Optimized Remediation Contract (ORC) Program Management Plan (PMP) Guidance

Version 1

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Prepared for:

Air Force Civil Engineer Center

(AFCEC/CZR)

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ACRONYM LISTING

AF	Air Force
AFI	Air Force Instruction
AFCEC	Air Force Civil Engineer Center
BCA	Business Case Analysis
CLIN	Contract Line Item Number
COC	Contaminant of Concern
COR	Contracting Officer Representative
CPSMR	Contractor's Progress, Status, and Management Report
CSM	Conceptual Site Model
CWBS	Contractor Work Breakdown Structure
DQO	Data Quality Objective
EISB	Enhanced In Situ Bioremediation
EQS	Environmental Quality System
ERPIMS	Environmental Restoration Program Information Management System
FFP	Firm Fixed Price
FS	Feasibility Study
FTA	Fire Training Area
IMS	Integrated Master Schedule
ISAP	Installation Specific Acquisition Planning
ISCO	In Situ Chemical Oxidation
ITRC	Interstate Technology and Regulatory Council
KO	Contracting Officer
LCC	Life Cycle Cost
LTM	Long-Term Management
MCL	Maximum Contaminant Level
MNA	Monitored Natural Attenuation
MPS	Milestone Payment Schedule
OES	Optimized Exit Strategy
ORC	Optimized Remediation Contract
PMBOK	Project Management Body of Knowledge
PMP	Program Management Plan
PO	Performance Objective
POP	Period of Performance
PP	Proposed Plan
PWS	Performance Work Statement
QAPP	Quality Assurance Program Plan
QASP	Quality Assurance Surveillance Plan
QC	Quality Control
QP	Quality Process

QPP	Quality Program Plan
RA-C	Remedial Action Construction
RA-O	Remedial Action Operation

ACRONYM LISTING (CONT.)

RC	Response Complete
RI	Remedial Investigation
RL	Remediation Level
RRM	Remediation Risk Management
RTC	Response to Comments
SC	Site Closeout
TCE	Trichloroethylene
UFP	Uniform Federal Policy
USACE	United States Army Corps of Engineers
UST	Underground Storage Tank
UU/UE	Unlimited Use/Unrestricted Exposure
WBS	Work Breakdown Structure

INTRODUCTION

This Program Management Plan (PMP) guidance is designed to aid Contractors in document development required to maintain compliance with the Optimized Remediation Contract (ORC) Performance Work Statement (PWS). The Guidance includes the following four sections:

- PMP instructions with two related attachments
- Performance model instructions with one related attachment
- Document quality guidance
- Instructions for Development of Contract Line Item Number (CLIN) structures, Work Breakdown Structures (WBSs), Integrated Master Schedules (IMSs), and Milestone Payment Schedules (MPSs)

Each section contains guidance developed as an expansion of the PWS language to aid the Contractor in developing acceptable documents, including examples and templates.

1 PROGRAM MANAGEMENT PLAN INSTRUCTIONS

1.1 Overview

The PMP is the basis for confirming that the Contractor understands and complies with the requirements in the PWS. It also provides the Air Force (AF) with the basis for developing oversight activities and Quality Assurance Surveillance Plans (QASPs). Each Contractor should refer to the applicable sections of the PWS for contract-specific requirements.

At a minimum, the PMP shall include the following sections: technical approach for achieving the Performance Objectives (POs) in accordance with the PWS, performance models, organization and integration of the project team, schedule management and project controls, transitional activities, risk management, quality management, health and safety management, procurement management, and security management. The Contractor is responsible for complying with the Air Force Civil Engineer Center (AFCEC) ORC PMP Guidance.

The PMP shall be maintained throughout the duration of the contract utilizing dated page changes and additions as practicable. PMP updates during the life of the ORC will be necessary based on the accumulation of small incremental changes or significant changes (e.g., contract requirements, technical approaches, risk and issue management, or key personnel). Updates to the PMP shall be coordinated with the United States Army Corps of Engineers (USACE) Contracting Officer (KO)/Contracting Officer Representative (COR) and AF points of contact.

1.2 Program Management Plan Guidance

The PMP provides information necessary to ensure successful achievement of the POs by the performance period specified for each site in Table 1 of the ORC PWS, for the contracted cost. The PMP also forms the basis for the AF and USACE QASP.

A large portion of the PMP can be incorporated from the proposal without substantial rework, and simply modified to include plans based on new information, negotiated terms, or lessons learned since the proposal was prepared. A suggested table of contents is provided in Attachment 1-1. ORC award indicates AF selection of the aggregated package of POs and approaches and does not indicate AF agreement with every aspect of the proposal. Components of individual site approaches needing refinement following ORC award can be reconciled during the PMP development process.

The Contractor shall address the technical approach at each site to include a description of how resources will be organized and communications with the team will be maintained to accomplish the stated objective. Contractors shall include descriptions of economies of scale and consecutive and concurrent processes that will be implemented to achieve the awarded POs. (Example: “There will be two teams removing underground storage tanks (USTs) for the first 6 months, then the excavation team at Site 1 will join the team at Site 2 until all the USTs are removed.”)

The technical approach must include a performance model for all sites listed in Table 1 of the PWS that do not have a PO of long-term management (LTM) and have a remedy planned and/or in place. See Section 2 of this document for performance model guidance. The technical approach should identify any potential risks that can occur and associated mitigation and contingency actions. In addition, AF approval must be obtained before implementing contingency actions.

The AF recognizes that technical approaches may change from the time of proposal preparation to PMP preparation due to various factors (e.g., information obtained during questions and answers, regulatory input/requirements, site data updates, and remedial technology advances). Rationale for changes in the technical approach for any site must be put forward to show how the change will meet or exceed the PO compared to the proposed technical approach. In addition, changes to the technical approach must be

justified using a Business Case Analysis (BCA) of alternatives to minimize future AF liability and approved by the AF prior to implementation. All alternatives identified for evaluation should be compared against the currently implemented remedy. An example BCA is presented in Attachment 1-2. The BCA should include:

- A focused analysis of alternative approaches, to include conceptual designs and engineering cost estimates. The analysis should identify the total cost of executing the optimized remedy (including the plan and reports).
- An estimate of the reduction of life cycle cost (LCC) due to the alternatives selected to optimize the remedy.
- Any risk inherent in implementing the alternative optimized remedy.
- A summary comparison of the LCC and risk of each alternative in a BCA and a clear statement of the recommended optimized approach.

Information in the PMP technical approach must be consistent with the progression of activities and the dates provided in the IIMS/ MPS.

1.3 Program Management Plan Frequently Asked Questions

Q: What is the AF really looking for in a PMP?

A: The PMP is the basis for confirming that the Contractor understands and complies with the requirements in the PWS. It also provides the AF with the basis for developing oversight activities and QASPs.

Q: What is the connection between the PMP and the QASP?

A: The QASP will identify selected project components and will be used to schedule surveillance activities at the appropriate time. Therefore, it is essential that the QASP and Contractor PMP (including the IMS and MPS) remain in lockstep synchronization such that surveillance activities are planned, scheduled, and timed appropriately.

Q: How will the AF and USACE conduct surveillance for this contract?

A: Using the QASP in conjunction with the PMP, IMS/MPS, and performance model, the AF and USACE will conduct 100% reviews of all project deliverables. The USACE COR oversees all Surveillance activities, with AF point of contact concurrence.

Q: Can we just screen our proposal for sensitive and proprietary information and submit it as the PMP?

A: No. It is expected that some of the information in the PMP will come from the Contractor's proposal; however, the PMP must stand alone (without the proposal) as a management planning and decision support tool. While portions of the proposal may be used, the PMP is expected to contain more detail on the way the overall project will be conducted, integrating all site-specific approaches and addressing resource limitations, scheduling conflicts, economies of scale, describing how access restrictions will be mitigated, and any other issues that help to understand and support the Contractor's performance.

Q: Do we need to outline decision logic for determining alternative pathways if risks are realized?

A: Yes. Descriptions of decision logic and processes, including consideration of contingency actions, are required parts of risk management in PMPs. The decision logic and process should also include a description of how a BCA of alternatives for each site would be implemented to determine alternative pathways. The BCA must show how future AF liability and LCC will be minimized by the implementation of the selected alternative.

Q: How detailed does the personnel organization management need to be (to what level)?

A: Personnel organization management should show key personnel and subcontractor roles.

Q: How does the AF make use of the organizational chart?

A: The USACE COR and AF point of contact have a primary point of contact identified as the Contractor's Project Manager. Other roles and responsibilities described in the personnel organization management and organizational chart are intended to demonstrate the adequacy of planning and functional relationships among key personnel.

Q: What needs to remain constant from the proposal to the PMP and what is allowed to change?

A: Table 1 of the PWS is binding upon contract award. POs/performance periods for each site cannot be changed without modification of the contract. Likewise, the dollar value of each site cannot change without a modification of the contract. These aspects of the contract—the PO/ performance period /cost for each site—specify what the AF is buying and the Contractor is obligated to deliver. (There may also be other miscellaneous, schedule, and mission-related requirements that must be satisfied.) The technical approach and milestone payments can be changed without modification in response to changes needed to achieve the POs. Any restructuring of the milestone payments in response to the need to employ contingent actions, for example, must be coordinated and approved by the USACE COR/AF point of contact.

1.4 Program Management Plan Checklist

Item No.	PMP Checklist Items
1	Include a technical approach for achieving the POs for each site in accordance with the PWS.
2	Present an organized strategy for coordinating the various tasks.
3	Ensure that POs are the same as those awarded or approved by the AF subsequent to award and meet or exceed POs noted in the final PWS Performance Table (Table 1).
4	Verify that although milestones may change during development of the PMP with AF approval, the technical approach is at least as aggressive as presented in the proposal or where different, thoroughly described and supported by a BCA.
5	Specify the resources and procedures for the planning, scheduling, execution, controlling, and completion of the POs.
6	Include the project organization, integration, personnel management, resources, and tasks corresponding to each milestone.
7	Include an organization chart identifying the names of personnel and their roles, including subcontractors, and a description of how the project team will be organized and integrated.
8	Include a communication plan and stakeholders, a transition plan, a risk management plan, a quality management plan, a health and safety management plan, a procurement management plan, and a security management plan.
9	Describe provisions for adapting the PMP to accommodate revised project plans and schedules.
10	Ensure that results and activities are associated with report submittals that include performance data that satisfy Data Quality Objectives (DQOs) and Quality Assurance Program Plan (QAPP) requirements.

Item No.	PMP Checklist Items
11	Verify that performance models, schedule management and project controls, document quality, and a QASP are provided that allow the measurement and demonstration of progress towards the awarded POs. Note that assessments of these components are described in other sections of this PMP guidance.

ATTACHMENTS:

1-1: Suggested PMP Table of Contents

1-2: Example BCA

ATTACHMENT 1-1: SUGGESTED PROGRAM MANAGEMENT PLAN TABLE OF CONTENTS

Below is an example Table of Contents that can serve as a general outline of the PMP. The indicated sections address the primary PMP components and are considered a starting point in developing the overall structure of the PMP. The structure for any given PMP needs to consider the specifics of the Base's remedial program and the details of the negotiated ORC. As such, the example Table of Contents does not list all possible headings and subheadings and does not prescribe the preferred organization for all PMPs.

PROGRAM MANAGEMENT PLAN

for the

Optimized Remediation Contract at [*insert Base(s) name(s)*]

SUGGESTED TABLE OF CONTENTS

(The following topics are suggested to be addressed in the PMP.)

- **INTRODUCTION** (Present the context of the Task Order, such as Contract Number, USACE and AF points of contact, TO Number, Scope, etc. Include a table of original and revised POs by site, a list of regulatory objectives, and a regulatory framework detailing regulatory agencies.)
- **PROJECT ORGANIZATION, RESOURCES, COMMUNICATIONS** (Describe how project team resources will be managed, coordinated, and integrated to achieve project POs.)
  - PROJECT TEAM ORGANIZATION AND RESPONSIBILITIES
  - ORGANIZATIONAL CHART
  - MANAGEMENT APPROACH (Include overall as well as subcontractor management procedures, plans to manage work at multiple installations, and plans to manage multiple and concurrent unforeseen events.)
  - COMMUNICATION PLAN (Include Project Team and Stakeholders. Address all project communication, including internal, AF point of contact and Restoration Program Manager, USACE, regulatory agencies, and public.)
  - TRANSITIONAL ACTIVITIES (Describe how the transition from the previous existing Contractor responsibilities will be managed such that the AF is protected from an absence, delay, or gap in performance.)
- **SITE SPECIFIC TECHNICAL APPROACHES**
  - DETAILS (This includes the anticipated technical approaches, funding, schedule, and deliverables for the sites included in the PWS. This can be taken largely from the proposal but should also include discussion of efficiencies and economies of scale that the AF can help support to improve productivity. This can be addressed on a site-by-site basis but should include a discussion of the overall approach for completing the entire task order scope. The technical approach should include a summary of the general remedial strategy, a site background, current site status, execution, performance, and exit strategy. The technical approach must include Performance Indicators and a performance model. The technical approach must also include potential revised remedial actions that would be implemented, with AF approval, if the Performance Indicators show the need for process improvement/minor corrective actions or process failure/contingency actions. Contingency actions must include triggers and timing for implementation.)

  - RISK MANAGEMENT (This may be incorporated into the technical approach discussion for each site or presented as a separate discussion. Resources include Project Management Body of Knowledge [PMBOK] and Interstate Technology and Regulatory Council [ITRC] Remediation Risk Management [RRM] Technical Regulatory Guide.)
- **METHODOLOGY** (Describe how project risks will be identified and evaluated, as well as how revised remedial actions will be triggered, assessed, implemented, and communicated in the context of the AF surveillance requirements.)
- **RISK REGISTER** (Include general project risks and site-specific risks).
- **SUSTAINABILITY MEASURES**
- **SITE-SPECIFIC RISK MANAGEMENT MEASURES**
- **PROJECT PLANS, REPORTS, AND MEETINGS**
  - PROJECT PLANNING (Discuss how systematic planning will be conducted and documented in the execution of this Task Order.)
  - QUALITY CONTROL (QC) DOCUMENTS (State when the QC documents required by the PWS will be prepared and submitted, what guidance their preparation will follow, and how the QC documents will be used.)
  - MONTHLY/QUARTERLY REPORTING (Describe what will be contained in monthly Contractor's Progress, Status, and Management Reports [CPSMRs]. Distinguish from what quarterly reports will focus on.)
  - MEETINGS (Describe how planned meetings will be communicated and coordinated with the AF and stakeholders.)
  - MASTER DOCUMENT LIST
  - SUB-CONTRACT LINE ITEM NUMBER (CLIN) MANAGEMENT (Describe how Sub-CLINs will be managed and integrated into project planning, execution, and reporting.)
- **SCHEDULE MANAGEMENT AND PROJECT CONTROLS** (Address how project changes and progress will be managed, tracked, and reported.)
  - Schedule
  - Project Milestones
  - Project Deliverables
- **QUALITY MANAGEMENT**
  - BASIC PRACTICES (Describe the Contractor corporate Quality Assurance Program and resolution procedures.)
  - MEETING PWS REQUIREMENTS (Describe how the project management procedures will demonstrate and document achievements integral and necessary for completing the awarded POs.)
    - *Document Control (Describe how document versioning, retention, and archival will be maintained.)*
    - *Data and Document Management*
    - *Problem Resolution*
- **HEALTH AND SAFETY MANAGEMENT** (Resources include 29 CFR 1910.120)
  - PREPARATION AND IMPLEMENTATION OF SITE SAFETY AND HEALTH PLANS AND PROCEDURES
  - TRAINING

  - MEDICAL SURVEILLANCE
  - SUPPLIERS AND SUBCONTRACTORS

- **PROCUREMENT MANAGEMENT** (Describe how materials, equipment, services, and subcontracts will be procured such that the Contractor and the AF are protected from delays and quality failures. Include competition and best value approach for all procurements.)
- **SECURITY MANAGEMENT** (Describe how Contractor access to secure areas [like flight lines and research facilities] will be achieved and managed to complete the awarded POs with minimal effects on AF mission.)
- (Suggested) **LIST OF TABLES**
  - Key Features of Approach
  - Authorities of Personnel to Effectively Perform the Contract
  - Transition Approach
  - General Risks, Risk Impact, and Risk Management
  - Site-Specific Risk Management
  - Points of Contacts and Stakeholders
- (Suggested) **LIST OF FIGURES**
  - Team Organization Chart
  - Communication Flow Chart
- (Suggested) **LIST OF ATTACHMENTS**
  - Statement of Objectives for ORC at Bases
  - Technical Approach to Each Site (taken from Awarded Contract)
  - Performance Indicators and scientifically-based models for each remedial action (for each remedial action at the degree of precision appropriate based on available performance data; include Process Improvement and Corrective Action ranges, and Process Failure and Contingency Action Ranges.)
  - IMS (Organize in a work breakdown structure to include: installation name, site number, CLIN/Sub-CLIN, task description, start and finish dates, milestone payment amount, percent complete, and predecessor and successor. Preferred as an integrated IMS and MPS within one Microsoft™ Project file.)
  - MPS (Organize in a work breakdown structure to include: installation name, site number, CLIN/Sub-CLIN, milestone payment identification number, milestone payment description, milestone payment amount, milestone payment percentage, completion date, percent complete, and invoice number. Preferred as an integrated IMS and MPS within one Microsoft™ Project file.)

ATTACHMENT 1-2: EXAMPLE BUSINESS CASE ANALYSIS

This Attachment provides an example BCA for a hypothetical former fire training site called FT-23 Site. The example includes a brief site background, description of risks, description of alternatives, cost estimate, and alternative selection rationale. Depending on the nature and complexity of a site, not all aspects of the BCA example may be necessary, but sufficient information must be provided to the AF to enable review and potential approval of the proposed alternative.

Example: FT-23 Site

Site Description

Site FT-23 consists of a trichloroethylene (TCE) plume 1000-feet-long in shallow alluvium currently moving slowly beneath an abandoned on-base rail yard but eventually will reach an off-base neighborhood. Minimal biodegradation is naturally occurring, but previous pilot testing showed it can be stimulated. Modeling shows that contaminants of concern (COCs) reach the base fence line at concentrations at Maximum Contaminant Levels (MCLs) in 30 years under current conditions. There are no current plans to develop the on-base area.

Current Project State Description (Current Status)

Remedial Investigation (RI)/Feasibility Study (FS) complete.

Problem Statement

Site cannot be left in current condition for regulatory reasons due to a future off-site risk. Remedial options considered are: (1) Site Closeout (SC) (unlimited use/unrestricted exposure [UU/UE], aggressive in-situ chemical oxidation [ISCO] at highest concentrations of plume), (2) Response Complete (RC) (enhanced bioremediation plus LTM for 9 years, SC in 12 years), (3) Remedial Action Operation (RA-O) Recirculation System (cutoff wells with re-injection using existing wells with 15 years RA-O, SC in 18 years), (4) Monitored natural attenuation (MNA)/LTM for 30 years. Options 2 and 3 require three years of monitoring after RC to prove effectiveness prior to SC.

Objective

The objective of a PO BCA is to select the PO that provides the best value for the AF warfighter, balancing cost, risk, land use schedule, and land use scenario (function).

Future Project State Description (Endpoint)

This land is considered industrial but is in an unused portion of the base property. There are no known uses currently listed for this land in the Base Master Plan. There is an off-base residential community at the property line.

Assumptions

It is assumed that characterization is complete and accurate. Contamination in the form of dissolved TCE exists in the groundwater plume in the shallow alluvium. Depth to groundwater is amenable to direct push techniques, pilot studies for ISCO and enhanced in situ bioremediation (EISB) are positive, and there is an existing groundwater monitoring well network.

There is no apparent use of this land that could benefit the warfighter at this time; however, future liabilities exist if the on-base land were to be developed or if the plume were to reach the community.

Alternatives

Description

- SC: Achieve UU/UE, petition regulators for site closure, and achieve SC.
- RC: Achieve RC within the Period of Performance (POP), achieve SC within next POP.
- RA-O: Achieve RA-O within POP, continue RA-O and achieve SC within next POP.
- LTM/MNA during POP: Continue LTM within POP, SC not achieved for the foreseeable future.

Alternative-Specific Assumptions

- SC: Conduct ISCO injections in areas of plume exceeding MCLs over one-year period, monitor for performance for three years, achieve SC.
- RC: Conduct EISB injections over nine-year period, monitor for performance for three years after injections cease, achieve SC in next POP.
- RA-O: Achieve remedial action construction (RA-C) and RA-O during POP, achieve RC during next POP.
- LTM: Utilize MNA and LTM during POP, manage site minimally and perpetually.

Cost Estimates

See Table 1-1.

Table 1-1. Cost Estimate for FT-23 Site

EESOH-MIS Site Name: FT-23 site											
Current Status: Former Fire Training Area (FTA) Site plume (CERCLA). RI/FS complete. TCE plume 1000-feet-long in shallow alluvium moving slowly beneath abandoned rail yard but eventually toward off-base neighborhood. Minimal biodegradation naturally occurring but it can be stimulated. Modeling shows that COCs reach fence line at MCLs in 30 years. Area is in industrial portion of base, unused overgrown area. Alternatives: (1) SC (UU/UE, aggressive ISCO at highest concentrations of plume); (2) RC (enhanced bioremediation plus LTM for 9 years, SC in 12 years); (3) RA-O Recirculation System (cutoff wells with re-injection using existing wells with 15 years RA-O, SC in 18 years); (4) MNA/LTM for 30 years.											
PO 1: RI/FS to SC			**PO 2: RI/FS to RC**			**PO 3: RI/FS to RA-O**			**PO 4: RI/FS to MNA/LTM**		
Scope	**Cost ($K)**	**Present Worth ($K)**	**Scope**	**Cost ($K)**	**Present Worth ($K)**	**Scope**	**Cost ($K)**	**Present Worth ($K)**	**Scope**	**Cost ($K)**	**Present Worth ($K)**
UFP-QAPP	$15	$15	UFP-QAPP	$15	$15	UFP-QAPP	$15	$15	UFP-QAPP	$15	$15
Pilot Test	$35	$35	Pilot Test	$35	$35	Pilot Test	$15	$15	Pilot Test	$0	$0
PP/ROD	$10	$10	PP/ROD	$10	$10	PP/ROD	$10	$10	PP/ROD	$10	$10
RD/RAWP	$15	$15	RD/RAWP	$15	$15	RD/RAWP	$15	$15	RD/RAWP	$0	$0
RA	$950	$950	RA	$500	$430	RA	$150	$150	RA	$0	$0
RACR	$15	$15	RACR	$15	$12	RA-O	$150	$75	RA-O	$0	$0
LTM[1]	$30	$30	LTM[1]	$30	$28	LTM[1]	$30	$28	LTM[2]	$100	$50
PoP TOTAL	**$1,070**			**$620**			**$385**			**$125**	
Present Worth PoP Total ($K)		**$1,070**			**$545**			**$308**			**$75**
Post Closure Care											
Scope	**Cost ($K)**	**Present Worth ($K)**	**Post PoP**	**Cost ($K)**	**Present Worth ($K)**	**Post PoP**	**Cost ($K)**	**Present Worth ($K)**	**Post PoP**	**Cost ($K)**	**Present Worth ($K)**
N/A	0		5YR 2015	$5	$3.10	5YR 2015	$5	$3.10	5YR 2015	$5	$3.10
N/A	0		5YR 2020	$7	$2.70	5YR 2020	$7	$2.70	5YR 2020	$7	$2.70
N/A	0					5YR 2025	$9	$2.15	5YR 2025	$14	$3.35
N/A	0								5YR 2030	$16	$2.38
N/A	0								5YR 2035	$18	$1.66
N/A	0								5YR 2040	$20	$1.15
Post Closure TOTAL	**$0**	**$0**		**$7**	**$3**		**$21**	**$8**		**$80**	**$14**
Present Worth TOTAL		**$1,070**	**Present Worth TOTAL**		**$548**	**Present Worth TOTAL**		**$316**	**Present Worth TOTAL**		**$89**

Notes: 1 - LTM to prove site closure assumes 1 sampling round per year for 3 years after RC; 2 - Includes LTM costs only for 10-year ORC POP, thereafter, included in 5YR costs

Acronyms: CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; PP/ROD – Proposed Plan/Record of Decision; RACR – Remedial Action Completion Report; RAWP – Remedial Action Work Plan

Non-Financial Considerations

Although this location is currently an unused industrial part of the base, there is a potential for future construction on base, including housing units, and a potential risk if the plume migrates past the base boundary.

Analysis

Table 1-2. PO BCA Summary Table for FTA-23 Site

Date of PO BCA	*Day, Month, Year*			
Base and Site ID	*Installation and Site ID*			
Site Description	*FTA-23: Former FTA Site plume*			
Project Status	*Currently being managed under contract XX. RI/FS complete.*			
Problem Statement	*TCE plume 1000-feet long in shallow alluvium moving slowly beneath abandoned rail yard but eventually toward off-base neighborhood. Minimal biodegradation naturally occurring but it can be stimulated. Modeling shows that COCs reach fence line at MCLs in 30 years. Area is in industrial portion of base, unused overgrown area.*			
Objective	*Select the PO that represents the best value for the warfighter balancing cost, risk, land use schedule, and land use scenario.*			
Assumptions	**General**			
	Most probable future project state endpoint is industrial land use; base is active. Base is fenced and guarded with no public access. Private housing off base near fence line.			
Alternatives	*SC during POP with UU/UE in 3 years*	*RC during POP, SC with UU/UE in 12 years*	*RA-O during POP, SC in 15 Years*	*IC/LTM during POP, SC 30+ years*
	Alternative-Specific Assumptions			
	PO 1: ISCO injections and SC (UU/UE)	*PO 2: EISB injections and RC*	*PO 3: Groundwater recirculation system to RA-O*	*PO 4: MNA to ICs/LTM*
Cost to Achieve PO within PoP ($K)	*$1,070*	*$548*	*$316*	*$89*
Non-Financial Factors	*No residual risk, short duration*	*No residual risk, moderate duration*	*No residual risk, slightly longer duration*	*Potential residual risk, longest duration*

Cost/Benefit Analysis				
Comparison of Alternatives	*PO 1 has highest short-term cost but no residual risk, no LTM*	*PO 2 has moderate cost, no residual risk but longer to implement, no LTM*	*PO 3 has less cost, more infrastructure intensive, only slightly longer to implement than PO 2, no residual risk, no LTM*	*PO 4 has minimal cost to implement, probable residual risk, longest duration, LTM, no SC*

<table>
<tr><td rowspan="4">Results</td><td colspan="4">• Remedial action objective of SC can be achieved but with increased expenditures during POP</td></tr>
<tr><td colspan="4">• Current site conditions are protective of human health and the environment but do not preclude plume movement or daughter products</td></tr>
<tr><td colspan="4">• Potential benefits that may be gained by increased expenditures to reach SC during initial 10-year POP cannot be justified by current site conditions, modeling results or project requirements</td></tr>
<tr><td colspan="4">• PO 3 uses existing wells, allows for modification of existing systems or injections if needed to speed results, and will reach SC</td></tr>
<tr><td colspan="5">Best Value Decision Balance</td></tr>
<tr><td rowspan="2">Decision Summary</td><td>Cost ($K)</td><td>Risk</td><td>Land Use Schedule</td><td>Land Use
Scenario</td></tr>
<tr><td>$316</td><td>Low Site Risk, Higher Off-Site Risk</td><td>No planned change</td><td>Industrial to Residential (off-site)</td></tr>
<tr><td>Recommendations</td><td colspan="4">Recommended PO: Alternative 3, RA-O</td></tr>
</table>

The selected PO is RA-O.

Summary Statement of Recommended PO

Because this site is currently low risk, with no receptors, and aggressive remediation methods are costly, it would make sense to select MNA with LTM for this site for the PoP; however, because the plume will migrate off-base in the future, the Best Value Decision is to achieve RA-O for this site during the POP. This is a lower-cost option than Alternatives 1 and 2, but still maintains control and reduces risk at lower cost. If land use changes, the existing RA-O remedy can be augmented with more aggressive in-situ methods.

2 PERFORMANCE MODEL INSTRUCTIONS

2.1 Overview

In accordance with the ORC PWS, Contractors shall develop performance models that describe how site conditions are expected to change over time, using appropriate performance indicators, from the current baseline state through PO achievement. Performance models are required for all sites listed in Table 1 of the PWS that do not have a PO of LTM and have a remedy planned and/or in place.

In general terms, performance will be measured against meeting and demonstrating value-added (remedial) services as described by the PO. Under an ORC, the Contractor determines the method(s) to meet the POs with a larger goal of reaching the POs rapidly and efficiently. Specifically, as part of each site technical approach, the Contractor develops performance model(s) that define the performance indicators and standards to be used in assessing the performance of their remedial actions and monitoring programs. Those performance indicators (measurable parameters that can be used to most directly represent remedial mechanisms) may be presented as primary or secondary goals that include reduction of contaminants in impacted media (decay curves, mass flux, etc.), maintaining capture of an existing groundwater contaminant plume, reaching or maintaining regulatory compliance, and reducing site LCCs. The performance model facilitates communication between the AF and Contractor and provides a framework that incentivizes the Contractor to develop exit strategies aiming to close sites as efficiently as possible and reduce the AF's overall environmental liability.

Summarizing from the PWS, performance models shall:

- Be based in the understanding of the current Conceptual Site Model (CSM) and represent the extent of contamination being addressed for a given COC.
- Be scientifically based.
- Define the baseline state for a given COC.
- Include a documented approach to quantifiably determine remedial progress relative to the defined performance indicators, to apply decision criteria associated with performance indicator results, and to demonstrate achievement of annual and final goals consistent with the projection of expected performance in the performance model.
- Differentiate indications of successful demonstration of contaminant reduction, process improvement and corrective action, and process failure and contingency action that reconcile underperforming remedies when combined with the decision criteria.

The performance model must also contain supporting information explaining the development approach and justification. Sufficient detail includes, but is not limited to, identification of baseline conditions specific to the proposed performance indicator; the sample data used (e.g., monitoring wells and dataset range) and methods employed (e.g., statistical approaches for summarizing sample data) in developing the baseline and future performance indicator data; the methods employed to project expected performance (e.g., best-fit model); how performance indicator data is evaluated against expected performance; and decision logic used to conclude successful remedial performance and achievement of proposed performance milestones, when to implement corrective or contingency actions, and what the corrective/contingency options might be. An individual site/COC may have more than one performance model (e.g., different parts of the site that are addressed by separate remedies and represented by different sets of monitoring wells). In addition, multiple performance models may be needed to reflect variability in site attenuation rates at different locations of the site (e.g., aquifer zones, source area versus dilute plume). Each Contractor should refer to the applicable sections of the PWS for contract-specific requirements.

Performance model development incorporates two primary components: (1) determining the performance model baseline and (2) projecting the expected course of site performance from the baseline through PO achievement, or simply, model performance.

2.2 Performance Model Guidance

This guidance focuses on developing a performance model that uses COC concentration as the performance indicator. Certain site POs and remedies may require different types of performance models and indicators, and site-specific factors may influence the inputs to the models (e.g., use of certain wells and data ranges) that cannot be fully addressed in this general guidance. Therefore, an acceptable performance model is not limited to the approaches described in this guidance and may include other mathematical approaches based on professional judgement.

Determine Performance Model Baseline

A fundamental component of the performance model is the baseline (i.e., starting point of the performance model). The baseline state is determined by using select monitoring wells that are representative of the site and have sufficient data to develop statistics-based historic concentration trends for site COCs. A scientific approach that uses a line of best-fit (e.g., first order decay rate) is appropriate for estimating the baseline attenuation rate. The baseline attenuation rate, in turn, can be used to extrapolate a baseline concentration and measures of future performance. Supporting information for the baseline concentrations must include the rationale for the well selection and the time period used to develop the trends, justification for the selected line of best-fit, actual values used to define the trend, and extension of the line of best-fit to predict values for future years independent of future remedy implementation plans. Other statistical approaches can be used to calculate a baseline concentration, such as calculating a mean concentration value for the site COC. If multiple methods are used to calculate a baseline concentration, then the most conservative value (i.e., lowest concentration) should be used.

An approach for generating a performance model baseline, with an example, that uses two methods for determining the baseline concentration and selects the more conservative value is described in Attachment 2-1.

Modeling Performance

A performance model is used to compare actual performance indicator data gathered as the remedial action progresses with projected performance. This comparison is expected to facilitate optimization decisions and demonstrate achievement of identified interim goals, and ultimately, the PO. The initial performance model(s) should include projected values of performance indicators that are based on all available data provided in the Government Furnished Information and account for any proposed enhancements to the baseline conditions (e.g., acceleration of the baseline attenuation rate). These projections serve as a starting point for defining milestones that demonstrate value-added progress (e.g., concentration reduction) toward the PO, which may be defined as payment milestones in the MPS. As data become available warranting updates to the CSM understanding and remedial exit strategy, performance models should be further refined in the development of site-specific work plans. Contractors should devise and prepare performance models that provide sufficient detail for the AF to transparently evaluate actual performance data against projected performance indicator values. Performance indicator projections must be scientifically based, employing statistical approaches where possible, and are typically consistent with methods used to define the performance model baseline. Because performance models are to reflect the proposed site exit strategy, performance projections should be extrapolated through the performance period and achievement of site remedial goals or remediation levels (RLs). The applied area of the performance model during the performance period may only be a portion of the overall exit strategy.

Outline decision logic capable of identifying performance issues that would preclude achieving the POs as soon as the data indicate unacceptable performance, triggering corrective action and/or contingencies

as soon as possible. Such decision logic is aided by using performance thresholds that signify acceptable performance, the need for process improvement and corrective action, and process failure and need for contingency action. Thresholds should be developed taking both rates of contaminant reduction and inherent data variability into consideration and must also be protective of achieving the PO. Options for corrective or contingency actions should be identified as part of the decision logic.

Demonstrated progress that is not on target through comparison against the expected performance is valuable for indicating re-evaluation of a given approach. The Contractor must continually review progress and present annual reports at a minimum, or whenever new monitoring data that feed into the performance model is reported, with actual data values and explanations as necessary. Consistent with established decision logic, missing a performance threshold during a certain period should trigger an evaluation of why actual performance is not as expected. Remedial performance outside of expected threshold ranges may show the need for process improvement and trigger corrective actions or show process failure and require contingency actions. It also may indicate CSM inadequacies that have not been accounted for in the performance model, which can dictate performance model refinement consistent with an updated CSM and exit strategy. Any proposed changes in the technical approach must be scoped with the AF, planned, documented, and justified to show how the change will meet or improve the endpoint the Contractor set in their original technical approach. Proposed changes to the technical approach must be approved by the AF.

An approach for generating a performance model, with an example, that consists of projecting expected performance, establishing performance thresholds, and identifying decision logic through use of performance indicator data, is described in Attachment 2-1.

2.3 Performance Model Frequently Asked Questions

Q: What is a performance model?

A: A performance model is typically a technically-based predictive model that describes and graphically shows (using an illustration, plot, graph, or rarely a text description) the expected changes in a performance indicator over time throughout the performance period and until RLs are achieved. An example of a performance model is a plot showing groundwater concentrations following an exponential decay curve. The performance indicator in this example is the groundwater concentration of the COC (micrograms per liter [µg/L]) and the model is the plot showing the sequence of values that indicator is expected to take over time (each year). As with all environmental data, error and variation about the expected value will be typical, and interpretation of data will be required to determine compliance or substantial deviation from the expected values in the model. The performance model should include depiction of successful contaminant concentration reduction, process improvement and corrective action level thresholds, and process failure and contingency action level thresholds, that when combined with the decision criteria should reconcile underperforming remedies.

Q: Why is a performance model for each COC required?

A: A performance model is required for each COC to assure the AF that the remedial actions are effective for each COC and not causing buildup of intermediate contaminants. For example, biodegradation of TCE can produce vinyl chloride, which is more toxic than the TCE parent.

Q: What is a performance indicator?

A: A performance indicator is a measured or calculated parameter that represents a specific mechanism or benefit resulting from a specific remedial action. For example, in the context of a groundwater extraction system with an objective to remove mass as efficiently and effectively as possible, contaminant concentrations in groundwater would NOT be an appropriate performance indicator since reductions in concentration would not discern between the mass removed by extraction and other possible mechanisms responsible for those reductions (e.g., natural attenuation). Mass of contaminant extracted per unit time

(e.g., month) could be used as a performance indicator for the groundwater extraction system. Remedial approaches may have more than one performance indicator that is useful for demonstrating their effectiveness and efficiency. A performance indicator is presented in a performance model as the measure of value-added remedial progress towards contract POs and overall site objectives.

Q: When is a performance model developed and submitted to the AF?

A: A performance model is an excellent tool to demonstrate integral and necessary accomplishments for any site with remedial or removal actions. Performance models fit well into documents that are required to comply with the Interagency Data Quality Task Force Uniform Federal Policy on Environmental Quality System (UFP-EQS) and UFP-QAPP policies, as are all documents that plan the collection of environmental data. Therefore, performance models can appropriately be components of work plans, monitoring plans (especially performance monitoring plans), technical reports, optimized exit strategies, and other documents that predict and report changes to environmental conditions resulting from remedial efforts. Final Performance Models, subject to be modified as needed during the life of the contract, shall be submitted along with the Work Plan required under PWS Section 6.1.2

2.4 Performance Model Checklist

Item No.	Performance Model Checklist Items
1	Provide a detailed explanation of the methods, with technical rationale, for generating the performance model baseline and projected expected performance.
2	Graphically illustrate expected performance throughout the performance period and to the site end point (i.e., achievement of RL).
3	Clearly define projected performance indicator values for annual and final performance goals that are consistent with payment milestones in the MPS.
4	Define performance thresholds that differentiate success, process improvement, and process failure with decision logic that specifies the course of action relative to each performance threshold.

ATTACHMENTS:

2-1: Detailed Performance Model Approach and Example

ATTACHMENT 2-1: DETAILED PERFORMANCE MODEL APPROACH AND EXAMPLE

Approach

Determine Performance Model Baseline

1. Determine site-specific primary COCs and performance monitoring wells by using one of the following approaches:
   a. Conferring with the Installation Specific Acquisition Planning (ISAP) team; or
   b. Identifying monitoring wells with contaminant concentrations exceeding RLs or remedial action objectives within the past five years.
      - Query the Environmental Restoration Program Information Management System (ERPIMS) to determine wells exceeding RLs within the past five years.
      - Identify primary COCs per a PP/Decision Document or other recent document identifying COCs based on occurrence within the past five years.
      - Provide justification for exclusion of wells exceeding RLs that are not used as performance monitoring wells.
      - Select performance monitoring wells that are representative of the extent of contamination being addressed by a given remedy. Multiple performance models should be developed if there are separate remedies addressing different parts of the site that are represented by different monitoring wells. In addition, multiple performance models may be needed to reflect variability in site attenuation rates at different locations of the site (e.g., aquifer zones, source area versus. dilute plume).
2. Gather relevant analytical data associated with the selected performance monitoring wells and the selected COCs within the past ten years, or other available data range that represents the current site conditions, from ERPIMS and/or available documents.
   - Assume one-half of the method detection limits for any non-detect values.
   - Justify any exclusion of specific data points (outliers, etc.).
3. Determine the baseline concentration value as the more conservative (i.e., lower) value calculated using the following two methods:
   a. METHOD A: Determine the median value from a set of geometric mean values of the annual average concentration for a given COC for the dataset defined in #2.
      - Calculate annual average concentration for a given well:

        a. $C_w = \Sigma C_i / n$

        b. where C_w is the averaged concentration for an analyte in a given well per year, C_i is the measured concentrations for an analyte sampled in a given well for a given year, and *n* is the number of concentration data points for the respective analyte for that well in a given year.

      - Calculate geometric mean of the annual average concentrations for a given well:

        c. $$C_{m(well,A)} = \sqrt[n]{C_{w1(well,A)} \times C_{w2(well,A)} \ldots \times C_{wn(well,A)}}$$

        d. where $C_{m(well,A)}$ is the geometric mean of annual average concentrations in well A, $C_{w1(well,A)}$ is the annual average concentration in well A in the 1st year of the dataset, and $C_{wn(well,A)}$ is the annual average concentration in well A in the *n*th year of the dataset. This calculation is

repeated for all selected performance monitoring wells to yield a single geometric mean value for each well.

- Determine the baseline concentration value using the median of the set of geometric mean values calculated for all wells.

b. METHOD B: Conduct trend analysis to determine baseline attenuation rate and extrapolate to the ORC performance period start date.

- Calculate the geometric mean of the annual average concentration for a given well in a given year:

e. $$C_{m(yr,A)} = \sqrt[n]{C_{w1(yr,A)} \times C_{w2(yr,A)} \ldots \times C_{wn(yr,A)}}$$

f. where $C_{m(yr,A)}$ is the geometric mean of all wells in year A. This calculation is repeated for all years included in the dataset to yield a single geometric mean value for each year.

- Plot the geometric mean values for each year.
- Use a best-fit model (generally, first-order decay) to represent the baseline attenuation rate and extrapolate through site end point (i.e., achievement of RL). The baseline concentration is given by the concentration at the performance period start date as determined by the extrapolated attenuation rate best-fit line. An example is shown in Figure 2-1 below.

g.

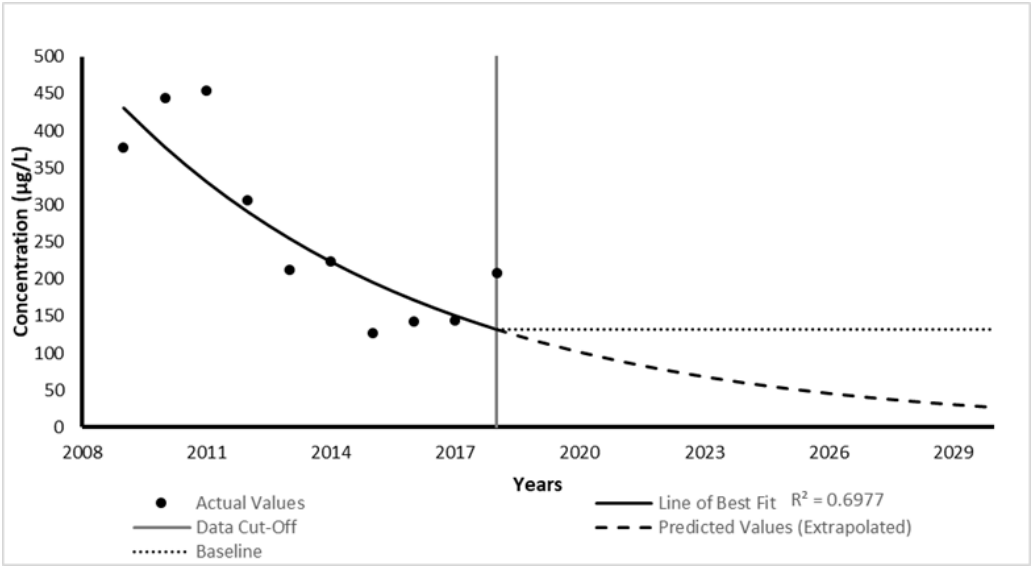


Figure 2-1. Graphical Representation of Baseline Attenuation Rate and Extrapolation

- The trend analysis is only applied to data where statistically significant (e.g., p-value < 0.05) attenuation is observed. An alternative method to determine the baseline concentration (e.g., METHOD A) should be applied if the trend is not statistically significant.

c. Select the most conservative baseline concentration value (i.e., lowest concentration) based on the results of METHOD A and METHOD B. If the most conservative value is not used, justification for the selected baseline concentration should be provided.

Performance Model Setup

4. Plot a graph (see Figure 2-2) depicting the expected course of remediation progress over the duration of the performance period and through achievement of the RL considering any proposed

enhancements relative to the baseline attenuation rate (as determined in METHOD B) extrapolated from the selected baseline concentration.

- An alternative method to depict the expected course of remediation progress that does not use the baseline attenuation rate should be applied if the baseline attenuation trend is not statistically significant.

5. Differentiate success, process improvement, and process failure and contingency action thresholds as represented in Figure 2-2 below.
   - For any site with an objective to improve the baseline status, a performance model must represent an acceleration of the baseline attenuation rate consistent with specified goals (e.g., success is demonstrated by accelerating the baseline attenuation rate by at least 20% [being below the green line in Figure 2-2]).

h.

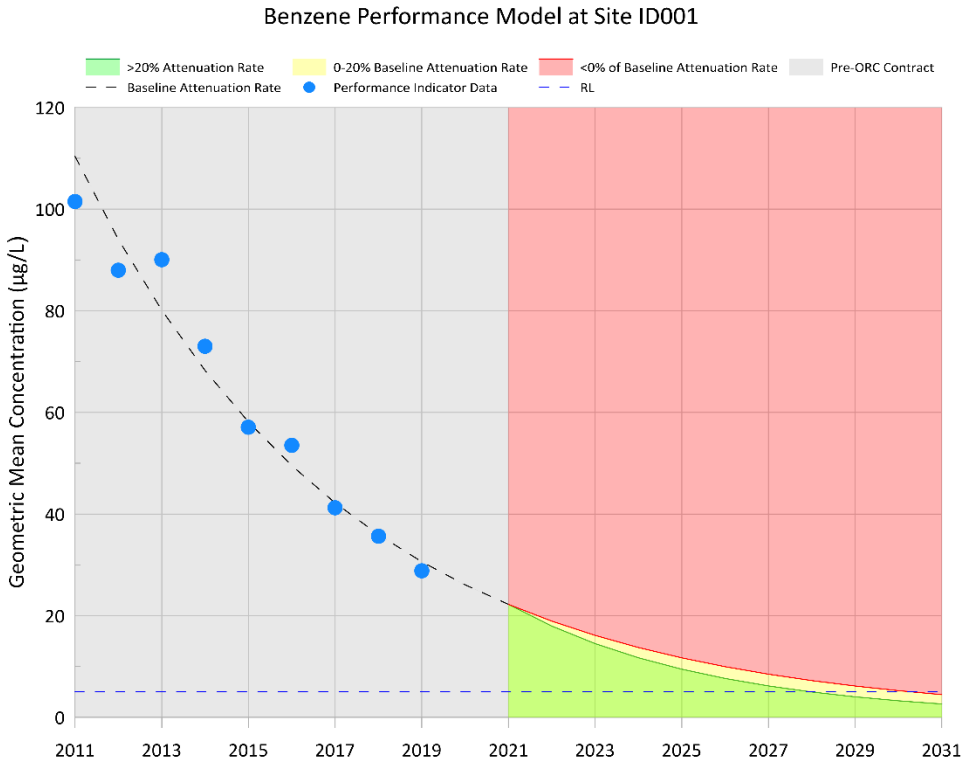


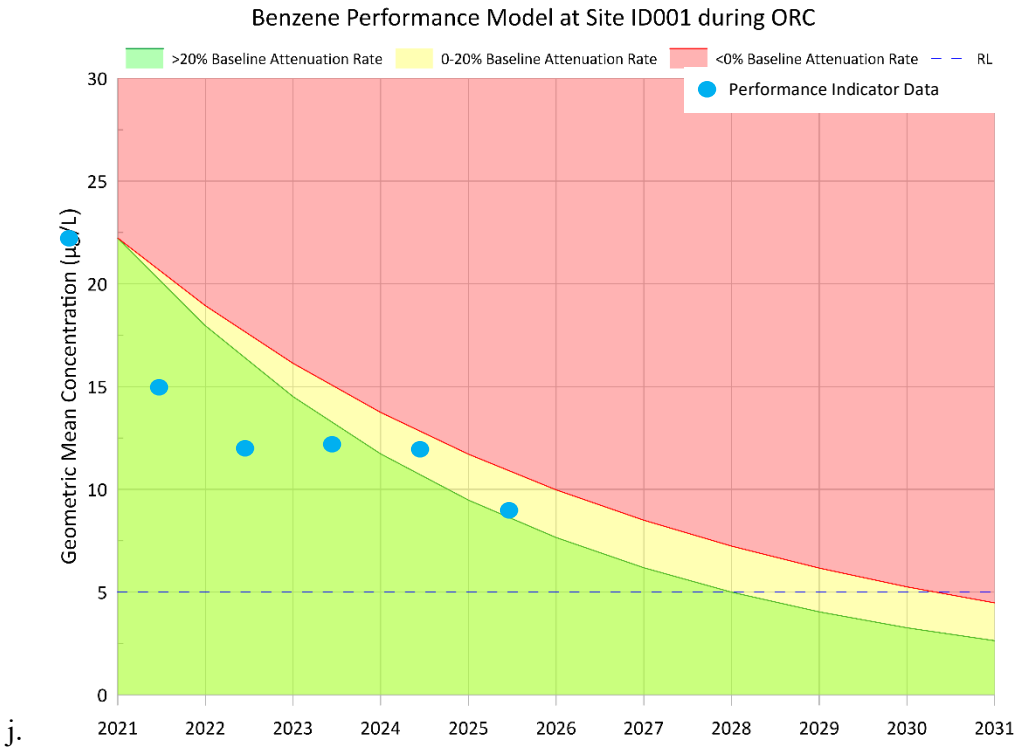
Figure 2-2. Example Performance Model with respect to Baseline Attenuation Rate

i. **Decision logic:** The green shaded region depicts an accelerated rate of attenuation (success) relative to the baseline attenuation rate (e.g., >20%), the red shaded region depicts performance less than the baseline attenuation rate (failure), and the yellow shaded region is greater than the baseline attenuation rate but by a small margin (e.g., 0–20%) indicating the need for process improvement. Re-evaluation of the approach occurs when performance indicator data with acceptable levels of confidence fall within the yellow or red threshold limits.

- Note: For site POs of RC/SC, specific criteria must be met (e.g., all wells at or below RLs) that may not be reflected in a representation of average monitoring well concentrations in a performance model. If a performance model is not capable of demonstrating achievement of a final site objective, then additional performance evaluation tools (table of all site wells and concentrations with respect to RLs) would be appropriate.

Performance Model Implementation

6. As the remedy progresses and data are collected, demonstrate achievement of annual and final performance goals by plotting performance indicator data on the performance model over the course of the ORC performance period (see Figure 2-3). Methods for measuring/calculating performance indicator data should be consistent with methods for calculating the baseline.



j.

Figure 2-3. Example Plot of Performance Indicator Data on Performance Model

7. Use decision logic in accordance with established performance thresholds to determine whether to stay the course, optimize the existing approach, or implement contingencies.

Example

An example of applying the approach described above for a given contaminant is shown below.

1. Identify COCs for a given site that will be tracked in a performance model.

Table 2-1. Identifying Primary COCs for a Given Site

Installation	Site ID	Primary/Driver COCs	Remedy
ABCD	ID001	Benzene Naphthalene 1,2,4-trimethylbenzene 1,3,5-trimethylbenzene	Biosparge

2. Identify performance monitoring wells to use in determining baseline.

Table 2-2. Listing Wells Used to Estimate Baseline for ID001

Well IDs	Benzene	1,2,4-TMBZ	1,3,5-TMBZ	Naphthalene
ID001W13	✓	✓	✓	✓
ID001W20	✓	✓	✓	✓
ID001W22	✓	✓	✓	
ID001W24	✓	✓	✓	
ID001W25	✓	✓	✓	✓
ID001W3	✓	✓	✓	✓
ID001W4	✓	✓	✓	✓
ID001W9	✓	✓	✓	✓
ID001W14		✓	✓	✓
ID001W15		✓	✓	✓
ID001W11		✓	✓	
ID001W23		✓		
ID001W26		✓	✓	

✓ Exceeds RL in past 5 years
1,2,4-TMBZ: 1,2,4-trimethylbenzene
1,3,5-TMBZ: 1,3,5-trimethylbenzene

3. Calculate baseline concentration for a given COC (values are for illustration purposes only)
   a. METHOD A

Table 2-3. Calculating Geometric Mean for a Given Well from Average Annual Concentration

	Avg. Annual Benzene Concentration (µg/L)							
Year	**W13**	**W20**	**W22**	**W24**	**W25**	**W3**	**W4**	**W9**
2011	100	90	80	--	--	120	115	110
2012	90	81	55	--	--	110	105	100
2013	85	75	63	--	--	115	111	104
2014	80	70	40	--	--	89	95	80
2015	70	50	40	35	30	93	98	84
2016	70	65	33	30	25	85	90	78
2017	65	40	32	28	11	74	70	63
2018	58	45	25	20	8	70	65	55
2019	55	30	20	15	5	64	58	52
$C_{m(well)}$	**73.44**	**57.36**	**39.50**	**24.50**	**12.70**	**89.10**	**87.36**	**78.09**

µg/L = micrograms per liter

- Determine median of calculated geometric means:

12.70, 24.50, 39.50, **57.36, 73.44**, 78.09, 87.36, 89.10

Median = 65.40

b. METHOD B

Table 2-4. Determining Geometric Mean for a Given Year from Average Annual Concentration

	Avg. Annual Benzene Concentration (µg/L)								
Year	**W13**	**W20**	**W22**	**W24**	**W25**	**W3**	**W4**	**W9**	**$C_{m(yr)}$**
2011	100	90	80	--	--	120	115	110	**101.49**
2012	90	81	55	--	--	110	105	100	**87.96**
2013	85	75	63	--	--	115	111	104	**90.05**
2014	80	70	40	--	--	89	95	80	**73.01**
2015	70	50	40	35	30	93	98	84	**57.07**
2016	70	65	33	30	25	85	90	78	**53.51**
2017	65	40	32	28	11	74	70	63	**41.24**
2018	58	45	25	20	8	70	65	55	**35.66**
2019	55	30	20	15	5	64	58	52	**28.83**

- Plot geometric mean on annual basis and extrapolate through the performance period and achievement of RL. Identify baseline concentration from extrapolated line at performance period start date (e.g., 2021).

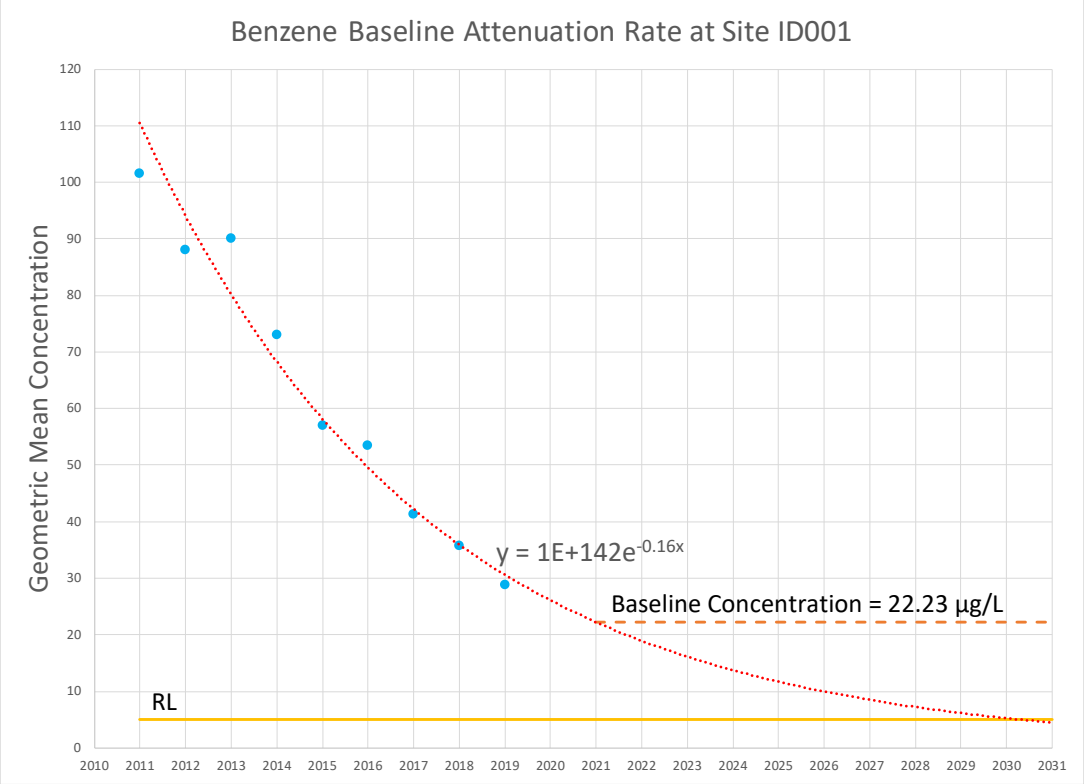


Figure 2-4. Identifying Baseline Concentration from Extrapolated Baseline Attenuation Rate

c. Determine baseline concentration to use in performance model as more conservative value.

Table 2-5. Selection of Baseline Concentration Value for Benzene

ID001	**METHOD A**	**METHOD B**	**Selected Baseline**
Baseline Concentration (µg/L)	65.40	22.23	22.23

Repeat determination of baseline concentrations for all relevant COCs.

Table 2-6. Summary of Selected Baseline Concentrations with Respect to RLs

ID001	Benzene	Naphthalene	1,2,4-TMBZ	1,3,5-TMBZ
RL (µg/L)	5	6.5	12	12
Baseline Concentration (µg/L)	22.23	8.32	240	50.97

4. Create performance model for a given COC.
   a. For this example, the baseline attenuation rate for benzene is -0.16 (Figure 2-4). The proposed technical approach will accelerate the baseline attenuation rate by 20%; therefore, the new attenuation rate will be -0.192.
   b. Apply the new attenuation rate to the baseline concentration. The concentration in 2022 would be: 22.23(1 – 0.192) = 17.96
   c. Reiterate through the end of the performance period.

Table 2-7. Expected Performance of Benzene Concentrations Based on Accelerated Attenuation Rate

Year	Expected Performance (Benzene Concentration µg/L)
2021	22.23
2022	17.96
2023	14.51
2024	11.73
2025	9.48
2026	7.66
2027	6.19
2028	5.00
2029	4.04
2030	3.26
2031	2.64

   k. These new set of numbers will serve as the projection of expected performance.

   d. Plot the expected performance based on the accelerated attenuation rate extrapolated from the baseline concentration (see green line in Figure 2-2).

5. Establish performance threshold limits as success, process improvement, and failure during the performance period (see Figure 2-3).

l. Repeat for each COC.

3 DOCUMENT QUALITY GUIDANCE

3.1 Introduction

The purpose of this guidance is to provide a framework for establishing a consistent and agreed upon process for preparing and reviewing documents. This approach should be tailored to meet the specific needs of the ORC as defined by the AF and USACE, regulators, and the Contractor; as well as the number and complexity of documents as defined by the Contractor's approach to meet the POs in the PWS. This guidance does not replace the Contractor's Quality Control/Quality Process (QC/QP) or the QASP; rather, its purpose is to ensure that there is agreement among all parties on the approach to document review, the number of reviews, the response required (which may vary according to document type), and the method of the responses required.

The Contractor is responsible for the quality of all work performed under the contract regardless of whether the work is performed by Contractor employees or by subcontractors. The Contractor measures quality through their QC/QP program, as documented in the quality management section of the PMP. The Contractor's QC/QP sets forth the staffing and procedures for self-inspecting quality, timeliness, responsiveness, customer satisfaction, and other performance standards in the PWS and QASP while reporting the inspection results to the designated government representative.

Establishing and following a QP throughout the document development and review process, from scoping to document finalization, must be a high priority for Contractors. Up-front communication and submittal of high quality documents has the ability to build trust with the AF, USACE, and regulators resulting in less burdensome and costly rounds of response to comments (RTC), document revision, re-review, etc. This will ensure smooth flow of reviews, acceptance, and payment. Submittal of poor quality documents leads to increased resistance to innovative approaches by the AF and regulators, invites increased scrutiny by all reviewers, and contributes to a breakdown in communication. This could stop the progress of the work, resulting in delayed payments to the Contractor, delayed AF achievement of performance goals, and increases in LCC.

3.1.1 Applicability

The document preparation and review process for each installation may vary. The process, number of document versions, and specific names of the documents (i.e., Internal Draft, Draft, Draft Final, Final, Version 1, Version 2, etc.) should be discussed and documented at the contract kick-off meeting. The approved process applies to all technical plans and documents unless otherwise approved by the AF and USACE. For example, certain documents may follow a more streamlined process, such as, documents that do not require regulatory review and approval.

3.1.2 Performance Work Statement Quality Requirements

The following sections of the PWS are related to the contractor's responsibility for preparing and delivering quality documents. This is not inclusive of all applicable sections, and should not substitute for review of the contract.

PWS Section 6.2 Technical Plans and Reports

The Contractor shall provide reports and various other deliverables in accordance with the most appropriate industry standard, or where applicable, any federal or state guidelines.

Technical plans and reports are required to demonstrate that POs and milestones are being met and that payment is appropriate.

PWS Section 8.1.1 Scope Discussion and Limits

The Contractor shall be responsible for establishing a QA/QP to ensure documents are of an acceptable quality and do not contain typos, formatting issues, contradictory information in tables and text, etc.

PWS Section 9.0 Quality Assurance Surveillance Plan

The AF and USACE will utilize the QASP to define the procedures and guidelines to evaluate the technical and quality performance of the Contractor in accordance with this PWS.

3.2 Document Preparation and Review

The following steps in the document preparation and review process are key elements to producing quality documents.

3.2.1 Document Scoping

Scoping is a crucial phase of the systematic planning process. Time for scoping should be incorporated into the approved document preparation process and the integrated master schedule. The scoping meeting is a systematic planning meeting in accordance with the UFP-QAPP process. The meeting should integrate technical and quality control aspects of a project including planning, implementation, assessment, and corrective actions. The meeting should establish:

1) Agreement on site history and problem definition
2) Purpose and scope of the document
3) Document format
4) Data required to make decisions
5) Decision pathways (if-then statements)
6) Identification of any data needs
7) Resolution for issues

Scoping should occur on all Primary Documents such as the Work Plan or UFP-QAPP. Additionally, scoping meetings can be used for Secondary Documents to facilitate planning, and obtaining recommendations that will expedite document review. For example, scoping is not necessary for every monitoring report; however, it may be helpful to conduct a scoping meeting on the first monitoring report to ensure an approved format, appropriate level of analysis, etc.

Prior to preparing the document, the Contractor coordinates a scoping meeting with the AF and USACE. The Contractor shall take meeting minutes and ensure delivery of the final minutes to the entire team. For Primary Documents a scoping meeting with the regulators is highly recommended. Scoping meetings with the regulators should only be conducted after the AF, USACE, and Contractor team are in agreement; the regulators should not be used as tie-breaker between the Contractor and AF/USACE. The AF coordinates a scoping meeting with the regulators to be attended by the AF, USACE, and the Contractor.

3.2.2 Drafting Documents

The following outlines what is expected in a quality document and the processes involved to ensure quality is kept throughout the lifespan of the document.

In all respects, documents shall be complete; substantively correct and consistent with applicable laws, regulations, DoD/AF policies; in proper format; and free of grammatical and typographical errors. The Contractor shall complete the QC/QP prior to submitting any document and each subsequent revision.

If there is an extended time between the scoping meeting and the submittal of the initial version of a document, it is recommended that the Contractor either coordinate a meeting or provide the meeting minutes from the scoping meeting to the AF and USACE to recap the purpose of the document and the agreements made in the scoping meeting.

Some documents, particularly Primary Documents, may require additional review and coordination with AF Legal, Wing Commander/Installation Staff, and AF Technical Points of Contact. For these documents, the Contractor shall coordinate the timing of the submission of documents in advance with the USACE COR to ensure timely reviews.

3.2.3 Reviewing Documents

Upon submittal of a document, and each subsequent revision to the AF and USACE, the USACE COR conducts a quick quality screening of the document to determine if it is ready for technical and legal review. If the document does not substantively meet the following criteria, it will be rejected:

1) Overall free of grammatical, typographical, and figure/graphical errors
2) In the agreed upon format
3) Adheres to the agreements made during the scoping meeting

In addition to the above criteria, the quick quality screening for subsequent revisions will also check that RTCs have been appropriately incorporated into the document. Based on the quality screening, the AF and USACE will either proceed immediately to the technical document review or reject the document.

Once the document has passed the quality screening, the AF and USACE conduct a thorough technical and legal (if applicable) review including determining if the document is:

1) Substantively correct with sufficient lines of evidence to support the conclusions;
2) Consistent with applicable laws, regulations, DoD/AF policies, etc.

Comments are documented in a comment matrix. The USACE COR adjudicates conflicting or repetitive comments and consolidates for submittal to the Contractor. The format and comment categories that will be utilized throughout the contract should be discussed during the kick-off meeting. Note that if the schedule was not coordinated with AF Legal, Wing Commander/Installation Staff, and AF Technical Points of Contact, their comments may be submitted separately. The USACE COR informs the Contractor if additional comments are pending.

3.2.4 Resolving Comments

If comments are complex or unclear, it is recommended that the Contractor coordinate a meeting with applicable AF and USACE reviewers to clarify comments and discuss the Contractor's initial responses. In the event the AF and USACE reviewers fundamentally disagree with key elements of the document, for example, lines of evidence toward a specific conclusion, it is recommended that the Contractor plan an on board review of the document where the issues can be discussed via teleconference or in person as appropriate. The document should not be submitted for regulatory review until all comments have been adequately addressed and the AF and USACE approve of the revised document.

Once regulatory comments are received, the Contractor coordinates a meeting with AF and USACE to clarify regulators comments and discuss the Contractor's initial responses, if needed. If additional

clarification or discussion with the regulators is required, the AF coordinates a meeting with the regulators in which the AF, USACE, and Contractor attend.

3.2.5 Approving Draft and Final Documents

Once AF and USACE comments have been resolved, and the AF is confident that the quality and content of the document is ready to be reviewed by the regulators, the USACE COR sends the Contractor a notice of AF and USACE Approval of the Draft. Once the approval notice has been received, the Contractor may submit an invoice for the Draft if there is an applicable milestone in the approved MPS.

A document is final once it has received AF, USACE, and regulatory (if applicable) concurrence in writing (i.e., some documents are not sent or reviewed by the regulator; therefore, the document is final upon approval of AF and USACE). If the document requires signature per Air Force Instruction (AFI) 32-7020, the document is not considered final until all signatures are complete. The signature process is dependent on the regulatory structure at the installation, and should be discussed at the kick-off meeting.

Once the document is signed, if applicable; or is final with AF, USACE, and regulatory (if applicable) approval, the Contractor may submit an invoice for the Final if there is an applicable milestone in the approved MPS.

3.3 Conflict Resolution

The conflict resolution process should adhere to the following business rules.

1) Conflicts should be resolved at the lowest level possible, but must be made by persons with authority to make the decision.
2) Decisions should be made in a meeting whenever possible and meeting minutes should be taken in order to document decisions, changes, and action items. Meeting minutes should be distributed to the entire AF, USACE, and Contractor team.
3) Small groups of decision-makers should be used when possible.
4) If the conflict cannot be resolved at the current level, it should be elevated to the next level.

Note: The Contractor shall take no direction from any Government employee or any person other than the KO on anything that may change the terms and conditions of the contract action, the scope, or any change that impacts the price or schedule.

4 INSTRUCTIONS FOR DEVELOPMENT OF CONTRACT LINE ITEM NUMBER STRUCTURES, WORK BREAKDOWN STRUCTURES, INTEGRATED MASTER SCHEDULES, AND MILESTONE PAYMENT SCHEDULES

This guidance communicates the Air Force's requirements for the development of CLIN and Sub-CLIN structures within the ORCs and their relation to the subsequent development of the WBS, IMS, and MPS. This guidance outlines minimum requirements for developing these contract documents.

4.1 Contract Line Item Number and Sub- Contract Line Item Number Structure

Each site and programmatic task in the ORC will have its own CLIN that serves as a unique identifier. Each CLIN may be further sub-divided into Sub-CLINs. Sub-CLINs provide a means for funding segments of work that accomplish interim objectives in support of the site PO per Table 1 of the PWS. Sub-CLIN nomenclature identifies interim remedial objectives that relate directly to, and are an integral part of, the overall CLIN. Each CLIN and Sub-CLIN shall have its own remedial activity objective or overall site PO expressly stated in the description, as well as a firm fixed price (FFP). Sub-CLIN values must not exceed the overall CLIN value. With the exception of the PMP, QASP, IMS/ MPS and Basewide Quality Program Plan (QPP), all Sub-CLIN costs such as program or project management, support of Five-Year Reviews, etc. are allocated to the applicable sites.

CLINs shall consist of four (4) numeric digits. The numeric digits for the CLIN shall either be defined by the base contract or begin with 0001, 0002, 0003, and so forth. Sub-CLINs shall consist of the four (4) numeric digits assigned to the CLIN and two (2) alpha characters (ex., 0001AA). Only 24 alpha characters shall be used (alpha characters I and O should be avoided due to the potential for confusion with numeric digits 1 or 0). Sub-CLINs designated for performance-type activities shall use AA, AB, AC, etc. Sub-CLINs designated for compliance-type activities shall use CA, CB, CC, etc. Once a Sub-CLIN number has been assigned, it shall not be assigned to another Sub-CLIN within the same contract.

Contractors will not be allowed to propose revisions to the Sub-CLIN structure provided in the RFP. The final CLIN/Sub-CLIN Structure, negotiated and accepted by the KO, will be included in Section B of the awarded contract.

Each CLIN or Sub-CLIN will be funded in its entirety with current fiscal year funds at the time the CLIN or Sub-CLIN is exercised. Sub-CLINs designated for compliance-type activities (i.e., routine regulatory requirements to comply with binding agreements) are projected to be funded annually. Sub-CLINs designated for performance-type activities (i.e., remedial advancement or progress towards PO) will be funded based on bona fide need that includes the determination of sufficient progress of the predecessor Sub-CLIN, and funds availability. Sub-CLINs designated for Alternate Objectives will be funded based on site-specific needs and Government determination of successful completion of predecessor Sub-CLINs.

FUNDS CANCELLATION:

Funds cancel on 30 September five (5) years after obligation. Sub-CLINs should include activities not more than three (3) years in duration to mitigate the risk of funds cancellation. Creating Sub-CLINs with only three (3) years of remedial activities mitigates the risk of funds cancelling should there be any

significant delays. Additionally, all activities should be complete by 30 July in the year of cancellation to ensure there is sufficient time for invoicing and payment before funds cancel on 30 September.

4.2 Work Breakdown Structure

The ORC WBS and WBS Dictionary shall be developed in accordance with standard industry business practices (e.g., PMI Practice Standard for Work Breakdown Structures, NASA WBS Handbook, DOE WBS Handbook, DOD WBS Handbook, and supplemental guidance provided for this ORC). The consistency in WBS development and nomenclature required for the ORC are critical to provide the Government and Contractor with a uniform and consistent approach to a programmatic planning and execution structure of the PWS, IMS, and MPS. An effective WBS assists with good communication between the Government and Contractor throughout the life-cycle of the program. The benefits of this standardized approach include clear segregation of the work into its component parts/elements; effective assignment of management and technical responsibilities; and improvement of status tracking for all elements of the program cost, schedule, and technical execution. The WBS is an objective oriented decomposition of the project into smaller components. The Government places a strong emphasis on effective WBS development because, if done correctly, it requires the analysis of each task and decomposition of work into detailed steps, establishes the foundation for scheduling and budgeting, creates accountability/commitment, and provides the Government with tools to better analyze the status and performance parameters of the ORC.

The WBS is developed as a precursor to a detailed IMS and MPS. The WBS should be accompanied by a WBS Dictionary, which lists and defines WBS elements.

The goals of developing a WBS and WBS Dictionary are 1) for the project team to proactively and logically plan out the project to completion, 2) to collect the information about work that needs to be done for a project, and 3) to organize activities into manageable components that will achieve project objectives. The WBS and WBS Dictionary are not the schedule, but rather the building blocks to it. The progression of WBS and WBS Dictionary development is depicted in Figure 4-1.

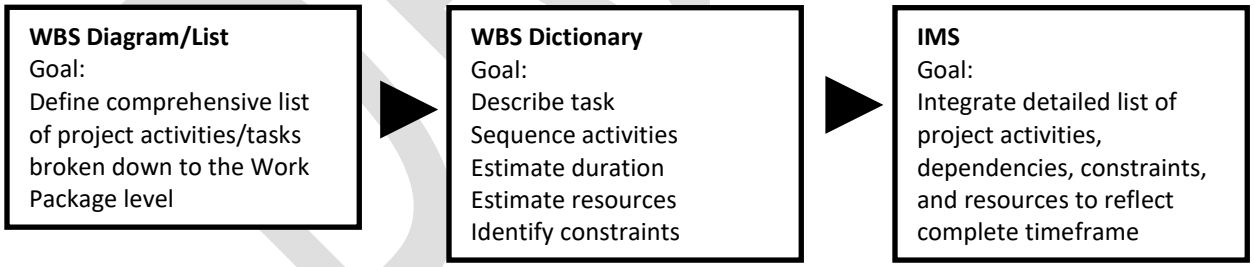


Figure 4-1. WBS, WBS Dictionary, and IMS Creation

DEFINITIONS:

Work Breakdown Structure (WBS) – A product-oriented hierarchical division of the services and other work tasks that organizes, displays, and defines the objectives to be achieved and relates the elements of the work to be accomplished to each other and the POs. The WBS shall be accompanied by a text document referred to as a WBS Dictionary that describes the work content each element of the WBS in detail. The WBS is a critical tool in ensuring all portions of the program are covered. The WBS will also

facilitate the required collaboration within the ORC Team by providing a tie between performance, cost, schedule, and risk information.

WBS Levels – The arrangement or configuration of a WBS that establishes the hierarchy of work package details to the ORC Program.

WBS Element – Any block or unique entry in a WBS regardless of level.

WBS Dictionary – A document that describes the work content of each WBS element and relates each element to the respective, progressively higher levels of the structure, as well as to the PWS.

Work Package (WP) – Detailed activities identified by the implementer for accomplishing work required to complete the project/contract. A work package has the following characteristics:

a. It represents units of work at levels where work is performed.
b. It is clearly distinguished from all other work packages.
c. It is assigned to a single organizational element.
d. It has scheduled start and completion dates and, as applicable, interim milestones, which are representative of physical accomplishment.
e. It has a budget or assigned value expressed in terms of dollars, man-hours, or other measurable units.
f. Its duration is limited to a relatively short span of time or it is subdivided by discrete value milestones to facilitate the objective measurement of work performed or it is level-of-effort.
g. It is integrated with detailed engineering, manufacturing, or other schedules.

ORC WBS:

The Contractor shall prepare and submit a Contract Work Breakdown Structure (CWBS) to AFCEC and USACE. The CWBS shall be in accordance with the WBS and data dictionary described below. The CWBS provides a framework for organizing all technical, schedule development, and budget planning activities. The Contractor shall establish and clearly define all CWBS elements in the CWBS dictionary.

The goal of the AF in providing guidance for a WBS structure is to standardize the CWBS and the subsequent development of each ORC contract IMS and MPS in order to allow for aggregation of cost, schedule, and performance data from lower elements up to the ORC program level. The Contractor shall develop a CWBS from the elements of the AF WBS. The Contractor shall include all of the work to be performed under the ORC in the CWBS, including subcontracted services.

The Contractor shall extend the AF provided WBS levels and then further define the WBS elements and lower-level activities needed to achieve the PO. At a minimum, the Contractor must include and identify all logically sequenced performance milestones at the appropriate level of detail to support and manage achievement of the POs. The CWBS and CWBS Dictionary provide the structural basis for the IMS and MPS and therefore must be developed and submitted as part of the proposal, and will be evaluated by the Government during the evaluation and selection process.

Project characteristics shall dictate the number of WBS levels used. It is a good practice to identify the number of levels to be used so that a project maintains consistency when building the WBS. The number of levels must be sufficient to allow the Contractor to reliably estimate schedule and cost, and effectively monitor and control work packages. One approach is for the lowest level of project detail to be no more than 40 total hours of work and should be assignable to only one person. This level of detail allows the Contractor to easily assess what project work is complete, who is responsible for executing what work, and what tasks are at variance with the baseline plan. Another good measure is the “8 – 80” rule, which

recommends that the lowest level of work should be no less than eight hours and no more than 80 hours. The level of detail for work packages should be documented in the WBS Dictionary.

All contract modifications and non-contract adjustments to the IMS and MPS shall result in an update to all affected documents (e.g., WBS/WBS Dictionary, PMP, IMS, and MPS) following the Change Control process.

As tasks for each of the lowest WBS elements are input into the scheduling tool (Microsoft™ Project), various types of associated data are also input for each task, such as description, duration, sequencing, logic, constraints, and WBS coding. The lowest level of each WBS element shall be at the individual Work Package for that element. When all task information is in place in Microsoft™ Project for all lowest-level WBS elements and sub-tasks required to complete the Work Package, the result is an IMS. Because WBS coding is included in the IMS, schedule data can be produced at the lowest detail or summarized to various levels of the WBS structure for project management insight, assessment, and control. Since a performance oriented WBS serves as the framework for schedule development, the resulting project schedules are also performance oriented. This type of schedule allows managers to monitor the schedule baseline for the project's POs to ensure that the POs are completed on time. The Contractor shall submit required schedule reporting, with WBS coding included, to allow Government insight and control at the necessary levels of detail.

The Contractor shall use the approved CWBS as the framework for integration of cost, schedule, and technical progress in order to manage work. The AFCEC/CZR WBS Element Tree is presented in Figure 4-2.

ORC WBS DICTIONARY:

The WBS Dictionary provides detailed information about each element in the WBS, including work packages/deliverables/products and control accounts. For each WBS element, the WBS Dictionary may include a brief definition of the scope, defined reports, a list of associated IMS activities, and milestones. It may also include information such as responsible organization, start and end dates, constraints, required resources, cost, quality requirements, and technical references to facilitate performance of the work. The scope baseline is typically considered a combination of the PWS, WBS, and the WBS Dictionary. The benefit of a WBS Dictionary is to ensure the work is completed correctly the first time by providing the Contractor team with the information they need to produce quality reports that meet project requirements and organization/contract standards.

The WBS Dictionary element content descriptions should be clear enough to provide a link to the detailed technical documents and each Work Package. The Contractor shall develop and use a standard WBS Dictionary template to ensure consistency and ease of use by the Government and Contractor personnel. The level of detail should be less for WBS elements that are higher in the hierarchy and more detailed for lower-level elements. Due to the nature of the performance based ORC, the WBS Dictionary may be revised frequently. Therefore, the Contractor shall review the contents of the WBS Dictionary frequently to assure proper project management.

The Contractor shall maintain the baseline WBS Dictionary with revisions being reviewed and approved as part of baseline change control for the life of the project.

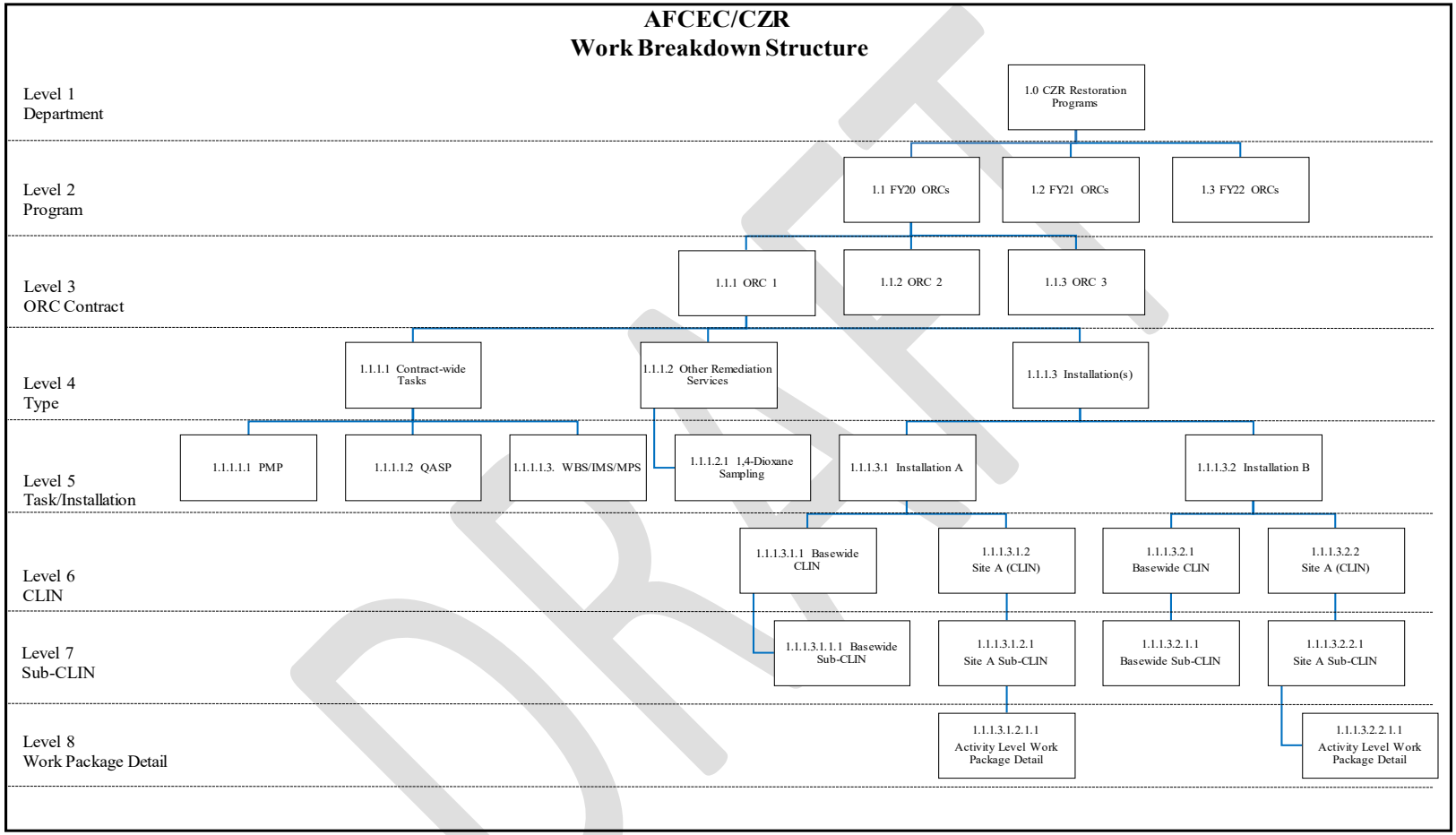


Figure 4-2. ORC WBS Element Tree

Each element of the Government WBS dictionary contains the following information:

a. WBS element title
b. WBS element code
c. Site and CLIN/Sub-CLIN associated with the WBS element
d. Performance Objectives

The Contractor WBS shall include the above descriptors, at a minimum, as well as the following as revised through the Period of Performance:

a. Description
b. Assumptions, Constraints, Risk
c. Responsible Parties
d. Schedule Milestones
e. Associated Schedule Activities
f. Quality Requirements
g. Acceptance Criteria
h. Technical References (e.g., regulations, SOPs, etc.)

The CWBS Dictionary shall contain enough information detail to allow effective project control. When originally creating the WBS, the Contractor may chose elements largely based on schedule or other acceptance criteria control. Hence, the CWBS Dictionary provides all of the information behind the WBS that is necessary to manage each task. The CWBS Dictionary serves as a point of reference for other task-related information, which generally includes the following:

- An identifier or label for each individual task
- Description
- Job owner
- Objectives
- Functional requirements to be fulfilled
- Technical requirements for completing the task
- Performance Objective

Each component should end with a statement about the function's main objective.

WBS Dictionary revisions shall be assigned with indices for the different versions created by the modifications or changes. In line with this, there shall be a "version history" section in which the following important information should be indicated:

- The version number of the revised dictionary in conjunction with the revised version of WBS
- The date of revision
- The author of the revision
- The date the revision was approved
- The approving authority that allowed the implementation of the revision (i.e., USACE Contracting Officer's Representative [COR] through change control board)
- A brief description of the reason why the dictionary revision was deemed necessary

AFCEC ORC WBS DICTIONARY:

Level 1 – Department

- Element 1.0 – Internal CZR Level

Level 2 – ORC Program

- Element 1.1 – FY20 ORCs

Level 3 – ORC

- Elements 1.1.1 thru 1.1.20 – ORC. The AF will provide the Level 3 designation for the individual ORC in Section 4.2 of the PWS. This designation will be retained, at a minimum, for the life of the contract.

Level 4 – Type

- Element 1.1.1.1 – Contract-wide Tasks
- Element 1.1.1.2 – Other Remediation Services. This includes activities that do not belong to Contract-wide tasks or Installation/site-specific tasks.
- Element 1.1.1.3 – Installation(s)

Level 5 – Task/Installation

- Element 1.1.1.1.1 – PMP
- Element 1.1.1.1.2 – QASP
- Element 1.1.1.1.3 – WBS/IMS/MPS
- Element 1.1.1.2.1 – Other Remediation Services tasks, as applicable (e.g., 1,4-dioxane sampling)
- Element 1.1.1.3.1 – Installations; Specify the number of Installations on the ORC. For example, for an ORC with three Installations (A, B, C) the following element codes apply: 1.1.1.2.1 for Installation A, 1.1.1.2.2.for Installation B, and 1.1.1.2.3 for Installation C. For single Installation ORCs, this element will be the same as 1.1.1.2. Retain both levels for program wide consistency across the elements.

Level 6 – CLIN

- Element(s) 1.1.1.3.1.1 – Basewide CLINs – This includes Basewide Quality Program Plans and other installation-wide POs/CLINs such as basewide well inventory. Each CLIN is designated with a separate Element Number (i.e., 1.1.1.3.1.1 Basewide QPP, 1.1.1.3.1.2 Basewide Well Inventory, etc.)
- Element(s) 1.1.1.3.1.2 – Sites – Site-specific designations per the CLIN/Sub-CLIN Structure. Note that the site element numbers start following all of the Basewide CLINs. Each site for the installation receives its own element number.

Level 7 – Sub-CLIN

- Element(s) 1.1.1.3.1.1.1 – Sub-CLINs per the CLIN/Sub-CLIN Structure for a Basewide CLIN.
- Element(s) 1.1.1.3.1.2.1 – Sub-CLINs per the CLIN/Sub-CLIN Structure for a Site CLIN.

Level 8 – Work Package Detail

- Element 1.1.1.3.1.1.1.1 – Work package detail.

4.3 Integrated Master Schedule

The Contractor shall prepare and submit an activity-based IMS built on the WBS specified above consistent with the PWS requirements, CLIN/Sub-CLIN Structure, and MPS. The IMS shall be submitted as part of the proposal, updated with each PMP delivery, and updated monthly in electronic format consistent/compatible with Air Force software, currently Microsoft™ Project, Microsoft™ Excel, and in Adobe Acrobat portable document file (.pdf). The IMS shall identify completion of the POs within the performance period designated in Table 1 of the PWS.

The following are minimum AF requirements for the IMS:

- Presents a realistic sequence and timing of all activities and documents necessary to demonstrate achievement of the PO within the performance period.
- Organized in a WBS per the guidance above, aligned with the CLINs/Sub-CLINs in Section B and includes the following columns in the prescribed order:
  a. Installation Name: Identify Enterprise Environmental, Safety, and Occupational Health Management Information System (EESOH-MIS) Installation Name per PWS Table 1.
  b. Site Number: Identify EESOH-MIS Site Number per PWS Table 1 and Site Alias, if applicable.
  c. CLIN/Sub-CLIN: Identify CLIN and/or Sub-CLIN per Section B of the contract.

     Note Sub-CLINs for compliance activities (routine regulatory requirements to comply with binding agreements) are denoted as ####CX and Sub-CLINs for performance activities (remedial advancement or progress towards the Performance Objective) are denoted as ####AX.
  d. WBS Element number designation/code.
  e. Task Description: Include detailed description of all activities (e.g., meetings, permitting, site access, work plans, mobilization, field work, documents, reviews, coordination with stakeholders, etc.) associated with achievement of the Performance Objective and a clear indication of regulatory (CERCLA, RCRA, and/or State Program, as applicable) phase completions (e.g., RIP Achieved, RC Achieved, etc.) and Performance Objective achievement.
  f. Start and Finish Dates: Document Start date and Finish date for each required activity and document including appropriate durations and realistic Government and Regulatory review periods.
  g. Include an obligation date, notice to proceed date, or projected award date as the first activity for each Sub-CLIN.
  h. Include a clearly identified final field work (e.g., FINAL FIELD ACTIVITY) Start date and Finish Date for each site (i.e., indicate when the final set of field activities such as injections, groundwater sampling, or others will be complete).
  i. Milestone Payment Amount: Include negotiated amount consistent with the approved MPS ensuring the sum of all milestone payments equals the value of the CLIN/Sub-CLIN per Section B of the contract.
  j. Percent Complete: Record completion status of all activities and documents as approved by the COR.
  k. Predecessor and Successor: Define relationships and constraints associated with activities and documents.

Some common IMS errors include, but are not limited to:

- Mislabeled columns (i.e., Site, Sub-CLIN incorrectly noted)
- Contract and/or financial constraints (usually to denote either PP date, Section F date or funds cancellation date) shown as an activity row
- Activities included after the achievement of SC
- PO achievement not properly identified per the definitions
- Activities not in alignment with CERCLA or RCRA timing/phasing (ex., ROD completing before PP)

The following are GAO Schedule Assessment Guide Best Practices for IMSs:

- Capturing All Effort
- Sequencing All Activities
- Establishing the Duration of All Activities
- Verifying That the Schedule Can Be Traced Horizontally and Vertically
- Ensuring Reasonable Total Float
- Conducting a Schedule Risk Analysis
- Updating the Schedule Using Actual Progress and Logic
- Maintaining a Baseline Schedule

ACTIVITY CODING:

The IMS shall include activity-level coding that will allow additional ease in filtering specific activities as needed to manage the ORC. Activities that require coding include, but are not limited to, achievement of interim and final POs, reports, regulatory reviews (USEPA and State). Additional coding requirements may be defined after award per COR direction.

4.4 Milestone Payment Schedule

The Contractor shall prepare and submit an MPS (along with the IMS) in hardcopy and in electronic format (Microsoft Excel) as part of the proposal, updated and submitted with each PMP, and updated and submitted monthly. The MPS is not included in the contract and is not considered final with award of the contract. Award of the contract does not equate to final acceptance of the MPS. The MPS, including terms of acceptance of milestone payments, will be negotiated during development of the PMP and approved by the COR.

The following are minimum AF requirements for the MPS:

- Presents appropriate milestone payments considered integral and necessary to the achievement of the POs.
- Includes a reasonable number of milestone payments per CLIN/Sub-CLIN based on the scope and anticipated duration to achieve CLIN/Sub-CLIN objective and/or Performance Objective.
- Organized in a WBS aligned with the CLINs/Sub-CLINs in Section B and includes the following columns:
    a. Installation Name: Identify EESOH-MIS Installation Name per Table 1.
    b. Site Number: Identify EESOH-MIS Site Number per Table 1 and Site Alias, if applicable.

c. CLIN/Sub-CLIN: Identify CLIN and/or Sub-CLIN per Section B of the contract.

   Note Sub-CLINs for compliance activities (routine regulatory requirements to comply with binding agreements) are denoted as ####CX and Sub-CLINs for performance activities (remedial advancement or progress towards the PO) are denoted as ####AX.

d. Milestone Payment Identification Number: Include unique number assigned to each milestone payment for tracking purposes.

e. Milestone Payment Description: Include detailed description of definable and measurable step considered integral and necessary to the achievement of the CLIN/Sub-CLIN objective and/or Performance Objective.

f. Milestone Payment Amount: Include negotiated amount ensuring the sum of all milestone payments equals the value of the CLIN/Sub-CLIN per Section B of the contract.

g. Milestone Payment Percentage: Include percentage of the milestone payment in relation to the total CLIN/Sub-CLIN value. The final payment milestone(s) within a CLIN/Sub-CLIN demonstrating achievement of the CLIN/Sub-CLIN objective must be a minimum of 20% of the total CLIN/Sub-CLIN value. This may include both the AF and USACE approved and regulator approved versions.

h. Completion Date: Document completion date for each milestone payment consistent with the Finish date presented in the IMS.

i. Percent Complete: Identify completion status (0% or 100%) of all milestone payments as approved by the COR.

j. Invoice Number: Clearly indicate the invoice number associated with the milestone payment as approved by the COR for the purposes of tracking payment. This information can be completed as invoices are prepared.

- Excludes unacceptable milestone payments representing a "progress" payment or a monthly payment for level of effort expended including:
  - Submittal of documents
  - Site mobilization/demobilization (unless exempted by KO)
  - Accomplishment of field activities
  - Submittal of a monthly status
  - Management and overhead type costs (e.g., program/project management, monthly reporting, etc.)
  - Allocation of PMP, Basewide QPP, or other basewide costs to specific sites

The Contractor shall maintain and submit an MPS monthly (and with PMP updates, as needed), in electronic format in accordance with the requirements above and include updates to progress (e.g., Percent Complete, Invoice Number). The MPS shall be submitted electronically to the Contractor's ORC document repository and in accordance with instructions from the COR.

Milestone payments within a CLIN/Sub-CLIN may be revised in response to changes in the approach for achievement of the CLIN/Sub-CLIN objective without a contract modification so long as the changes do not impact the total value or objective of the CLIN/Sub-CLIN. All changes to the MPS, with the exception of tracking invoicing of completed milestone payments, must be approved by the COR. Milestone payments will not be renegotiated if the Contractor is unable to achieve the milestones, CLIN/Sub-CLIN objectives, and/or POs.

Completion of milestones shall demonstrate payment is appropriate and warranted. COR approval of the documentation supporting the completion of the milestone is required for payment. Where regulatory acceptance/concurrence is required for this documentation, AF and USACE acceptance will occur following regulatory acceptance/concurrence of the documentation. Acceptance/concurrence occurs upon final signature of documents requiring signature by the AF and/or regulators. Final decisions regarding the adequacy of milestone completion resides with the AF and USACE. The COR will take into consideration the appropriate acceptance and/or concurrence of necessary documentation by regulators consistent with the applicable regulatory drivers of this PWS.

The Contractor is limited to one invoice submitted to USACE per month. The invoice must itemize the milestone payments for each CLIN/Sub-CLIN associated with the invoice. The Contractor will not receive payment until milestones are achieved in accordance with the MPS. The AF and USACE will not approve partial payments.

The AF and USACE will not accept milestone payments for Draft versions of every document, but on a specific case-by-case basis such as for significant reports (e.g., RI/FS, ROD/DD, etc.) and/or more complex site documents. For example, if the PO is to achieve Remedy in Place (RIP) and the work required to achieve RIP includes the Feasibility Study (FS), Proposed Plan, Record of Decision (ROD), Remedial Design (RD), and Remedial Action (RA), then potential milestone payments could be:

- Government approval of Draft FS
- Government and Regulator approval of Final FS
- Government and Regulator approval of Final Proposed Plan
- Government and Regulator approval of Final ROD
- Government approval of Draft RA Work Plan/RD
- Government and Regulator approval of Final RA Work Plan/RD
- Government approval of Draft Remedial Action Completion Report (RACR)
- Government and Regulator approval of Final RACR (Achieve RIP)

Milestone payments for AF and USACE approval of Draft documents require sufficient funds to remain associated with the Final document to ensure completion of the PO. Milestone payments shall not exceed 80% of the total payment for that Sub-CLIN prior to achievement of the final PO. The Sub-CLIN's final report may include the combination of the Draft and Final versions. Said another way, the final Sub-CLIN milestone payment for each site must be a minimum of 20% of the total Sub-CLIN cost. AF and USACE acceptance of Contractor proposed draft milestone payments, or the proposed percentage of the milestone payment as compared to the total payment for that Sub-CLIN, is discretionary and negotiated on a case-by-case basis between the AF and USACE and the Contractor. These negotiations may occur prior to award and/or during development of the PMP.

Milestone payments shall be based upon AF and USACE or AF, USACE, and Regulatory approval (depending on the document version) of the document, not upon Contractor submittal.

Some common MPS errors include, but are not limited to:

- Description is too generic (i.e., AF, USACE, and Regulatory approval of Annual Groundwater Report instead of AF, USACE, and Regulatory Approval of Final 2020 Annual Groundwater Monitoring Report).
- Description does not include the appropriate AF, USACE, and/or Regulatory approvals per the Performance Standard.

- Description does not include reference to performance model/performance goals for Optimized Exit Strategy (OES) milestones.
- Description does not include PO achievement.
- Rollup costs for all milestone payments do not equal Sub-CLIN amount per contract.
- Description is not a definable point that is considered integral and necessary to achieve the PO.
- MPS does not align with IMS.

4.5 WBS/IMS/MPS Baseline

Following ORC award, the WBS, IMS, and MPS will be further reviewed and negotiated with the Government to ensure weaknesses, errors, omissions, and other concerns are adequately addressed along with the PMP. The accepted PMP and WBS/IMS/MPS will be established as the ORC baseline and will only be modified through an official Change Control process. The Government approved IMS shall be defined in Microsoft™ Project as the baseline schedule and modifications shall be identified as approved changes.

Changes to the schedule baseline are incorporated in response to approved change requests related to project scope changes, activity resources, or activity duration estimates (generally the result of a contract modification). It may be updated to reflect changes caused by schedule compression techniques. Documents included in the schedule baseline are the accepted schedule performance measures based on the proposed technical approach, including start to finish dates, and payment milestones. Because of new work (or omitted work) generated by the risk responses, schedule baselines may be updated to reflect those changes, if approved.

At the beginning of ORC execution, the Microsoft™ Project IMS is the same as the IMS Baseline. As work is completed, the actual progress is updated on the project IMS. At any given date, the latest version of the actual schedule is referred to as the "Project IMS". The Project IMS and IMS Baseline are versions of the same “IMS”; however, the distinction between the active schedule and frozen baseline schedule must be understood. Some differences between the Project IMS and IMS Baseline are as follows:

- The Project IMS is a "living" document, whereas IMS Baseline is "frozen".
- The Project IMS is the "actual", whereas IMS Baseline is the "plan".
- The Project IMS is updated as the project is being executed, whereas the IMS Baseline is revised only as a result of an approved change request.
- Schedule performance is measured by comparing the actual (Project IMS) vs the baseline (IMS Baseline).

4.6 PMP/WBS/IMS/MPS Integrated Change Control:

Changes to the ORC plan documents (PMP, WBS, IMS, and MPS) are inevitable as work progresses, approaches are modified, and issues are encountered and resolved. Any change to the ORC plan documents requires Change Control approval.

The Contractor or the Government may initiate a Change Control Request. The Government may initiate a Change Control Request due to changes in contract requirements or other reasons. The Contractor may initiate a Change Control Request based on changes to PO approach, changes to the IMS or MPS, and other issues. Changes that affect scope, cost, and contract requirements (e.g., contract modification) can

only be approved by the KO. Changes that do not affect scope, cost, or other contract requirements are approved by the COR, with input from AFCEC.

Change Control Request

The Contractor shall submit a formal Change Control Request to the COR that contains the detail necessary to evaluate the change and make an acceptance/denial determination. A Change Control Request related to scope or cost changes will be processed following existing contract modification procedures.

Change Control Review

Depending on the level of the request, the COR will engage the Project Team (consisting of the USACE Project Manager, AFCEC, Installation Points of Contact, and other Subject Matter Experts) to evaluate the merits of the Change Control Request. The COR will respond to the Change Control Request with acceptance, denial, or request for more information.

Change Control Implementation

Following an approved Change Control Request, the Contractor shall maintain and update a Change Register. The Change Register thoroughly documents the details of the change request and how the applicable documents have been modified. The Change Register is maintained as part of the PMP.