

# Environmental Management



Month Day, Year

Title of Project (IGCE/ICR) @ Location/Site

Contract/RFP/Modification Number

*Prepared for*

Environmental Management Consolidated Business Center  
(EMCBC)

Office of Contracting

*by the*

Office of Cost Estimating & Project Management Support

Comment [MML1]: An Example of a Customer

Prepared by:

[Redacted]  
Name  
Cost Estimator

Peer Reviewed by:

[Redacted]  
Name  
Senior Cost Engineer

Approved by:

[Redacted]  
M. Allen Moe  
Supervisory Cost Estimator  
EMCBC Office of Cost Estimating & Project Management Support

**Comment [e2]:** STEP 11: Present estimate to management for approval.

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**Appendix A: IGCE Summary/Estimate**

**Appendix B: Statement of Work & Technical Specifications (Data Sources)**

**Appendix C: GAO Checklist**

**Appendix D: Supporting Documentation, References & Record of Communications**  
(ex. Labor Rates, Additional Tables, Briefing Charts, etc.)

**Comment [e3]:** STEP 6: Obtain the Data; Documented in the Notes section of MII files.

**Comment [e4]:** Examples of possible Appendices that may need to be added.

## 1.0 INTRODUCTION

### 1.1 Overview

Provide an overview of this document (BOE), and describe features that facilitate its use. Include all of the following information within:

- Purpose
- Title of Project
- Physical Location
- Sponsors of the Project (Requester)
- Contract/RFP/Modification Number
- Elements Included in the Report

*This document provides a detailed description of the Basis of Estimate (BOE) for an Independent Government Cost Estimate (IGCE) requested to support a procurement action to develop the Assessment Plan for the Natural Resource Damage Assessment (NRDA) at Los Alamos National Laboratory (LANL), Request for Proposal (RFP) Number 75898-RFP-09. This estimate is based on a defined scope included in the Statement of Work & Technical Specifications dated February 10, 2010. This estimate, and the basis for it only apply to the request made by the procurement official and the documents supplied by the team members. Should the request for proposal and/or the associated documents be revised or otherwise changed, then this Basis of Estimate (BOE) and the associated estimate should be assessed as to its continued applicability and revised as needed.*

Comment [MAM5]: Example text

Comment [e6]: STEP 12 : Update the estimate to reflect actual costs and changes.

*This BOE report will document the purpose, scope, cost estimating strategy, assumptions, source information, methodology, and associated limitations of the IGCE. This document and the associated estimate has been prepared in accordance with guidance in Department of Energy (DOE) Guide (DOE G 413.3-21), and the policies and practices of the Environmental Management Consolidated Business Center (EMCBC) Office of Cost Estimating and Project Management Support (OCE&PMS).*

Comment [e7]: Standard statement that should be include for each estimate's BOE.

### 1.2 Technical Description

Comment [e8]: STEP 3: Define the program characteristics

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. Items to include:

- **Requirements** - What the program is supposed to do
- **Purpose** - How the program will fulfill its mission
- **Technical Characteristics** - What it will look like
- **Development Plan** – Where and How the program will be built
- **Acquisition Strategy** - How the program will be acquired
- **Operations Plan** - How the program will operate
- **Risk** - Which characteristics affect cost the most

## 2.0 APPROACH

### 2.1 Objective

Describe the purpose of the cost estimate being documented. 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.

Cost estimates have two general purposes: 1) to help managers evaluate affordability and performance against plans, as well as the selection of alternative systems and solutions, and 2) to support the budget process by providing estimates of the funding required to efficiently execute a program.

The IGCE is a “should cost” assessment, which is used to support the Contracting Officer’s price reasonableness determination. In accordance with HCA Directive 2.10, it is the policy of EM that the IGCE will be used as the Government’s own estimated cost/price of the proposed procurement action. Its purposes are to:

- 1) Serve as the basis for reserving funds for the contract as part of acquisition planning
- 2) Serve as a basis for comparing costs or prices proposed by offerors
- 3) Assist in determining cost/price realism and/or reasonableness
- 4) Assist in determining whether or not the offeror/contractor understands the scope and contract requirements
- 5) Assist in establishing the Government’s initial negotiation position (FAR 15.406-1)

### 2.2 Team Composition

Provide a table of the individuals involved and their roles for the development of the estimate. Include Cost Estimators, Contracting Officers, Technical & Subject Matter Experts, Reviewers, and any others involved in the process.

Name	Organization	Phone No./e-mail	Role/Responsibility
			Author
			Peer Review
			OCE&PMS AD
			Contracting Officer

### 2.3 Project Scope Description

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 contractors costs, other contractor costs, Activity 5

**Comment [e9]:** STEP 1: Define the Estimate’s Purpose

**Comment [a10]:** Key sentences that should be included in each BOE for all IGCEs, language is from HCA 2.10.

costs, and the costs for other EM organizations. If the Statement of Work (SOW) has been provided include the document as an Appendix for future reference.

A Work Breakdown Structure (WBS) is the cornerstone of every program because it defines in detail the work necessary to accomplish a program's objectives. The WBS reflects the requirements, resources, and tasks that must be accomplished to develop a program; the WBS structure used in the estimate should reflect the tasks described in the Statement of Work (SOW).

**Comment [MML11]:** STEP 4: Determining the Estimating Structure

For each WBS Element, include the WBS Number, Title, and Element Description.

### 2.3.1 Work Breakdown Structure

*For each WBS element, describe the effort in sufficient detail to provide an independent reviewer with an understanding of the scope that is included in the IGCE. 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. Be concise, but include important details that are the basis for your costs.

### 2.3.2 Technical Approach

*For each WBS element, describe the approach that is expected to be followed to perform the work that has been included in the Statement of Work (SOW). The technical approach may have a significant impact on the costs included in the estimates. The level at which details pertaining to the technical approach are included will vary, and may not always be at as low of a level as the costs are being reported or described above.*

### 2.4 Schedule

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. Include as an attachment any additional schedules that provide clarification of the project or that have been obtained in support of developing the estimate.

*Refer to the Request for Proposal (RFP) for additional information that can be added here.*

### 3.0 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 and any deviations from standard practices here with the rationale for the deviations. Include a description of any allowances that will be included in the estimate, and the calculations to decide the size of the allowance to be made. Include the sources or cost basis used for all material and labor pricing.

Describe the source of inflation rates used to adjust Constant Year cost estimates into Then Year dollars. (BLS/CPI/etc.) Also provide explanation as to how the rates were applied.

**Comment [e12]:** STEP 5: Identify Ground Rules & Assumptions

**Comment [e13]:** STEP 6: Obtain the Data; Documentation of cost elements used in estimate.

## 4.0 COST ESTIMATE SUMMARY & ANALYSIS

### 4.1 Execution Approach

Explanation of the overall approach for how the work scope will be accomplished. Specifically discuss areas where multiple approaches could be selected. Provide explanation of approach chosen for select tasks.

### 4.2 Methodology

Summarize the primary methodologies (Analogy, Engineering Build-Up, Parametric), factor libraries, models and data sources used to estimate program or alternative costs; and briefly state why they were selected. 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, etc.) can be presented in a summary table.

Use the items listed below to assist in documenting the estimate methodologies for those used:

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

### 4.3 Cost Estimate Classification

Identify the estimate classification(s) that is(are) appropriate for the estimate based on the guidelines provided in the table. The Basis of Estimate should include the table, for reference, and the reasons or justification used in the selection of the estimate classification. (Example provided below)

- 5 -

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Source Selection Information - Subject to Procurement Integrity Act Non-Disclosure Requirements

The IGCE is based on information provided in the solicitation documents provided by the EMCBC Office of Contracting (OCC), specifically the Statement of Work & Technical Specifications. The level of detail and completeness of this information will dictate the “Class” or level of confidence in the IGCE developed. The more detailed and mature the information that is made available to the estimator, the higher the confidence level of the IGCE. Based on the Class of the IGCE a probable cost range can be established and used for evaluation of cost proposals received. The OCE&PMS uses an Industry Standard to establish the Class of each IGCE.

The Association for the Advancement of Cost Engineering (AACE) International has established a classification system for cost estimates with the following levels:

**AACE Classifications of Estimates**

<b>Cost Estimate Classification</b>	<b>Level of Definition (% of Complete Definition)</b>	<b>Cost Estimating Description (Techniques)</b>	<b>Expected Accuracy Range</b>
Class 5, Order of Magnitude	0% to 2%	Stochastic, most parametric, judgment (parametric, specific analogy, expert opinion, trend analysis)	L: -20% to -50% H: +30% to +100%
Class 4, Budget	1% to 15%	Various, more parametric (parametric, specific analogy, expert opinion, trend analysis)	L: -15% to -30% H: +20% to +50%
Class 3, Preliminary	10% to 40%	Various, including combinations (detailed, unit-cost, or activity-based; parametric; specific analogy; expert opinion; trend analysis)	L: -10% to -20% H: +10% to +30%
Class 2, Intermediate	30% to 70%	Various, more definitive (detailed, unit-cost, or activity-based; expert opinion; learning curve)	L: -5% to -15% H: +5% to +20%
Class 1, Definitive	50% to 100%	Deterministic, most definitive (detailed, unit-cost, or activity-based; expert opinion; learning curve)	L: -3% to -10% H: +3% to +15%

*Source: DOE G 413.3-21 (AACE International Recommended Practice No. 18R-97)*

*This estimate can be classified as a Class 3 estimate. This classification is based on the cost estimate methodologies used (Analogy, Expert Opinion, Unit-Cost) due to the information that is currently available. The estimating team was only able to draw on the experience of one other similar effort. And due to the complexities that exist at LANL, and the unseen issues that may arise due to the number of Trustees this classification has been made. For these reasons, the estimate included herein has a probable range of (-) 15% to (+) 30%. Should the SOW be changed and/or the scope of the required work is modified for any reason, it is suggested that this IGCE be revisited and appropriate adjustments made.*

#### 4.4 Estimate – Cost Summary by WBS

Include a table for the estimated costs of the point estimate at a summary level (WBS Level 2 or 3; to be tailored for audience/purpose). This table should include then-year dollars that track to the WBS Structure and Methodology descriptions. Columns for major cost drivers (Hours, Material, Equipment, Subcontractor) can be included as well to provide additional information.

**Cost Summary**

<i>Item</i>	<i>Total Hours</i>	<i>Total Cost</i>
<i>1.1 Assessment Plan Approach</i>	492	\$76,132
<i>1.2 Preliminary Data Review &amp; Gap Analysis</i>	816	\$134,271
<i>1.3 Annotated Outline</i>	524	\$89,050
<i>1.4 Prepare Draft &amp; Final Assessment Plan</i>	588	\$79,992
<i>1.5 Other Requirements</i>	274	\$53,544
<b>Totals</b>	<b>2694</b>	<b>\$432,988</b>

Comment [MAM14]: Example Data

**Cost Summary by Element of Cost**

<b>WBS No.</b>	<b>Labor Cost</b>	<b>Material &amp; Equipment Cost</b>	<b>Sub-contract Cost</b>	<b>Contractor Markups</b>	<b>Line Total</b>
2.1	\$178,297	\$0	\$0	\$106,354	\$284,651
2.1.1	\$83,489	\$0	\$0	\$49,801	\$133,290
2.1.2	\$40,433	\$0	\$0	\$24,118	\$64,552
2.1.3	\$54,375	\$0	\$0	\$32,435	\$86,809
2.2	\$928,893	\$413,929	\$471,472	\$1,082,226	\$2,896,520
2.2.1	\$21,665	\$0	\$0	\$12,923	\$34,589
2.2.2	\$18,173	\$0	\$0	\$10,840	\$29,013
2.2.3	\$101,271	\$105,143	\$130,874	\$201,192	\$538,479
2.2.4	\$315,318	\$263,786	\$111,098	\$411,706	\$1,101,909
2.2.5	\$0	\$0	\$110,500	\$65,913	\$176,413
2.2.6	\$452,872	\$45,000	\$113,000	\$364,385	\$975,257
2.2.7	\$19,594	\$0	\$6,000	\$15,267	\$40,860
2.3	\$143,393	\$0	\$40,800	\$109,871	\$294,064
2.3.1	\$86,619	\$0	\$40,800	\$76,005	\$203,424
2.3.2	\$56,774	\$0	\$0	\$33,866	\$90,640
2.4	\$50,757	\$0	\$27,200	\$46,501	\$124,458
<b>TOTALS</b>	<b>\$1,301,340</b>	<b>\$413,929</b>	<b>\$539,472</b>	<b>\$1,344,952</b>	<b>\$3,599,693</b>

Comment [a15]: Example Data

#### 4.5 Cost Reasonableness – Traceability & Benchmarking

In order to provide a cost reasonableness review, the IGCE should be compared to a similar project or previously developed estimate. The review can assess the differences in regards to the primary cost elements, the relative percentage of the total cost, the underlying basis of estimate for each cost element, and more.

Estimates being updated or based on a previously developed estimate should be compared to the current estimate to provide traceability due to the changes made to the effort.

**Comment [e16]:** STEP 7: develop Estimate and Compare to an ICE (Check Estimate, Previous Estimate, etc.)

#### 4.6 Risk Adjustment – Sensitivity & Uncertainty Analysis

Include analysis which examines the effects of changing assumptions and ground rules. Since uncertainty cannot be avoided, identify the cost elements that represent the most risk, and if possible, quantify the risk using sensitivity and uncertainty analysis.

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.

**Comment [e17]:** STEP 8: Conduct Sensitivity Analysis & STEP 9: conduct Risk & Uncertainty Analysis

#### 4.7 Estimate – Summary

Provide the point estimate, as well as the range that was determined based on the cost uncertainties and the AACE Estimate Classification.

## **Appendix A: IGCE Summary**

**To include Tables such as (plus others as needed):**

- **Costs By Year (If duration of estimate is > 1yr)**
- **Costs By WBS Element (According to RFP or Lowest Level requested)**
- **MII / RACER Summary Print-Out**

- A -

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Source Selection Information - Subject to Procurement Integrity Act Non-Disclosure Requirements

**Appendix B: Statement of Work & Technical Specifications (Data Sources)**

- B -

## Appendix C: GAO Checklist

### The Steps of a High-Quality Cost Estimate

Step	Description	Section to reference within the BOE
1	Define estimate's purpose and schedule	<i>Section 1.0 – Introduction</i>
2	Develop estimating plan	<i>Section 2.0 - Approach</i>
3	Obtain data and information	<i>Appendix X – Data</i>
4	Identify ground rules and assumptions	<i>Section 3.0 – Ground Rules &amp; Assumptions</i>
5	Determine Estimating approach	<i>Section 4.1 – Execution Approach &amp; Section 4.2 - Methodology</i>
6	Develop Estimate	<i>Section 4.4 – Estimate; Appendix X – MII Report</i>
7	Conduct Sensitivity/ Risk Analysis	<i>Section 4.6 – Risk Adjustment</i>
8	Draft Basis of Estimate (BOE) Document	<i>This Checklist is included as an Appendix to the BOE</i>
9	Perform QA/QC and Peer reviews	<i>Signature Page: Peer Review conducted by S. Olszewski</i>
10	Present Estimate for Approval	<i>Signature Page; Approved by T. Brennan (If presentation was used, attach and note the attachment as Appendix X)</i>
11	Check/Validate and update estimate to reflect actual cost data and conduct variance analysis	<i>Typically will be "To be conducted as necessary"</i>
12	Store Estimate data in database	<i>IGCE is stored within EMCBC OCE&amp;PMS file system</i>

**Comment [M18]:** This statement is an example only, must be changed to fit each situation – do not include "typically will be".

**Appendix D: Supporting Documentation, References & Record of Communications**

