

*Response to Comments on the Chemical Oxidation Treatability Study Installation Restoration Site 25
 Alameda Point, Alameda, California
 July 24, 2001*

225

| Comments by: Melinda Trizinsky | | | | |
|--------------------------------|----------|------------------------|---|---|
| Comment No. | Page No. | Section, Figure, Table | Comments | Response |
| <i>General Comments</i> | | | | |
| 1 | | | <p>This document is well written and concise. However, several issues should be discussed in more detail. It is very difficult to evaluate soil remediation technologies when the contaminant of concern is distributed very heterogeneously in the soil matrix. This is the situation with the PAHs in soil at Alameda Point. Although the concentrations are generally higher in this portion of Alameda; the data shown in Figures 1-4 and 1-5 clearly demonstrate that PAH concentrations are not normally distributed or geostatistically correlated.</p> <p>The heterogeneous PAH concentrations need to be acknowledged and discussed in this document.</p> <p>Clarify how the sampling design and PAH data analysis will be optimized to deal with this difficult analytical task.</p> <p>Are sufficient samples being collected to demonstrate that the concentrations measured over the course of the treatability test are sufficiently different from the controls?</p> | <p>Several options to address the heterogeneous distribution of PAHs were evaluated during the conceptual design of the sampling. Options for both the vertical and areal sampling approaches were considered with respect to heterogeneity.</p> <p>The vertical sampling approach has been designed using soil compositing to address the vertical heterogeneity. Two-foot soil samples will be collected and composited in lieu of the typical six-inch discrete soil tubes.</p> <p>Both randomized and systematic sampling approaches were considered for the areal layout of the sampling locations. Three rounds of systematic spatially distributed sampling are planned. Three sampling rounds are planned to allow both a comparison of the change in the average of the results from each cell over time and the changes at each individual matched location over time within each cell. Randomized sampling schemes would preclude the second analysis discussed above. Randomized sampling schemes may be more appropriate for confirmatory sampling following full-scale application of this remedial technology.</p> <p>Sufficient samples will be collected to demonstrate changes as compared to the controls. At the end of the treatability study, a total of fifteen samples from each depth interval in the test cells will be compared to six samples from each depth in the corresponding control cells.</p> |

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| 2 | | | <p>What are the background concentrations of manganese at Alameda Point? Because this demonstration is treating surface soil, it will be very important to insure that the KMnO₄ added to the surface soil does not elevate our Mn concentrations to the point that they exceed the residential PRG for Mn (1800 mg/kg). Approximately 1/3 of the weight of KMnO₄ is Mn. If the proposed dose of 2500 mg/kg of KMnO₄ is not effectively distributed throughout the treatment zone, you could create a new Mn problem for the site. What approach will be used to insure that this will not occur?</p> | <p>The residual manganese concentration will be considered in the permanganate dose calculations. The KMnO₄ dose will be calculated such that the additional Mn contribution plus the background Mn concentration in soil will be less than the residential PRG value or a residential risk-based exposure scenario.</p> <p>Efforts will be made to maximize the uniformity of the delivery of KMnO₄, and as a result additional Mn, to maximize the uniformity of treatment. It is not possible to ensure that less than ideal delivery is achieved.</p> |
| Work Plan | | | | |
| 3 | 2-5 | Section 2.2 | <p>3rd paragraph. Statements in this paragraph regarding the relative rates of oxidation using ozone and KMnO₄ conflict with rates given on page 2-3. Reaction rates with ozone are usually faster with ozone so statements made in this paragraph appear to be wrong. Clarify.</p> | <p>Ozone reaction rates are generally faster than KMnO₄ reaction rates. The conflicting statements have been revised to reflect this fact.</p> |
| 4 | | Section 2.3.2 | <p>It is hard to imagine that deep tilling would be "logistically and technically feasible" in the residential areas and in close proximity to underground utilities at the site. Is this approach actually practical for full-scale deployment at this site and if not then is there another reason to include it in this treatability study? Clarify.</p> | <p>Deep tilling is both the most intrusive and the most uniform of the delivery methods to be tested. As a result, this method of delivery is the most likely to succeed though logistical issues such as shallow residential utilities may limit the areas that may be treated by this approach during full scale remediation.</p> <p>Three delivery methods will be evaluated during the treatability study. Full-scale remediation of Estuary Park may involve one or more of these KMnO₄ delivery methods in combination with excavation and/or biological treatment. All KMnO₄ delivery methods that prove to be effective will be further evaluated in the FS. The FS will evaluate the implementability, in addition to other factors, to determine the most appropriate remedial approach for the large-scale treatment.</p> |

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| 5 | | Section 3.2.4 | <p>Clarify whether any steps will be taken to stabilize/cover the 6" of topsoil removed from these test cells, which will remain on-site over the 6-month course of these tests.</p> <p>The usefulness of soil berms on the surface of these test cells is not clearly explained. It appears that these berms would interfere with the use of tilling and injection equipment in the test cells. Explain the purpose of these berms around the test cells. The purpose of the berms around the chemical storage areas are clear and do not require additional discussion.</p> | <p>This statement within the text is unclear. The sod and root zone will be removed, but no extra soil will be taken. The root zone may extend approximately 6-in. The berms are necessary to keep the applied water and/or KMnO₄ solution within the cells. The goal is to keep all of the permanganate and water within the cells (with extreme caution regarding the control cells) and to properly monitor the amount of water used during the treatability study.</p> <p>Modifications may be necessary to gain access to the cells. Ramps or other modifications will be addressed in the field to allow proper access to the cells.</p> |
| 6 | | Figure 3-1 | <p>Include information regarding the length of the well screen and placement relative to groundwater for the piezometers.</p> | <p>The text and Figure 3-1 will be modified with the length of well screen for the piezometers and the casing depths for the neutron probe casings and their relation to groundwater.</p> <p>Well screens will be five feet long. The well screens will be set one foot below the water table surface to allow for hydration of the well seals. The text and Figures 3-1, 3-2, and 3-3 have been modified to show depth information relative to groundwater.</p> |
| 7 | | Section 3.5.3 | <p>Clarify where and how soil samples will be collected during the performance monitoring portion of this treatability test. Although the location and methodology are explained for the baseline sampling event, subsequent sampling locations and methodology are not discussed. Also, clarify whether performance monitoring will occur at 1, 3, and 6 months of operation. Although the introductory portion of this section mentions three sampling events, the subsections only mention two (1 and 3 months).</p> | <p>The text has been modified to clarify the sampling. The Field Sampling Plan will be modified to clarify where and how the samples will be collected.</p> <p>Three rounds of performance soil samples will be collected (1,3, and 6 months after delivery is completed). Figure 1-3 shows solid black dots at each soil sampling location. Performance soil samples will be collected as close a possible (less than two feet) to previous soil cores. As a result the soil sample locations will be matched as closely as possible to prior soil core locations during each of the performance sampling events. Matched sampling of composited soil samples was selected to minimize the inherent variability in the soil</p> |

| <i>Comments by: Melinda Trizinsky</i> | | | | |
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| | | | | analytical results resulting from the heterogeneous distribution of PAHs observed in Estuary Park and discussed in comment 1. The Work Plan has been modified to clarify the sampling plan and remove inconsistencies |
| 8 | | Section 3.6.1.4 | Will the berms interfere with the injection equipment? | Modifications to the berms may be made in the field to allow access to the cells. Ramps or other modifications may be necessary for equipment to enter the cells. The planned injection rig has a very small foot print which will allow movement within the test cells. |
| 9 | | Section 3.6.2 | Would the berms be installed after tilling? | The berms will be installed prior to tilling. The berm design will allow disassembly if needed to allow access of large tilling equipment. A temporary ramp or soil pile will most likely be used to allow a larger walk-behind tiller to be used as compared to a towed tiller. This balances the competing needs of accessibility and maximum depth of the tiller. Additional efforts are underway to further refine the equipment that will be used to perform the tilling operation. |
| 10 | | Section 3.6.2.1 | What about contact hazard with KMnO ₄ solids? Doesn't solid KMnO ₄ have the potential to cause burns when it is damp/wet? | <p>The physical hazards are discussed in the SHSP (Appendix C). Caution must be used during all mixing, application and monitoring activities as the dry KMnO₄ is a strong oxidizer.</p> <p>The primary hazard associated with KMnO₄ solids is inhalation. Level C PPE will be used whenever KMnO₄ solids are handled. The primary hazard associated with KMnO₄ solutions is splashes. As a result, whenever KMnO₄ solutions are in use Modified Level D including Tyvek suits, overboots, gloves, and face shields will be used. The physical hazards are discussed in the SHSP (Appendix C). A KMnO₄ Safety training program is required for all site workers prior to handling any KMnO₄ or entering the Exclusion Zone. This training program will discuss hazards, emergency response, and accident case studies.</p> |

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| 11 | | Section 3.6.2.2 | Would this tilling approach be feasible for full-scale remediation? It seems unlikely that this heavy equipment could be operated effectively/safely in close proximity to residential housing and underground utility lines. | <p>Three delivery methods will be analyzed during the treatability study to determine effectiveness. All methods that show effectiveness will be further evaluated in the FS. The FS will evaluate the implementability in addition to other factors to determine the most appropriate remediation alternative for the large-scale treatment.</p> <p>A variety of tilling equipment is available ranging from small hand operated tillers used in gardens to large towed tillers used in agriculture and fire prevention. Selection of the size of the tilling equipment for the treatability study will be made to balance the competing goals of accessibility and ease of operation versus depth of till. Detailed design and selection of tilling equipment will be performed during full-scale system design if this delivery approach is successful.</p> |
| 12 | | Section 4.2 | Clarify what will happen to the 6" of topsoil/sod that was stockpiled at the beginning of the treatability tests. It may be necessary to cover the test cells with clean topsoil at the conclusion of these tests to reduce possible exposure risks associated with B(a)P, residual KMnO ₄ , or elevated Mn. Additional topsoil may also improve seed generation and provide a better cover. | The topsoil/sod will be used in construction of the berms and covered throughout the treatability study. This material will be reused during site restoration. Final evaluation of the need for additional topsoil will be made during site restoration. |
| 13 | | Section 5.2 | What about the 6" of topsoil/sod that was removed at the beginning of the test? See section 3.2.4. The revegetation approach discussed in section 4.2 doesn't mention reusing this material. If this topsoil will not be reused, it adds significantly to the volume of soil that must be disposed of. | See above. The sod and topsoil will be reused during site restoration. |

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| Quality Assurance Project Plan | | | | |
| 14 | | Section 3.1.4 | This section discusses a treatability study of 4 months duration. The work plan describes a 6-month study. Clarify. | The text has been corrected to be a 6-month treatability study. |
| 15 | | Section 3.1.6 | The variability of B(a)P concentrations in site soils may create a situation where it is difficult to demonstrate that changes in B(a)P concentrations are truly related to the chemical oxidation process. The inherent variability of B(a)P concentrations at the site should be discussed in this section, and an approach should be formulated to deal with this problem. Was any effort made to statistically analyze how many samples should be collected for PAH analysis to ensure that changes in concentration can be distinguished from normal variation? | The discussion has been added. A statistical approach was considered for the sampling design as discussed in the response to comment 1. A statistical analysis of the number of samples that should be collected was not performed. The number of samples that are planned was based on ensuring adequate vertical and areal coverage of the treatment cells within reasonable budgetary limitations. Revisions to Section 3.1.7 were made to address this comment. |
| 16 | | Section 3.1.7 | Clarify how the PAH variability will be handled in the performance evaluation? Will the 9 samples from each test plot and 4-5 samples from each control be evaluated as individual samples, averaged, or both? | Both. See revisions to Section 3.1.7. |
| Field Sampling Plan | | | | |
| 17 | | Section 2.1 | Clarify where and how soil samples will be collected during the performance monitoring portion of this treatability test. Although the location and methodology are explained for the baseline sampling event, subsequent sampling locations and methodology are not discussed. | The text has been corrected to include a discussion of the performance monitoring sample collection. Three rounds of performance soil samples will be collected (1,3, and 6 months after delivery is completed). Figure 1-3 shows solid black dots at each soil sampling location. Performance soil samples will be collected as close a possible (less than two feet) to previous soil cores. As a result, the soil sample locations will be matched as closely as possible to prior soil core locations during each of the performance sampling events. Matched sampling of composited soil samples was selected to minimize the inherent variability in the soil |

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| | | | | analytical results resulting from the heterogeneous distribution of PAHs observed in Estuary Park and discussed in comment 1. The Field Sampling Plan will be modified to clarify where and how the samples will be collected. |

**Response to Comments on the Chemical Oxidation Treatability Study Installation Restoration Site 25
Alameda Point, Alameda, California
July 24, 2001**

| <i>Comments by: Nars Ancog</i> | | | | |
|---------------------------------------|-----------------|-------------------------------|--|--|
| Comment No. | Page No. | Section, Figure, Table | Comments | Response |
| General Comment | | | | |
| 1 | | | The order of the QAPP and FSP in the document is switched. | The FSP has been changed to Appendix A and the QAPP to Appendix B. |
| Field Sampling Plan | | | | |
| 2 | | Section 3.3.1 | Field Duplicates: Remove the reference to using field duplicates to evaluate sampling and analysis precision. Field duplicates will be used to assess the overall sample matrix variability. | The text has been changed to read: "... The purpose of field duplicate samples is to assess the overall sample matrix variability of the site..." |
| 3 | | Section 4.3 | Subsurface Soil Sampling Procedures: Need to reference Figures showing sample locations and how many samples per boring. | The text has been changed to include a reference to Figure 1-2, which shows soil boring locations and a reference to the number of samples per boring. |
| 4 | | Section 4.4 | Groundwater/Piezometer Sampling Procedures: Provide reference to piezometer locations and number of samples to be collected. | The text has been changed to include a reference to Figure 1-2, which shows the proposed piezometer locations; Figure 2-1, which shows the construction of piezometers; and Table 3-2, which references sampling frequency. |
| Quality Assurance Project Plan | | | | |
| 5 | | Section 3.1.5 | Developing a Decision Rule: The amount of reduction in BaP equivalents should be quantitative. A range or magnitude should be specified. | The text has been changed to read: "Treatment effectiveness will be evaluated in terms of BaP equivalent mass reduction, percent reduction, and residual concentrations. Additionally, treatment effectiveness will take into account the residual manganese concentrations at the site from the potassium permanganate. If the evaluation criteria are considered favorable and the minimum percent reduction in BaP equivalent concentration is 50 percent, then the in-situ chemical oxidation technology will be evaluated in the IR Site 25 |

Comments by: Nars Ancog

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| | | | | feasibility study. However if the treatment is not considered effective based on the evaluation criteria, then the treatment technology will not be evaluated in the IR Site 25 feasibility study.” |
| 6 | | Section 3.5 | Project-Required Reporting Limits: The text needs to include a statement relating the MDL discussion to the final RLs for the project. | The text has been changed to include the following sentence. “The laboratory will select the reporting limits (RL) for all analytes at concentration levels that exceed the calculated MDLs by a factor of two to ten.” |
| 7 | | Section 7.2 | Data Validation: According to 4EN.1, data collected during pilot tests does not require data validation. | The text has been changed to eliminate data validation by a third party validation company. The data will be reviewed by an IT project chemist prior to use for project decisions. |

**Response to Comments on the Chemical Oxidation Treatability Study Installation Restoration Site 25
Alameda Point, Alameda, California
July 29, 2001**

| <i>Comments by: Janet A. Corbett, US Navy</i> | | | | |
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| Comment No. | Page No. | Section, Figure, Table | Comments | Response |
| Site Health and Safety Plan | | | | |
| 1 | | | The Health and Safety Plan addresses the major requirements of references (a) and (c) when used in conjunction with the IT Corporation Program Health and Safety Plan for Environmental Remedial Actions. | (Response not applicable) |
| 2 | | Cover Page | Please sign cover page. | All appropriate persons will sign the cover pages before submittal of the Final Work Plan. |
| 3 | 1-2 | Section 1.2 | Please include duration of the project. | The project duration is approximately 9 months beginning on August 1, 2001. |
| 4 | | | Recommendations: Address/incorporate comments. | This Response to Comments will be attached to the Final Work Plan. |

Response to Comments on the Chemical Oxidation Treatability Study Installation Restoration Site 25
Alameda Point, Alameda, California
July 31, 2001

| <i>Comments by: Shirley Ng</i> | | | | |
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| Comment No. | Page No. | Section, Figure, Table | Comments | Response |
| <i>Project Quality Control Plan</i> | | | | |
| 1 | | Appendix D | Update IT personnel chart, i.e., project superintendent. | The personnel chart has been updated to include Sean Orman as the Alternate Superintendent. |
| <i>Site Health and Safety Plan</i> | | | | |
| 2 | | | Emergency telephone numbers: The correct telephone number for me as ROICC contact is (510) 749-5939. | The text has been corrected with the appropriate phone number. |



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CONTRACT : N62474-98-D-2076

DOCUMENT CONTROL NUMBER : 1809.0

TO: Administrative Contract Officer
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San Diego, CA 92101

Date : August 09, 2001

CTO : 0076

Location: Alameda

FROM:

Bob Hucet Joe

Tony Searls ←
Project Manager

DESCRIPTION *Responses to Comments on the Chemical Oxidation Treatability Study IR Site 25*
OF *Alameda Point dated July 24, 2001*
ENCLOSURE :

TYPE : Response To Comments

VERSION : N/A

REVISION No : 0

ADMIN RECORD : Yes

SCHEDULED DELIVERY DATE : N/A

ACTUAL DELIVERY DATE : August 09, 2001

NUMBER OF COPIES SUBMITTED TO THE NAVY: 1/O, 0/C, 1/E

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