

## **STATEMENT OF WORK ECOLOGICAL RISK ASSESSMENT**

### **GENERAL SCOPE**

The contractor shall conduct an ecological risk assessment (ERA) for [insert Activity and site name(s)] in accordance with Navy Policy and the EPA's Ecological Risk Assessment Guidance for Superfund [ERAGS]: Process for Designing and Conducting Ecological Risk Assessments, Interim Final, June 5, 1997.

### **GOVERNMENT FURNISHED MATERIALS**

1. CNO Ltr 5090 Ser N453E/9U595355; Navy Policy for Conducting Ecological Risk Assessments, dtd 5 Apr 99
2. Appropriate Regulatory Screening Benchmarks
2. *[Identify all documents, data, & previous investigations that will assist contractor]*

### **BACKGROUND**

*[Provide applicable background information on the base/site(s)/OUs that contractor might need to complete an Ecological Risk Assessment (ERA)]*

### **DESCRIPTION OF TASKS**

**TASK 1: Ecological Risk Screen.** The contractor shall conduct an Ecological Risk Screening in accordance with the Navy Tier1 Screening Risk Assessment and EPA ERAGS Steps 1 & 2 and. Utilizing existing site data and information, the contractor is to conduct an initial ecological risk screening assessment by comparing the maximum site contaminant concentrations against benchmark ecotoxicity screening values.

- a. Conduct Site Visit. The contractor shall conduct a site visit to generate first-hand expert opinion of site conditions and identify site-specific pathways. Specific attention should be directed to the verification of possible exposure routes, habitat maps, contaminant area estimates, observations of plant and animal species, soil and water types, and the potential for sensitive habitats and/or endangered species.
- b. Evaluate Site Conditions and Contamination. The contractor shall conduct a preliminary screening of the extent of contamination and the potential for adverse ecological effects to take place at the site(s). As a minimum, the following major issues shall be addressed:
  - Environmental setting and contaminants known or suspected to exist at the site(s).
  - Identify all contaminant fate and transport mechanisms that may exist at the site(s),
  - Identify the toxic mechanisms of site contaminants and categories of receptors likely to be affected,
  - Identify complete exposure pathways that may exist at the site(s).
  - Identify Preliminary Assessment Endpoint(s)
  - Initial Problem Formulation
- c. Perform Preliminary Exposure Estimate and Risk Calculation. The contractor shall calculate a preliminary estimate of risk by comparing maximum documented site exposure concentrations with the screening-level ecotoxicity benchmarks (see government provided

materials) in a hazard quotient approach. Conservative exposure assumptions shall be used including but not limited to: a 100% area use factor, 100% bioavailability, use of the most sensitive species, use of the most sensitive life stage, and minimum body weight to maximum ingestion rate. In addition, the ecotoxicity threshold value shall be based on the region specific best conservatively estimated No Observed Adverse Effect Level (NOAEL). Exposure pathways and preliminary contaminants of concern that pose negligible risks shall be documented and eliminated from further evaluation.

d. Screening Risk Assessment Report and Meeting. The contractor shall clearly document the findings, methodology, assumptions, and calculations from Task 1a) – 1c) into a report. The contractor shall attend a meeting with the Navy Remedial Project Manager(s) and regulators to decide that either the screening-level ecological risk assessment is adequate to determine that ecological threats are negligible, or the process should continue to a more detailed ecological risk assessment. If the process continues, the screening-level assessment is to be used to identify exposure pathways and preliminary contaminants of concern for the baseline risk assessment by eliminating those contaminants and exposure pathways that pose negligible risks. All scientific and management decisions including any eliminated contaminants and pathways are to be fully documented in the final screening ERA report and meeting minutes as part of the Scientific/Management Decision Point (SMDP).

**Deliverables under Task 1:**

- Draft ERA Screen Report
- Final ERA Screen Report
- Meeting minutes documenting the SMDP

**TASK 2: Proposed Baseline Ecological Risk Assessment Approach.** The contractor shall prepare a Baseline Ecological Risk Assessment Approach in accordance with the Navy Tier 2 Baseline Ecological Risk Assessment and EPA ERAGS Step 3-4 and.

a. Negotiate COPC List. The contractor shall re-evaluate the list of contaminants of potential concern (COPC) resulting from the Task 1 ERA screen. This re-evaluation shall include but not be limited to the use of defensible less conservative values; more site-specific toxic reference values (TRV); background concentration data; bioavailability data; detection frequencies; cancer risk; Quantitative Structural Activity Relationships (QSAR); etc. If re-evaluation of the data supports a no unacceptable risk finding, the Contractor is to skip Task 2b and proceed to Task 2c by stopping the Ecological Risk Assessment and documenting the findings in a Scientific/Management Decision Point paper or meeting.

b. Establish Site Specific Approach. Utilizing the ERA screen as the start point, the contractor is to establish the ERA approach by identifying the goals, breadth and focus of the baseline ERA. Based on input from the Navy Remedial Project Manager (RPM) and other involved parties, the contractor shall initiate the following: the problem formulation, identify the assessment endpoints, develop the questions and hypotheses that the ecological risk assessment will answer, develop the conceptual model, and identify the appropriate measurement endpoints for each site. The hypotheses shall be in a form that allows for remedial decision making for operable units and/or site specific numeric clean-up levels. The

conceptual model shall trace contaminants through the site-specific ecosystem, including all appropriate food chains, to evaluate: (1) threats to chosen assessment endpoints, and (2) the appropriateness of measurement endpoints. In addition, the model shall include the complete exposure pathways that will be evaluated in the ecological risk assessment and describes the relationship of the measurement endpoints to the assessment endpoints. The problem formulation shall address site specific characterization of ecological effects of the contaminants and site specific information on the contaminant fate and transport, complete exposure pathways, and ecosystems potentially at risk.

c. Proposed Ecological Risk Assessment Approach and SMDP Meeting. The contractor shall clearly summarize the information from Tasks 2a & 2b into a “proposed ERA approach”. Once approved by the Navy RPM, the contractor shall present the report to the regulators and stakeholders at a Scientific/Management Decision Point meeting to obtain agreement on the assessment endpoints, the exposure pathways, the risk questions, conceptual site model integrating these components, and the measurement endpoints. The contractor is to document all agreements/disagreements in the meeting minutes and modify the report as needed.

**Deliverables under Task 2:**

- Proposed ERA approach identifying COPC list, assessment endpoints, exposure pathways, conceptual site model, and measurement endpoints
- Meeting minutes documenting the SMDP
- Modified preliminary ERA Approach, as agreed to during the SMDP

**TASK 3: Work Plan Development.** The Contractor shall develop an ERA Work Plan (WP), Field Sample and Analysis Plan (SAP), and Quality Assurance Project Plan (QAPP) in accordance with Navy Tier 2 Baseline Ecological Risk Assessment and EPA ERAGS Step 4.

a. Plans Development. The contractor shall utilize the agreed to ERA assessment endpoints, exposure pathways, risk questions, conceptual model, and measurement endpoints from Task 2b to develop the ERA study design (resulting in the workplan) and data quality objectives (DQO) (resulting in the SAP and QAPP). As a minimum, these plans shall clearly specify:

- Assessment Endpoints
- Testable Hypothesis
- Site Conceptual Model
- Measurement Endpoints
- Field Data to be collected
- Study Methodology and Protocols to be used
- Required lab detection limits
- Study Design, Uncertainties, and Assumptions
- Lines of Evidence approach & how all data will be used to answer the Hypothesis
- Data Quality Objectives
- Data Analysis Procedures
- How Data Interpretation is to be done
- Process for handling sampling plan modifications in the field

b. Workplan SMDP approval. The contractor shall obtain SMDP approval from the Navy RPM and regulators on all plans prior to implementation. All involved parties should agree that the WP, SAP, and QAPP describes a study that will provide the risk manager with the information needed to fulfill the requirements of the baseline risk assessment and to incorporate ecological considerations into the site remedial process. Once this step is completed, most of the professional judgment needed for the ecological risk assessment will have been incorporated into the design and details of the Plans and there should be no fundamental changes in goals or approach to the ecological risk assessment during the implementation of Tasks 4-6.

**Deliverables under Task 3:**

- Draft workplan
- Draft field SAP
- Draft QAPP
- Meeting minutes documenting the SMDP
- Final workplan
- Final field SAP
- Final QAPP

**TASK 4: Field Verification of Workplans.** The contractor shall verify the ability to implement the field workplans developed in Task 3 in accordance with Navy Tier 2 Baseline Ecological Risk Assessment and EPA ERAGS Step 5. In addition, the contractor shall specify specific contingency options for unexpected conditions that could arise in the field that would make full implementation of the WP or SAP, as written, difficult or impractical. As a minimum, the following shall be field verified:

- the ability to collect specific species required
- the toxicity test(s) are appropriate for the site specific matrix
- the ability to collect the number of samples or required sample size specified,
- that the sample collection method can be used.

**TASK 5: Field Work Implementation.** Upon approval from the Navy RPM, the contractor shall implement the work plan (WP), field sample and analysis plan (SAP), and quality assurance project plan (QAPP) following the guidelines set by the approved plans from Task 3. Implementation shall be in accordance with the Navy Tier 2 Baseline Ecological Risk Assessment and EPA ERAGS Step 6.

In instances where unexpected conditions arise in the field that makes data collection, as specified and agreed to in the plans impractical, the contractor shall obtain **prior** approval from the Navy RPM before implementing field modifications. This is especially important when field conditions do not allow the collection of the specific species or number of samples required to meet QA/QC requirements specified in the SAP or QAPP. The contractor shall fully document all field deviations from the workplan, SAP, or QAPP, including their impact on the conceptual model and risk questions. Written documentation of the requested field change is to be provided to the Navy RPM within 3 working days of identification.

**Deliverables under Task 5:**

- Written field changes

**TASK 6: Sample Analysis and Validation.** The Contractor shall analyze and validate the field data against sampling protocols and QA/QC requirements to determine the usefulness of the data in accordance with Navy policy and EPA guidance. The contractor shall immediately notify the Navy RPM, in writing, about any data that failed validation, protocols or QA/QC. This data shall not be used in the risk characterization without prior approval from the Navy RPM.

As part of the data analysis, the contractor shall use the site-specific data obtained during the site investigation to replace many of the assumptions that were made for the screening-level analysis done in Task 1.

**Deliverables under Task 6:**

- Data failure report

**TASK 7: Risk Characterization and Ecological Risk Assessment Report.** The contractor shall consolidate the field data analysis into a statement about risk to the assessment endpoints identified in Task 2 in accordance with the Navy Tier 2 Ecological Risk Assessment and EPA ERAGS Step 7. The contractor shall use the information collected during the Task 4 site investigation and related information from any previous work efforts to characterize exposures and ecological effects. In addition, the contractor shall document the uncertainties associated with the field measurements and with assumptions where site-specific data are not available. The site investigation and analysis of exposure and effects should be straightforward, following the WP and SAP developed in Task 3. The risk characterization section of the baseline ecological risk assessment shall include a qualitative and quantitative presentation of the risk results and associated uncertainties. As a minimum, the report shall include the following:

- all information from the preliminary Baseline Ecological Risk Assessment
- all data collected
- A section describing the risk(s)
  - threshold for effects on Assessment Endpoints as a range between contamination levels posing no ecological effects and the lowest concentration likely to produce adverse ecological effects
  - likelihood of risk
  - additional risk information
- all QC reviews and evaluations
- an uncertainty analysis
  - categories of uncertainty
  - tracking uncertainties

**Deliverables under Task 7:**

- draft ERA Report
- draft final ERA Report
- final ERA Report

## **REQUIRED EXPERIENCE**

As a minimum, the contractor project team shall include an ecological risk assessor, toxicologist, biologist (wildlife, marine etc), chemist, statistician and the Remedial Project Manager

## **SCHEDULE OF DELIVERABLES**

	Deliverable	Due Date	# of Copies	Receiving Party	Review Time
Task 1	Draft ERA Screen Report				
	Meeting minutes				
	Final ERA Screen Report				
Task 2	Proposed ERA Approach				
	Meeting minutes				
	Modified ERA Approach				
Task 3	Draft workplan				
	Draft field SAP				
	Draft QAPP				
	Meeting minutes				
	Final workplan				
	Final field SAP				
	Final QAPP				
Task 5	Written field changes				
Task 6	Data Failure Report				
Task 7	Draft ERA Report				
	Draft final ERA Report				
	Final ERA Report				

## **SPECIAL CONSIDERATIONS**

1. All work shall be completed in accordance with all applicable Navy, Federal, State, and/or Local guidance.
2. All detailed directions for work identified in this CTO shall be provided by *[insert name of RPM/EIC and phone number]*. Work not specified in this CTO shall not be undertaken without prior notification to the RPM/EIC and approval by the Contracting Officer.
3. Minutes of meetings with the regulatory agencies, Navy, or the activity shall be submitted within ten (10) calendar days after such meeting.
4. Public Affairs - the contractor shall not make available to the news media, or make public disclosure of any data resulting from actions in this contract. The contractor shall refer all press or public contacts to the Activity POC, and shall notify the RPM/EIC. The contractor may not distribute reports or data to any other source, unless specifically authorized by the RPM/EIC.

5. All data/lab tests shall be done by certified laboratories and using appropriate ASTM methods.
6. All raw and/or validated data generated from this CTO will be provided in CD ROM, magnetic or electronic media as follows: *[specify format required]*
7. Final or draft final document deliverables will be provided in CD ROM, magnetic, or electronic media as follows: *[specify format required]*
8. All basic contract requirements other than those specifically modified by this CTO shall remain in full effect and performance under this CTO will be in accordance therewith. The contractor as a change in scope to this CTO shall not construe verbal directions, instructions, explanations, commitments, and/or acceptances given to the contractor or his personnel by any government employee. Any change in scope of work must be issued in writing by the Contracting Officer.

**REFERENCES:** The following shall be used in the development of the ERA:

1. Ecological Risk Assessment Guidance for Superfund [ERAGS], U.S. EPA, Environmental Response Team, Interim Final, June 5, 1997
2. Department of the Navy Environmental Policy Memorandum 97-04; Use of Ecological Risk Assessments, May 16, 1997
3. Chief of Naval Operations (CNO) Letter 5090 Ser N453E/9U595355 dated 05 April 1999; Navy Policy for Conducting Ecological Risk Assessments
4. *[Include any state or region specific references]*