

**APPENDIX A3
ANNOTATED OUTLINE FOR
SITE CHARACTERIZATION REPORT**

TABLE OF CONTENTS

	<u>Page</u>
Preface.....	A3-1
Annotated Outline	A3-2

PREFACE

The annotated outline included in this appendix identifies potential content for a Site Characterization Report. This outline is not intended to be prescriptive and should be adjusted as appropriate for the site-specific conditions.

This outline is for guidance only, and is applicable on a case-by-case basis. Some elements of the outline may apply to your site, while other elements may not. Additional elements than are addressed by this outline may also be needed.

ANNOTATED OUTLINE FOR SITE CHARACTERIZATION REPORT

TABLE OF CONTENTS

- 1.0 INTRODUCTION
 - 1.1 Site Investigation Objectives
 - 1.2 Site Description
 - 1.3 Site Background
 - 1.3.1 History of Site
 - 1.3.2 Previous Investigations (if applicable)
 - 1.3.3 Contaminants of Concern
 - 1.3.4 Community Issues
- 2.0 SITE GEOLOGY AND HYDROGEOLOGY
 - 2.1 Geologic Setting
 - 2.2 Stratigraphy
 - 2.3 Hydrogeology
- 3.0 SITE INVESTIGATION SUMMARY
 - 3.1 Investigation Objectives
 - 3.2 Analytical Methods
 - 3.3 Field Activities
 - 3.3.1 Location of Samples
 - 3.3.2 Sampling Strategies
 - 3.3.2 Quality Assurance/Quality Control
- 4.0 BACKGROUND METALS CONCENTRATIONS
 - 4.1 Criteria for Identification of Background
 - 4.2 Lithology/ Soil Type
 - 4.3 Site-Specific Background Range
- 5.0 SOIL INVESTIGATION RESULTS
 - 5.1 Nature and Extent of Elevated Metals
 - 5.1.1 Horizontal Extent
 - 5.1.2 Vertical Extent
 - 5.2 Areas of Concern
 - 5.2.1 Criteria for Identification of Areas of Concern
 - 5.2.2 Criteria for Identification of Potential Areas of Concern
 - 5.3 Conceptual Site Model
 - 5.4 Data for Remedy Design and Evaluation

TABLE OF CONTENTS (Continued)

6.0 HUMAN AND ECOLOGICAL RISK EVALUATIONS
6.1 Comparison to Health Based Screening Levels
6.2 Human Health Screening Evaluation
6.3 Ecological Screening Evaluation

7.0 SUMMARY AND CONCLUSIONS
5.1 Compounds of Concern
5.2 Areas of Concern in Soil
5.3 Interim Measures Recommendations

8.0 REFERENCES

TABLES
FIGURES
APPENDICES

EXECUTIVE SUMMARY

Instructions: Provide a concise summary of the site investigation. This should be a text summary (i.e., no tables or figures). Inform the reader of major physical aspects of the site, measures taken to fulfill the objectives of the investigation, and conclusions and recommendations.

This section should include, but not be limited to, very brief descriptions of the following:

- *Purpose of investigation;*
- *Site location, characteristics, background, and current status;*
- *Known and potential releases to media (soil, air, groundwater);*
- *Significant contamination;*
- *Pathways demonstrating potential threats and hazards from contaminants;*
- *Potentially exposed populations or sensitive receptors, and;*
- *Conclusions and recommendations*

1.0 INTRODUCTION

Instructions: Give an overview of the site and background information behind the purpose of the investigation. As applicable, summarize information previously presented in the characterization workplan.

1.1 SITE INVESTIGATION OBJECTIVES

Instructions: Clearly describe the goals and purpose of the investigation. Discuss the area investigated, the media investigated, and specific goals of the investigation (e.g., nature and extent of contamination, background determination, remedy design).

1.2 SITE DESCRIPTION

Instructions: Provide a physical description of the site. Include all pertinent details of the topographic and physiographic setting, the local climate, and local land uses. Describe other features as appropriate.

1.3 SITE BACKGROUND

Instructions: Summarize the site history, any previous investigations, chemicals of concern, and any community issues. Address other topics (under appropriate subsections) as needed to support an updated conceptual site model (CSM) and subsequent sections of the report.

1.3.1 History of Site

Instructions: Provide a complete history of the site. Include as much detail as possible on the pre-development uses of the property, the types of operations that have been conducted on the property, and modifications that have been done (e.g., infill, foundation construction, zoning).

Provide information regarding all current and past business operations, including:

- 1) Business Type: Identity and description of the types of businesses which are currently operating or have operated at the site in the past.*
- 2) Years of Operation: Operating dates for each business identified.*
- 3) Prior Land Use: Identity of the land use prior to development of the site (including placement of fill upon the property).*
- 4) Facility Ownership/Operators: Identity of all persons or corporations which owned and/or operated businesses on the site.*
- 5) Summary of the property ownership at the site extending back to the date of first business operations. This should reference title documents and tax assessor parcel maps which should be included as appendices, and should also include current street addresses, mailing addresses, and phone numbers for all persons/corporations identified.*
- 6) Surrounding Land Use: History and/or general uses of properties in the area surrounding the site should be researched to the extent to which the information is useful to determine the influence on contaminant releases and dispersal.*

1.3.2 Previous Investigations (if applicable)

Instructions: Summarize the results of any previous investigations or soil removal activities at the site. The investigation documents may be referenced, or included as Appendices.

1.3.3 Compounds of Concern

Instructions: Provide a general discussion of the complete list of the compounds of suspected and detected at the site. Identify which media (soil, surface water, sediment, groundwater, soil gas) are impacted, and at what general range of concentrations. If applicable, briefly indicate how natural background metal conditions were determined, with a more complete description of background determination described in a later report section.

1.3.4 Community Issues

Instructions: Discuss any local community issues relevant to the investigation. Include a summary of residential areas adjacent to and near the site, sensitive land uses, and community groups involved in the investigation. Summarize any community meetings and all efforts taken to send mailings, internet announcements, and make documents available for public review.

2.0 SITE GEOLOGY AND HYDROGEOLOGY

Instructions: Summarize the site geology. Include relevant information from published sources (maps, USGS Bulletins, California Geological Survey (CGS) Maps) and observations made in the field. Discuss the geologic setting, stratigraphy, surface water hydrology, and hydrogeology. The level of detail of these descriptions may vary, based on the nature of the impacts to the site. For instance, shallow soil contamination with little impacts to groundwater does not require a detailed description of site hydrogeology.

- 2.1 GEOLOGIC SETTING
- 2.2 STRATIGRAPHY
- 2.3 HYDROGEOLOGY

3.0 SITE INVESTIGATION SUMMARY

Instructions: Summarize the investigation conducted at the site. Reference the approved workplan under which the investigation was conducted, and list the overall objectives of the investigation. Discuss and reference a map showing the actual locations and depths of the samples collected in the field. Discuss any deviations from the approved workplan sample locations and depths. Discuss sampling strategies and analytical methods. Summarize the general quality assurance and quality control measures taken during the investigation (field blanks, duplicates, splits, etc.). Discuss how the data quality objectives (DQOs) for the investigation were met.

- 3.1 INVESTIGATION OBJECTIVES
- 3.2 ANALYTICAL METHODS
- 3.3 FIELD ACTIVITIES
 - 3.3.1 Location of Samples
 - 3.3.2 Sampling Strategies
 - 3.3.2 Quality Assurance/Quality Control

4.0 BACKGROUND METAL CONCENTRATIONS

Instructions: Describe how background metals concentrations were determined for the site. Summarize the approach for identifying of background concentrations (e.g., published or reported values, reference to other studies, and special local considerations that could affect background values). If soil sampling was conducted, demonstrate that the resultant data set is representative of the site soils and conditions (e.g., discuss the lithology of the background samples relative to the lithology of the site samples, show that the concentration ranges of metals in the background data set are reasonable and have not been impacted by site activities or other unforeseen conditions)). Describe the statistical methods used in the background determination. If applicable, include the calculations in this section or as an appendix to the report.

Present the background data set, any statistical interpretations of the data set, and limitations of the data set and statistical interpretations.

- 4.1 CRITERIA FOR IDENTIFICATION OF BACKGROUND
- 4.2 LITHOLOGY/ SOIL TYPE
- 4.3 SITE-SPECIFIC BACKGROUND RANGE

5.0 SOIL INVESTIGATION RESULTS

Instructions: Summarize the general results of the investigation. Reference maps depicting the sample locations, depths, and analytical results. Describe any limitations to the investigation (e.g., areas inaccessible to sample collection, or analytical limitations to data).

5.1 NATURE AND EXTENT OF ELEVATED METALS

Instructions: Summarize the investigation results which have defined the extent of the metals impacts (and any other contaminants of concern). Support the section with appropriate figures that show the lateral and vertical extent of impacted soil. Discuss any hot spots or areas of special concern.

- 5.1.1 Horizontal Extent
- 5.1.2 Vertical Extent

5.2 AREAS OF CONCERN

Instructions: Discuss and depict the results of the metals investigation which have allowed of areas of concern (AOCs) to be defined. The area and volume of impacted soil within these AOCs should be calculated and presented, and each AOC should be individually identified. Potential AOCs should also be identified in the report and depicted in appropriate figures.

- 5.2.1 Criteria for Identification of Areas of Concern
- 5.2.2 Criteria for Identification of Potential Areas of Concern

5.3 CONCEPTUAL SITE MODEL

Instructions: Provide an updated conceptual site model (CSM) that incorporates data collected during the investigation.

5.4 DATA FOR REMEDY EVALUATION AND DESIGN

Instructions: Present and discuss the results of data collected to support the remedy evaluation and design.

6.0 HUMAN AND ECOLOGICAL RISK EVALUATIONS

Instructions: Extensive risk assessment for human and ecological receptors may or may not be required of the report. In those cases where such evaluations are required, this section of the report should be reserved for their presentation. Several options are provided in the subsections below.

6.1 COMPARISON TO HEALTH BASED SCREENING LEVELS

Instructions: If the results of the investigation are proposed to be compared to health-based screening levels or other screening criteria, this section of the report should provide such a comparison. Include a discussion of the limitations of such comparisons, and the specific purposes for which comparisons are being made.

6.2 HUMAN HEALTH SCREENING EVALUATION

Instructions: A human health screening evaluation, if required, should be presented in this section of the report. The detailed outline of such an evaluation is beyond the scope of this document, and DTSC's Human and Ecological Risk Division (HERD) can provide more details and reference to appropriate guidance.

6.3 ECOLOGICAL SCREENING EVALUATION

Instructions: An ecological screening evaluation, if required, should be presented in this section of the report. The detailed outline of such an evaluation is beyond the scope of this document, and HERD can provide more details and reference to appropriate guidance.

7.0 SUMMARY AND CONCLUSIONS

Instructions: Provide a broad summary and conclusions of the results of the investigation. These conclusions should extensively reference the individual sections of the report, rather than repeat analyses and discussions. The section should include a summary of the investigations findings involving:

- 1) compounds of concern detected at the site;*
- 2) extent (vertical and horizontal) of contamination;*
- 3) risks associated with the metals;*
- 4) considerations for remedy evaluation and design; and*
- 5) recommendations for future actions, such as interim remedial measures, or the selection and implementation of a final remedy.*

8.0 REFERENCES

List all references cited in the report.