

*Office of Civilian Radioactive Waste Management*

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# **Program Cost and Schedule Baseline**

## **Revision 3**

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**September 1992**

**U.S. Department of Energy**  
**Office of Civilian Radioactive Waste Management**  
**Washington, DC 20585**

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OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT  
PROGRAM CHANGE CONTROL BOARD  
DIRECTIVE

(1) DCP NUMBER: 58

(2) DCP TITLE: Revision 3 of the Program Cost and Schedule (PCSB)

PAGE 1 OF 1

(3) DOCUMENT NUMBER: DOE/RW-0253Rev.2

REVISION: 2

DOCUMENT TITLE: Program Cost and Schedule Baseline

(4) COGNIZANT ORGANIZATION: PCAD, RW-13

(5) DCP DISPOSITION:

APPROVE

APPROVE WITH CONDITIONS

DISAPPROVE

ACTION DEFERRED

CANCELLED/WITHDRAWN

(6) CONDITIONS/RATIONALE:

(7) IMPLEMENTATION DIRECTION:

1. RW-20 shall document annualized Yucca Mountain Project (YMP) cost for inclusion in the next revision of the Program Cost and Schedule Baseline (PCSB) following: (1) completion of ICE reconciliation; (2) possible RW-1 replanning/rescoping of YMP; and (3) receipt of OMB FY 1994 budget passback (per 4/30/92 guidance memo).
2. Following approval of the revision to the OCRWM System Engineering Management Plan (SEMP), RW-30 shall provide RW-10 with suggested modifications to the completion criteria for PCSB milestones that are consistent with the approved SEMP. Modified criteria shall be included in the next PCSB revision.
3. Following ICE reconciliation for the MRS Project, RW-40 shall submit a DCP to the PCCB to update the MRS Project cost and schedule baseline for inclusion in the next PCSB revision.
4. RW-20 shall determine the appropriate additional Key Decision(s) for ESF construction for inclusion in the next PCSB revision.

(8) CONCURRENCE: \_\_\_\_\_  
(IF REQUIRED) DIRECTOR, OQA

DATE: \_\_\_\_\_

(9) SIGNATURE: \_\_\_\_\_  
PCCB CHAIRMAN

DATE: 9/10/92

(10) SIGNATURE: \_\_\_\_\_  
PCCB EXECUTIVE SECRETARY

DATE: \_\_\_\_\_

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## 1.0 INTRODUCTION

### 1.1 PURPOSE

The purpose of this document is to establish quantitative expressions of proposed costs and schedule to serve as a basis for measurement of Program performance. It identifies the components of the Program Cost and Schedule Baseline (PCSB) that will be subject to change control by the Executive (Level 0) and Program (Level 1) Change Control Boards (CCBs) and establishes their baseline values. This document also details PCSB reporting, monitoring, and corrective action requirements. The Program technical baseline contained in the Waste Management System Description (WMSD), the Waste Management System Requirements (WMSR), and the Physical System Requirements documents provide the technical basis for the PCSB.

Changes to the PCSB will be approved by the Program Change Control Board (PCCB). In addition to the PCCB, the Energy System Acquisition Advisory Board Baseline CCB (ESAAB BCCB) will perform control functions relating to Total Project Cost (TPC) and major schedule milestones for the Yucca Mountain Site Characterization Project and the Monitored Retrievable Storage (MRS) Project. Additional information on how the PCSB is integrated into the OCRWM management system is contained in the Program Management System (PMS) Manual.

### 1.2 SCOPE

The PCSB establishes baseline values for the Yucca Mountain Site Characterization Project cost and schedule through submittal of the repository license application to the Nuclear Regulatory Commission (NRC). Cost and schedule baselines for the MRS Project, including transportation, are established through the completion of MRS construction. Other components of OCRWM costs, such as Program Support (Quality Assurance, Systems Integration and Compliance, and Program Management), are not baselined in the PCSB.

The PCSB also contains a long-term reference schedule from the end of the baseline period through completion of the Program's life cycle (i.e., the decommissioning of the Mined Geologic Disposal System (MGDS) and MRS). The primary purpose of the long-term reference schedule is to establish a schedule which is consistent with the scope and time frame of the Program's technical baseline. This long-term reference schedule will be used largely to analyze the schedule impacts associated with change proposals to the technical baseline. By maintaining a Program long-term reference schedule, Program schedule changes resulting from changes in the technical baseline can be formally documented. The long-term reference schedule will not be subject to ESAAB BCCB review, but will be controlled only by the PCCB.

OCRWM regularly prepares cost estimates that extend beyond the end of the cost baseline. The source for all such cost estimates will be the most recent approved Total System Life Cycle Cost (TSLCC) analysis performed in conjunction with the annual fee adequacy assessment.

### 1.3 REFERENCES

- a. U.S. Department of Energy, Secretary of Energy Notice, "Strengthening the Department of Energy Project Management System," SEN-27-90, August 15, 1990.
- b. U.S. Department of Energy, DOE Order 4240.1J, "Designation of Major System Acquisitions and Major Projects," March 18, 1991.
- c. U.S. Department of Energy, DOE Order 4700.1 "Project Management System," March 6, 1987.
- d. U.S. Department of Energy, DOE Notice 4700.4A "Baseline Change Control Process at the Executive Level," October 31, 1991.
- e. U.S. Department of Energy, Office of Civilian Radioactive Waste Management, Program Management System Manual (DOE/RW-0043), Rev. 4, October 1990.
- f. U.S. Department of Energy, Office of Civilian Radioactive Waste Management, Program Change Control Procedure (DOE/RW-0223), March 1992.
- g. Program Work Breakdown Structure Dictionary (DOE RW-0325P), February 1992.
- h. U.S. Department of Energy, DOE Order 5100.3 "Field Budget Process," August 23, 1984.

### 1.4 RELATIONSHIP TO OTHER OCRWM COST/SCHEDULE INFORMATION

The PCSB is OCRWM's primary mechanism for cost/schedule control and performance measurement. More detailed cost and schedule baselines, subject to change control, shall be maintained at the project level. These other cost and schedule baselines shall support and be subordinate to the PCSB. Other OCRWM management plans that contain costs or schedule milestones shall acknowledge the PCSB as the controlling document.

The PCSB is also the primary source of cost and schedule information released outside OCRWM. As shown in Figure 1, PCSB costs are related to budget formulation, TSLCC analysis, and the Fee Adequacy Report. The cost baseline may require updating as a result of the budget formulation process. Likewise, budget data, along with related schedule information contained in the PCSB, will be used as input into the TSLCC analysis. The TSLCC analysis is then used as the cost basis to calculate the adequacy of the ongoing fee paid by waste generators/owners into the Nuclear Waste Fund to fully recover the costs of the Program. This information is published in the annual Fee Adequacy Report.

The schedule baseline shall be the basis for externally-released schedule information in the Project Decision Schedule, any amendments to the Mission Plan, and the Mission Implementation Plan. The schedule baseline shall define the reference case schedule for Program budget formulation. Critical path networks that show the major activities and activity relationships for the PCSB shall be maintained and shall define the basis for the baseline milestone dates and costs.

## **2.0 COST AND SCHEDULE BASELINE DATA**

### **2.1 COST BASELINE**

The Program cost baseline is a controlled list of estimated costs expressed on a TPC basis. It is subject to independent review and will be changed as necessary to reflect improved cost data, changing assumptions, future budget appropriations, etc.. The cost baseline is defined to Level 3 of the Program Work Breakdown Structure (WBS). The current WBS (to Level 3) is presented in Figure 2. The Program WBS Dictionary contains the detailed breakdown of work scope and products defined for each Program element.

The annualized cost baseline (to Level 3 of the WBS) for the Yucca Mountain Site Characterization Project is contained in Appendix A. The annualized cost baseline for the MRS Project, including transportation, will be added following completion of independent reviews. All costs in the PCSB are expressed in year-of-expenditure dollars. The TPC, as defined in DOE Order 4700.1, includes all development and evaluation costs, operating costs associated with test and evaluation, and plant and capital equipment costs specifically associated with a project through the start of operations. In addition, TPC includes all historical costs for Major System Acquisitions (MSAs), as required by DOE Order 5100.3. It is the sum of Total Estimated Cost (TEC) plus all other costs identifiable with the project. TEC is defined in DOE Order 4700.1 as the cost of the project, including the cost of land and land rights, engineering design and inspection costs, direct and indirect construction costs, and initial equipment costs necessary to place the plant or installation in operation, whether funded from operating or plant and capital equipment appropriations.

The responsible organization for the Yucca Mountain Site Characterization Project cost baseline data is the Office of Geologic Disposal. The responsible organization for the MRS Project cost baseline data is the Office of Storage and Transportation. Responsible organizations shall maintain backup information that defines the basis for the cost baseline.

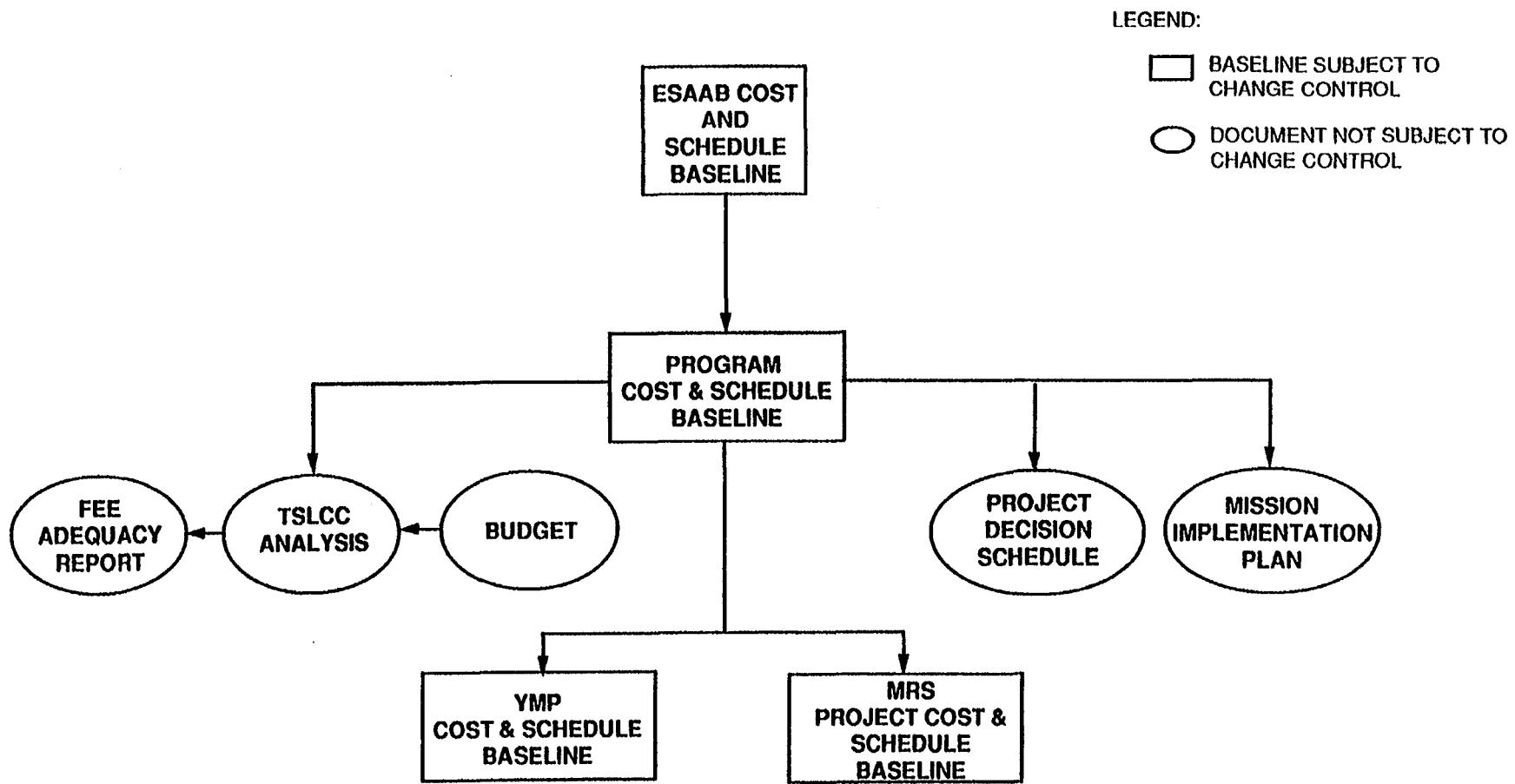
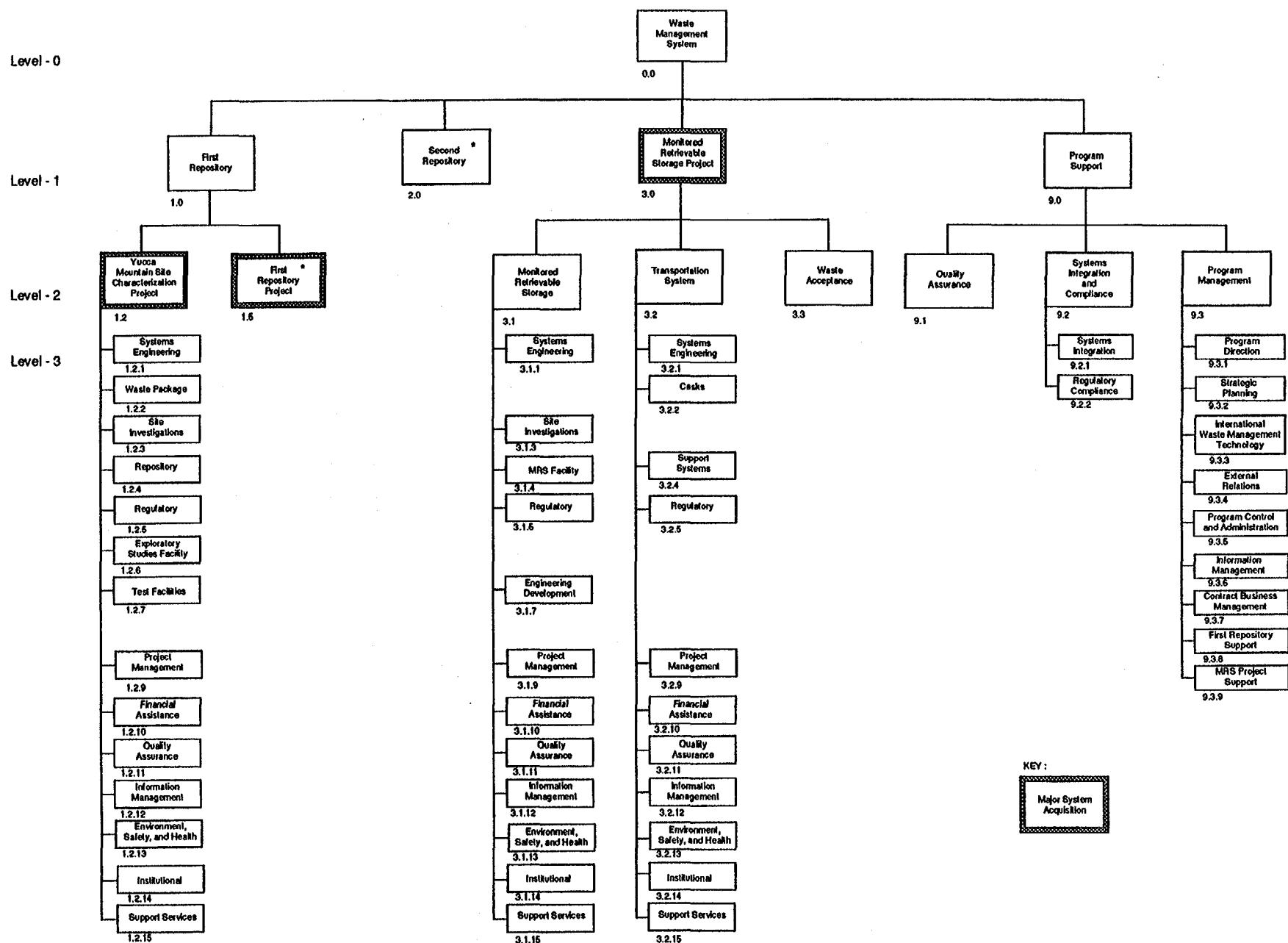


FIGURE 1. RELATIONSHIP OF COST AND SCHEDULE BASELINES AND RELATED PLANS

REVISION 3  
4/30/92



\* Inactive Future Element

FIGURE 2. PROGRAM WORK BREAKDOWN STRUCTURE

### 2.1.1 ESAAB Cost Baseline

The TPC for the Yucca Mountain Site Characterization Project that shall be controlled by the ESAAB BCCB is \$6.319 billion (see Table 1).

### 2.1.2 Program Cost Baseline

The costs that shall be controlled by the PCCB are presented in Table 1. All costs are expressed in year-of-expenditure dollars to WBS Level 3.

## 2.2 SCHEDULE BASELINE

The schedule baseline is a controlled list of Program milestones that satisfy the criteria described in Table 2. Appendices B, C, and D contain the schedule milestones for the Yucca Mountain Site Characterization Project, MRS, and Transportation, respectively. The following information is included for each milestone in the schedule baseline:

Milestone Description - A concise description of an event. The milestone description shall be appropriate for release outside DOE. The first word of the milestone description shall be a verb.

Milestone Identification - A unique identification number. The first character of the identification shall be R, M, or T for Repository (Yucca Mountain Site Characterization Project), MRS, or Transportation, respectively.

Milestone Responsibility - The cognizant Associate Director responsible for performing the activity associated with the milestone.

Highest-Level Change Control Board - The highest-level change control board shall be specified. All milestones controlled by the ESAAB BCCB will also be controlled by the PCCB.

Milestone WBS - The work breakdown structure assignment (see Figure 2) for the activity associated with the milestone. Milestones shall be assigned to Level 3 of the Program WBS and consistent with the Program WBS Dictionary.

Milestone Completion Criteria - A description of the scope of work and required actions which signal the completion of the milestone by the responsible organization. Where applicable, the completion criteria shall identify major prerequisites for the milestone.

Baseline Date - The approved date that shall be used for internal planning and external reporting.

**TABLE 1. SUMMARY OF COST BASELINE ESTIMATES**  
(millions of year-of-expenditure dollars)

<b>Yucca Mountain Site Characterization Project</b>	<b>Total Project Cost<sup>a)</sup></b>	<b>6,319.3<sup>b,c)</sup></b>
	System Engineering	129.4
	Waste Package	273.2
	Site Investigations	1,035.2
	Repository	846.7
	Regulatory	518.7
	Exploratory Studies Facilities	838.3
	Test Facilities	316.4
	Project Management	447.9
	Financial Assistance	950.5
	Quality Assurance	249.2
	Information Management	192.4
	Environment, Safety, & Health	248.2
	Institutional	49.5
	Support Services	223.7
<b>MRS Project</b>	<b>Total Project Cost<sup>a)</sup></b>	<b>1,332.3<sup>c)</sup></b>
	MRS	
	Systems Engineering	2.2
	Site Investigations	6.9
	MRS Facility	602.5
	Regulatory	39.6
	Engineering Development	TBD
	Project Management	33.4
	Financial Assistance	76.4
	Quality Assurance	5.3
	Information Management	5.3
	Environment, Safety, & Health	25.5
	Institutional	2.8
	Support Services	7.6
	Transportation System	
	Systems Engineering	29.2
	Casks	279.9
	Support Systems	143.3
	Regulatory	1.6
	Project Management	8.2
	Financial Assistance	0.0
	Quality Assurance	1.6
	Information Management	1.6
	Environment, Safety, & Health	1.6
	Institutional	56.2
	Support Services	1.6
	Waste Acceptance	TBD

- a. Total Project Costs for both the Yucca Mountain Project and MRS Project are subject to independent review and validation.
- b. Total Project Cost includes \$1.3 million for land acquisition in pre-FY 1992 costs.
- c. May not add due to independent rounding.

TABLE 2. CRITERIA FOR INCLUSION OF MILESTONES IN THE PCSB

1. Milestones controlled by the Level 0 (ESAAB) Baseline Change Control Board.
2. Milestones that define the critical paths to MRS waste acceptance and repository waste emplacement.
3. Start and completion dates for all system and subsystem designs.
4. Start and completion dates for system and subsystem construction and fabrication.
5. Major regulatory compliance actions, including environmental impact statement scoping, draft environmental impact statement issuance, final environmental impact statement issuance, record of decision, license application submittals, and certification of compliance submittals.
6. Start and completion dates for each phase of operations.
7. Start and completion dates for facility decommissioning.
8. Major systems integration milestones, including decisions related to establishing the physical configuration of the waste management system, and operational interfaces between Program elements.

### 2.2.1 ESAAB Schedule Baseline

Milestones controlled by the ESAAB BCCB are a subset of the Program schedule milestones contained in Appendices B, C, and D. The schedule milestones for the Yucca Mountain Site Characterization Project MSA that shall be controlled by the ESAAB BCCB are:

Start ESF Site Preparation (KD-3)	11/92
Energy System Acquisition Review	11/93
Energy System Acquisition Review	11/94
Energy System Acquisition Review	11/95
Start ESF In-Situ Test Phase (KD-4)	6/96
Start Repository License Application Design (KD-1B)	6/96
Energy System Acquisition Review	11/97
Energy System Acquisition Review	11/98
Issue Draft Environmental Impact Statement	10/99
Notify State of Proposed Site Selection	10/99
Energy System Acquisition Review	11/99
Energy System Acquisition Review	11/00
Issue Site Recommendation Report to the President	4/01
Submit License Application to the NRC	10/01

The schedule milestones for the MRS Project MSA that shall be controlled by the ESAAB BCCB are:

Start MRS Facility Safety Analysis Report (SAR) Design (KD-1A)	10/92
Complete Environmental Assessment(s) for Site(s)	6/93
Award Contracts for Existing Tech. Cask Acquisition (KD-1B)	6/93
Congress Enacts Agreement	9/93
Start MRS Facility Final Procur. and Constr. Design (KD-2)	9/94
Energy System Acquisition Review	6/95
Submit MRS Facility License Application to the NRC	9/95
Start MRS Facility Site Preparation (KD-3A)	7/96
Start Fabrication of GA-4/GA-9 LWT Casks for Fleet (KD-3B)	9/96
Start Fabrication of BR-100 Rail/Barge Casks for Fleet (KD-3C)	3/97
Start Spent Fuel Receipt at MRS Facility (KD-4A)	1/98
Start Operations at Completed MRS Facility (KD-4B)	7/99

### 2.2.2 Program Schedule Baseline

Figure 3 shows all the PCSB milestones that shall be subject to change control. The complete set of schedule baseline milestones for the Yucca Mountain Site Characterization Project, MRS, and the Transportation System are contained in Appendices B, C, and D, respectively. Appendix E contains the long-term reference schedule.

### **3.0 REPORTING**

#### **3.1 MAJOR SYSTEM ACQUISITION REPORTING**

The Project Manager, YMP, is required to submit a quarterly progress report to the Director, OCRWM, with a copy to the Director, Program Control and Administration Division (PCAD), Office of Program and Resources Management (OPRM). The Director, PCAD, will provide a copy of the quarterly progress reports to the Office of Program/Project Management (PR-24). These quarterly progress reports shall contain cost and schedule performance data in compliance with DOE Order 4700.1, Chapter IV, Part B, and requirements in the OCRWM PMS Manual, Rev. 4. The Project Manager, MRS Project, will be responsible for Major System Acquisition reporting following approval of KD-1.

#### **3.2 NEAR-TERM MILESTONE REPORTING**

Project Managers shall, upon request, provide the status of PCSB milestones within a 6 month planning horizon for use in the Operations Management Tracking System (OMTS) twice each month.

### **4.0 MONITORING AND CONTROL**

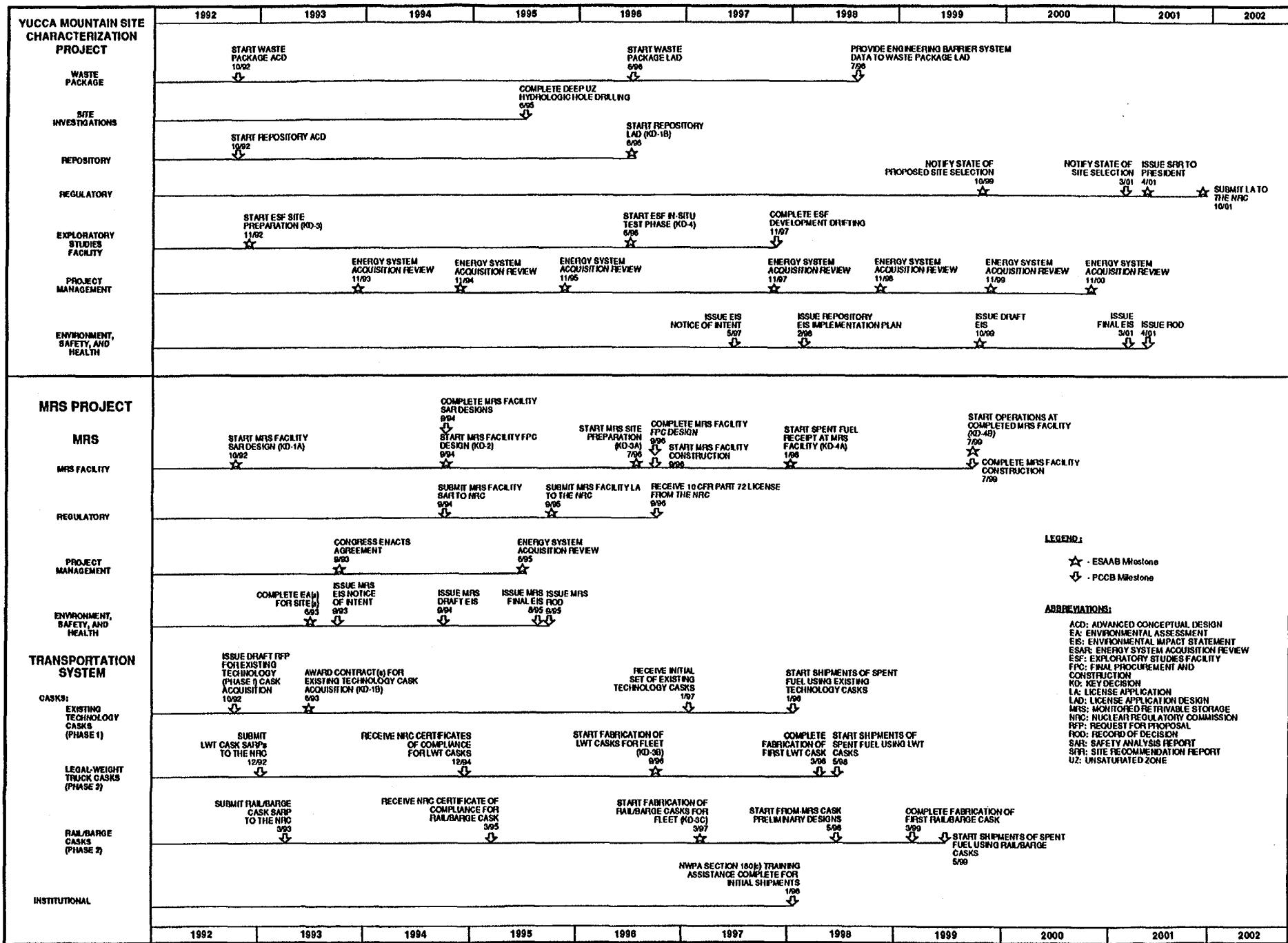
#### **4.1 OPRM MONITORING REQUIREMENTS**

The Director, PCAD, shall review the Project Manager's Progress Report and the OMTS to identify schedule and cost variances that exceed Program and ESAAB thresholds. The Director, PCAD, shall prepare a report for each Program Management meeting that identifies reported variances and provides a status of Corrective Action Plan (CAP) or Document Change Proposal development. The Director, PCAD may request that project managers develop a CAP or a Document Change Proposal as described in Section 5.0.

#### **4.2 ESAAB BCCB THRESHOLDS**

Thresholds for the ESAAB BCCB are contained in DOE Notice 4700.4A. The cost threshold for ESAAB BCCB involvement is a change of  $\geq \$50,000,000$  in TPC. The baseline TPC value for the Yucca Mountain Site Characterization Project is shown in Table 1. Table 1 also shows the TPC for the MRS Project, although ESAAB approval of the MRS Project TPC will not occur until KD-1.

The ESAAB BCCB schedule threshold is a milestone change of  $\geq 6$  months. The ESAAB schedule baseline against which the ESAAB BCCB threshold will be measured for the Yucca Mountain Site Characterization Project is contained in Section 2.2.1. An ESAAB schedule baseline for the MRS Project (including MRS and Transportation System) will be established at KD-1. A Baseline Change Proposal shall be submitted to the ESAAB BCCB when changes exceeding the above thresholds cannot be brought within thresholds by a CAP, except for directed changes. In the latter case, the ESAAB BCCB shall be informed of the change. (See Section 5.2).



## LEGEND:

- ★ - ESAB Milestone
- ↓ - PCCB Milestone

## ABBREVIATIONS:

- ACD: ADVANCED CONCEPTUAL DESIGN
- EA: ENVIRONMENTAL ASSESSMENT
- EMI: ENVIRONMENTAL IMPACT STATEMENT
- ES: ENVIRONMENTAL SYSTEM ACQUISITION REVIEW
- ESF: EXPLORATORY STUDIES FACILITY
- FPC: FINAL PROCUREMENT AND CONSTRUCTION
- KD: KEY DECISION
- LA: LICENSE APPLICATION
- LAD: LICENSE APPLICATION DESIGN
- MRS: MOUNTAIN REPOSITORY STORAGE
- NWPA: NUCLEAR WASTE POLICY COMMISSION
- RFP: REQUEST FOR PROPOSAL
- ROD: RECORD OF DECISION
- SAR: SAFETY ANALYSIS REPORT
- SRR: SITE RECOMMENDATION REPORT
- UZ: UNSATURATED ZONE

FIGURE 3. PROGRAM COST AND SCHEDULE BASELINE - REV. 3  
MILESTONES SUBJECT TO CHANGE CONTROL

#### 4.3 PCCB THRESHOLDS

The PCCB thresholds are designed to control cost and schedule performance through WBS Level 2.

The cost thresholds for PCCB involvement are:

WBS Level 2:  $\geq \$25,000,000$

Cost performance shall be measured at WBS Level 2, against the cost baseline contained in Table 1.

The schedule threshold for PCCB involvement is a milestone change of  $\geq 3$  months. The Program schedule baselines against which schedule performance shall be measured are in Appendices B, C, and D. A Document Change Proposal (DCP) to the PCCB shall be submitted if the above cost or schedule thresholds are exceeded and cannot be mitigated by a CAP.

#### 5.0 CORRECTIVE ACTION

The monitoring and control procedures described in Section 4.0 are designed to identify problems related to cost and schedule performance that require senior management attention. Forecast deviations from the PCSB that exceed threshold values shall trigger a formal corrective action process.

##### 5.1 CORRECTIVE ACTION PLANS

CAPs shall be prepared to eliminate or minimize forecast variances that exceed PCSB thresholds. The organization responsible for the cost or schedule milestone shall prepare the CAP. A CAP may require a change to other items in the cost, schedule, or technical baseline; or it may require some other change in the planning basis, but not result in a baseline change. The CAP shall describe the baseline variance; the specific workaround actions; the effect of the workaround on the variance; and the cost, schedule, and technical impact. CAPs for a forecast variance that exceeds the established ESAAB BCCB or PCCB thresholds shall be approved by the Director, OCRWM.

CAPs that result in changes to other items in the cost, schedule, or technical baseline shall be processed in accordance with the appropriate change control procedure.

## 5.2 CHANGE CONTROL

The PCCB controls the issuance and revision of the PCSB. If at any time the responsible organization forecasts a change to the cost or schedule baseline that exceeds a PCSB threshold and cannot be mitigated by a CAP, the responsible organization shall, in coordination with the Director, PCAD, submit a DCP to the PCCB. In addition, proposed changes to the ESAAB cost baseline (TPC) and the ESAAB schedule baseline that exceed specified ESAAB thresholds shall also be evaluated by the ESAAB BCCB, with the exception of directed changes, which require only information copies of the change to be provided to the ESAAB BCCB. The PMS Manual (DOE/RW-0043), Rev. 4 and the Program Change Control Procedure (DOE/RW-0223) contain additional guidance on change control. A flowchart of the cost and schedule baseline monitoring and control process is shown in Figure 4.

### 5.2.1 ESAAB BCCB

The ESAAB BCCB was established to strengthen the DOE program/project management process at the executive level. The ESAAB BCCB exercises executive level control over certain changes to the cost and schedule baselines for MSAs. DOE Notice 4700.4A. defines ESAAB BCCB control and the thresholds that require ESAAB BCCB involvement. ESAAB BCCB cost and schedule thresholds are discussed in Section 4.2.

An MSA or MP, as designated in DOE Order 4240.1J, which has reached KD-1 is subject to ESAAB BCCB control. Baselines shall be approved by the Acquisition Executive (AE) at KD-1. The initial scope, cost, and schedule baselines shall be derived from the Conceptual Design Report (CDR) and related project documentation. Additional information concerning MSAs, MPs, and KDs can be found in DOE Order 4700.1 and DOE Notice 4700.4A.

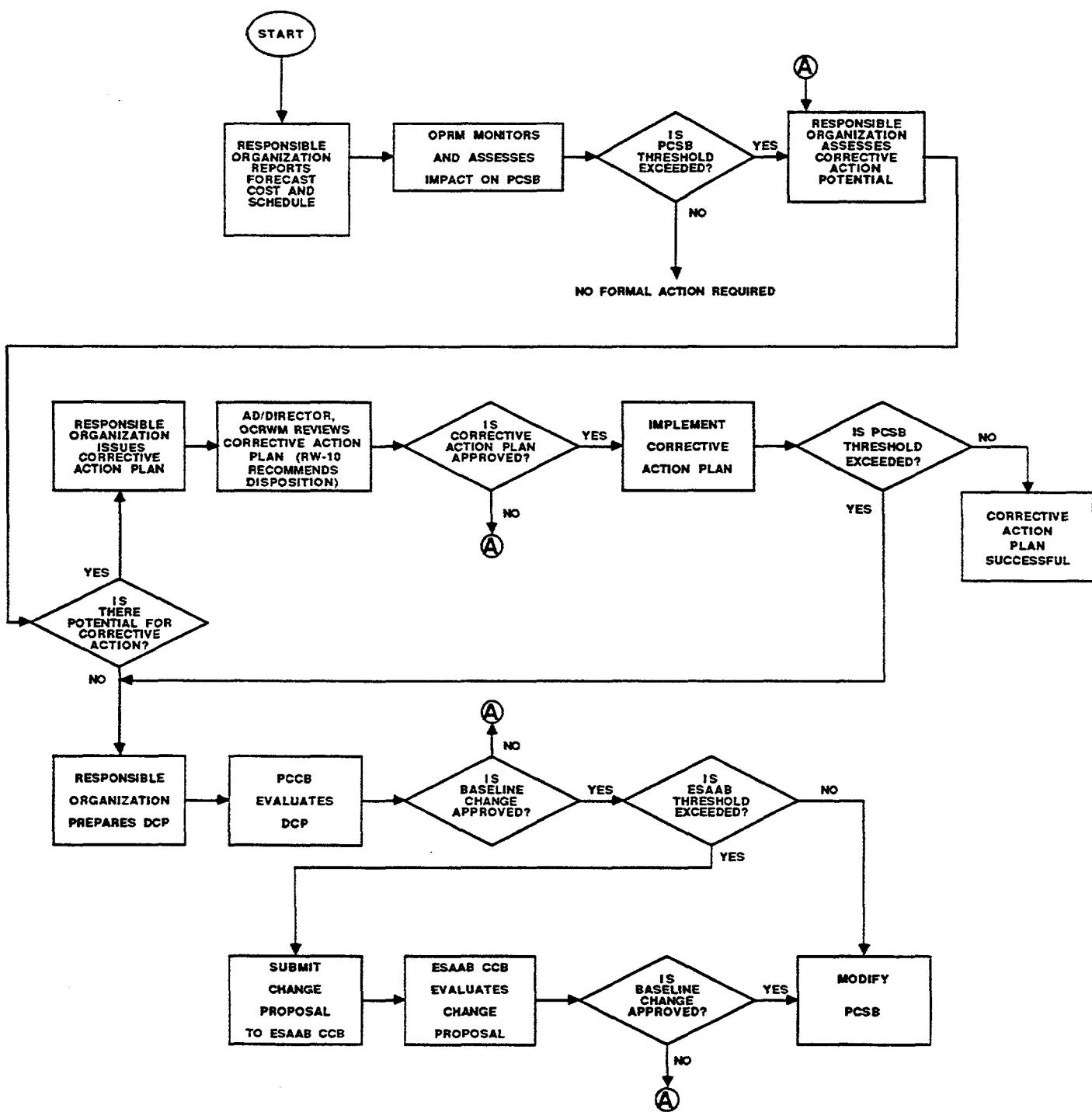
The Yucca Mountain Site Characterization Project and the MRS Project are designated MSAs. Designation of the Yucca Mountain Site Characterization Project and the MRS Project as MSAs can be found in DOE Order 4240.1J.

### 5.2.2 PCCB

Responsibilities and authorities of the PCCB are established in the OCRWM Program Change Control Procedure (DOE/RW-0223). All proposed changes to the PCSB require the approval of the PCCB. The PCCB also has responsibility for referring changes to Level 0 cost and schedule baselines exceeding ESAAB BCCB thresholds to the ESAAB BCCB.

### 5.2.3 Project CCBs

Cost and schedule data controlled by the PCCB may also be controlled by lower-level CCBs. Implementation of changes that exceed PCCB thresholds shall be subject to PCCB approval.



#### **FIGURE 4. PCSB MANAGEMENT PROCESS**

## ACRONYMS

AD	-	Associate Director
AE	-	Acquisition Executive
BCCB	-	Baseline Change Control Board
BCP	-	Baseline Change Proposal
CAP	-	Corrective Action Plan
CCB	-	Change Control Board
CDR	-	Conceptual Design Report
DCP	-	Document Change Proposal
DOE	-	Department of Energy
EA	-	Environmental Assessment
EIS	-	Environmental Impact Statement
ESAAB	-	Energy System Acquisition Advisory Board
ESAR	-	Energy System Acquisition Review
ESF	-	Exploratory Studies Facility
KD	-	Key Decision
LA	-	License Application
LWT	-	Legal Weight Truck
MIP	-	Mission Implementation Plan
MGDS	-	Mined Geologic Disposal System
MP	-	Major Project
MRS	-	Monitored Retrievable Storage
MSA	-	Major System Acquisition
NRC	-	Nuclear Regulatory Commission
NWPA	-	Nuclear Waste Policy Act
OCRWM	-	Office of Civilian Radioactive Waste Management
OMTS	-	Operations Management Tracking System
OPRM	-	Office of Program and Resources Management
PCAD	-	Program Control and Administration Division (OPRM)
PCCB	-	Program Change Control Board
PCSB	-	Program Cost and Schedule Baseline
PMS	-	Program Management System
RW	-	Radioactive Waste
SAR	-	Safety Analysis Report
TEC	-	Total Estimated Cost
TPC	-	Total Project Cost
TSLCC	-	Total System Life Cycle Cost Analysis
WBS	-	Work Breakdown Structure
YMP	-	Yucca Mountain Site Characterization Project
YMPO	-	Yucca Mountain Site Characterization Project Office

**Appendix A**  
**ANNUALIZED COST BASELINE FOR**  
**THE YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT**

TABLE A-1. COST BASELINE - YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT <sup>a</sup>  
(includes operating and capital costs in millions of year-of-expenditure dollars)

WBS Element	PRE-FY 1992	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	POST FY2001	TOTAL
Systems Engin.	23.8 <sup>b</sup>	5.4											129.4
Waste Package	83.0	5.4											273.2
Site Investigations	270.0	46.8											1035.2
Repository	91.6	3.8											846.7
Regulatory	87.1	28.1											518.7
Exploratory Studies Facilities <sup>c</sup>	104.8	6.3											838.3
Test Facilities <sup>d</sup>	22.7	6.8	<b>COST BASELINE WILL BE REVISED FOLLOWING COMPLETION OF PHASE-2 ICE AND RECEIPT OF FY 1994 OMB PASSBACK</b>										316.4
Project Management	98.4	20.0											447.9
Financial Assistance <sup>e</sup>	54.0	32.1											950.5
Quality Assistance	57.4	12.0											249.2
Information Management	44.6	8.2											192.4
Environment Safety and Health	55.7	10.5											248.2
Institutional	10.8	2.5											49.5
Support Services	51.1	12.5											223.7
<b>Total <sup>f</sup></b>	<b>1055.1<sup>b</sup></b>	<b>200.4<sup>b</sup></b>											<b>6319.3<sup>b</sup></b>

Note:

- a. Duration of project is from January 1983 through submittal of license application.
- b. Includes \$5.3 million in fiscal year 1991 M&O costs.
- c. Includes Exploratory Studies Facility (ESF) Ramp Configuration.
- d. Includes Power Upgrade for Exploratory Studies Facility.
- e. For the fiscal years 1993-2001, Financial and Technical Assistance costs were determined by taking other costs (5% for grants, 3% for University Funding and 2% for Impact Assistance), adding \$50 million for a Benefits Agreement and adding projected PETT costs.
- f. May not add due to independent rounding.
- g. Pre-FY 1992 costs include \$1.3 million for land acquisition.
- h. FY 1992 enacted budget plus prior year unobligated carry over.
- i. Total Project Cost approved by Acquisition Executive on January 28, 1992.

**Appendix B**

**YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT**  
**SCHEDULE BASELINE**

**Revision 3**

PROGRAM SCHEDULE BASELINE - YUCCA MOUNTAIN PROJECT MILESTONES

WBS: Waste Package |

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
RM233	01Oct92	1.2.2	20	PCCB

MILESTONE DESCRIPTION

Start Waste Package Advanced Conceptual Design

MILESTONE COMPLETION CRITERIA

This milestone will be complete when the Project Manager, YMP, starts waste package advanced conceptual design work. Prerequisites include a readiness review and authorization from the Director, OCRWM.

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
RT074	28Jun96	1.2.2	20	PCCB

MILESTONE DESCRIPTION

Start Waste Package License Application Design

MILESTONE COMPLETION CRITERIA

This milestone will be complete when the Project Manager, YMP, starts waste package license application design work. Prerequisites include DOE approval of the license application design requirements document (YMP milestone M627), a readiness review, and authorization from the Director, OCRWM. Waste package license application design activities will involve choosing from the conceptual designs developed during ACD and finalizing the details for the purpose of preparing the license application design.

PROGRAM SCHEDULE BASELINE - YUCCA MOUNTAIN PROJECT MILESTONES

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MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
R2201	30Jul98	1.2.2	20	PCCB

**MILESTONE DESCRIPTION**

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Provide Engineering Barrier System Data to Waste Package License Application Design

**MILESTONE COMPLETION CRITERIA**

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This milestone will be complete when the Project Manager, YMP, submits a report to the Director, OCRWM, documenting that the results of 13 months of engineering barrier system test data have been provided for the waste package license application design.

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**WBS: SITE INVESTIGATIONS :**

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MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
RP509	30Jun95	1.2.3	20	PCCB

**MILESTONE DESCRIPTION**

---

Complete Deep Unsaturated Zone Hydrologic Hole Drilling

**MILESTONE COMPLETION CRITERIA**

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This milestone will be complete when the Project Manager, YMP, submits a report to the Director, OCRWM, documenting that the geophysical logs have been completed for the last deep unsaturated zone borehole.

PROGRAM SCHEDULE BASELINE - YUCCA MOUNTAIN PROJECT MILESTONES

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WBS: Repository |

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
RN430	01Oct92	1.2.4	20	PCCB

MILESTONE DESCRIPTION

Start Repository Advanced Conceptual Design

MILESTONE COMPLETION CRITERIA

This milestone will be complete when the Project Manager, YMP, starts repository advanced conceptual design work. Prerequisites include a readiness review and authorization from the Director, OCRWM.

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MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
RM458	28Jun96	1.2.4	20	ESAAB

MILESTONE DESCRIPTION

Start Repository License Application Design (KD-1B)

MILESTONE COMPLETION CRITERIA

This milestone will be complete when the Project Manager, YMP, starts repository license application design work. Prerequisites include Repository Design Requirements Documents, a readiness review, authorization from the Director, OCRWM, and ESAAB approval of the start of repository LAD.

PROGRAM SCHEDULE BASELINE - YUCCA MOUNTAIN PROJECT MILESTONES

WBS: Regulatory |

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
R5210	29Oct99	1.2.5	20	ESAAB

MILESTONE DESCRIPTION

Notify State of Proposed Site Selection

MILESTONE COMPLETION CRITERIA

This milestone will be complete when the Secretary of Energy makes notification of proposed site selection required by Section 114(a)(1) of the NWPA, as amended.

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
R5220	30Mar01	1.2.5	20	PCCB

MILESTONE DESCRIPTION

Notify State of Site Selection

MILESTONE COMPLETION CRITERIA

This milestone will be complete when the Secretary of Energy makes notification of site selection required by Section 114(a)(1) of the NWPA, as amended.

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
R5200	30Apr01	1.2.5	20	ESAAB

MILESTONE DESCRIPTION

Issue Site Recommendation Report to the President

MILESTONE COMPLETION CRITERIA

This milestone will be complete when the Secretary of Energy submits the site recommendation report to the President. The report will provide a comprehensive statement of the basis for site recommendation, including the FEIS and the other information identified in section 114(a)(1)(a-g) of the NWPA.

PROGRAM SCHEDULE BASELINE - YUCCA MOUNTAIN PROJECT MILESTONES

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MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
R5181	30Oct01	1.2.5	20	ESAAB

**MILESTONE DESCRIPTION**

---

Submit License Application to the NRC

**MILESTONE COMPLETION CRITERIA**

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This milestone will be complete when the LA is approved by the Secretary of Energy and submitted to the NRC in accordance with 10 CFR 60.22, requesting permission to start repository construction. Prerequisites include License Application Design Review (LADR).

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WBS: Exploratory Studies Facility |

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MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
RM645	30Nov92	1.2.6	20	ESAAB

**MILESTONE DESCRIPTION**

---

Start ESF Site Preparation (KD-3)

**MILESTONE COMPLETION CRITERIA**

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This milestone will be complete when the Project Manager, YMP, starts ESF site preparation at Yucca Mountain. Prerequisites include a readiness review, authorization from the Director, OCRWM, and ESAAB approval.

PROGRAM SCHEDULE BASELINE - YUCCA MOUNTAIN PROJECT MILESTONES

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
R6610	03Jun96	1.2.6	20	ESAAB

**MILESTONE DESCRIPTION**

Start ESF In-Situ Test Phase (KD-4)

**MILESTONE COMPLETION CRITERIA**

This milestone will be complete when the Project Manager, YMP, submits a report to the Director, OCRWM, documenting that the in-situ test phase has begun in the Exploratory Studies Facility Main Test Level. Prerequisites include ESAAB approval.

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
RM656	28Nov97	1.2.6	20	PCCB

**MILESTONE DESCRIPTION**

Complete ESF Development Drifting

**MILESTONE COMPLETION CRITERIA**

This milestone will be complete when the Project Manager, YMP, submits a report to the Director, OCRWM, documenting that ESF development drifting is complete. Includes drifting to Drill Hole Wash, Ghost Dance Fault, and Imbricate Fault.

WBS: Project Management |

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
R9001	30Nov93	1.2.9	20	ESAAB

**MILESTONE DESCRIPTION**

Energy System Acquisition Review (ESAR)

**MILESTONE COMPLETION CRITERIA**

This milestone will be complete when the Project Manager, YMP, completes the annual Energy System Acquisition Review presentation to ESAAB.

PROGRAM SCHEDULE BASELINE - YUCCA MOUNTAIN PROJECT MILESTONES

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
R9002	30Nov94	1.2.9	20	ESAAB

**MILESTONE DESCRIPTION**

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Energy System Acquisition Review (ESAR)

**MILESTONE COMPLETION CRITERIA**

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This milestone will be complete when the Project Manager, YMP, completes the annual Energy System Acquisition Review presentation to ESAAB.

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
R9003	30Nov95	1.2.9	20	ESAAB

**MILESTONE DESCRIPTION**

-----  
Energy System Acquisition Review (ESAR)

**MILESTONE COMPLETION CRITERIA**

-----  
This milestone will be complete when the Project Manager, YMP, completes the annual Energy System Acquisition Review presentation to ESAAB.

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
R9004	28Nov97	1.2.9	20	ESAAB

**MILESTONE DESCRIPTION**

-----  
Energy System Acquisition Review (ESAR)

**MILESTONE COMPLETION CRITERIA**

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This milestone will be complete when the Project Manager, YMP, completes the annual Energy System Acquisition Review presentation to ESAAB.

PROGRAM SCHEDULE BASELINE - YUCCA MOUNTAIN PROJECT MILESTONES

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MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
R9005	30Nov98	1.2.9	20	ESAAB

**MILESTONE DESCRIPTION**

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Energy System Acquisition Review (ESAR)

**MILESTONE COMPLETION CRITERIA**

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This milestone will be complete when the Project Manager, YMP, completes the annual Energy System Acquisition Review presentation to ESAAB.

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
R9006	30Nov99	1.2.9	20	ESAAB

**MILESTONE DESCRIPTION**

---

Energy System Acquisition Review (ESAR)

**MILESTONE COMPLETION CRITERIA**

---

This milestone will be complete when the Project Manager, YMP, completes the annual Energy System Acquisition Review presentation to ESAAB.

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
R9007	30Nov00	1.2.9	20	ESAAB

**MILESTONE DESCRIPTION**

---

Energy System Acquisition Review (ESAR)

**MILESTONE COMPLETION CRITERIA**

---

This milestone will be complete when the Project Manager, YMP, completes the annual Energy System Acquisition Review presentation to ESAAB.

PROGRAM SCHEDULE BASELINE - YUCCA MOUNTAIN PROJECT MILESTONES

WBS: Environment, Health, & Safety |

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
R5108	30May97	1.2.13	20	PCCB

**MILESTONE DESCRIPTION**

Issue Repository EIS Notice of Intent

**MILESTONE COMPLETION CRITERIA**

This milestone will be complete when notice of document availability is published in the Federal Register.

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
R5142	27Feb98	1.2.13	20	PCCB

**MILESTONE DESCRIPTION**

Issue Repository EIS Implementation Plan

**MILESTONE COMPLETION CRITERIA**

This milestone will be complete when the Project Manager, YMP, issues the Repository EIS Implementation Plan as an approved document.

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
R5151	29Oct99	1.2.13	20	ESAAB

**MILESTONE DESCRIPTION**

Issue Draft Environmental Impact Statement

**MILESTONE COMPLETION CRITERIA**

This milestone will be complete when notice of document availability is published in the Federal Register.

PROGRAM SCHEDULE BASELINE - YUCCA MOUNTAIN PROJECT MILESTONES

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
R5161	30Mar01	1.2.13	20	PCCB

**MILESTONE DESCRIPTION**

Issue Final Environmental Impact Statement

**MILESTONE COMPLETION CRITERIA**

This milestone will be complete when notice of document availability is published in the Federal Register.

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
R5190	30Apr01	1.2.13	20	PCCB

**MILESTONE DESCRIPTION**

Issue Record of Decision

**MILESTONE COMPLETION CRITERIA**

This milestone will be complete when "a concise public record of decision" identifying all alternatives as found in 40 CFR 1505.2 is published in the Federal Register.

**Appendix C**  
**MRS PROJECT SCHEDULE BASELINE**  
**- MRS MILESTONES**

PROGRAM SCHEDULE BASELINE - MRS MILESTONES

WBS: MRS - MRS Facility

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
M1002	30Oct92	3.1.4	40	ESAAB

MILESTONE DESCRIPTION

Start MRS Facility Safety Analysis Report (SAR) Design (KD-1A)

MILESTONE COMPLETION CRITERIA

This milestone is complete when design for the Safety Analysis Report for the MRS Facility and Cask Maintenance Facility (CMF) begins. Prerequisites include an approval of System Requirements Baseline (SRBL) documents, a readiness review, and Energy System Acquisition Advisory Board (ESAAB) approval.

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
M1009	30Sep94	3.1.4	40	PCCB

MILESTONE DESCRIPTION

Complete MRS Facility Safety Analysis Report (SAR) Design

MILESTONE COMPLETION CRITERIA

This milestone is complete when the design for the Safety Analysis Report for the MRS Facility and Cask Maintenance Facility (CMF) is complete.

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
M1003	30Sep94	3.1.4	40	ESAAB

MILESTONE DESCRIPTION

Start MRS Facility Final Procurement and Construction (FP&C) Design (KD-2)

MILESTONE COMPLETION CRITERIA

This milestone will be complete when final procurement and construction design for the MRS Facility and CMF begins. Prerequisites include designation of MRS facility site (Congress Enacts Agreement), approval of Design Requirements Baseline (DRBL) documents, completion of SAR Design Review (SARDR), and ESAAB approval.

PROGRAM SCHEDULE BASELINE - MRS MILESTONES

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
M0001	31Jul96	3.1.4	40	ESAAB

MILESTONE DESCRIPTION

Start MRS Facility Site Preparation (KD-3A)

MILESTONE COMPLETION CRITERIA

This milestone will be complete when initial site preparation activities for the MRS Facility begin. Prerequisites include ESAAB approval and approval of required design packages.

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
M1004	30Sep96	3.1.4	40	PCCB

MILESTONE DESCRIPTION

Complete MRS Facility Final Procurement and Construction Design

MILESTONE COMPLETION CRITERIA

This milestone will be complete when all construction packages including construction drawings and technical procurement specifications have been accepted by the Associate Director for Storage & Transportation.

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
M1006	30Sep96	3.1.4	40	PCCB

MILESTONE DESCRIPTION

Start MRS Facility Construction

MILESTONE COMPLETION CRITERIA

This milestone will be complete when actual facility construction activities begin (does not include the start of initial site preparation). Prerequisites include a readiness review, and receipt of a materials 10 CFR Part 72 license from NRC.

PROGRAM SCHEDULE BASELINE - MRS MILESTONES

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
M1007	30Jan98	3.1.4	40	ESAAB

**MILESTONE DESCRIPTION**

Start Spent Fuel Receipt at MRS Facility (KD-4A)

**MILESTONE COMPLETION CRITERIA**

This milestone is complete when operations to receive and possess spent fuel begin. Prerequisites include a readiness review and ESAAB approval.

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
M0402	30Jul99	3.1.4	40	PCCB

**MILESTONE DESCRIPTION**

Complete MRS Facility Construction

**MILESTONE COMPLETION CRITERIA**

This milestone is complete when the facility construction activities end and the MRS and CMF facilities are fully operational.

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
M1010	30Jul99	3.1.4	40	ESAAB

**MILESTONE DESCRIPTION**

Start Operations at Completed MRS Facility (KD-4B)

**MILESTONE COMPLETION CRITERIA**

This milestone is complete when operations begin at complete MRS facility. Prerequisites include a readiness review and ESAAB approval.

PROGRAM SCHEDULE BASELINE - MRS MILESTONES

WBS: MRS - Regulatory |

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
M0502	30Sep94	3.1.5	40	PCCB

MILESTONE DESCRIPTION

Submit MRS Safety Analysis Report to the NRC

MILESTONE COMPLETION CRITERIA

This milestone will be complete when the document is approved by DOE and submitted to the NRC. Prerequisites include completion of SAR Design Review (SARDR).

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
M3004	29Sep95	3.1.5	40	ESAAB

MILESTONE DESCRIPTION

Submit MRS License Application to the NRC

MILESTONE COMPLETION CRITERIA

This milestone will be complete when the document is approved and submitted to the NRC by the Secretary of Energy along with a final environmental impact statement.

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
M0503	30Sep96	3.1.5	40	PCCB

MILESTONE DESCRIPTION

Receive 10 CFR Part 72 License from the NRC

MILESTONE COMPLETION CRITERIA

This milestone will be complete when the materials license is issued by the NRC.

PROGRAM SCHEDULE BASELINE - MRS MILESTONES

WBS: Project Management |

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
M9001	30Jun95	3.19	40	ESAAB

MILESTONE DESCRIPTION

Energy System Acquisition Review (ESAR)

MILESTONE COMPLETION CRITERIA

This milestone will be complete when the Project Manager, MRS, completes the annual Energy System Acquisition Review presentation to ESAAB.

WBS: MRS - Environment, Safety, & Health |

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
M5001	30Jun93	3.1.13	40	ESAAB

MILESTONE DESCRIPTION

Complete Environmental Assessment(s) for Site(s)

MILESTONE COMPLETION CRITERIA

This milestone is completed when the Secretary of Energy submits the EA to the Negotiator.

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
M3001	30Sep93	3.1.13	40	PCCB

MILESTONE DESCRIPTION

Issue MRS EIS Notice of Intent

MILESTONE COMPLETION CRITERIA

This milestone will be complete when a Notice of Intent is published in the Federal Register.

PROGRAM SCHEDULE BASELINE - MRS MILESTONES

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
M3002	30Sep94	3.1.13	40	PCCB

MILESTONE DESCRIPTION

Issue MRS DEIS

MILESTONE COMPLETION CRITERIA

This milestone will be complete when a Notice of Document Availability is published in the Federal Register.

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
M3003	31Aug95	3.1.13	40	PCCB

MILESTONE DESCRIPTION

Issue MRS FEIS

MILESTONE COMPLETION CRITERIA

This milestone will be complete when a Notice of Document Availability is published in the Federal Register.

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
M3005	29Sep95	3.1.13	40	PCCB

MILESTONE DESCRIPTION

Issue MRS Record of Decision

MILESTONE COMPLETION CRITERIA

This milestone will be complete when the document is published in the Federal Register.

PROGRAM SCHEDULE BASELINE - MRS MILESTONES

WBS: MRS - Institutional |

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
M5002	30Sep93	3.1.14	40	ESAAB

**MILESTONE DESCRIPTION**

Congress Enacts Agreement

**MILESTONE COMPLETION CRITERIA**

This milestone will be complete when Congress enacts legislation that identifies the proposed site. Prerequisites include submission to Congress of a written agreement between the potential host and the Nuclear Waste Negotiator and an EA.

**Appendix D**  
**MRS PROJECT SCHEDULE BASELINE**  
**- TRANSPORTATION SYSTEM MILESTONES**

PROGRAM SCHEDULE BASELINE - TRANSPORTATION MILESTONES

WBS: Casks - Existing Technology Cask Acquisition |

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
T1101	09Oct92	3.2.2	40	PCCB

MILESTONE DESCRIPTION

Issue Draft Request-For-Proposals (RFP) for Existing Technology (Phase 1) Cask Acquisition

MILESTONE COMPLETION CRITERIA

This milestone will be complete when the Draft RFP for existing technology (Phase 1) cask acquisition is issued by OCRWM's Management and Operating Contractor.

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
T1102	30Jun93	3.2.2	40	ESAAB

MILESTONE DESCRIPTION

Award Contracts for Existing Technology Cask Acquisition (KD-1B)

MILESTONE COMPLETION CRITERIA

This milestone will be complete when the contract(s) for existing technology (Phase 1) cask acquisition is awarded by OCRWM's Management and Operating Contractor. A prerequisite is that the Negotiator submit a proposed agreement to Congress.

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
T1103	31Jan97	3.2.2	40	PCCB

MILESTONE DESCRIPTION

Receive Initial Set of Existing Technology Casks

MILESTONE COMPLETION CRITERIA

This milestone will be complete when one of each cask type awarded in the existing technology cask acquisition is delivered and accepted by the Associate Director for Storage and Transportation for integrated operational testing.

PROGRAM SCHEDULE BASELINE - TRANSPORTATION MILESTONES

WBS: Casks - Legal Weight Truck (LWT) Casks |

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
T1298	31Dec92	3.2.2	40	PCCB

MILESTONE DESCRIPTION

Submit GA-4/GA-9 Legal Weight Truck (LWT) Cask Safety Analysis Report Packages (SARPs) to the NRC

MILESTONE COMPLETION CRITERIA

This milestone will be complete when the SARPs for the GA-4/GA-9 LWT casks are submitted by the cask contractor to the NRC for review. Prerequisites include performance of readiness review by OCRWM.

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
T1299	30Dec94	3.2.2	40	PCCB

MILESTONE DESCRIPTION

Receive NRC Certificates of Compliance for GA-4/GA-9 Legal Weight Truck (LWT) Casks

MILESTONE COMPLETION CRITERIA

This milestone will be complete when the NRC issues certificates of compliance for the GA-4/GA-9 LWT casks.

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
T1297	30Sep96	3.2.2	40	ESAAB

MILESTONE DESCRIPTION

Start Fabrication of GA-4/GA-9 Legal Weight Truck (LWT) Casks for Fleet (KD-3B)

MILESTONE COMPLETION CRITERIA

This milestone will be complete when the GA-4/GA-9 LWT cask fabrication contract has been awarded. Prerequisites include ESAAB approval and authorization from the Director, OCRWM.

PROGRAM SCHEDULE BASELINE - TRANSPORTATION MILESTONES

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
T1296	31Mar98	3.2.2	40	PCCB

MILESTONE DESCRIPTION

Complete Fabrication of First GA-4/GA-9 Legal Weight Truck (LWT) Cask for Fleet

MILESTONE COMPLETION CRITERIA

This milestone will be complete when the first GA-4/GA-9 production model LWT cask has been completed and is accepted by the Associate Director for Storage and Transportation.

WBS: Casks - Rail/Barge Casks |

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
T1301	31Mar93	3.2.2	40	PCCB

MILESTONE DESCRIPTION

Submit BR-100 Rail/Barge Cask Safety Analysis Report Package (SARP) to the NRC

MILESTONE COMPLETION CRITERIA

This milestone will be complete when the BR-100 rail/barge cask's SARP is submitted by the cask contractor to the NRC for review. Prerequisites include performance of readiness review by OCRWM.

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
T1302	31Mar95	3.2.2	40	PCCB

MILESTONE DESCRIPTION

Receive NRC Certificate of Compliance for BR-100 Rail/Barge Cask

MILESTONE COMPLETION CRITERIA

This milestone will be complete when the NRC issues a certificate of compliance for the BR-100 rail/barge cask.

PROGRAM SCHEDULE BASELINE - TRANSPORTATION MILESTONES

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
T1303	31Mar97	3.2.2	40	ESAAB

**MILESTONE DESCRIPTION**

Start Fabrication of BR-100 Rail/Barge Casks for Fleet (KD-3C)

**MILESTONE COMPLETION CRITERIA**

This milestone will be complete when the BR-100 rail/barge cask fabrication contract has been awarded. Prerequisites include ESAAB approval and authorization from the Director, OCRWM.

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
T1304	31Mar99	3.2.2	40	PCCB

**MILESTONE DESCRIPTION**

Complete Fabrication of First BR-100 Rail/Barge Cask for Fleet

**MILESTONE COMPLETION CRITERIA**

This milestone will be complete when the first BR-100 rail/barge production model cask has been completed and is accepted by the Associate Director for Storage and Transportation.

WBS: Casks - From-MRS Casks |

MILESTONE NUMBER	REFERENCE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
T1399	29May98	3.2.2	40	PCCB

**MILESTONE DESCRIPTION**

Start From-MRS Cask Preliminary Design(s)

**MILESTONE COMPLETION CRITERIA**

This milestone will be complete when the Director, OCRWM, authorizes from-MRS cask preliminary design work to begin. Prerequisites for the start of from-MRS cask preliminary design(s) are: the decision on the need and scope of from-MRS cask design development, preprocurement planning, and issuance of an RFP(s), and contract awarding.

PROGRAM SCHEDULE BASELINE - TRANSPORTATION MILESTONES

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WBS: Support Systems :

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MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
T6390	30Jan98	3.2.4	40	PCCB

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MILESTONE DESCRIPTION

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Start Shipments of Spent Fuel Using Existing Technology Casks

MILESTONE COMPLETION CRITERIA

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This milestone will be complete when shipments begin using existing technology casks. Prerequisites include operating license for MRS, authorization from the Director, OCRWM, completion of integrated operational testing and a readiness review.

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MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
T6399	29May98	3.2.4	40	PCCB

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MILESTONE DESCRIPTION

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Start Shipments of Spent Fuel Using GA-4/GA-9 Legal Weight Truck (LWT) Casks

MILESTONE COMPLETION CRITERIA

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This milestone will be complete when shipments begin using GA-4/GA-9 LWT casks. Prerequisites include operating license for MRS, authorization from the Director, OCRWM, completion of integrated operational testing and a readiness review.

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MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
T6391	28May99	3.2.4	40	PCCB

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MILESTONE DESCRIPTION

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Start Shipments of Spent Fuel Using BR-100 Rail/Barge Casks

MILESTONE COMPLETION CRITERIA

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This milestone will be complete when shipments begin using BR-100 rail/barge casks. Prerequisites include operating license for MRS and/or repository, authorization from the Director, OCRWM, completion of integrated operational testing and a readiness review.

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PROGRAM SCHEDULE BASELINE - TRANSPORTATION MILESTONES

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WBS: Institutional |

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MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
T2499	30Jan98	3.2.14	40	PCCB

MILESTONE DESCRIPTION

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NWPA Section 180(c) Training Assistance Complete for Initial Shipments

MILESTONE COMPLETION CRITERIA

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To be determined.

**Appendix E**  
**LONG-TERM REFERENCE SCHEDULE**

PROGRAM REFERENCE SCHEDULE - YUCCA MOUNTAIN PROJECT MILESTONES

WBS: Repository

MILESTONE NUMBER	REFERENCE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
R4185	30Oct01	1.2.4	20	PCCB

MILESTONE DESCRIPTION

Start Repository Final Procurement and Construction Design

MILESTONE COMPLETION CRITERIA

This milestone will be complete when the Director, OCRWM, authorizes design work to begin. Prerequisites include a design review and ESAAB approval.

MILESTONE NUMBER	REFERENCE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
R4390	29Oct04	1.2.4	20	PCCB

MILESTONE DESCRIPTION

Start Repository Construction

MILESTONE COMPLETION CRITERIA

This milestone will be complete when the Director, OCRWM, authorizes construction activities to begin. Prerequisites include a readiness review, NRC construction authorization, ESAAB approval, and acceptance by the Associate Director for Geologic Disposal, of required design packages.

MILESTONE NUMBER	REFERENCE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
R4490	29Jan10	1.2.4	20	PCCB

MILESTONE DESCRIPTION

Start Repository Waste Emplacement

MILESTONE COMPLETION CRITERIA

This milestone will be complete when the Secretary of Energy authorizes waste emplacement operations to begin. Prerequisites include a design review, NRC license to receive and possess waste, and ESAAB approval.

PROGRAM REFERENCE SCHEDULE - YUCCA MOUNTAIN PROJECT MILESTONES

WBS: Regulatory |

MILESTONE NUMBER	REFERENCE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
R5291	30Apr08	1.2.5	20	PCCB

MILESTONE DESCRIPTION

Submit Updated Repository LA to Receive and Possess Waste

MILESTONE COMPLETION CRITERIA

This milestone will be satisfied by the substantial completion of the construction of the surface and underground facilities needed for operations and the submittal of the updated license application to the NRC, in accordance with 10 CFR 60.24.

WBS: Casks - Legal Weight Truck Casks |

MILESTONE NUMBER	BASELINE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
T1295	29Sep00	3.2.2	40	PCCB

MILESTONE DESCRIPTION

Establish Capability to Ship 1200 MTU/YR with New Legal Weight Truck Casks

MILESTONE COMPLETION CRITERIA

This milestone will be complete when enough legal weight truck casks have been fabricated and accepted by the DOE to begin shipping 1200 MTU/YR from reactors.

WBS: Casks - From-MRS Cask |

MILESTONE NUMBER	REFERENCE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
T1398	30Apr01	3.2.2	40	PCCB

MILESTONE DESCRIPTION

Complete From-MRS Cask Preliminary Design(s) and Start Final Design

MILESTONE COMPLETION CRITERIA

This milestone will be complete when the from-MRS cask preliminary design report is accepted by the Director, OCRWM, and the Director, OCRWM, has notified the contractor to proceed with the final design development.

PROGRAM REFERENCE SCHEDULE - TRANSPORTATION MILESTONES

MILESTONE NUMBER	REFERENCE DATE	WBS	RESPONSIBLE ORGANIZATION	HIGHEST CCB
T1397	30Apr03	3.2.2	40	PCCB

**MILESTONE DESCRIPTION**

Complete From-MRS Cask Final Design(s)

**MILESTONE COMPLETION CRITERIA**

This milestone will be complete when the from-MRS cask final design report is accepted and submitted by the cask contractors to the NRC for review.

MILESTONE NUMBER	REFERENCE DATE	WBS	RESPONSIBLE ORGANIZATION	HIGHEST CCB
T1396	31Oct05	3.2.2	40	PCCB

**MILESTONE DESCRIPTION**

Start Fabrication of From-MRS Cask(s) Prototypes

**MILESTONE COMPLETION CRITERIA**

This milestone will be complete when the Director, OCRWM, authorizes prototype fabrication.

MILESTONE NUMBER	REFERENCE DATE	WBS	RESPONSIBLE ORGANIZATION	HIGHEST CCB
T1395	30Dec08	3.2.2	40	PCCB

**MILESTONE DESCRIPTION**

Start Fabrication of From-MRS Cask Fleet

**MILESTONE COMPLETION CRITERIA**

This milestone will be complete when the Director, OCRWM, authorizes fabrication of the from-MRS cask fleet. This will occur after the NRC has issued a certificate of compliance and the cask fleet contract has been awarded.

PROGRAM REFERENCE SCHEDULE - TRANSPORTATION MILESTONES

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MILESTONE NUMBER	REFERENCE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
T1394	29Jan10	3.2.2	40	PCCB

MILESTONE DESCRIPTION

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Establish Capability to Ship 400 MTU/YR Using From-MRS Casks

MILESTONE COMPLETION CRITERIA

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This milestone will be complete when the fabrication contractor notifies DOE that fabrication and delivery of enough from-MRS casks to begin shipping 400 MTU/YR has been complete and is ready for DOE acceptance.

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MILESTONE NUMBER	REFERENCE DATE	WBS	RESPONSIBLE RW ORGANIZATION	HIGHEST CCB
T1393	30Jan15	3.2.2	40	PCCB

MILESTONE DESCRIPTION

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Complete Fabrication of From-MRS Cask Fleet

MILESTONE COMPLETION CRITERIA

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This milestone will be complete when the fabrication contractor notifies DOE that the fleet of from-MRS casks has been completed and are ready for DOE acceptance.