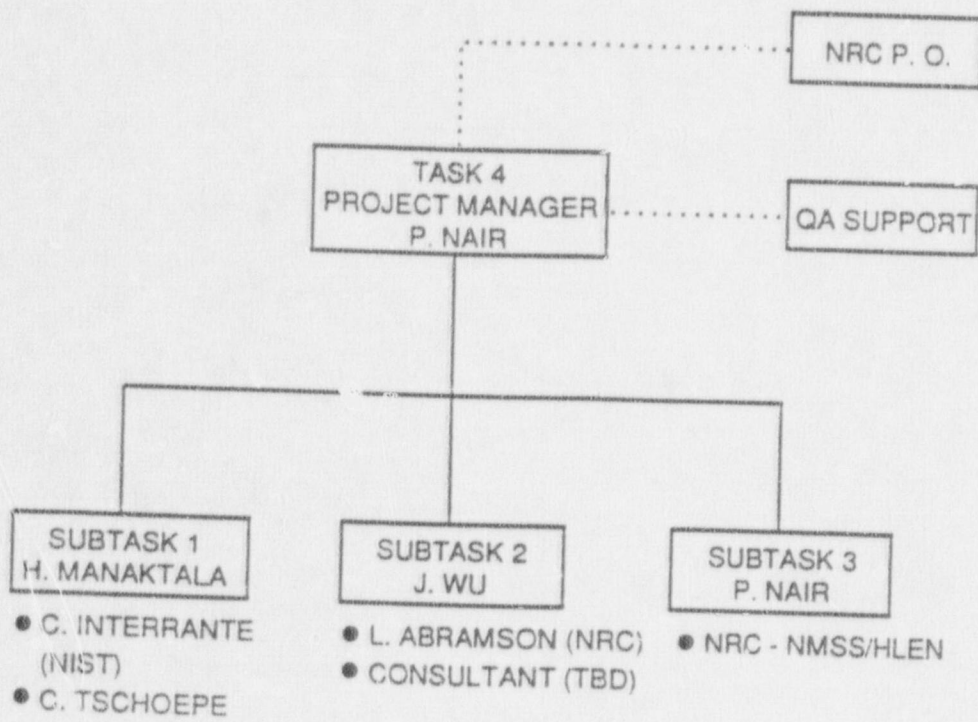


FIGURE 2. PROJECT ORGANIZATION