



# EM RECOVERY ACT PROJECT

**Documentation Guidance  
for Office of Environmental Management  
Independent Government Cost Estimates**

## **Cost Estimate Basis of Estimate [BOE]**

**EM CE&A Document No. EMCBC-CE&A-09001  
Version 1.0  
March 27, 2009**



**Creating Jobs through Environmental  
Cleanup, Nuclear Facility Decommissioning,  
and Radioactive Waste Disposal under the  
*American Recovery & Reinvestment Act of 2009***



**US Department of Energy  
Office of Environmental Management  
Consolidated Business Center  
Office of Cost Estimating & Analysis**

## **Introduction to Template for DOE Environmental Management Cost Basis of Estimate (BOE)**

This template provides the documentation guidance for all Office of Environmental Management (EM) cost estimates. Life cycle cost estimates (LCCEs) are required for all EM projects (DOE O 413.3A). Independent Government Cost Estimates (IGCEs) are required for all EM Clean-up projects (FAR 26.203/HCA Directive X.XX). EM acquisition policies require contracting officers to ensure that the final contract price is fair and reasonable for all acquisitions through cost analysis. This necessitates some type of IGCE for all acquisitions (FAR 15, 404-1(a)).

The Cost Basis of Estimate (BOE) provides a record of the procedures, ground rules and assumptions, data, environment, and events that underlie a cost estimate's development or update. Good documentation supports the cost estimate's credibility, aids in the analysis of changes in program cost, enables reviewers to effectively assess the cost estimate, and contributes to the population of EM data bases for estimating the cost of future programs.

A Cost BOE should be sufficiently complete and well organized such that a cost estimating professional can use the documentation by itself to understand and assess the estimate.

All cost estimates should be documented in accordance with this guidance. Note, however, that not all estimates require the same level of precision or detail. In determining the appropriate level of detail, i.e., the appropriate WBS level at which to estimate, the estimator should consider such factors as the following:

- *Dollar value of the program.* High-value programs typically require more extensive cost estimates prepared at a lower WBS level than do low-value programs.
- *Purpose of the estimate.* Early planning estimates, such as those to support a Mission Need Decision (CD-0), require less precision than later estimates; they can be prepared at a more aggregate level. Similarly, estimates to support a CD-1 decision can be of less depth than those that support a CD-2/3 decision or those IGCEs that are developed to support the "should cost" assessment, which is used to support the Contracting Officer's price reasonableness determination. Of the three, estimates supporting either the CD 2/3 decision process or that are used to determine price reasonableness (IGCE) should be the most detailed and at the lowest WBS level.
- *Nature of the program.* The program's nature can influence the appropriate level of WBS detail. For example, a buy of COTS equipment from a GSA schedule, regardless of dollar value, may require the EM to perform fewer WBS activities. Conversely, a complex program requiring development and construction of complex facilities or treatment systems, environmental clean-up activities, or Decontamination and Demolition (D&D) of excess facilities would require almost all WBS elements to be addressed, many of those in greater detail.
- *Data availability.* When technical or programmatic details of a program or alternative are unavailable, the associated cost estimate must be generated at an aggregate level and adjusted to account for technical or schedule uncertainties.

# EM RECOVERY ACT PROJECT

## Independent Government Cost Estimate

## Cost Estimate Basis of Estimate [BOE]

**Project Name:**  
**Contract No.:** DE-  
**Version 1.0**  
**Date Prepared:** March 27, 2009  
**Prepared by:**  
**Approved by:**



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## **1.0 INTRODUCTION**

### **1.1 Organization**

*Provide an overview of this document, and describe features that facilitate its use.*

### **1.2 Technical Description**

*Provide a brief technical and programmatic description of the system or alternative whose costs are being estimated. Identify any program documents used to prepare the estimate.*

### **1.3 Objective**

*Describe the purpose of the cost estimate being documented (e.g., for a JRC decision, to support a program rebaseline, etc.). Identify the organization that requested the estimate, briefly describe the specific tasking for the estimate, and cite any relevant correspondence.*

*If the estimate being documented updates a prior estimate, identify the prior estimate. A prior estimate is normally available when a program is being rebaselined. [Note: A cost track between the current and prior estimates may be presented in Section 6.]*

### **1.4 Scope**

*Identify the scope of the current cost estimate. List which of the standard WBS elements are covered by the estimate. State whether the estimate covers prime contractor costs, other contractor costs, Activity 5 costs, and the costs for other EM organizations.*

*Describe the years covered by the estimate, and explain the rationale for selecting the start and end years.*

*Identify any program costs that are excluded from the estimate. Examples of excluded costs may include costs that have been covered by other programs, costs covered by other government agencies, or sunk costs.*

### **1.5 Team Composition**

*Identify those who contributed to the cost estimates. For each contributor, include their organization, contribution, and areas of responsibility, routing symbol, telephone number, and email address.*

*Be sure to identify all technical and programmatic experts who contributed to the cost estimate.*

### **1.6 Program Schedule and Quantities**

*List the key acquisition events and milestones for the years covered by the cost estimate. Summarize the quantities to be purchased and installed by fiscal year. [Note: Presenting*

*schedule information in tabular format facilitates comparison with prior estimates, other alternatives, etc.]*

## **1.7 Acquisition Strategy and Cost-Relevant Contractual Information**

*Reference any acquisition strategy documents used to prepare the cost estimate, and describe how the acquisition strategy affected the estimate.*

*If the cost estimate was adjusted for type of contract award, contract options, or other contractual features, explain how such information was used to construct the estimate.*

## **1.8 Inflation Rates**

*Describe the source of inflation rates used to adjust Constant Year cost estimates into Then Year dollars.*

## **2.0 GROUND RULES AND ASSUMPTIONS**

*List key technical and programmatic conditions, estimating ground rules, and assumptions that underpin the estimate as a whole. Identify specific cost elements that have been excluded from the cost estimate.*

*Be sure to identify whether ground rules and assumptions pertain to Facilities & Equipment (F&E), Operations and Maintenance (O&M) or both. [Note: Details, ground rules and assumptions applicable to individual WBS elements are documented in Section 4.]*

## **3.0 METHODOLOGY SUMMARY**

### **3.1 Cost Estimation**

*Summarize the primary methodologies, factor libraries, models and data sources used to estimate program or alternative costs. Briefly state why they were selected. [Note: Details of the methodologies used for individual WBS elements are documented in Section 4.]*

*To facilitate the documentation, parameter values and factors that are used consistently throughout the estimate (e.g., labor rates, overhead factors, contract award fee percentages, quantities, scrap rates, etc.) can be presented in a summary table. The table should list the values of the parameters and factors, and it should explain how values were determined.*

### **3.2 Risk Adjustment**

*Describe how the high-confidence cost estimate was generated. Specifically, summarize how the standard cost methodologies were adjusted for cost estimating, technical, schedule, and other risks. Describe any risk analyses conducted by the Product Team or Investment Analysis Teams*

*(e.g., Monte Carlo simulation, identification of risk mitigation strategies) and how their results were used to create the most likely cost estimate. Describe the process used to distribute risk dollars among WBS elements and over fiscal years. Specify the percentile confidence of the risk-adjusted estimate.*

#### 4.0 ESTIMATE DESCRIPTION [BY WBS ELEMENT]

For each WBS element, describe the derivation of its estimated cost in sufficient detail to allow an independent reviewer to determine whether the estimate is complete, accurate, and realistic. The following information should be provided:

WBS Number and Title.

WBS Element Description. Include the definition from the EM-standard WBS and any tailoring used for this estimate.

Estimated Cost. Present the WBS element's estimated cost in Constant Year (CYXX) dollars, both total dollars and distributed across fiscal years. Be sure to identify the base year of calculation.

Methodology. Describe how the WBS element's costs were estimated. Depending on the choice of methodology, the estimator should include one or more of the following data:

- IF Labor Rates, then identify direct and indirect labor rates, what costs are included in the rates, and how the rates were determined.
- IF Labor Hours, then describe how labor hours were estimated.
- IF Material Purchases, then list the materials and purchased parts, the source of estimated prices and any crosschecks performed.
- IF Subcontracts, then summarize the work to be performed, how the price was determined.
- IF Cost Factors or Cost Estimating Relationships (CERs), then describe their source and how they were applied.
- IF Cost Models, then describe any estimating models used and how they were applied.
- IF System Analogs, then identify whether the analogous systems and explain how and why they were used.
- IF Estimator Judgment, then specify who provided the estimate and any justification.
- If Contractor Cost Estimates<sup>1</sup>, then identify whether contractor estimates were used and describe any crosschecks that were performed.

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<sup>1</sup> Note: Contractor Rough Order of Magnitude (ROM) estimates and non-negotiated contractor proposals should not be used for EM cost estimating unless absolutely necessary.

*Time Phasing.* Describe the analytic approach used to distribute the WBS element’s estimated costs across fiscal years.

*Calculations.* Present the inputs and algorithms or equation for each WBS element so reviewers can understand the basis for the cost estimate. Describe how WBS element costs were aggregated into the summary tables shown in Section 5 (if applicable).

*Data Sources.* Identify WBS-element-unique sources of cost and technical data and parameter values. Describe procedures, if any, used to normalize those data.

*Risk Adjustments.* Describe any WBS-element-specific procedures used to adjust the WBS element’s most likely estimated cost for risk. State in Constant-Year dollar terms the amount of the risk adjustment.

**5.0 COST ESTIMATE SUMMARY**

Include tables for Constant Year (CYXX) dollars and then-year dollars by fiscal year that track to the WBS methodology descriptions. Include a summary table of estimated costs by fiscal year by appropriation in Then Year dollars. The formats of the tables are shown below.

**Table 5-1. Most-Likely Cost Estimate, by WBS Element  
(Constant Year 20XX Dollars)**

	FYXX	FYXX	FYXX	FYXX	...	Total
WBS 3.0						
WBS 3.1						
WBS 3.2						
Etc.						
Etc.						
Etc.						
Etc.						
Total						

**Table 5-2. High-Confidence Cost Estimate, by WBS Element  
(Constant Year 20XX Dollars)**

	FYXX	FYXX	FYXX	FYXX	...	Total
WBS 3.0						
WBS 3.1						
WBS 3.2						
Etc.						
Etc.						
Etc.						
Etc.						
Total						

**Table 5-3. Most-Likely Cost Estimate, by WBS  
(Then-Year Dollars)**

	FYXX	FYXX	FYXX	FYXX	...	Total
WBS 3.0						
WBS 3.1						
WBS 3.2						
Etc.						
Etc.						
Total						

**Table 5-4. High-Confidence Cost Estimate, By WBS  
(Then-Year Dollars)**

	FYXX	FYXX	FYXX	FYXX	...	Total
WBS 3.0						
WBS 3.1						
WBS 3.2						
Etc.						
Etc.						
Total						

**Table 5-5. High-Confidence Cost Estimate, By Appropriation  
(Then-Year Dollars)**

	FYXX	FYXX	FYXX	FYXX	...	Total
F&E						
O&M						
Activity 5						
Total						

**6.0 COST TRACEABILITY.**

*When a prior cost estimate exists (for example, when the current estimate supports a program rebaseline), a cost reconciliation summary should be prepared. The cost reconciliation should provide a concise explanation for any change to a WBS element from the prior estimate, in Then Year dollars. An effective format for documenting a cost track to a prior estimate is shown in Table 6.1.*

**Table 6-1. Comparison of Program Cost Estimates  
(Then-Year Dollars)**

	[1]	[2]	[3]	[4]	[5]	
	<i>Current Estimate (Dollars)</i>	<i>Prior Estimate (Dollars)</i>	<i>Change ([1]-[2])</i>	<i>Percent Change ([3]/[2])</i>	<i>Reason for Change</i>	
<i>WBS 3.0</i>						
<i>WBS 3.1</i>						
<i>WBS 3.2</i>						
<i>Etc.</i>						
<i>Etc.</i>						

Appendices-include copies of estimate briefing charts, model runs, inflation rates, tables, etc.